73-99 EMPIRE BOULEVARD

KINGS COUNTY

BROOKLYN, NEW YORK

Remedial Action Work Plan

NYSDEC BCP Number: C224343

Prepared for:

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CERTIFICATION STATEMENT

I, Charles J. McGuckin, certify that I am currently a NYS registered professional engineer and that this Remedial Action Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and Green Remediation (DER-31).

Charles J. McGuckin, P.E.	June 1, 2026	
NYS Professional Engineer #069509	Date	Signature

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ACRONYMS

µg/kg ..... Micrograms per Kilogram

µg/L ..... Micrograms per Liter

µg/m^3 ..... Micrograms per Cubic Meter

mg/kg..... Milligrams per Kilogram

4,4'-DDE..... 4,4'-Dichlorodiphenyldichloroethylene

4,4'-DDD..... 4,4-Dichlorodiphenyldichloroethane

4,4'-DDT 4,4-Dichlorodiphenyltrichloroethane

AOCs..... Areas of Concern

ASP ..... Analytical Services Protocol

AWQSGVs ..... Ambient Water Quality Standards and Guidance Values

BCA..... Brownfield Cleanup Agreement

BCP ..... Brownfield Cleanup Program

BEEI ..... Bureau of Environmental Exposure Investigation

bls..... Below Land Surface

BOA..... Brownfield Opportunity Areas

CAMP..... Community Air Monitoring Plan

C/D ..... Construction and Demolition

CEH..... Center for Environmental Health

CFR..... Code of Federal Regulations

COC ..... Certificate of Completion

CP-51 ..... Commissioner Policy-51

CPP ..... Citizen Participation Plan

CQAP ..... Construction Quality Assurance Plan

CSM ..... Conceptual Site Model

CVOCs ..... Chlorinated Volatile Organic Compounds

CY ..... Cubic Yards

DAR..... Division of Air Resources

DCE..... cis-1,2-dichloroethene

DEC..... Department of Environmental Conservation

DER-10..... NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation

DMM ..... Division of Materials Management

DO ..... Dissolved Oxygen

DUSR ..... Data Usability Summary Report

EC ..... Engineering Control

ECL ..... Environmental Conservation Law

EDD ..... Electronic Data Deliverable

EJ ..... Environmental Justice

ELAP ..... Environmental Laboratory Approval Program

ESA ..... Environmental Site Assessment

FER ..... Final Engineering Report

Ft ..... Feet/Foot

HASP ..... Health and Safety Plan

HAZWOPER ..... Hazardous Waste Operations and Emergency Response

Hp ..... Horsepower

HVAC ..... Heating, Ventilation, and Air Conditioning

IC ..... Institutional Control

MEK ..... Methyl Ethyl Ketone; 2-butanone

MS/MSD ..... Matrix Spike/Matrix Spike Duplicate

MW ..... Monitoring Well

ng/L ..... Nanograms per Liter

NYCDEP ..... New York City Department of Environmental Protection

NYCDOT ..... New York City Department of Traffic

NYCRR ..... New York Codes, Rules, and Regulations

NYSDEC ..... New York State Department of Environmental Conservation

NYSDOH ..... New York State Department of Health

NYSDOT ..... New York State Department of Transportation

O&M ..... Operation and Maintenance

ORP ..... Oxidation-Reduction Potential

OSHA ..... Occupational Safety and Health Administration

PAHs ..... Polycyclic Aromatic Hydrocarbons

PCBs ..... Polychlorinated Biphenyls

PCE ..... Tetrachloroethene (Perchloroethene)

PEJA ..... Potential Environmental Justice Area

PDF ..... Portable Document Format

PID ..... Photo Ionization Detector

PPE ..... Personal Protective Equipment

PVC ..... Polyvinyl Chloride

QAPP ..... Quality Assurance Project Plan

QA/QC ..... Quality Assurance/Quality Control

RAOs ..... Remedial Action Objectives

RAWP ..... Remedial Action Work Plan

RI ..... Remedial Investigation

RIR ..... Remedial Investigation Report

SCG ..... Standards, Criteria, and Guidance

SCOs ..... Soil Cleanup Objectives

SEQRA ..... State Environmental Quality Review Act

SMP ..... Site Management Plan

SOE ..... Support of Excavation

SoMP ..... Soil Management Plan

SOP ..... Site Operations Plan

SSO ..... Site Safety Officer

SVOC ..... Semivolatile Organic Compounds

SWPPP ..... Stormwater Pollution Prevention Plan

TAGM ..... Technical and Administrative Memorandum

TAL ..... Target Analyte List

TCE ..... Trichloroethene

TCL ..... Target Compound List

TCLP ..... Toxicity Characteristics Leaching Procedure

TOGS ..... Technical and Operational Guidance Series

USEPA ..... United States Environmental Protection Agency

USGS ..... United States Geological Survey

VOC ..... Volatile Organic Compounds

EXECUTIVE SUMMARY

Site Description/Physical Setting/Site History

Empire McKeever Heights LLC (Empire McKeever) was added as a party to the existing Brownfield Cleanup Agreement (BCA) between Empire Boulevard Holdings LLC (Empire Boulevard) – the prior owner of the Site - and the New York State Department of Environmental Conservation (NYSDEC). The original BCA is dated March 16, 2022; Empire McKeever was added to the BCA as of August 8, 2025. NYSDEC determined that both Empire Boulevard and Empire McKeever qualified as a Volunteer. By further amendment, dated December 5, 2025, Empire Boulevard was removed from the BCA.

Empire Boulevard and, subsequently, Empire McKeever, entered into the New York State Brownfield Cleanup Program (BCP) to investigate and remediate a 0.87-acre property located at 73-99 Empire Boulevard in Brooklyn, Kings County, New York. Unrestricted use is proposed for the property. When completed, the Site will contain four multi-story buildings with cellar and sub-cellar levels for retail, parking garage and recreational space. Refer to the BCP application for additional details.

This Remedial Action Work Plan (RAWP) summarizes the nature and extent of contamination as determined from data gathered during the Remedial Investigation (RI), performed between March 10 and 13, 2023 and between July 28 and August 5, 2025, as well as the Supplemental RI performed on October 30 and 31, 2025. It provides an evaluation of a Track 1 cleanup and other applicable Remedial Action alternatives, their associated costs, and the recommended and preferred remedy. The remedy described in this document is consistent with the procedures defined in DER-10, DER-31, and complies with all applicable standards, criteria and guidance. The remedy described in this document also complies with all applicable Federal, State, and local laws, regulations and requirements. The NYSDEC and New York State Department of Health (NYSDOH) have determined that this Site does not pose a significant threat to human health and the environment. The RI for this Site did not identify fish and wildlife resources.

The Site is located in the County of Kings, Brooklyn, New York and is identified as Block 1306, Lot 28 on the New York City Tax Map. A United States Geological Survey (USGS) topographical quadrangle map (Figure 1) shows the Site location. The Site is situated on an approximately 0.87-acre area bounded by Sullivan Place to the north, Empire Boulevard to the south, commercial buildings to the east, and McKeever Place to the west (see Figure 2). A boundary map is attached to the BCA as required by Environmental Conservation Law (ECL) Title 14 Section 27-1419. The 0.87-acre property is fully described in Appendix A – Metes and Bounds. A global positioning system coordinate for the starting point is included.

The Remedial Action to be performed under the RAWP is intended to make the Site protective of human health and the environment consistent with the contemplated end use. The proposed redevelopment plan and end use are described here to provide the basis for this assessment. However, the Remedial Action contemplated under this RAWP may be implemented independent of the proposed redevelopment plan.

The planned redevelopment of the Site includes abatement and demolition of the existing buildings (already completed in July and August 2025) and construction of four multi-story residential buildings (14-story high) with a cellar level for retail space and utility rooms, as well as two levels of subcellar for parking garage and recreational space. Twenty percent (20%) of the residential units qualify as affordable units. The redevelopment plans are provided in Appendix B.

The Site is bounded by the following properties, as summarized in the table below. A figure representing the land use is provided as Figure 3. A Tax Map is shown in Figure 4.

Surrounding Property Uses	
North and Northeast	Sullivan Place beyond which is an apartment building (1720 Bedford Ave)
East	A commercial building occupied by Empire 103, a restaurant (103 Empire Blvd) beyond which is a mixed residential/commercial building occupied by a dance studio, a deli and residences (90 Sullivan Pl) and an industrial building occupied by Safeguard Self Storage (115 Empire Blvd)
Southeast	Empire Boulevard, beyond which are mixed residential/commercial buildings (104 and 110 Empire Blvd)
South and Southwest	Empire Boulevard beyond which is a commercial building occupied by Western Beef Supermarket (44 Empire Blvd)
West	McKeever Place, beyond which is a commercial building occupied by McDonald's (57 Empire Blvd)
Northwest	The intersection of McKeever Place and Sullivan Place beyond which is the Ebbets Field Middle School (46 McKeever Pl)

The Site is currently located in the C4-4D Zoning District. The nearest surface water body is the Prospect Park Lake located approximately 2,780 feet southwest of the Site. The Site is not in a flood zone. The Site is not located in or adjacent to any wetlands. The RI completed for the Site did not identify the potential for impacts to fish and wildlife resources. The nearest school (Ebbets Field Middle School) is located approximately 0.1 mile north of the Site. The nearest daycare (New Beginnings Family Daycare) is located approximately 0.3 miles northwest of the Site. The nearest hospital (Kings County Hospital) is located approximately 1.7 miles southeast of the Site.

Based on a review of previous environmental reports and documentation, including historical aerial photographs, former Lot 28 on the western portion of the Site was constructed in 1925 and was initially occupied by Mack Truck Auto Service until the late 1930s. It was later occupied by a garage in the mid-1940s and by an auto/truck/auto parts and service station in the early 1950s through early 2000s. A laundromat occupied the building from the early 2000s through 2014. The building remained vacant since 2014.

Former Lot 32 on the northwestern portion of the Site was developed with a store and apartment prior to 1932. The structures were demolished sometime between 1932 and 1951. Later, the parcel remained undeveloped, and it was used as a parking lot.

The Site is underlain with fill, mostly consisting of sand, gravel, silt, brick, concrete, cobble, asphalt and wood to a minimum depth of 5 feet (ft) below land surface (bls) and to a maximum depth of 14 ft bls across the Site. Beneath the fill, the subsurface is comprised of fine to coarse sand, silt, some gravel, and clay. Bedrock was not encountered but is estimated to be approximately 250 ft-bls according to the USGS survey.

According to the water level data collected from the newly installed wells on August 4 and 5, 2025, the elevation of the water table surface at the Site ranged from 11.06 ft to 11.51 ft relative to NAVD88, or from

61.2 ft bls in MW-1 to 61.3 ft bls in MW-3, respectively. Groundwater flow is generally to the east, as shown in Figure 6. A summary of water level data is included as Table 1.

Former Lot 35 on the eastern portion of the Site was constructed in 1930 and was originally occupied by the parts department of Mack Truck Auto Service. From the late 1930s to the early 1960s, the building was occupied by Tire Sales & Service. From the early 1960s to the late 1980s, the building was occupied by an auto and truck manufacturer. From the late 1980s through the early 1990s, the parcel was listed as Family Services. The building was vacant from 1994 through 2014. Later, World Laundry occupied the building until 2024.

Summary of the Remedial Investigation

The Site was investigated in accordance with the scope of work presented in the NYSDEC-approved Remedial Investigation (RI) Work Plan dated January 2023 and Supplemental RI (SRI) Work Plan dated October 2025. The remedial investigation was conducted between March 10 and 13, 2023 (in the former laundromat) and between July 28 and August 5, 2025 (in the former warehouse). The Supplemental RI (in the former warehouse) was performed on October 30 and 31, 2025.

The RI and SRI field investigation was completed in accordance with the RIWP and SRIWP, respectively, and associated project plans including the Health and Safety Plan (HASP), Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP) and Community Air Monitoring Plan (CAMP). All work was performed in accordance with appropriate regulations and guidance, including but not limited to NYSDEC DER-10 and NYSDOH SVI Guidance.

The following areas of concern (AOCs) were identified within the Site limits from historical documents:

- Soil contamination due to the presence of Site-wide urban fill; and
- Potential soil, groundwater, and soil vapor contamination from former Site uses.

Based on the existing data for the Site and known data gaps (e.g., a limited number of environmental samples were collected across the Site during the Phase II ESA), the following objectives have been identified:

- Delineate the nature and extent of potential impacts to soil from AOCs described above utilizing multiple sample depths (to define the cleanup track);
- Delineate the nature and extent of impacts to groundwater;
- Evaluate the soil vapor intrusion risk to future structures that will be built on-Site; and
- Fill data gaps from prior investigations (e.g., obtain more data across the Site).

Environmental data collected during the RI and SRI was used to qualitatively assess the potential exposure of receptors to Site contaminants and develop the information necessary to support the development of this RAWP.

Scope of Work

The scope of work for the RI and SRI included the following:

- The performance of Site reconnaissance to confirm proposed sampling locations;

- The collection of soil, groundwater and soil vapor samples sufficient to define the nature and extent of impacted media and current site conditions as summarized below;
    - The advancement of fourteen (14) soil borings and collection of twenty-six (26) soil samples during the RI and thirteen (13) soil borings and collection of 35 soil samples during the SRI, which were analyzed for the following full-suite of contaminants: VOCs, SVOCs, metals, PCBs, per- and polyfluoroalkyl substances (PFAS), and pesticides;
    - Installation of three (3) new groundwater monitoring wells and collection of three (3) groundwater samples during the RI, which were analyzed for the following full-suite of contaminants: VOCs, SVOCs, metals, PCBs, per- and polyfluoroalkyl substances (PFAS), and pesticides; and
    - Installation of six (6) soil vapor points and collection of six (6) soil vapor samples during the RI which were analyzed for VOCs using USEPA Method TO-15;
    - The collection of groundwater level measurements and land survey data as needed for developing a groundwater elevation contour map; and
- The performance of a qualitative exposure assessment to identify exposure pathways and evaluate contaminant fate and transport.

A Site plan showing all the sample locations from the RI and SRI is included in Figure 7. The soil boring and monitoring well logs are provided in Appendix D. The purge logs (groundwater and soil vapor sampling forms) are included in Appendix E.

The RIR, submitted under separate cover in November 2025, details all RI and SRI implementation field activities. All data was produced in accordance with NYSDEC Analytical Services Protocol (ASP) Category B deliverables and was reviewed and validated by Data Validation Services, a party independent of the project team, in a Data Usability Summary Report (DUSR) before being incorporated into the RIR for the Site.

Roux performed Site reconnaissance and, in conjunction with the previous Phase I ESA and Phase II ESA, identified potential AOCs, described above, which were evaluated during the RI. An inspection of the existing Site conditions was conducted to determine final locations of soil borings, monitoring wells, and soil vapor points based on actual field conditions.

A geophysical survey was conducted by Vertex during the Phase II Investigation on December 1, 2020, and March 8, 2021. The geophysical survey included a scan of drilling locations and targeted areas of the site. Anomalies indicative of USTs were not identified during the geophysical investigation.

Soil Investigation During the RI

Previous investigation indicated that fill was present throughout the Site at depths varying from the shallow zone (0 to 2 ft bls) to deeper zone in some areas ranging from 5 to 12 ft bls. Data collected during the RI was used to evaluate the thickness and distribution of fill, general soil quality conditions, to characterize the soil conditions for the AOCs at the Site and fill existing data gaps. To achieve that, fourteen (14) soil borings were installed at the locations shown in Figure 7 (12 in the former warehouse and 2 in the former laundromat). Boreholes were pre-cleared to five ft bls using non-intrusive methods, such as hand tools and/or vacuum excavation, prior to advancement of soil borings to verify the absence of utilities and/or other subsurface features (i.e., obstructions). Soil samples were collected by hand and by utilizing the GeoProbe® Direct-Push Drill Rig as well as the Sonic Rig. Soil samples were collected continuously from land surface to the base of the fill encountered. During installation of the soil borings, the lithology was

recorded, and soil was inspected for evidence (visual or olfactory) of contamination and field screened continuously for VOCs using a PID with a 10.6 eV lamp. No evidence of contamination was observed during the sampling. In each boring, two soil samples were collected (one above and one below the fill interface). Soil borings were advanced to a maximum depth of 15 ft bls.

Region of Site	Number of Borings	Boring ID	Analyses	Depth of Sample (ft bls)
Former Vacant Building (west)	12	RXSB-1 through RXSB-8 and RXSB-11 through RXSB-14	TCL/Part 375 + 30/TAL, ECs	3-5 or 6-8 or 7-9 or 8-10 (within the fill); and 5-7 or 8-10 or 9-11 or 10-12 or 13-15 (below the fill interface)
Former Laundromat (east)	2	RXSV-9, RXSB-10	TCL/Part 375 + 30/TAL, ECs	5-8 or 7-9 (within the fill); and 9-11 (below the fill interface)

Soil Investigation During the SRI

Data collected during the SRI was used to supplement existing RI data as well as to further determine the proposed remedial excavation depths. To achieve that, thirteen (13) soil borings were installed at the locations shown in Figure 7 (10 in the former warehouse and 3 in the former laundromat). Boreholes were drilled from grade to final depth using a Sonic Drill Rig. Soil samples were collected continuously from land surface to the predetermined depths established at each boring location. During installation of the soil borings, lithology was recorded, and soil was inspected for evidence (visual or olfactory) of contamination and field screened continuously for VOCs using a PID with a 10.6 eV lamp. No evidence of contamination was observed during the sampling. Soil borings were advanced to a maximum depth of 14 ft bls.

Grid Excavation Area	RI Samples Collected and Results (green indicates below UUSCO and red indicates above UUSCO)*	SRI Samples and Depth (Intervals in ft bls)
A	RXSB-3 (7-9) RXSB-3 (9-11)	SRI-1: (0-2), (4-6)
B	RXSB-5 (8-10) RXSB-5 (10-12) RXSB-13 (8-10) RXSB-13 (10-12)	SRI-2: (0-2), (3-5), (6-8), (12-14)
C	RXSB-6 (6-8) RXSB-6 (8-10)	SRI-3: (0-2), (3-5)
D	RXSB-9 (7-9) RXSB-9 (9-11)	SRI-4: (0-2), (4-6), (11-13)
E	RXSB-4 (6-8) RXSB-4 (8-10)	SRI-5: (0-2), (3-5)
F	RXSB-7 (3-5) RXSB-7 (5-7)	SRI-6: (0-2)
G	RXSB-10 (5-8) RXSB-10 (8-11)	SRI-7: (0-2), (2-4), (11-13)
H	RXSB-11 (6-8) RXSB-11 (13-15)	SRI-8: (0-2), (3-5)
I	RXSB-1 (8-10) RXSB-1 (10-12) RXSB-2 (6-8) RXSB-2 (8-10)	SRI-9: (0-2), (3-5)

Grid Excavation Area	RI Samples Collected and Results (green indicates below UUSCO and red indicates above UUSCO)*	SRI Samples and Depth (Intervals in ft bls)
J	RXSB-12 (6-8) RXSB-12 (8-10) RXSB-14 (8-10) RXSB-14 (10-12)	SRI-10: (0-2), (3-5), (10-12)
K	RXSB-8 (7-9) RXSB-8 (9-11)	SRI-11: (0-2), (4-6), (11-13) SRI-12 (near potential UST): (0-2), (4-6), (7-9), (11-13)
L	--	SRI-13: (0-2), (4-6), (7-9), (11-13)

Soil samples collected during the RI and soil samples collected during the SRI were analyzed for target compound list (TCL) + 30/ target analyte list (TAL), 1,4-Dioxane, and PFAS.

Groundwater Investigation

To characterize Site groundwater flow and quality conditions and to evaluate for potential off-Site migration, three permanent groundwater monitoring wells (MW-1, MW-2 and MW-3) were installed in the former warehouse at selected soil boring locations (RXSB-11, RXSB-13 and RXSB-14, respectively). According to the water level data collected during the RI, the elevation of the water table surface at the Site is relatively deep ranging from 61.2 to 61.3 ft bls The groundwater monitoring well locations are shown on Figure 7.

Monitoring wells were constructed of 2-inch inside diameter, Schedule 40 polyvinyl chloride (PVC) casing and 0.020-inch slot, machined PVC screen. Wells were constructed with 20-foot screen. A sand pack was placed around the well screen, extending two feet above the top of the screened zone. A two-foot-thick bentonite pellet seal was placed above the sand pack. The wells were completed using locking well plugs and flush mounted, bolt down, watertight and manhole covers cemented into place. Based on observed soil moisture during the well installation using the sonic drill rig, the wells were screened between 85-105 ft, 67-87 ft and 75-95 ft below grade.

Each new monitoring well was developed to ensure a proper hydraulic connection with the aquifer, and to reduce/eliminate turbidity of the groundwater. The 2-inch monitoring wells were developed using a submersible pump, which was surged periodically until well yield was consistent, and turbidity was visually clear.

Prior to sampling any wells, the depth to groundwater in each monitoring well was measured using an electronic water level meter and a groundwater contour was developed using the survey data. One week following redevelopment, all wells were sampled consistent with USEPA low-flow sampling requirements using a peristaltic pump and one round of groundwater samples was collected in accordance with the QAPP/FSP provided in the RIWP. Field parameters (e.g., pH, dissolved oxygen, oxidation-reduction potential [ORP], etc.) were also collected using a water quality meter during purging and prior to sampling.

All monitoring wells were surveyed by a licensed New York State surveyor (Fehringer Surveying, P.C.) to obtain horizontal and vertical coordinates.

The groundwater samples were analyzed for:

- TCL + 30/TAL/Part 375 (including filtered and unfiltered metals, SVOCs, PCBs and pesticides) and ECs.

Soil Vapor Investigation

Six soil vapor samples (RXSV-1 through RXSV-6) were collected during the RI to further assess the impact of the urban fill and historical operations as shown on Figure 7. RXSV-1 through RXSV-4 were installed within the former warehouse in 2025. RXSV-5 and RXSV-6 were installed in the former laundromat in 2023.

The soil vapor samples were collected from soil vapor points installed by hand or by using a Geoprobe® to the target depth of approximately 5 ft bls.

New Teflon®-lined tubing was attached to an expendable soil vapor sampling point with a 6-inch stainless steel screen. The soil vapor points were backfilled with #2 Morie sand to approximately one foot above the screen. The remainder of the borehole were backfilled with a concrete/bentonite slurry to grade.

The soil vapor samples were collected using pre-cleaned (batch certified) 6-liter summa canisters with regulators calibrated to collect samples and analyzed using USEPA Method TO-15 for VOCs. A helium tracer gas test was performed on each vapor point prior to sampling in accordance with the procedures outlined in the NYSDOH Guidance.

The laundromat was operational in 2023; accordingly, in addition to the two sub-slab soil samples, two indoor air samples (IA-1 and IA-2) and one outdoor ambient air sample (AA-1) were collected inside and outside the laundromat over an 8-hour period. The sub-slab samples taken from the former warehouse were collected over an 8-hour period.

Local Geology and Hydrogeology

Based on the RI and SRI completed by Roux and investigation results from prior consultants, the Site is underlain with fill, mostly consisting of sand, gravel, silt, brick, concrete, cobble, asphalt, and wood to a minimum depth of 5 feet (ft) below land surface (bls) and to a maximum depth of 14 ft bls across the Site. Beneath the fill, the subsurface is comprised of fine to coarse sand, silt, some gravel, and clay. Bedrock was not encountered but is estimated to be approximately 250 ft-bls according to the USGS survey. Soil boring logs are provided in Appendix D.

According to the water level data collected from the newly installed wells on August 4 and 5, 2025, the elevation of the water table surface at the Site ranged from 11.06 ft to 11.51 ft relative to NAVD88, or from 61.2 ft bls in MW-1 to 61.3 ft bls in MW-3, respectively. Groundwater flow is generally to the east, as shown in Figure 6. A summary of water level data collected during the RI is included in Table 1.

Summary of Results

In summary, the data generated during the RI and SRI indicate the following about Site-wide conditions:

- Previous investigation indicated that fill was present throughout the Site at depths varying from the shallow zone (0 to 2 ft bls) to deeper zone in some areas ranging from 5 to 12 ft bls. Data collected during the RI indicated that the Site is underlain with fill, mostly consisting of sand, gravel, silt, brick, concrete, and wood to a minimum depth of 5 feet (ft) below land surface (bls) and to a maximum depth of 10 ft bls across the Site. Beneath the fill, the subsurface is comprised of fine to coarse sand, silt, some gravel and clay. Data collected during the SRI indicated that the Site is underlain with fill, mostly consisting of sand, gravel, silt, brick, cobble and asphalt to a maximum depth of 14 ft bls across the Site. Beneath the fill, the subsurface is comprised of fine to coarse sand, silt, some gravel and clay.

- According to the water level data collected during the RI, the elevation of the water table surface at the Site ranged from 11.06 ft to 11.51 ft relative to NAVD88, or from 61.2 ft bls in MW-1 to 61.3 ft bls in MW-3, respectively. Groundwater flow is generally to the east.
- In general, exceedances of soil contamination were mostly limited to SVOCs, metals and pesticides with the exception of some VOC impacts in RXSB-8, on the south side of the former warehouse. Groundwater impacts were limited to SVOCs in MW-1 and MW-3. Four VOCs (benzene, ethylbenzene, toluene and xylenes) in exceedance of the UUSCOs and PGWSCOs were detected in only one of the 31 soil samples. There were no exceedances of their respective RRSCOs. The VOCs detected in RXSB-8, located on the south side of the former warehouse, could be associated with a potential presence of a gasoline UST in this vicinity, although it was not observed during the geophysical survey. The only VOC detected in groundwater was chloroform, likely as result of the by-product from the water supply used during sonic drilling activities.
- SVOCs were not detected in all but one of the RI soil samples exceeding the SCOs at marginal levels, but were detected in groundwater exceeding AWQSGVs in all wells except MW-2. Therefore, these SVOC exceedances in groundwater can be attributed to turbidity or offsite sources and not related to onsite soil contamination. During the SRI, nine SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo (g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-c,d)pyrene, phenanthrene) were detected in exceedance of one or more SCOs (UUSCOs, RRSCOs and/or PGWSCOs) in 11 of the 37 soil samples. These SVOCs exceedances were found in shallow soils (0-2, 3-5 and 4-6 ft bls) and are indicative of fill material.
- During the RI, metals (lead, mercury and nickel) in exceedance of the UUSCOs were detected in six soil samples. Metals in exceedance of the RRSCOs were detected in one soil sample. Metals in exceedance of PGWSCOs were detected in one soil sample. During the SRI, metals (hexavalent chromium, copper, lead, mercury, nickel and/or zinc) were detected in exceedance of one or more SCOs (UUSCOs, RRSCOs and/or PGWSCOs) in 25 of the 37 soil samples. The metals detected in soil are indicative of fill material. All metals detected in groundwater (iron, selenium, sodium and magnesium) above AWQSGVs are naturally occurring. Therefore, there is no indication that metals in soil are a source of metals in groundwater.
- During the RI, PCBs, Pesticides and Herbicides were either not detected or the detections were below the SCOs in both soil and groundwater. During the SRI, Pesticides (p,p'-DDE and p,p-DDT) were detected in three soil samples (SRI-7 and SRI-8) in the shallow soils (0-2 and 3-5 ft bls) above the UUSCO.
- During the RI, PFOA was detected in both soil and groundwater exceeding the SCOs. PFOA was detected in one soil sample exceeding UUSCOs and PGWSCOs and all groundwater samples exceeding AWQSGVs. PFOS was detected in three of the four groundwater exceeding AWQSGVs. There is no documented use of PFAS at the Site, and only one detection of PFOA exceeded PGWSCOs in soil at RXSB-1, which is not co-located with MW-3. During the SRI, PFOA was detected in one soil sample (SRI-8 at 3-5 ft bls) exceeding UUSCOs and PGWSCOs. These detections of PFAS could indicate an upgradient, off-Site source. There is no documented use of PFAS at the Site.
- Based on the soil vapor samples collected during the RI, there were Site-wide detections of VOCs. Petroleum-related and chlorinated VOCs were detected in soil vapor samples across the Site at low concentrations and are not attributed to soil or groundwater contamination onsite.
- The indoor and outdoor samples collected in 2023 during the RI when the laundromat was operational, indicate that carbon tetrachloride detections were attributed to the laundromat operations since they were not detected in the soil vapor samples. The other petroleum and chlorinated VOCs detected in the indoor and outdoor samples were at low concentrations which did not require further action based on the NYSDOH matrices.

In summary, the data collected during the RI and SRI indicate that fill-related impacts (SVOCs, and some metals and pesticides) are present in Site soils. Limited petroleum related VOC exceedances are present in the south portion of the Site. In groundwater, SVOC exceedances can be attributed to turbidity or offsite sources since groundwater is very deep (60+ feet below grade). Metal exceedances in groundwater are naturally occurring. Soil vapor samples across the Site have low VOC detections and are not attributed to soil or groundwater contamination.

Qualitative Human Health Exposure Assessment

As described in Appendix 3B of DER-10, *"The overall purpose of the Qualitative Human Health Exposure Assessment (or the exposure assessment) is to evaluate and document how people might be exposed to site related contaminants, and to identify and characterize the potentially exposed population(s) now and under the reasonably anticipated future use of the site."* The following section details the Qualitative Human Health Exposure Assessment based on data discussed in previous sections of this RAWP.

Soil Exposure

Soil samples collected during the RI and SRI indicated the presence of VOCs, SVOCs, metals, pesticides and PFOA at concentrations above the NYSDEC UUSCOs. Individuals could be exposed to these contaminants through direct contact with soil during ground intrusive work at the Site if they do not take precautionary measures to protect themselves as will be required during the BCP remediation. Direct contact without the use of proper personal protective equipment (PPE) and personal hygiene measures could lead to dermal contact and incidental ingestion of these compounds. Since the Site is currently fully fenced and will be fully fenced during construction activities, and access is controlled, potential contact with Site soil is restricted to remedial and construction contract workers at the Site performing ground intrusive activities in addition to trespassers and passersby (through potential particulate matter in the air) to the extent the dust control measures are not implemented. The general public will not be exposed to direct contact with Site soil. CAMP and dust control measures will be implemented, including a truck wash at the exit of the Site during intrusive activities to minimize the potential for offsite exposures by controlling soil/dust/vapor from leaving the Site.

Groundwater Exposure

Groundwater samples collected during the RI indicated that one VOC (chloroform), SVOCs, and PFOS/PFOA are present at concentrations above the NYSDEC AWQSGVs. Groundwater is not used for drinking or other potable purposes (the area is connected to the public water supply), and there is no direct contact with or ingestion of groundwater by the general public. Furthermore, no public water supply wells are located in the area surrounding the Site or are allowed to be located in this area pursuant to NYC law.

Individuals who perform intrusive work (i.e., utility construction and/or repair), perform groundwater sampling, or remedial activities may come into contact with contaminated groundwater. The depth to groundwater of over 60 feet below grade makes exposure to groundwater unlikely to workers. Proper personal protective equipment (PPE) and personal hygiene measures will be required to prevent dermal contact and the potential for incidental ingestion of these compounds.

The proposed on-Site buildings will be serviced by the public water supply. Based on this, there is no public exposure pathway for contaminated groundwater, and the exposure pathway for workers with potential direct contact with contaminated groundwater will be reduced or eliminated via implementation of the HASP.

Soil Vapor Exposure

Soil vapor samples collected during the RI indicated the presence of petroleum-related VOCs and CVOCs across the Site. These impacts are Site-wide, at generally low concentrations.

Individuals who perform ground intrusive work and passersby during the remedial action may be exposed to contaminated soil vapor if HASP and CAMP measures are not employed. CAMP and odor/vapor control measures will be implemented during intrusive activities to minimize the potential for offsite exposures from vapors leaving the Site during the remedial action.

Soil vapor intrusion could be a concern for the occupants in the future on-Site building if soil vapor intrusion mitigation measures are not proposed. Therefore, soil vapor mitigation measures will be considered as part of the remedy.

Fish and Wildlife Assessment (FWIA)

The RI for this Site did not identify the potential for impacts to fish and wildlife resources as determined by the Fish and Wildlife Resources Analysis Decision Key (Appendix A of the RIR).

Summary of the Remedy

A remedial program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings shall be constructed, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), or similar Department accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as

well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial program, as appropriate. The project will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial program.

Additionally, the remedial program will include a climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities

The elements of the selected Track 1 Unrestricted Use Cleanup are detailed below.

- Installation of support of excavation (SOE) to support the proposed remedial excavation depths. The SOE is comprised of drilled soldier piles, waler and timber lagging installed along the Site boundary. A temporary 1:1 earth berm (outside the property line) will be installed (along the north, south and west sides of the Site) until the foundation wall is braced by the proposed building first floor.
- For remedial purposes, the estimated excavation and disposal of soil to achieve Track 1 Unrestricted Use cleanup is approximately 13,450 CY. The limits and approximate depths of the remedial excavation ranging from 3 to 14 feet below grade and are shown on Figure 11. For construction purposes, the excavation and off-site disposal of soil is approximately 54,300 CY. The estimated depth of excavation for construction purposes is 37 feet below grade.
- Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during intrusive Site work.
- Appropriate off-site disposal of all materials removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport and disposal.
- To evaluate the performance of the remedy with respect to attainment of Track 1 UUSCOs, collection and analysis of post-excavation bottom confirmation endpoint samples at a frequency of one per 900 square feet as well as confirmation sidewall samples at a frequency of one per 30 linear feet to document that the SCOs were met. Based on this frequency, a total of 42 bottom endpoint samples and 11 sidewall samples would be required. The sidewall samples are located in between the remedial excavation grids. Sidewall samples are not required where excavation extends to the property line.
- Backfill and compaction of clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in (if needed) to replace the excavated soil and establish the designed grades at the Site. Backfill and compaction of clean fill meeting UUSCO, shall be in compliance with: (1) chemical limits and other specifications included in Table 18, (2) all Federal, State and local rules and regulations for handling and transport of material.
- Dewatering is not expected to be required to complete the remedial excavation because the depth to groundwater is much deeper (approximately 61 feet below grade) than the proposed excavation depths. In the event that limited shallow dewatering is required, it will be in compliance with city, state, and federal laws and regulations. Extracted groundwater will either be containerized for off-Site licensed or permitted disposal or will be treated on-Site under an NYSDEC SPDES equivalency permit and site connection permit from New York City Department of Environmental Protection to meet pretreatment requirements prior to discharge to a storm sewer system discharging to an outfall.

- Since all sources are being removed through extensive excavation as part of the Track 1 remedy, and depth the groundwater is much deeper than the proposed excavation, groundwater treatment is not required.
- As part of the Track 1 remedy, a soil vapor intrusion evaluation will be completed. The evaluation will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion.

REMEDIAL ACTION WORK PLAN

1.0 INTRODUCTION

Empire McKeever Heights LLC (Empire McKeever) was added as a party to the existing Brownfield Cleanup Agreement (BCA) between Empire Boulevard Holdings LLC (Empire Boulevard) – the prior owner of the Site - and the New York State Department of Environmental Conservation (NYSDEC). The original BCA is dated March 16, 2022; Empire McKeever was added to the BCA as of August 8, 2025. NYSDEC determined that both Empire Boulevard and Empire McKeever qualified as Volunteer. By further amendment, dated December 5, 2025, Empire Boulevard was removed from the BVA.

Empire Boulevard, and subsequently, Empire McKeever, entered into the New York State Brownfield Cleanup Program (BCP) to investigate and remediate a 0.87-acre property located at 73-99 Empire Boulevard in Brooklyn, Kings County, New York. Unrestricted use is proposed for the property. When completed, the Site will contain four multi-story buildings with cellar and sub-cellar levels for retail, parking garage and recreational space. Refer to the BCP application for additional details.

This Remedial Action Work Plan (RAWP) summarizes the nature and extent of contamination as determined from data gathered during the Remedial Investigation (RI), performed between March 10 and 13, 2023 and between July 28 and August 5, 2025, as well as the Supplemental RI performed on October 30 and 31, 2025. It provides an evaluation of a Track 1 cleanup and other applicable Remedial Action alternatives, their associated costs, and the recommended and preferred remedy. The remedy described in this document is consistent with the procedures defined in DER-10, DER-31, and complies with all applicable standards, criteria and guidance. The remedy described in this document also complies with all applicable Federal, State, and local laws, regulations and requirements. The NYSDEC and New York State Department of Health (NYSDOH) have determined that this Site does not pose a significant threat to human health and the environment. The RI for this Site did not identify fish and wildlife resources.

A formal Remedial Design document will not be prepared.

1.1 Site Location And Description

The Site is located in the County of Kings, Brooklyn, New York and is identified as Block 1306, Lot 28 on the New York City Tax Map. A United States Geological Survey (USGS) topographical quadrangle map (Figure 1) shows the Site location. The Site is situated on an approximately 0.87-acre area bounded by Sullivan Place to the north, Empire Boulevard to the south, commercial buildings to the east, and McKeever Place to the west (see Figure 2). A boundary map is attached to the BCA as required by Environmental Conservation Law (ECL) Title 14 Section 27-1419. The 0.87-acre property is fully described in Appendix A – Metes and Bounds. A global positioning system coordinate for the starting point is included.

1.2 Contemplated Redevelopment Plan

The Remedial Action to be performed under the RAWP is intended to make the Site protective of human health and the environment consistent with the contemplated end use. The proposed redevelopment plan

and end use are described here to provide the basis for this assessment. However, the Remedial Action contemplated under this RAWP will be implemented independent of the proposed redevelopment plan.

The planned redevelopment of the Site includes abatement and demolition of the existing buildings (already completed in July and August 2025) and construction of four multi-story residential buildings (14-story high) with a cellar level for retail space and utility rooms, as well as two levels of subcellar for parking garage and recreational space. Twenty percent (20%) of the residential units will qualify as affordable units. The redevelopment plans are provided in Appendix B.

1.3 Description of Surrounding Property

The Site is bounded by the following properties, as summarized in the table below. A figure representing the land use is provided as Figure 3. A Tax Map is shown in Figure 4.

Surrounding Property Uses	
North and Northeast	Sullivan Place beyond which is an apartment building (1720 Bedford Ave)
East	A commercial building occupied by Empire 103, a restaurant (103 Empire Blvd) beyond which is a mixed residential/commercial building occupied by a dance studio, a deli and residences (90 Sullivan Pl) and an industrial building occupied by Safeguard Self Storage (115 Empire Blvd)
Southeast	Empire Boulevard, beyond which are mixed residential/commercial buildings (104 and 110 Empire Blvd)
South and Southwest	Empire Boulevard beyond which is a commercial building occupied by Western Beef Supermarket (44 Empire Blvd)
West	McKeever Place, beyond which is a commercial building occupied by McDonald's (57 Empire Blvd)
Northwest	The intersection of McKeever Place and Sullivan Place beyond which is the Ebbets Field Middle School (46 McKeever Pl)

The Site is currently located in the C4-4D Zoning District. The nearest surface water body is the Prospect Park Lake located approximately 2,780 feet southwest of the Site. The Site is not in a flood zone. The Site is not located in or adjacent to any wetlands. The RI completed for the Site did not identify the potential for impacts to fish and wildlife resources. The nearest school (Ebbets Field Middle School) is located approximately 0.1 mile north of the Site. The nearest daycare (New Beginnings Family Daycare) is located approximately 0.3 miles northwest of the Site. The nearest hospital (Kings County Hospital) is located approximately 1.7 miles southeast of the Site.

2.0 BACKGROUND

The following sections provide pertinent background information, including documented history of the Site, and the results of previous environmental investigation work conducted at the Site.

2.1 Historical Land Uses

Based on a review of previous environmental reports and documentation, including historical aerial photographs, former Lot 28 on the western portion of the Site was constructed in 1925 and was initially occupied by Mack Truck Auto Service until the late 1930s. It was later occupied by a garage in the mid-1940s and by an auto/truck/auto parts and service station in the early 1950s through early 2000s. A laundromat occupied the building from the early 2000s through 2014. The building has been vacant since 2014.

Former Lot 32 on the northwestern portion of the Site was developed with a store and apartment prior to 1932. The structures were demolished sometime between 1932 and 1951. Later, the parcel remained undeveloped, and it was used as a parking lot.

Former Lot 35 on the eastern portion of the Site was constructed in 1930 and was originally occupied by the parts department of Mack Truck Auto Service. From the late 1930s to the early 1960s, the building was occupied by Tire Sales & Service. From the early 1960s to the late 1980s, the building was occupied by an auto and truck manufacturer. From the late 1980s through the early 1990s, the parcel was listed as Family Services. The building was vacant from 1994 through 2014. Later, World Laundry occupied the building until 2024.

2.2 Geologic and Hydrogeologic Conditions

The Site is underlain with fill, mostly consisting of sand, gravel, silt, brick, concrete, cobble, asphalt, and wood to a minimum depth of 5 feet (ft) below land surface (bls) and to a maximum depth of 14 ft bls across the Site. Beneath the fill, the subsurface is comprised of fine to coarse sand, silt, some gravel, and clay. Bedrock was not encountered but is estimated to be approximately 250 ft-bls according to the USGS survey.

According to the water level data collected from the newly installed wells on August 4 and 5, 2025, the elevation of the water table surface at the Site ranged from 11.06 ft to 11.51 ft relative to NAVD88, or from 61.2 ft bls in MW-1 to 61.3 ft bls in MW-3, respectively. Groundwater flow is generally to the east, as shown in Figure 6. A summary of water level data is included as Table 1.

2.3 Historical Environmental Reports

This section provides an overview of previous environmental-related activities completed at the Site based on a review of readily available information and the following environmental reports (included in Appendix B of the RIR). The following previous environmental documents have been reviewed for the Site:

- **Phase I Environmental Site Assessment**, prepared by The Vertex Companies, Inc., dated December 23, 2020.
- **Phase II Limited Subsurface Investigation/Supplemental Phase II Limited Subsurface Investigation**, prepared by The Vertex Companies, Inc., dated November 4, 2021.

A summary of the findings from assessments of the Site is provided below.

Phase I Environmental Site Assessment, prepared by The Vertex Companies, Inc., dated December 23, 2020

VERTEX performed a Phase I ESA of the site in November 2020. The following Recognized Environmental Conditions (RECs) were identified:

- Historical onsite operations including auto service and auto, truck, and equipment manufacturing at Lot 28 and auto service operations at former Lot 35. A forge was depicted at Lot 28 in historical resources.
- Historical operations on off-site properties to the west (filling station and/or auto repair from the 1920s to 1990s with gasoline tanks) and to the east (auto repair and/or manufacturing from the 1950s to late 2000s with gasoline tanks).
- A reportedly out of service fuel oil tank was observed in the partial basement of Lot 28. While the tank is aboveground, it is encased in concrete and unable to be inspected. Accordingly, the tank is considered to be an underground storage tank (UST) per New York State regulations.
- A gasoline UST was identified on historical Sanborn fire insurance maps on Lot 28. Evidence of the gasoline UST was not observed during the Phase I ESA site walk.
- Remnants of hydraulic lifts were observed in the building on Lot 28.

The following environmental concerns were identified:

- A 55-gallon drum with unknown contents was observed in the basement of Lot 28. The drum was in poor condition; however, the concrete floor beneath the drum was in good condition.
- Two structures were formerly present on former Lot 32, which is now paved with no buildings present. The heating source for the previous buildings could not be confirmed. As such, there is the potential for the presence of heating oil tanks on former Lot 32.

Phase II Limited Subsurface Investigation/Supplemental Phase II Limited Subsurface Investigation, prepared by The Vertex Companies, Inc., dated November 4, 2021

VERTEX performed a Phase II Limited Subsurface Investigation (LSI) in December 2020 and supplemental Phase II LSIs in March and August 2021 (Phase II ESA). The purpose of the Phase II ESA was to investigate the RECs and environmental concerns identified during the Phase I ESA. The Phase II ESA consisted of the following:

Phase II ESA – December 2020

- A geophysical investigation.
- The collection and analysis of five sub-slab soil vapor (SSSV) sampling locations.
- The installation of fifteen soil borings and the collection and analysis of soil samples to evaluate RECs identified during the Phase I ESA.

Supplemental Phase II ESA – March 2021

- A geophysical investigation.
- The installation of six soil borings and collection and analysis of soil samples to delineate elevated concentrations of polynuclear aromatic hydrocarbons (PAHs) identified at Phase II ESA sampling location VTX-09.

- The installation of four test pits and the collection and analysis of soil samples to evaluate the presence or absence of fill material at the site.
- The installation of a temporary monitoring well to evaluate groundwater conditions at the site.

Supplemental Phase II ESA- Shallow Soil Investigation – August 2021

- A geophysical investigation.
- The installation of twenty shallow soil borings and the collection and analysis of soil samples.

The results of the Phase II ESA identified the following:

- A geophysical survey was conducted by Vertex during the Phase II Investigation on December 1, 2020, and March 8, 2021. The geophysical evaluation included a scan of drilling locations and targeted areas of the site and did not include a scan of the entire site. A geophysical report was not prepared; however, VERTEX was on-site during the investigation to document the findings. Drilling locations were relocated, as required. Anomalies indicative of USTs were not identified during the geophysical investigation.
- SSSV impacts suspected to be related to a leaking fire sprinkler line and historical site operations were identified. All detected SSSV concentrations were below the New York State Department of Health (NYSDOH) Soil Vapor/Indoor Air Matrix Values.
- PAH-impacted soil with concentrations higher than detected elsewhere on the site was initially identified in the vicinity one of the hydraulic lifts (VTX-09) on the northern side of the site. This area was delineated horizontally and vertically during the Supplemental Phase II ESA. The area is approximately 3,000 square feet by 10 feet deep, which equates to approximately 1,670 tons (based on a conversion factor of 1.5 tons per cubic yard). A spill was reported to the NYSDEC on June 4, 2021, and Spill No. 2102064 was assigned to the site.
- Extensive soil sampling has been completed at the site. Soils consisting of fill material containing mostly brown silty sand and gravel. Isolated areas with brick, wood, and concrete were observed on the eastern and northern portions of the site. Underlying the fill is red brown sand. Shallow soil sampling (less than 5 feet bgs) results identified concentrations of PAHs and metals in exceedance of the NYSDEC Soil Cleanup Objectives (SCOs) for Industrial Use (RUSCO-I), for Commercial Use (RUSCO-C), and for Restricted Residential Use (RUSCO-RR). Intermediate sampling (5 to 10 feet bgs) also identified concentrations of metals in exceedance of the RUSCO-RR. Deeper soil sampling (10 to 15 feet bgs) identified concentrations of PAHs in exceedance of the RUSCO-RR.
- These contaminants are consistent with historic fill material; however, the PAH impacts are present in areas of observed fill material as well as in areas with no observed brick, wood, etc. The distribution of the elevated PAH and metal detections in some portions of the site without fill indicates historic site operations as the source of the PAH and metal impacts. This is further supported by the elevated concentrations of PAHs at depth in the vicinity of VTX-09 and the mercury concentrations detected across the site in intermediate soils.
- Two additional mercury and lead hot spot areas were identified at VTX-06 and VTX-15.
- A temporary monitoring well was installed to 63 feet bgs on the eastern side of Lot 28, downgradient from the former site operations. Bedrock or groundwater were not encountered during the investigation. No evidence of deep soil impacts with the potential to adversely impact groundwater quality was observed.

2.4 Sanborn Maps

All Sanborn Maps available for this Site were reviewed prior to the preparation of the RAWP.

The table below provides a summary of the Subject Property and surrounding area from 1888 to 2007, as determined from the Certified Sanborn Fire Insurance maps, which are included as Appendix C.

Sanborn Map Review		
Year	**Summary (OnSite)**	**Summary (OffSite)**
1888	The site is developed with a residence and several storage sheds on the eastern side (Lot 35) of the property.	The northwestern adjacent properties are developed with residences. Properties to the north, west, east, and south are primarily undeveloped. Clove Road is depicted on the western site boundary.
1908	No significant changes from the 1888 Sanborn map.	Properties to the north, northwest, and west are developed with dwellings and storage sheds. No other significant changes from the 1888 Sanborn map.
1932	The site (Lots 28 and 35) is occupied by Mack Truck Auto Service. The property is divided into four parts: an office, file room, a forge, and a parts department. A gasoline tank is shown on the southern portion of the property. Lot 32 is developed with a store and an apartment.	The northern adjacent property is developed with Ebbets Field, a baseball field. The western adjacent property is additionally developed with a filling station, an auto repair station, and the Flatbush Pumping Station. The southern adjacent properties are developed with the King County Buick Company, Inc. Several auto repair areas, garages, and gasoline tanks are depicted. Properties to the east are occupied by garages. There are several gasoline tanks depicted at the garages.
1951	The site is depicted as Auto Sales & Service. The gasoline tank is still depicted on the southern side of the site. Lot 32 is undeveloped.	The western adjacent property is occupied by a filling station, stores, and residences. No other significant changes to the eastern, western, or southern neighboring properties.
1963	No significant changes compared to the 1951 Sanborn map.	The northern adjacent property has been redeveloped into an apartment complex. The eastern adjacent properties are occupied by a private garage and magazine depot, a stationary warehouse, and a sheet metal working business. The southern properties are additionally developed with a tire sales and service station, private garage, and residences. The western adjacent property is occupied by a filling station, auto repair station, and residences.
1965	No significant changes compared to the 1963 Sanborn map.	The property to the west is listed as a used auto sales dealer. Gasoline tanks are depicted at the same location as the former filling station. No other significant changes to the north, west, east, or south compared to the 1963 Sanborn map.
1978 1979 1980	Lot 35 is listed as manufacturing. No other significant changes compared to the 1965 Sanborn map.	The Jackie Robinson Intermediate School occupies the northwestern adjacent property. No other significant changes to the north, west, east, or south compared to the 1963 Sanborn map.
1982 1987	The site (Lot 28) is listed as a commercial property. The gasoline tank is no longer depicted.	No significant changes compared to the 1980 Sanborn map.
1988 1989	Lot 35 is listed as Family Service. No other significant changes compared to the 1987 Sanborn map.	No significant changes compared to the 1987 Sanborn map.

Sanborn Map Review		
Year	**Summary (OnSite)**	**Summary (OffSite)**
1991 1992 1993	No significant changes compared to the 1989 Sanborn map.	No significant changes compared to the 1989 Sanborn map except the western adjacent property is labeled as a commercial building. The southern adjacent properties are occupied by garages and auto repair stations.
1994	Lot 35 is labeled as vacant. No other significant changes.	The southeastern adjacent property is occupied by a commercial building. No other changes from the 1993 Sanborn map.
1995 2001	No significant changes compared to the 1994 Sanborn map.	The southern adjacent properties are listed as commercial. No other changes.
2002 2003 2004	No significant changes compared to the 2001 Sanborn map.	No significant changes to the northern and southern neighboring properties compared to the 2001 Sanborn map.
2005 2006 2007	No significant changes from the 2004 Sanborn map.	No significant changes to the northern and southern neighboring properties compared to the 2001 Sanborn map. The eastern neighboring property is now labeled as an Auto-Repair.

2.5 Description of areas of concern

Based on the findings of the prior investigations, the following area of concern (AOCs) were further investigated as part of the RI and SRI:

- Historic fill based on previously identified fill material at depth at the Site;
- Presence of potential impacts to soil and groundwater from any USTs encountered;
- Presence of potential impacts from historical on-Site operations; and
- Collection and analysis of additional soil samples to supplement the existing RI data as well as to further determine the proposed remedial excavation depths.

3.0 REMEDIAL INVESTIGATION FIELD ACTIVITIES

The Site was investigated in accordance with the scope of work presented in the NYSDEC-approved Remedial Investigation (RI) Work Plan dated January 2023 and Supplemental RI (SRI) Work Plan dated October 2025. The remedial investigation was conducted between March 10 and 13, 2023 (in the former laundromat), and between July 28 and August 5, 2025 (in the former warehouse). The Supplemental Remedial Investigation (in the former warehouse) was performed on October 30 and 31, 2025.

The RI and SRI field investigation was completed in accordance with the RIWP and SRIWP, respectively, and associated project plans including the Health and Safety Plan (HASP), Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP) and Community Air Monitoring Plan (CAMP). All work was performed in accordance with appropriate regulations and guidance, including but not limited to NYSDEC DER-10 and NYSDOH SVI Guidance.

The following areas of concern (AOCs) were identified within the Site limits from historical documents:

- Soil contamination due to the presence of Site-wide urban fill; and
- Potential soil, groundwater, and soil vapor contamination from former Site uses.

Based on the existing data for the Site and known data gaps (e.g., a limited number of environmental samples were collected across the Site during the Phase II ESA), the following objectives have been identified:

- Delineate the nature and extent of potential impacts to soil from AOCs described above utilizing multiple sample depths (to define the cleanup track);
- Delineate the nature and extent of impacts to groundwater;
- Evaluate the soil vapor intrusion risk to future structures that will be built on-Site; and
- Fill data gaps from prior investigations (e.g., obtain more data across the Site).

Environmental data collected during the RI and SRI was used to qualitatively assess the potential exposure of receptors to Site contaminants and develop the information necessary to support the development of this RAWP.

The scope of work for the RI and SRI included the following:

- The performance of Site reconnaissance to confirm proposed sampling locations;
- The collection of soil, groundwater and soil vapor samples sufficient to define the nature and extent of impacted media and current site conditions as summarized below;
    - The advancement of fourteen (14) soil borings and collection of twenty-six (26) soil samples during the RI and thirteen (13) soil borings and collection of 35 soil samples during the SRI, which were analyzed for the following full-suite of contaminants: VOCs, SVOCs, metals, PCBs, per- and polyfluoroalkyl substances (PFAS), and pesticides;
    - Installation of three (3) new groundwater monitoring wells and collection of three (3) groundwater samples during the RI, which were analyzed for the following full-suite of contaminants: VOCs, SVOCs, metals, PCBs, per- and polyfluoroalkyl substances (PFAS), and pesticides;
    - Installation of six (6) soil vapor points and collection of six (6) soil vapor samples during the RI which were analyzed for VOCs using USEPA Method TO-15;

    - The collection of groundwater level measurements and land survey data as needed for developing a groundwater elevation contour map; and
- The performance of a qualitative exposure assessment to identify exposure pathways and evaluate contaminant fate and transport.

A Site plan showing all the sample locations from the RI and SRI is included in Figure 7. The soil boring and monitoring well logs are provided in Appendix D. The purge logs (groundwater and soil vapor sampling forms) are included in Appendix E.

The RIR, submitted under separate cover in November 2025, details all RI and SRI implementation field activities. All data was produced in accordance with NYSDEC Analytical Services Protocol (ASP) Category B deliverables and was reviewed and validated by Data Validation Services, a party independent of the project team, in a Data Usability Summary Report (DUSR) before being incorporated into the RIR for the Site.

3.1 Best Management Practices

The following best management practices (BMPs) were implemented during the RI and SRI:

- Daily communication with the NYSDEC and completion of daily reports.
- Compliance with the RIWP and SRIWP.
- Constant communication between team members including Roux's personnel and subcontractors (driller, geophysical surveyor, laboratory).
- Good housekeeping was performed during drilling and sampling activities.
- Adherence to the site-specific health and safety plan (HASP).

3.2 Site Reconnaissance and Geophysical Survey

Roux performed Site reconnaissance and, in conjunction with the previous Phase I ESA and Phase II ESA, identified potential AOCs, described above, which were evaluated during the RI. An inspection of the existing Site conditions was conducted to determine final locations of soil borings, monitoring wells, and soil vapor points based on actual field conditions.

A geophysical survey was conducted by Vertex during the Phase II Investigation on December 1, 2020, and March 8, 2021. The geophysical survey included a scan of drilling locations and targeted areas of the site. Anomalies indicative of USTs were not identified during the geophysical investigation.

3.3 Soil Investigation

3.3.1 Soil Investigation during the RI

Previous investigation indicated that fill was present throughout the Site at depths varying from the shallow zone (0 to 2 ft bls) to deeper zone in some areas ranging from 5 to 12 ft bls. Data collected during the RI was used to evaluate the thickness and distribution of fill, general soil quality conditions, to characterize the soil conditions for the AOCs at the Site and fill existing data gaps. To achieve that, fourteen (14) soil borings were installed at the locations shown in Figure 7 (12 in the former warehouse and 2 in the former laundromat). Boreholes were pre-cleared to five ft bls using non-intrusive methods, such as hand tools and/or vacuum excavation, prior to advancement of soil borings to verify the absence of utilities and/or

other subsurface features (i.e., obstructions). Soil samples were collected by hand and by utilizing the GeoProbe® Direct-Push Drill Rig as well as the Sonic Rig. Soil samples were collected continuously from land surface to the base of the fill encountered. During installation of the soil borings, the lithology was recorded, and soil was inspected for evidence (visual or olfactory) of contamination and field screened continuously for VOCs using a PID with a 10.6 eV lamp. No evidence of contamination was observed during the sampling. In each boring, two soil samples were collected (one above and one below the fill interface). Soil borings were advanced to a maximum depth of 15 ft bls.

Region of Site	Number of Borings	Boring ID	Analyses	Depth of Sample (ft bls)
Former Vacant Building (west)	12	RXSB-1 through RXSB-8 and RXSB-11 through RXSB-14	TCL/Part 375 + 30/TAL, ECs	3-5 or 6-8 or 7-9 or 8-10 (within the fill); and 5-7 or 8-10 or 9-11 or 10-12 or 13-15 (below the fill interface)
Former Laundromat (east)	2	RXSV-9, RXSB-10	TCL/Part 375 + 30/TAL, ECs	5-8 or 7-9 (within the fill); and 9-11 (below the fill interface)

3.3.2 Soil Investigation during the SRI

Data collected during the SRI was used to supplement existing RI data as well as to further determine the proposed remedial excavation depths. To achieve that, thirteen (13) soil borings were installed at the locations shown in Figure 7 (10 in the former warehouse and 3 in the former laundromat). Boreholes were drilled from grade to final depth using a Sonic Drill Rig. Soil samples were collected continuously from land surface to the predetermined depths established at each boring location. During installation of the soil borings, lithology was recorded, and soil was inspected for evidence (visual or olfactory) of contamination and field screened continuously for VOCs using a PID with a 10.6 eV lamp. No evidence of contamination was observed during the sampling. Soil borings were advanced to a maximum depth of 14 ft bls. The rationale for the SRI sampling collection was based on the RI sample results as described in the table below.

Grid Excavation Area	RI Samples Collected and Results (green indicates below UUSCO and red indicates above UUSCO)*	SRI Samples and Depth (Intervals in ft bls)
A	RXSB-3 (7-9) RXSB-3 (9-11)	SRI-1: (0-2), (4-6)
B	RXSB-5 (8-10) RXSB-5 (10-12) RXSB-13 (8-10) RXSB-13 (10-12)	SRI-2: (0-2), (3-5), (6-8), (12-14)
C	RXSB-6 (6-8) RXSB-6 (8-10)	SRI-3: (0-2), (3-5)
D	RXSB-9 (7-9) RXSB-9 (9-11)	SRI-4: (0-2), (4-6), (11-13)
E	RXSB-4 (6-8) RXSB-4 (8-10)	SRI-5: (0-2), (3-5)
F	RXSB-7 (3-5) RXSB-7 (5-7)	SRI-6: (0-2)
G	RXSB-10 (5-8)	SRI-7: (0-2), (2-4), (11-13)

Grid Excavation Area	RI Samples Collected and Results (green indicates below UUSCO and red indicates above UUSCO)*	SRI Samples and Depth (Intervals in ft bls)
	RXSB-10 (8-11)	
H	RXSB-11 (6-8) RXSB-11 (13-15)	SRI-8: (0-2), (3-5)
I	RXSB-1 (8-10) RXSB-1 (10-12) RXSB-2 (6-8) RXSB-2 (8-10)	SRI-9: (0-2), (3-5)
J	RXSB-12 (6-8) RXSB-12 (8-10) RXSB-14 (8-10) RXSB-14 (10-12)	SRI-10: (0-2), (3-5), (10-12)
K	RXSB-8 (7-9) RXSB-8 (9-11)	SRI-11: (0-2), (4-6), (11-13) SRI-12 (near potential UST): (0-2), (4-6), (7-9), (11-13)
L	--	SRI-13: (0-2), (4-6), (7-9), (11-13)

*Note - RI results from the table do not take into account PFAS results.

3.4 Groundwater Investigation

To characterize Site groundwater flow and quality conditions and to evaluate for potential off-Site migration, three permanent groundwater monitoring wells (MW-1, MW-2 and MW-3) were installed in the former warehouse at selected soil boring locations (RXSB-11, RXSB-13 and RXSB-14, respectively). According to the water level data collected during the RI, the elevation of the water table surface at the Site is relatively deep ranging from 61.2 to 61.3 ft bls The groundwater monitoring well locations are shown on Figure 7.

Monitoring wells were constructed of 2-inch inside diameter, Schedule 40 polyvinyl chloride (PVC) casing and 0.020-inch slot, machined PVC screen. Wells were constructed with 20-foot screen. A sand pack was placed around the well screen, extending two feet above the top of the screened zone. A two-foot-thick bentonite pellet seal was placed above the sand pack. The wells were completed using locking well plugs and flush mounted, bolt down, watertight and manhole covers cemented into place. Based on observed soil moisture during the well installation using the sonic drill rig, the wells were screened between 85-105 ft, 67-87 ft and 75-95 ft below grade.

Each new monitoring well was developed to ensure a proper hydraulic connection with the aquifer, and to reduce/eliminate turbidity of the groundwater. The 2-inch monitoring wells were developed using a submersible pump, which was surged periodically until well yield was consistent, and turbidity was visually clear.

Prior to sampling any wells, the depth to groundwater in each monitoring well was measured using an electronic water level meter and a groundwater contour was developed using the survey data. One week following redevelopment, all wells were sampled consistent with USEPA low-flow sampling requirements using a peristaltic pump and one round of groundwater samples was collected in accordance with the QAPP/FSP provided in the RIWP. Field parameters (e.g., pH, dissolved oxygen, oxidation-reduction potential [ORP], etc.) were also collected using a water quality meter during purging and prior to sampling.

All monitoring wells were surveyed by a licensed New York State surveyor (Fehringer Surveying, P.C.) to obtain horizontal and vertical coordinates.

The groundwater samples were analyzed for:

- TCL + 30/TAL/Part 375 (including filtered and unfiltered metals, SVOCs, PCBs and pesticides) and ECs.

3.5 Soil Vapor Investigation

Six soil vapor samples (RXSV-1 through RXSV-6) were collected during the RI to further assess the impact of the urban fill and historical operations as shown on Figure 7. RXSV-1 through RXSV-4 were installed within the former warehouse in 2025. RXSV-5 and RXSV-6 were installed in the former laundromat in 2023.

The soil vapor samples were collected from soil vapor points installed by hand or by using a Geoprobe® to the target depth of approximately 5 ft bls.

New Teflon®-lined tubing was attached to an expendable soil vapor sampling point with a 6-inch stainless steel screen. The soil vapor points were backfilled with #2 Morie sand to approximately one foot above the screen. The remainder of the borehole were backfilled with a concrete/bentonite slurry to grade.

The soil vapor samples were collected using pre-cleaned (batch certified) 6-liter summa canisters with regulators calibrated to collect samples and analyzed using USEPA Method TO-15 for VOCs. A helium tracer gas test was performed on each vapor point prior to sampling in accordance with the procedures outlined in the NYSDOH Guidance.

The laundromat was operational in 2023; accordingly, in addition to the two sub-slab soil samples, two indoor air samples (IA-1 and IA-2) and one outdoor ambient air sample (AA-1) were collected inside and outside the laundromat over an 8-hour period. The sub-slab samples taken from the former warehouse were collected over a 8-hour period.

3.6 Laboratory Analysis

Soil and groundwater samples collected during the RI and soil samples collected during the SRI were analyzed for target compound list (TCL) + 30/ target analyte list (TAL), 1,4-Dioxane, and PFAS.

All soil vapor samples were analyzed using USEPA Method TO-15 for VOCs.

All samples were analyzed at a NYSDOH Environmental Laboratory Approval Program-certified (ELAP) laboratory (Alpha Analytical Labs).

4.0 REMEDIAL INVESTIGATION RESULTS

The following section provides a summary of the geological and hydrogeological findings, and the soil, groundwater, and soil vapor quality data that were generated by Roux during the RI and SRI. Data tables with all the data generated during the RI and SRI are provided in Tables 2 through 15. Soil exceedances of applicable criteria are provided in Figure 8. Groundwater exceedances of AWQSGVs are provided in Figure 9. Soil vapor data is provided in Figure 10. Laboratory analytical reports are provided in Appendix F.

4.1 Significant Threat

The NYSDEC and NYSDOH have determined that this Site does not pose a significant threat to human health and the environment. A copy of the Fact Sheet is included in Appendix G.

4.2 Geological and Hydrogeological Conditions

The following sections provide a description of the geological and hydrogeological findings of Site as determined by performance of the RI and SRI. A hydrogeologic investigation was conducted to evaluate the subsurface conditions that could influence the nature and extent, possible migration, and remediation of contamination at the Site.

4.2.1 Local Geology And Stratigraphy

Based on the RI and SRI completed by Roux, and investigation results from prior consultants, the Site is underlain with fill, mostly consisting of sand, gravel, silt, brick, concrete, cobble, asphalt, and wood to a minimum depth of 5 feet (ft) below land surface (bls) and to a maximum depth of 14 ft bls across the Site. Beneath the fill, the subsurface is comprised of fine to coarse sand, silt, some gravel, and clay. Bedrock was not encountered, but is estimated to be approximately 250 ft-bls according to the USGS survey. Soil boring logs are provided in Appendix D.

4.2.2 Site Hydrogeological Setting

According to the water level data collected from the newly installed wells on August 4 and 5, 2025, the elevation of the water table surface at the Site ranged from 11.06 ft to 11.51 ft relative to NAVD88, or from 61.2 ft bls in MW-1 to 61.3 ft bls in MW-3, respectively. Groundwater flow is generally to the east, as shown in Figure 6. A summary of water level data collected during the RI is included in Table 1.

4.3 Identification of Standards, Criteria and Guidance

Standards, Criteria and Guidance (SCGs) are promulgated requirements (“standards” and “criteria”) and non-promulgated guidance (“guidance”) that govern activities that may affect the environment and are used by the NYSDEC at various stages in the investigation and remediation of a site. SCGs incorporate both the concept of “applicable or relevant and appropriate requirements” (ARARs) and the “to be considered” (TBCs) category of non-enforceable criteria or guidance, consistent with the United States Environmental Protection Agency (USEPA) remediation programs. The following table provides a list of SCGs potentially applicable to the Site. Key SCGs are discussed in greater detail below.

Citation	Title	Regulatory Agency
General		
ECL Article 27 Title 14 and 6 NYCRR Part 375	Environmental Remediation Programs	NYSDEC
29 CFR 1910.120	Hazardous Waste Operations and Emergency Response	US Department of Labor, OSHA
29 CFR 1926	Safety and Health Regulations for Construction	US Department of Labor, OSHA
TAGM HWR-4031	Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites	NYSDEC
No Citation	Analytical Services Protocol	NYSDEC
DER-10	Technical Guidance for Site Investigation and Remediation	NYSDEC
No Citation	Sampling for 1,4-Dioxane and Per- and Polyfluoroalkyl Substances (PFAS) Under DEC's Part 375 Remedial Programs	NYSDEC
Soil		
6 NYCRR Part 375	Environmental Remediation Programs	NYSDEC
CP-51	Soil Cleanup Guidance	NYSDEC
Groundwater		
6 NYCRR Part 700-705	Surface Water and Ground Water Classification Standards	NYSDEC
TOGS 1.1.1	Ambient Water Quality Standards and Guidance Values (AWQSGVs)	NYSDEC
TOGS 2.1.3	Primary and Principal Aquifer	NYSDEC
Air		
Air Guide No. 1	Guidelines for the control of toxic ambient air contaminants	NYSDEC
No Citation	Final - Guidance for Evaluating Soil Vapor Intrusion in the State of New York	NYSDOH
Solid Waste		
6 NYCRR 360	Solid Waste Management Facilities	NYSDEC
6 NYCRR 364	Waste Transporters	NYSDEC
Hazardous Waste		
6 NYCRR Part 371	Identification and Listing of Hazardous Wastes	NYSDEC
6 NYCRR 372	Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities	NYSDEC
6 NYCRR 376	Land Disposal Restrictions	NYSDEC
Site Management		
CP-43	Groundwater Monitoring Well Decommissioning Procedures	NYSDEC

SCGs for Soil

SCGs for soil at BCP sites are the numerical soil cleanup objectives (SCOs) presented in the Part 375-6.8(a-b) regulations. The SCOs are categorized into unrestricted use criteria and restricted use (residential,

restricted-residential, commercial, or industrial) criteria, as well as criteria for protection of groundwater and ecological resources. The applicability of each category of soil cleanup objectives is determined based upon the location and current and reasonably anticipated future use of the Site, as well as cleanup tracks being evaluated. SCGs for per- and polyfluoroalkyl substances (PFAS, specifically Perfluorooctanoic acid [PFOA] and Perfluorooctane sulfonic acid [PFOS]) in soil are the Guidance Values presented in the NYSDEC Sampling, Analysis and Assessment of Per-and Polyfluoroalkyl Substances (PFAS) guidance document, last revised April 2023.

The UUSCOs are applicable to the evaluation of an unrestricted use cleanup and are included in this RAWP. The RAWP for the Site will evaluate a Track 1 unrestricted use scenario, as required by DER-10. The RRSCOs are also appropriate for the Site based upon the proposed future mixed residential and commercial land use. The Protection of Groundwater Soil Cleanup Objectives (PGWSCOs) are applicable to those parameters that are present in both soil and groundwater exceeding the applicable standard presented below.

SCGs for Groundwater

The document entitled "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations," issued by the NYSDEC in June 1998 and as amended in 2000, 2004 and 2023, presents the standards that were used to evaluate potential groundwater issues for the Site.

SCG for Soil Vapor

The Final "Guidance for Evaluating Soil Vapor Intrusion in the State of New York," (NYSDOH SVI Guidance) issued by the NYSDOH in October 2006 and last updated in February 2024, presents the screening levels that were used to evaluate potential soil vapor intrusion issues for the Site.

4.4 Soil/Fill Contamination

The following section provides a summary of the soil quality data that was generated by Roux during the RI and SRI.

Tables 2 through 8 shows exceedances from Track 1 Unrestricted SCOs as well as Track 2 RRSCOs and PGWSCOs for all soil/fill at the Site. Figure 8 is a spider map that shows the location and summarizes exceedances from Track 1 Unrestricted SCOs, as well as Track 2 RRSCOs and PGWSCOs for all soil/fill. Laboratory analytical reports are provided in Appendix F.

4.4.1 Summary of Soil/Fill Data

A total of 31 soil samples (including field duplicates) were collected and analyzed from 14 soil boring locations during the RI and submitted for laboratory analysis. A total of 37 soil samples (including field duplicates) were collected and analyzed from 13 soil boring locations during the SRI and submitted for laboratory analysis.

Site-wide analytical soil data was compared to the following NYCRR Part 375-6.8 (a-b) SCOs as noted in the RIWP and SRIWP in order to evaluate Site-wide soil quality and to determine contamination in soil, if present:

- NYSDEC UUSCOs;
- NYSDEC RRSCOs; and
- NYSDEC PGWSCOs.

4.4.1.1 Volatile Organic Compounds In Soil

A summary of the VOC detections exceeding SCOs in the soil samples analyzed is provided below:

VOC Exceedances of SCOs in Soil

Analyte	NYSDEC UUSCO (mg/kg)	Detections above NYSDEC UUSCOs	NYSDEC RRSCOs (mg/kg)	Detections above NYSDEC RRSCOs	NYSDEC PGWSCO (mg/kg)	Detections above NYSDEC PGWSCO	Range in Concentration Above NYSDEC SCOs (mg/kg)	Soil Sample with Maximum Detection
Benzene	0.06	1	3.7	-	0.06	1	0.24	RXSB-8 (9-11)
Ethylbenzene	1	1	1	-	1	1	1.3	RXSB-8 (9-11)
Toluene	0.7	1	100	-	0.7	1	0.8	RXSB-8 (9-11)
Xylenes	0.26	1	100	-	1.2	1	7.7	RXSB-8 (9-11)

– No exceedances detected

mg/kg – milligram per kilograms

Four VOCs (benzene, ethylbenzene, toluene and xylenes) in exceedance of the UUSCOs and PGWSCOs were detected in only one of the 31 soil samples. There were no exceedances of their respective RRSCOs. The VOCs detected in RXSB-8 are petroleum related compounds, indicative of petroleum contamination that could be associated with the potential presence of a gasoline UST in this vicinity, although it was not observed during the geophysical survey.

During Vertex's Phase II investigation, VOCs (with exception of acetone) were not detected in exceedance of any SCOs. During the SRI, VOCs were not detected in any of the soil samples.

4.4.1.2 Semivolatile Organic Compounds in Soil

A summary of the SVOC detections exceeding SCOs in the soil samples analyzed is provided below:

SVOC Exceedances of SCOs in Soil

Analyte	NYSDEC UUSCO (mg/kg)	Detections above NYSDEC UUSCOs	NYSDEC RRSCOs (mg/kg)	Detections above NYSDEC RRSCOs	NYSDEC PGWSCO (mg/kg)	Detections above NYSDEC PGWSCO	Range in Concentration Above NYSDEC SCOs (mg/kg)	Soil Sample with Maximum Detection
Benzo(A)Anthracene	1	9	1.4	5	1	9	1.1 – 4.5J-	SRI-4 (0-2)
Benzo(A)Pyrene	1	5	1	5	22	-	1.2 – 3.4J-	SRI-4 (0-2)
Benzo(B)Fluoranthene	1	10	1.4	5	2.1	2	1.1 – 4.8J-	SRI-4 (0-2)
Benzo (G,H,I)Perylene	0.64	7	4.9	-	1000	-	0.75 – 2.3	SRI-1 (4-6)
Benzo(K)Fluoranthene	0.8	2	4.9	-	2	-	1.3J-	SRI-1 (4-6), SRI-4 (0-2)
Chrysene	1	7	4.9	-	1	7	1.1 – 3.9J-	SRI-4 (0-2)
Dibenz(A,H)Anthracene	0.33	2	0.33	2	1000	-	0.52 - 0.6J	SRI-4 (0-2)
Indeno(1,2,3-C,D)Pyrene	0.5	10	1.4	2	6.6	-	0.59 – 2.2J-	SRI-1 (4-6), SRI-4 (0-2)
Phenanthrene	1.1	11	4.9	3	1000	-	1.3 - 12	SRI-4 (0-2)

– No exceedances detected

mg/kg – milligram per kilograms

J- – Estimated value, low bias

One SVOC was detected marginally in exceedance of the UUSCO in one RI sample. Nine SVOCs were detected in exceedance of one or more SCOs in 11 of the 37 SRI soil samples. These SVOC exceedances were found in shallow soils and are indicative of fill material.

During Vertex's Phase II investigation, SVOCs were detected in exceedance of the SCOs in almost all shallow samples (0-2 ft bls) and in some sample locations at 4.5-5 ft bls and at 11.5-12 ft bls. During the RI, SVOCs were not detected in any of the soil samples exceeding the SCOs.

4.4.1.3 Metals In Soil

A summary of the metal detections exceeding SCOs in the soil samples analyzed is provided below:

Metals Exceedances of SCOs in Soil

Analyte	NYSDEC UUSCO (mg/kg)	Detections above NYSDEC UUSCOs	NYSDEC RRSCOs (mg/kg)	Detections above NYSDEC RRSCOs	NYSDEC PGWSCO (mg/kg)	Detections above NYSDEC PGWSCO	Range in Concentration Above NYSDEC SCOs (mg/kg)	Soil Sample with Maximum Detection
Chromium, Hexavalent	1	3	1	3	19	-	1.7 – 2.07	SRI-8 (3-5)
Copper	50	3	280	-	1720	-	55.7J – 78.6J	SRI-6 (0-2)
Lead	63	23	400	5	450	4	63.9 – 964	SRI-13 (4-6)
Mercury	0.18	17	0.3	12	0.73	6	0.221 – 2.46	SRI-3 (3-5)
Nickel	30	7	320	-	130	-	31 – 50.6	SRI-13 (7-9)
Zinc	109	5	6600	-	2480	-	114 - 314	SRI-8 (3-5)

– No exceedances detected
mg/kg – milligram per kilograms
J – Estimated value

Metals in exceedance of the UUSCOs were detected in 30 soil samples (6 during the RI and 24 during the SRI). Metals in exceedance of the RRSCOs were detected in 8 soil samples (1 during the RI and 7 during the SRI). Two metals (lead and/or mercury) in exceedance of PGWSCOs were detected in 9 soil samples (one during the RI and 8 during the SRI).

During Vertex's Phase II investigation, similar metals were detected in exceedance of the SCOs in almost all shallow samples (0-2 ft lbs) and in some sample locations at 4.5-5 ft bls and at 11.5-12 ft bls.

The metals detected in soil are indicative of fill material.

4.4.1.4 Polychlorinated Biphenyls in Soil

PCBs were not detected in any of the RI and SRI soil samples.

4.4.1.5 Pesticides and Herbicides in Soil

A summary of the Pesticide and Herbicide detections exceeding SCOs in the soil samples analyzed is provided below:

Pesticide and Herbicide Exceedances of SCOs in Soil

Analyte	NYSDEC UUSCO (mg/kg)	Detections above NYSDEC UUSCOs	NYSDEC RRSCOs (mg/kg)	Detections above NYSDEC RRSCOs	NYSDEC PGWSCO (mg/kg)	Detections above NYSDEC PGWSCO	Range in Concentration Above NYSDEC SCOs (mg/kg)	Soil Sample with Maximum Detection
P,P'-DDE	0.0033	3	3.4	-	9.3	-	0.00346 – 0.00722	SRI-7 (0-2)
P,P'-DDT	0.0033	3	3.8	-	135	-	0.00514 – 0.0138	SRI-7 (0-2)

– No exceedances detected

mg/kg – milligram per kilograms

Pesticides or herbicides were not detected in any of the RI soil samples. Two pesticides were detected above UUSCO in three SRI samples at shallow depths between 0-5 ft bls.

4.4.1.6 Emerging Contaminants in Soil

A summary of the emerging contaminants detections exceeding SCOs in the soil samples analyzed is provided below:

Emerging Contaminants Exceedances of SCOs in Soil

Analyte	NYSDEC Guidance UUSCO (ng/g)	Detections above NYSDEC Guidance UUSCOs	NYSDEC Guidance RRSCOs (ng/g)	Detections above NYSDEC Guidance RRSCOs	NYSDEC Guidance PGWSCO (ng/g)	Detections above NYSDEC Guidance PGWSCO	Range in Concentration Above NYSDEC Guidance SCOs (ng/g)	Sample with Maximum Guidance Detection
Perfluorooctanoic acid (PFOA)	0.66	2	33	-	0.8	2	1.15 – 1.28	SRI-8 (3-5)

– No exceedances detected/no SCO available

ng/g – nanogram per gram

The emerging contaminants list includes the 40 PFAS compounds listed in the NYSDEC April 2023 "Sampling, Analysis and Assessment of Per-and Polyfluoroalkyl Substances (PFAS)." PFOA was detected in two soil samples (one during the RI and one during the SRI) exceeding UUSCOs and the PGWSCOs. The limited presence of PFOA in soil can be an indication of an upgradient, off-Site source.

4.4.2 Comparison of Soil/Fill with SCGS

In summary, the data generated during the RI and SRI indicate the following about Site-wide conditions:

- Four VOCs (benzene, ethylbenzene, toluene and xylenes) were detected in one soil sample, RXSB-8 (9-11), exceeding NYSDEC UUSCOs and PGWSCOs. There were no VOCs detected in soil exceeding RRSCOs. The VOCs detected in this sample are petroleum related compounds, indicative of petroleum contamination that could be associated with the potential presence of a gasoline UST in this vicinity, although it was not observed during the geophysical survey nor during the Site investigation.
- SVOCs, exclusively PAHs, were detected in soil at concentrations above NYSDEC UUSCOs, RRSCOs, and PGWSCOs in 10 of the 37 samples. These SVOC exceedances were found in shallow soils (0-2 and 4-6 ft bls) and are indicative of fill material.
- Metals were detected in soil at concentrations above NYSDEC UUSCOs, RRSCOs and PGWSCOs across the Site. Hexavalent chromium, copper, lead, mercury, nickel and zinc were detected above UUSCOs. Lead and mercury were also detected above RRSCOs and PGWSCOs. Metals contamination is related to the presence of historic fill material as they were predominantly encountered in shallow soils (0-2, 3-5, 4-6 and 7-9 ft bls).

- PCBs were not detected in any of the soil samples.
- Two pesticides were detected in soil at concentrations exceeding UUSCOs (but not detected in exceedance of RRSCOs or PGWSCOs) in three soil samples at shallow depths between 0-5 ft bls.
- PFOA was detected in two soil samples exceeding guidance UUSCOs and PGWSCOs. There is no documented use of PFAS at the Site and no known historical Site use that would indicate the past use of these compounds. The presence of PFAS is an indication of an upgradient, off-Site source.

4.5 Groundwater Contamination

The following section provides a summary of the groundwater quality data that was generated by Roux during the RI.

Tables 9 through 14 shows exceedances of AWQS in monitoring wells prior to the remedy. A spider map that indicates the locations of and summarizes exceedances of AWQS prior to the remedy is shown in Figure 9. Laboratory analytical reports are provided in Appendix F.

4.5.1 Summary of Groundwater Data

A total of four groundwater samples (including a field duplicate) were collected from three permanent monitoring wells installed during the RI. No groundwater samples were collected during the SRI. The Site-wide analytical groundwater data was compared to NYSDEC AWQSGVs for Class GA groundwater as noted in the RIWP to evaluate groundwater quality and to determine the contamination in groundwater, if present. However, it should be noted that the groundwater beneath the Site is not currently used as a drinking water source and will not be used in the future.

Analytes that exceeded NYSDEC PGWSCOs in Site-wide soil were compared to analyte detections in Site-wide groundwater to assess whether, and to what extent, constituents detected in soil are impacting groundwater quality. An evaluation of soil exceedances and groundwater detections is provided in the below sections.

A summary of groundwater quality results is provided in the below sections.

4.5.1.1 Volatile Organic Compounds in Groundwater

A summary of the VOC exceedances in the groundwater samples analyzed is provided below:

VOC Exceedances of AWQSGVs in Groundwater

Analyte	NYSDEC AWQSGVs (µg/L)	Detections above NYSDEC AWQSGVs	Range in Concentration Above NYSDEC AWQSGVs (µg/L)	Sample with Maximum Detection
Chloroform	7	4	7.4 - 22	MW-2

Chloroform was detected in all groundwater samples above AWQSGVs, however it was not detected in any of the soil samples. It is possible that chloroform was a by-product from the water supply used during the sonic drilling activities.

4.5.1.2 Semivolatile Organic Compounds in Groundwater

A summary of the SVOC exceedances in the groundwater samples analyzed is provided below:

SVOC Exceedances of AWQSGVs in Groundwater

Analyte	NYSDEC AWQSGVs (µg/L)	Detections above NYSDEC AWQSGVs	Range in Concentration Above NYSDEC AWQSGVs (µg/L)	Sample with Maximum Detection
1,4-Dioxane (P-Dioxane)	0.35	1	0.359	MW-1
2,6-Dinitrotoluene	5	1	22	MW-3
Benzo(A)Anthracene	0.002	3	0.04 J – 0.43	MW-1
Benzo(A)Pyrene	0	2	0.2 – 0.46	MW-1
Benzo(B)Fluoranthene	0.002	2	0.32 – 0.71	MW-1
Benzo(K)Fluoranthene	0.002	2	0.09 J – 0.19	MW-1
Chrysene	0.002	2	0.22 – 0.47	MW-1
Indeno(1,2,3-C,D)Pyrene	0.002	2	0.16 – 0.36	MW-1
Nitrobenzene	0.4	1	49	MW-3
Phenol	1	1	11	MW-3

µg/L – micrograms per liter

J – estimated value

SVOCs (mainly PAHs) were detected above AWQSGVs in all wells except MW-2. SVOCs were not detected in any of the any soil samples collected during the RI, however some SVOCs (PAHs) were detected in shallow soils (primarily in the 0-2 ft bls) during the SRI. 2,5-Dinitrotoluene, Nitrobenzene and Phenol were not detected in any of the soil samples. Therefore, these SVOC exceedances can be attributed to turbidity or offsite sources.

4.5.1.3 Metals in Groundwater

A summary of the metals exceedances in the groundwater samples analyzed is provided below:

Metals Exceedances of AWQSGVs in Groundwater

	Analyte	NYSDEC AWQSGVs (µg/L)	Detections above NYSDEC AWQSGVs	Range in Concentration Above NYSDEC AWQSGVs (µg/L)	Sample with Maximum Detection
Total	Iron	300	2	703 – 1,100	MW-1
	Selenium	10	1	10.4	MW-2
	Sodium	20,000	4	58,400 – 93,300	MW-2
Dissolved	Magnesium	35,000	2	36,600 – 37,900 J	MW-2
	Selenium	10	1	10.5	MW-2
	Sodium	20,000	4	59,700 – 94,100	MW-2

µg/L – micrograms per liter

J – estimated value

All metals detected above AWQSGVs are naturally occurring. The metals detected in total and dissolved groundwater samples were not detected above PGWSCOs in any soil samples. Therefore, there is no indication that metals in soil are a source of metals in groundwater.

4.5.1.4 Polychlorinated Biphenyls in Groundwater

PCBs were not detected in any of the groundwater samples exceeding AWQSGVs or any of the soil samples.

4.5.1.5 Pesticides and Herbicides in Groundwater

Pesticides and Herbicides were not detected in any of the groundwater samples exceeding AWQSGVs, and were not detected in any of the soil samples.

4.5.1.6 Emerging Contaminants in Groundwater

A summary of the EC detections exceeding AWQSGVs are provided in the table below:

Emerging Contaminant Exceedances of AWQSGVs in Groundwater

Analyte	NYSDEC AWQSGVs (ng/L)	Detections above NYSDEC AWQSGVs	Range in Concentration Above NYSDEC AWQSGVs (ng/L)	Sample with Maximum Detection
Perfluorooctanesulfonic acid (PFOS)	2.7	3	3.67 J – 3.94	MW-3
Perfluorooctanoic acid (PFOA)	6.7	4	26.2 – 43.5	MW-3

ng/L – nanograms per liter

J – estimated value

There is no documented use of PFAS at the Site, and only one detection of PFOA exceeded PGWSCOs in soil at RXSB-1, which is not co-located with MW-3. These detections of PFAS could indicate an upgradient, off-Site source.

4.5.2 Comparison of Groundwater with SCGS

In summary, the data generated during the RI and PDI indicate the following about Site-wide conditions:

- Only one VOC (chloroform) was detected in all groundwater samples exceeding AWQSGVs, however it was not detected in any of the soil samples. It is possible that chloroform was a by-product from the water supply used during sonic drilling activities.
- SVOCs (mainly PAHs) were in MW-1 and MW-3 but not in MW-2, which is located on the northwest portion of the Site. The SVOCs detected in soil were predominantly in the shallow zone and depth to groundwater at the Site is deep (approximately 61 ft bls). 2,5-dinitrotoluene, nitrobenzene and phenol were not detected in any of the soil samples, therefore, these SVOC exceedances can be attributed to turbidity or offsite sources.
- Metals detected at concentrations above NYSDEC PGWSCOs in soil (lead and mercury) were not detected in groundwater indicating that metals in soil are not a source of groundwater contamination at the property. All dissolved metals detected above AWQSGVs in the samples are naturally occurring including magnesium, selenium and sodium.
- There were no detections of PCBs in groundwater as in soil.
- Pesticides were not detected in groundwater, therefore, pesticides in soil are not a source of groundwater contamination at the Site, and the detections in soil are indicative of historic fill material.
- PFOS and PFOA were detected in groundwater exceeding AWQSGVs across the Site. There is no documented use of PFAS at the Site and no known historical Site use that would indicate the

past use of these compounds. The presence of PFAS is an indication of an upgradient, off-Site source.

4.6 Soil Vapor Contamination

The following section provides a summary of the soil vapor quality data that was generated by Roux during the RI.

A total of six sub-slab soil vapor samples [four in the former warehouse (RXSV-1 through RXSV-4) and two in the former laundromat (RXSV-5 and RXSV-6)] were collected from the newly installed soil vapor points during the RI and submitted for laboratory analysis. In addition, two indoor air (IA-1 and IA-2) and one ambient air (AA-1) samples were collected in 2023 when the laundromat was still operational. No soil vapor samples were collected during the SRI.

A table of soil vapor data collected prior to the remedy is shown in Table 15. A spider map that indicates the locations of and summarizes soil vapor data prior to the remedy is shown in Figure 10. Laboratory analytical reports are provided in Appendix F.

VOC Detections in Soil Vapor (Sub-Slab)

Analyte	Detections	Range in Concentrations (µg/m^3)	Sample with Maximum Detection
1,1,1-Trichloroethane (TCA)	1	1.31	RXSV-4
1,2,4-Trimethylbenzene	7	1.21 – 3.99	RXSV-3
1,3-Butadiene	2	1.66 – 1.8	RXSV-6
2,2,4-Trimethylpentane	5	1.26 – 2.22	RXSV-4
2-Hexanone	4	1.59 – 2.45	RXSV-2
Acetone	7	16.3 – 119	RXSV-2
Benzene	7	1.04 – 2.57	RXSV-2
Carbon Disulfide	7	1.63 – 65.7	RXSV-3
Carbon Tetrachloride	2	1.35 - 3.23	RXSV-4
Chloroform	5	1.47 – 9.13	RXSV-2
Chloromethane	2	0.785 – 1.15	RXSV-1
Cyclohexane	5	0.854 – 5.68	RXSV-2
Dichlorodifluoromethane	7	1.9 – 2.36	RXSV-6
Ethanol	7	13.9 - 122	RXSV-1
Ethylbenzene	6	0.93 – 3.34	RXSV-3
Isopropanol	7	2.48 – 12.6	RXSV-2
m,p-Xylene	7	2.45 – 15.1	RXSV-3
Methyl Ethyl Ketone (2-Butanone)	6	1.72 – 6.25	RXSV-2
n-Heptane	7	0.889 – 4.59	RXSV-2
n-Hexane	7	0.948 – 11	RXSV-2
o-Xylene	7	1.14 – 6.17	RXSV-3
Tertiary butyl Alcohol	7	4.3 – 160	RXSV-2
Tetrachloroethylene (PCE)	6	12.8 – 23.6	RXSV-3
Tetrahydrofuran	2	2.02 – 5.43	RXSV-2
Toluene	7	3.48 – 153	RXSV-3
Trichlorofluoromethane	5	1.24 – 3.9	RXSV-3

µg/m3 – microgram per cubic meter

VOC Detections in Soil Vapor (Indoor and Outdoor Air)

Analyte	Detections	Range in Concentrations (µg/m^3)	Sample with Maximum Detection
1,2,4-Trimethylbenzene	2	1.24 – 3.16	IA-2
1,3-Butadiene	1	0.449	IA-2
Acetone	3	4.89 – 12.1	IA-1
Benzene	3	1.04 – 1.52	IA-2
Bromodichloromethane	1	1.39	IA-1
Carbon Tetrachloride	3	0.566 – 1.8	IA-1
Chloroform	2	16.2 – 25.2	IA-1
Chloromethane	3	1.15 – 1.71	IA-1
Dichlorodifluoromethane	3	2.28 – 2.35	IA-2
Ethanol	3	11.7 - 710	IA-2
Isopropanol	3	1.72 – 95.9	IA-2
m,p-Xylene	2	1.82 – 3.17	IA-2
n-Hexane	2	0.744 – 0.832	IA-2
o-Xylene	1	1.26	IA-2
Tertiary butyl Alcohol	2	1.63 – 2.11	IA-2
Tetrachloroethylene (PCE)	3	0.203 – 0.468	IA-2
Tetrahydrofuran	1	1.49	AA-1
Toluene	3	2.02 – 3.38	IA-2
Trichlorofluoromethane	3	1.21 – 1.23	AA-1, IA-2
Vinyl Chloride	1	0.067	IA-1

µg/m3 – microgram per cubic meter

Analytical data for soil vapor VOCs indicates there were detections of different VOCs across the Site, including petroleum-related VOCs and CVOCs.

4.6.1 Comparison of Soil Vapor with SCGS

The following CVOCs are discussed because they are included in the NYSDOH SVI Guidance for Matrices A through C.

- Matrix A provides guidance relative to Trichloroethylene (TCE), Cis-1,2-Dichloroethylene (Cis-1,2-DCE), 1,1-Dichloroethylene (1,1-DCE), and Carbon Tetrachloride;
- Matrix B provides guidance relative to Tetrachloroethylene (PCE), 1,1,1-Trichloroethane (1,1,1-TCA), and Methylene Chloride; and
- Matrix C provides guidance relative to Vinyl Chloride.

The following petroleum-related VOCs are discussed because they are included in the NYSDOH SVI Guidance Matrices D through F.

- Matrix D provides guidance relative to Benzene, Ethylbenzene, Naphthalene, Cyclohexane, Isooctane (2,2,4-Trimethylpentane), 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, and O-Xylene;
- Matrix E provides guidance relative to m,p-Xylene, N-Heptane, and N-Hexane; and
- Matrix F provides guidance relative to Toluene.

A summary of the detections is described below.

Matrix A Compounds

- Only Carbon Tetrachloride was detected in two soil vapor samples, ranging in concentration of 1.35 µg/m^3 in RXSV-1 to 3.23 µg/m^3 in RXSV-4.

Matrix B Compounds

- 1,1,1-TCA was detected in one soil vapor samples, at a concentration of 1.31 µg/m^3 in RXSV-4.
- PCE was detected in six soil vapor samples, ranging in concentration from 14.3 µg/m^3 in RXSV-5 to 23.6 µg/m^3 in RXSV-3.

Matrix C Compound

- Vinyl Chloride was not detected in soil vapor.

Matrix D Compounds

- 1,2,4-Trimethylbenzene was detected in seven soil vapor samples ranging in concentration from 1.21 µg/m3 in RXSV-5 to 3.99 µg/m3 in RXSV-3.
- 2,2,4-Trimethypentane was detected in five soil vapor samples ranging in concentration from 1.26 µg/m3 in RXSV-3 to 2.22 µg/m3 in RXSV-4.
- Benzene was detected in seven soil vapor samples, ranging in concentration from 1.04 µg/m3 in RXSV-3 to 2.57 µg/m3 in RXSV-2.
- Cyclohexane was detected in five soil vapor samples, ranging from 0.854 µg/m3 in RXSV-1 to 5.68 µg/m3 in RXSV-2.
- Ethylbenzene was detected in six soil vapor samples, ranging in concentration from 0.93 µg/m3 in the RXSV-5 to 3.34 µg/m3 in RXSV-3.
- Isooctane (2,2,4-trimethylpentane) was detected nine soil vapor samples, ranging from 0.48 J µg/m3 in SV-02 to 673,000 µg/m3 in RXSV-9.
- O-Xylene was detected in seven soil vapor samples, ranging in concentrations from 1.14 µg/m^3 in RXSV-1 to 6.17 µg/m^3 in RXSV-3.

Matrix E Compounds

- m,p-Xylene was detected in seven soil vapor samples, ranging in concentration from 2.45 µg/m3 inRXSV-1 to 15.1 µg/m3 in RXSV-3.
- N-Heptane was detected in seven soil vapor samples, ranging in concentration from 0.889 µg/m^3 in RXSV-1 to 4.59 µg/m^3 in RXSV-2.
- N-Hexane was detected in seven soil vapor samples, ranging in concentration from 0.948 µg/m^3 in RXSV-6 to 11 µg/m^3 in RXSV-2.

Matrix F Compound

- Toluene was detected in seven soil vapor samples, ranging in concentration from 3.48 µg/m^3 in RXSV-1 sample to 153 µg/m^3 in RXSV-3.

In conclusion, petroleum-related and chlorinated VOCs were detected in soil vapor samples across the Site at low concentrations, but are not attributed to soil or groundwater contamination onsite. Exceedances of soil contamination were mostly limited to metals, with the exception of some VOC impacts in RXSB-8, on the south side of the former warehouse. Groundwater impacts were limited to SVOCs in MW-1 and MW-3. During Vertex's Phase II investigation, similar VOCs were detected in the soil vapor samples.

Indoor/Outdoor Air Samples in the Former Laundromat

Two indoor (IA-1 and IA-2) and one outdoor (AA-1) air samples were collected during the RI in the former laundromat in 2023, which was operational at the time of sampling. Currently, the laundromat has been demolished. NYSDEC, NYSDOH and Roux had discussed the findings of the former laundromat when data became available in November 2023. The following summarizes the detections compared to the NYSDOH Matrices.

- Carbon tetrachloride was found in both indoor air and ambient air samples at concentrations ranging from 0.566 µg/m^3 in the ambient air sample AA-1 to 1.80 µg/m^3 in the indoor air sample IA-1. NYSDOH matrix calls for "identify sources and resample or mitigate". Roux believes that carbon tetrachloride could be related to laundry products since it was detected in both indoor and outdoor air samples but it was not found in the soil vapor samples under the slab.
- PCE was detected in both indoor and outdoor air samples at concentrations ranging from 0.203 µg/m^3 in the ambient air sample AA-1 to 0.468 µg/m^3 in the indoor air sample IA-2, as well as in the soil vapor samples, ranging from 14.3 µg/m^3 in RXSV-5 to 19 µg/m^3 in RXSV-6, however based on the NYSDOH matrix, no further action is required since the concentrations are low.
- Vinyl chloride was only detected in indoor air sample IA-1 at 0.067 µg/m^3 and based on the NYSDOH matrix, no further action is required since the concentration is low.
- 1,2-4 Trimethylbenzene was detected in both indoor air samples at concentrations ranging from 1.24 µg/m^3 in IA-1 to 3.16 µg/m^3 in IA-2, as well as in the soil vapor samples, ranging from 1.21 µg/m^3 in RXSV-5 to 1.48 µg/m^3 in RXSV-6, however based on the NYSDOH matrix, no further action is required since the concentrations are low.
- Benzene was detected in both indoor and ambient air samples at concentrations ranging from 1.04 µg/m^3 in AA-1 to 1.52 µg/m^3 in IA-2, as well as in the soil vapor samples, ranging from 1.43 µg/m^3 in RXSV-5 to 1.94 µg/m^3 in RXSV-6, however based on the NYSDOH matrix, no further action is required since the concentrations are low.
- O-xylene was detected in one indoor air sample at a concentration of 1.26 µg/m^3 in IA-2, as well as in the soil vapor samples, ranging from 1.35 µg/m^3 in RXSV-6 to 1.52 µg/m^3 in RXSV-5, however based on the NYSDOH matrix, no further action is required since the concentrations are low.
- M,p-xylene was detected in one both indoor air samples at concentrations ranging from 1.82 µg/m^3 in IA-1 to 3.17 µg/m^3 in IA-2, as well as in the soil vapor samples, ranging from 3.38 µg/m^3 in RXSV-6 to 3.41 µg/m^3 in RXSV-5, however based on the NYSDOH matrix, no further action is required since the concentrations are low.
- N-hexane was detected in one both indoor air samples at concentrations ranging from 0.744 µg/m^3 in IA-1 to 0.832 µg/m^3 in IA-2, as well as in the soil vapor samples, ranging from 0.948 µg/m^3 in RXSV-6 to 0.99 µg/m^3 in RXSV-5, however based on the NYSDOH matrix, no further action is required since the concentrations are low.

- Toluene was detected in both indoor and ambient air samples at concentrations ranging from 2.02 µg/m^3 in AA-1 to 3.38 µg/m^3 in IA-2, as well as in the soil vapor samples, ranging from 10 µg/m^3 in RXSV-5 to 52 µg/m^3 in RXSV-6; however, based on the NYSDOH matrix, no further action is required since the concentrations are low.

4.7 Conclusions

In summary, the data generated during the RI and SRI indicate the following about Site-wide conditions:

- Previous investigation indicated that fill was present throughout the Site at depths varying from the shallow zone (0 to 2 ft bls) to deeper zone in some areas ranging from 5 to 12 ft bls. Data collected during the RI indicated that the Site is underlain with fill, mostly consisting of sand, gravel, silt, brick, concrete, and wood to a minimum depth of 5 feet (ft) below land surface (bls) and to a maximum depth of 10 ft bls across the Site. Beneath the fill, the subsurface is comprised of fine to coarse sand, silt, some gravel and clay. Data collected during the SRI indicated that the Site is underlain with fill, mostly consisting of sand, gravel, silt, brick, cobble and asphalt to a maximum depth of 14 ft bls across the Site. Beneath the fill, the subsurface is comprised of fine to coarse sand, silt, some gravel and clay.
- According to the water level data collected during the RI, the elevation of the water table surface at the Site ranged from 11.06 ft to 11.51 ft relative to NAVD88, or from 61.2 ft bls in MW-1 to 61.3 ft bls in MW-3, respectively. Groundwater flow is generally to the east.
- In general, exceedances of soil contamination were mostly limited to SVOCs, metals and pesticides with the exception of some VOC impacts in RXSB-8, on the south side of the former warehouse. Groundwater impacts were limited to SVOCs in MW-1 and MW-3. Four VOCs (benzene, ethylbenzene, toluene and xylenes) in exceedance of the UUSCOs and PGWSCOs were detected in only one of the 31 soil samples. There were no exceedances of their respective RRSCOs. The VOCs detected in RXSB-8, located on the south side of the former warehouse, could be associated with a potential presence of a gasoline UST in this vicinity, although it was not observed during the geophysical survey. The only VOC detected in groundwater was chloroform, likely as result of the by-product from the water supply used during sonic drilling activities.
- SVOCs were not detected in all but one of the RI soil samples exceeding the SCOs at marginal levels, but were detected in groundwater exceeding AWQSGVs in all wells except MW-2. Therefore, these SVOC exceedances in groundwater can be attributed to turbidity or offsite sources and not related to onsite soil contamination. During the SRI, nine SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo (g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-c,d)pyrene, phenanthrene) were detected in exceedance of one or more SCOs (UUSCOs, RRSCOs and/or PGWSCOs) in 11 of the 37 soil samples. These SVOCs exceedances were found in shallow soils (0-2, 3-5 and 4-6 ft bls) and are indicative of fill material. SVOCs were not detected in deeper soil samples and do not appear to be a source of groundwater contamination.
- During the RI, metals (lead, mercury and nickel) in exceedance of the UUSCOs were detected in six soil samples. Metals in exceedance of the RRSCOs were detected in one soil sample. Metals in exceedance of PGWSCOs were detected in one soil sample. During the SRI, metals (hexavalent chromium, copper, lead, mercury, nickel and/or zinc) were detected in exceedance of one or more SCOs (UUSCOs, RRSCOs and/or PGWSCOs) in 25 of the 37 soil samples. The metals detected in soil are indicative of fill material. All metals detected in groundwater (iron, selenium, sodium and magnesium) above AWQSGVs are naturally occurring. Therefore, there is no indication that metals in soil are a source of metals in groundwater.
- During the RI, PCBs, Pesticides and Herbicides were either not detected or the detections were below the SCOs in both soil and groundwater. During the SRI, Pesticides (p,p'-DDE and p,p-DDT) were detected in three soil samples (SRI-7 and SRI-8) in the shallow soils (0-2 and 3-5 ft bls) above the UUSCO.

- During the RI, PFOA was detected in both soil and groundwater exceeding the SCOs. PFOA was detected in one soil sample exceeding UUSCOs and PGWSCOs and all groundwater samples exceeding AWQSGVs. PFOS was detected in three of the four groundwater exceeding AWQSGVs. There is no documented use of PFAS at the Site, and only one detection of PFOA exceeded PGWSCOs in soil at RXSB-1, which is not co-located with MW-3. During the SRI, PFOA was detected in one soil sample (SRI-8 at 3-5 ft bls) exceeding UUSCOs and PGWSCOs. These detections of PFAS could indicate an upgradient, off-Site source. There is no documented use of PFAS at the Site.
- Based on the soil vapor samples collected during the RI, there were Site-wide detections of VOCs. Petroleum-related and chlorinated VOCs were detected in soil vapor samples across the Site at low concentrations and are not attributed to soil or groundwater contamination onsite.
- The indoor and outdoor samples collected in 2023 during the RI when the laundromat was operational, indicate that carbon tetrachloride detections were attributed to the laundromat operations since they were not detected in the soil vapor samples. The other petroleum and chlorinated VOCs detected in the indoor and outdoor samples were at low concentrations which did not require further action based on the NYSDOH matrices.

In summary, the data collected during the RI and SRI indicate that fill-related impacts (SVOCs, and some metals and pesticides) are present in Site soils. Limited petroleum related VOC exceedances are present in the south portion of the Site. In groundwater, SVOC exceedances can be attributed to turbidity or offsite sources since groundwater is very deep (60+ feet below grade). Metal exceedances in groundwater are naturally occurring. Soil vapor samples across the Site have low VOC detections and are not attributed to soil or groundwater contamination.

5.0 CONCEPTUAL MODEL OF SITE CONTAMINATION

This section explains the occurrence of contaminants and their fate and transport at the Site in the context of the local Site stratigraphy and hydrogeology.

Historically, the building on former Lot 28 (the western portion of the Site) was constructed in 1925 and was initially occupied by Mack Truck Auto Service until the late 1930s. It was later occupied by a garage in the mid-1940s and by an auto/truck/auto parts and service station in the early 1950s through early 2000s. A laundromat occupied the building from the early 2000s through 2014. The building has been vacant since 2014. Former Lot 32 on the northern portion of the Site was developed with a store and apartment prior 1932. The structures were demolished sometime between 1932 and 1951. Later, the parcel remained undeveloped and used as a parking lot. The building on former Lot 35 (the eastern portion of the Site) was constructed in 1930 and was originally occupied by the parts department of Mack Truck Auto Service. From the late 1930s to the early 1960s, the building was occupied by Tire Sales & Service. From the early 1960s to the late 1980s, the building was occupied by an auto and truck manufacturer. From the late 1980s through the early 1990s, the parcel was listed as Family Services. The building was vacant from 1994 through 2014. Later, World Laundry occupied the building until 2024.

Based on previous environmental reports and investigations completed by Roux and former consultants, the Site is underlain with fill, mostly consisting of sand, gravel, silt, brick, concrete, cobble, asphalt and wood to a minimum depth of 5 feet (ft) below land surface (bls) and to a maximum depth of 15 ft bls across the Site. Beneath the fill, the subsurface is comprised of fine to coarse sand, silt, some gravel and clay. According to the water level data collected during the RI, the elevation of the water table surface at the Site ranged from 11.06 ft to 11.51 ft relative to NAVD88, or from 61.2 ft bls in MW-1 to 61.3 ft bls in MW-3, respectively. Groundwater flow is generally to the east.

Exceedances of soil contamination were mostly limited to some metals and SVOCs. Petroleum-related VOC impacts were found in RXSB-8, on the south side of the former warehouse. Two pesticides were detected in shallow soils during the SRI, in SRI-7 and SRI-8, which are located on the east and southwest corner of the Site, respectively. PCBs were not detected in any of the soil samples. The detections of VOCs in RXSB-8 can be attributed to a potential UST in the area. The detections of metals, SVOCs and limited pesticides are indicative of historic fill. PFOA was detected in two soil samples exceeding UUSCOs the PGWSCOs. The presence of PFOA can be an indication of an upgradient, off-Site source.

Groundwater impacts were limited to SVOCs (in MW-1 and MW-3 only), one VOC (chloroform), some metals (iron, selenium, magnesium and sodium) at concentrations exceeding AWQSGVs. Chloroform was not detected in any of the soil samples and its presence in groundwater can be attributed to being a by-product from the water supply used during the sonic drilling activities. SVOCs were not detected in any of the soil samples collected during the RI, however during the SRI, there were some SVOCs (PAHs) exceedances in shallow soils only. Therefore, these SVOC exceedances in groundwater at a depth of over 60 feet can be attributed to turbidity or offsite sources. The metals detected in total and dissolved groundwater samples were not detected above PGWSCOs in any soil samples. Therefore, there is no indication that metals in soil are a source of metals in groundwater. PFOA was detected in both soil and groundwater exceeding the SCOs. PFOA was detected in one soil sample exceeding UUSCOs and PGWSCOs and all groundwater samples exceeding AWQSGVs. PFOS was detected in three of the four groundwater exceeding AWQSGVs. There is no documented use of PFAS at the Site, and only one

detection of PFOA exceeded PGWSCOs in soil at RXSB-1, which is not co-located with MW-3. These detections of PFAS could indicate an upgradient, off-Site source.

Based on the soil vapor samples collected during the RI, there were Site-wide detections of VOCs. Petroleum-related and chlorinated VOCs were detected in soil vapor samples across the Site at low concentrations, but are not attributed to soil or groundwater contamination onsite.

6.0 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

As described in Appendix 3B of DER-10, *"The overall purpose of the Qualitative Human Health Exposure Assessment (or the exposure assessment) is to evaluate and document how people might be exposed to site related contaminants, and to identify and characterize the potentially exposed population(s) now and under the reasonably anticipated future use of the site."* The following section details the Qualitative Human Health Exposure Assessment based on data discussed in previous sections of this RAWP.

6.1 Soil Exposure

Soil samples collected during the RI and SRI indicated the presence of VOCs, SVOCs, metals, pesticides and PFOA at concentrations above the NYSDEC UUSCOs. Individuals could be exposed to these contaminants through direct contact with soil during ground intrusive work at the Site if they do not take precautionary measures to protect themselves as will be required during the BCP remediation. Direct contact without the use of proper personal protective equipment (PPE) and personal hygiene measures could lead to dermal contact and incidental ingestion of these compounds. Since the Site is currently fully fenced and will be fully fenced during construction activities, and access is controlled, potential contact with Site soil is restricted to remedial and construction contract workers at the Site performing ground intrusive activities in addition to trespassers and passersby (through potential particulate matter in the air) to the extent the dust control measures are not implemented. The general public will not be exposed to direct contact with Site soil. CAMP and dust control measures will be implemented, including a truck wash at the exit of the Site during intrusive activities to minimize the potential for offsite exposures by controlling soil/dust/vapor from leaving the Site.

6.2 Groundwater Exposure

Groundwater samples collected during the RI indicated that one VOC (chloroform), SVOCs, and PFOS/PFOA are present at concentrations above the NYSDEC AWQSGVs. Groundwater is not used for drinking or other potable purposes (the area is connected to the public water supply), and there is no direct contact with or ingestion of groundwater by the general public. Furthermore, no public water supply wells are located in the area surrounding the Site or are allowed to be located in this area pursuant to NYC law.

Individuals who perform intrusive work (i.e., utility construction and/or repair), perform groundwater sampling, or remedial activities may come into contact with contaminated groundwater. The depth to groundwater of over 60 feet below grade makes exposure to groundwater unlikely to workers. Proper personal protective equipment (PPE) and personal hygiene measures will be required to prevent dermal contact and the potential for incidental ingestion of these compounds.

The proposed on-Site buildings will be serviced by the public water supply. Based on this, there is no public exposure pathway for contaminated groundwater, and the exposure pathway for workers with potential direct contact with contaminated groundwater will be reduced or eliminated via implementation of the HASP.

6.3 Soil Vapor Exposure

Soil vapor samples collected during the RI indicated the presence of petroleum-related VOCs and CVOCs across the Site. These impacts are Site-wide, at generally low concentrations.

Individuals who perform ground intrusive work and passersby during the remedial action may be exposed to contaminated soil vapor if HASP and CAMP measures are not employed. CAMP and odor/vapor control measures will be implemented during intrusive activities to minimize the potential for offsite exposures from vapors leaving the Site during the remedial action.

Soil vapor intrusion could be a concern for the occupants in the future on-Site building if soil vapor intrusion mitigation measures are not proposed. Therefore, soil vapor mitigation measures will be considered as part of the remedy.

The following table summarizes the exposure assessment.

Environmental Media and Exposure Route	Human Exposure Assessment
Direct contact with subsurface soils (and incidental ingestion)	• Construction and remedial contractors can come into contact with soil if they complete ground intrusive work at the Site and have not implemented measures to protect themselves pursuant to a Health & Safety Plan (HASP). • During remediation, remedial workers, trespassers, passersby, and utility workers could come into contact with contaminated soil contained in dust through inhalation, incidental ingestion, and dermal contact. Implementation of the HASP, Community Air Monitoring Plan (CAMP) and dust controls during the remedial action and any future ground intrusive activities will mitigate potential exposures. • Future exposure will be eliminated though excavating contaminated soil in all areas of the Site if Track 1 is achieved. If a Track 4 is achieved, future exposure will be eliminated through the installation of a cover system at the Site.
Ingestion of groundwater	• Groundwater is not and will be not used for drinking water, as any future buildings proposed on the Site will be connected to the public water supply.
Direct contact with groundwater (and incidental ingestion)	• Remedial workers, trespassers, and utility workers could come into contact with contaminated groundwater through dermal contact and incidental ingestion during ground intrusive work if they have not implemented measures to protect themselves. This is unlikely due to the depth to water of over 60 feet. • Proper PPE and personal hygiene measures, as defined in the HASP, will be required to prevent dermal contact and the potential for incidental ingestion of impacted groundwater during construction. • Future exposure to Site groundwater will be eliminated by the redevelopment that covers the entire Site.
Inhalation of air (exposures related to soil vapor intrusion)	• Remedial workers, trespassers, and utility workers may be exposed to contaminated soil vapor during ground intrusive activities if they do not protect themselves through implementation of the HASP. • Exposures to workers and passersby during the remedial action and future ground intrusive activities will be reduced or eliminated through implementation of the HASP, CAMP, and odor/vapor controls during construction. • Future exposure will be reduced or eliminated through installation of any required soil vapor mitigation measures.

7.0 FISH AND WILDLIFE REMEDIAL IMPACT ANALYSIS

The RI for this Site did not identify the potential for impacts to fish and wildlife resources as determined by the Fish and Wildlife Resources Analysis Decision Key (Appendix A of the RIR).

8.0 INTERIM REMEDIAL ACTION

To date, Interim Remedial Action has not been performed at the Site.

9.0 REMEDIAL ACTION OBJECTIVES

Based on the results of the Remedial Investigation, the following Remedial Action Objectives (RAOs) have been identified for this Site.

9.1 Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

9.2 Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

9.3 Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at the Site.

10.0 DESCRIPTION OF REMEDIAL ACTION PLAN

The following is a detailed description of the alternatives analysis and remedy selection process to address impacted media on the Site.

This section of the RAWP was prepared in accordance with Subpart 375 – 3.8(f), Subpart 375 – 1.8(f), and Section 4.3 of DER-10. As required, a minimum of two remedial alternatives (one being an unrestricted use scenario) are evaluated, as follows:

- One alternative (Remedial Alternative 1) that will achieve an Unrestricted Use cleanup relative to all on-site soil (Track 1), as shown on Figure 11, without the use of institutional controls (ICs) or engineering controls (ECs); and
- One alternative (Remedial Alternative 2) that will achieve a Track 2 Restricted Residential Use cleanup for the Site, as shown on Figure 12 with the use of ICs.

Remedial Alternative 1: Track 1 Unrestricted Use Cleanup (Figure 11):

- Installation of support of excavation (SOE) to support the proposed remedial excavation depths. The SOE is comprised of drilled soldier piles, waler and timber lagging installed along the Site boundary. A temporary 1:1 earth berm (outside the property line) will be installed (along the north, south and west sides of the Site) until the foundation wall is braced by the proposed building first floor.
- For remedial purposes, the estimated excavation and disposal of soil to achieve Track 1 Unrestricted Use cleanup is approximately 13,450 CY. The limits and approximate depths of the remedial excavation ranging from 3 to 14 feet below grade and are shown on Figure 11. For construction purposes, the excavation and off-site disposal of soil is approximately 54,300 CY. The estimated depth of excavation for construction purposes is 37 feet below grade.
- Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during intrusive Site work.
- Appropriate off-site disposal of all materials removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport and disposal.
- To evaluate the performance of the remedy with respect to attainment of Track 1 UUSCOs, collection and analysis of post-excavation bottom confirmation endpoint samples at a frequency of one per 900 square feet as well as confirmation sidewall samples at a frequency of one per 30 linear feet to document that the SCOs were met. Based on this frequency, a total of 42 bottom endpoint samples and 11 sidewall samples would be required. The sidewall samples are located in between the remedial excavation grids. Sidewall samples are not required where excavation extends to the property line.
- Backfill and compaction of clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in (if needed) to replace the excavated soil and establish the designed grades at the Site. Backfill and compaction of clean fill meeting UUSCO, shall be in compliance with: (1) chemical limits and other specifications included in Table 18, (2) all Federal, State and local rules and regulations for handling and transport of material.
- Dewatering is not expected to be required to complete the remedial excavation because the depth to groundwater is much deeper (approximately 61 feet below grade) than the proposed excavation depths. In the event that limited shallow dewatering is required, it will be in compliance with city, state, and federal laws and regulations. Extracted groundwater will either be containerized for off-Site licensed or permitted disposal or will be treated on-Site under an NYSDEC SPDES equivalency permit and site connection permit from New York City Department of Environmental

Protection to meet pretreatment requirements prior to discharge to a storm sewer system discharging to an outfall.

- Since all sources are being removed through extensive excavation as part of the Track 1 remedy, and depth to groundwater is much deeper than the proposed excavation, groundwater treatment is not required.
- As part of the Track 1 remedy, a soil vapor intrusion evaluation will be completed. The evaluation will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion.

Remedial Alternative 2: Track 2 Restricted Residential Use Cleanup (Figure 12):

- Installation of support of excavation (SOE) to support the proposed remedial excavation depths. The SOE is comprised of drilled soldier piles, waler and timber lagging installed along the Site boundary. A temporary 1:1 earth berm (outside the property line) will be installed until the foundation wall is braced by the proposed building first floor.
- For remedial purposes, the estimated excavation and disposal of soil to achieve Track 2 Restricted Residential Use cleanup (RRSCO) is approximately 9,600 CY. The limits and approximate depths of excavation (ranging from 2 to 13 feet below grade) are shown on Figure 12.
- Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during intrusive Site work.
- Appropriate off-site disposal of all materials removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport and disposal.
- To evaluate the performance of the remedy with respect to attainment of Track 2 RRSCOs, collection and analysis of post-excavation bottom documentation endpoint samples at a frequency of one per 900 square feet. Based on this frequency, a total of 42 bottom documentation endpoint samples would be required. Sidewall samples are not required where excavation extends to the property line.
- Backfill and compaction of clean fill meeting the lower of PGWSCOs or RRSCOs, if necessary. Import of materials to be used for backfill and cover shall be in compliance with: (1) chemical limits and other specifications included in Table 20, (2) all Federal, State and local rules and regulations for handling and transport of material.
- Dewatering is not expected to be required to complete the remedial excavation because the depth to groundwater is much deeper (approximately 61 feet below grade) than the proposed excavation depths. In the event that dewatering is required, it will be in compliance with city, state, and federal laws and regulations. Extracted groundwater will either be containerized for off-Site licensed or permitted disposal or will be treated on-Site under an NYSDEC SPDES equivalency permit and site connection permit from New York City Department of Environmental Protection to meet pretreatment requirements prior to discharge to a storm sewer system discharging to an outfall.
- Installation of a 20-mil vapor barrier below the foundation slab as part of the site construction.
- Imposition of an institutional control in the form of an Environmental Easement for the Site to ensure proper site use and to prevent future exposure to any residual contamination remaining in these areas.
    - requires the remedial party or Site owner to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
    - allows the continued use and development of the controlled property for restricted residential (or less restrictive uses) as defined by Part 375-1.8(g), although land use is subject to local zoning laws;

- restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or Article 141 of the NYCDOH code (groundwater restriction applies to the entire Site); and
- requires compliance with the Department approved SMP.

- An SMP is required for all portions of the Site since a Track 1 Unrestricted Use cleanup will not be achieved, which includes the following:
  - an Institutional Control Plan that identifies all use restrictions for the Site and details the steps and media-specific requirements necessary to ensure the following institutional controls remain in place and effective:
    - Institutional Controls: The Environmental Easement discussed above.

10.1 Evaluation of Remedial Alternatives

The goal of the remedy selection process under the BCP is to select a remedy that is protective of human health and the environment taking into consideration the current, intended, and reasonably anticipated future use of the property and other evaluation factors. Each remedial alternative is evaluated based on the factors listed below:

- Protection of human health and the environment;
- Compliance with standards, criteria, and guidelines (SCGs);
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community Acceptance;
- Green and Sustainable Remediation (including climate resiliency); and
- Land use.

10.1.1 Overall Protection of Human Health and Environment

This criterion is an evaluation of the ability of each alternative or the remedy to protect public health and the environment.

Remedial Alternative 1, Track 1 would be protective of human health and the environment by removing all soil at the Site that exceeds the UUSCOs thus eliminating the potential for human and environmental exposure to contaminated soil/fill once construction of the planned subsurface sub-cellar level is complete. Groundwater is very deep (over 60ft deep) and residual exceedances are not attributed to Site contamination. A soil vapor intrusion evaluation would be completed as part of the remedy.

Remedial Alternative 2, Track 2 would also be protective of human health and the environment by excavating and removing soil above the RRSCOs within the building footprint in the Track 2 area, and addressing soil exceeding RRSCOs with the use of ICs. ICs including a SMP and Environmental Easement, would ensure long-term management of use restrictions for the Site.

For both alternatives, during Site remediation (e.g., excavation of soil, etc.) and other construction activities, workers may be exposed to impacted soil, groundwater (to a lesser extent due to its depth) and soil vapor. Potential worker exposure during remediation activities would be mitigated through the implementation of the HASP, which includes the CAMP, and required worker training. Potential environmental exposures will be mitigated by ECs implemented during remedial construction (i.e., dust suppression, odor control and traffic control). The SMP would include ICs to be implemented during future ground intrusive work to protect the workers and public from remaining contamination on-Site.

10.1.2 Standards, Criteria, and Guidance

The remedy must conform to officially promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance as appropriate.

Remedial Alternative 1 would achieve compliance with the UUSCOs in soil for all on-Site areas. The handling and management of contaminated materials will be in compliance with the applicable SCGs. The excavation would be backfilled with material meeting the Track 1 UUSCOs presented in the Part 375 Regulations.

Remedial Alternative 2 would achieve compliance with the RRSCOs in soil within the building footprint and would address soil exceeding RRSCOs with the use of ICs. The handling and management of contaminated materials would be in compliance with the applicable SCGs.

10.1.3 Short-Term Effectiveness and Impacts

This criterion is an evaluation of the potential short-term adverse environmental impacts and human exposure during the construction and/or implementation of an alternative or remedy.

Remedial Alternatives 1 and 2 pose minimal health and environmental risks during implementation; however, Alternative 1 has a slightly longer short-term impacts due to deeper soil excavation required to achieve Track 1. The potential adverse impacts to the community and workers (e.g., increased traffic or exposure to contaminants during soil excavation and transportation) can be mitigated with ECs (e.g., HASP, CAMP, dust, odor, and traffic controls). Other potential risks of both Alternatives include material handling, electrical shock, vapor inhalation, general trip hazards, and noise. These potential impacts under both Alternatives are addressed in the Site-specific HASP and CAMP and the Soil/Materials Management Plan (SoMP), which detail monitoring during the construction and describe ECs to be implemented.

Alternative 2 has fewer short-term impacts than Alternative 1 due to less truck traffic, and less soil management on-Site, shorter exposure impacts, and less soil to be disposed off-Site, which also makes it a greener remediation remedy.

10.1.4 Long-Term Effectiveness and Impacts

This criterion is an evaluation of the long-term effectiveness and permanence of an alternative or remedy after implementation.

Remedial Alternative 1 removes all impacted soil to the State's most stringent UUSCOs and the remedy should continue to meet RAOs in the future once Track 1 levels are achieved, thus providing a permanent long-term solution for the Site.

Remedial Alternative 2 removes all impacted soil above RRSCOs from within the building footprint and addresses soil exceeding RRSCOs with the use of ICs. ICs including a SMP and Environmental Easement, will ensure long-term management of use restrictions for the Site. The SMP will ensure long-term effectiveness of all ICs by requiring periodic inspection and certification that these controls and restrictions continue to be in place and are functioning as intended for the Site.

10.1.5 Reduction of Toxicity, Mobility, or Volume of Contaminated Material

This criterion is an evaluation of the ability of an alternative or remedy to reduce the toxicity, mobility and volume of Site contamination. Preference should be given to remedies that permanently or significantly reduce the toxicity, mobility, or volume of the contamination at the Site. The following is the hierarchy of source removal and control measures, ranked from most preferable to least preferable:

- Removal and/or treatment;
- Containment;
- Elimination of exposure; and

Treatment of source at the point of exposure.

Remedial alternatives that use treatment or removal to eliminate contaminants at a Site, reduce the total mass of toxic contaminants, cause irreversible reduction in contaminants mobility, or reduce the total volume of contaminated media are preferable.

Remedial Alternative 1 permanently eliminates the toxicity, mobility, and volume of contaminants within the Site by removing all soil with concentrations that exceeded the UUSCOs onsite.

Remedial Alternative 2 will significantly eliminate toxicity, mobility, and volume of contaminants above the RRSCOs within the building footprint. ICs, including a SMP and Environmental Easement, will provide long-term Site management for the Site.

10.1.6 Implementability

This criterion is an evaluation of the technical and administrative feasibility of implementing each alternative remedy. Both Remedial Alternatives are technically feasible and readily implementable. The techniques, materials and equipment to implement **Remedial Alternatives 1 and 2** are readily-available and have been proven effective in remediating the contaminants associated with the Site. Standard materials, services, and well-established technologies will be implemented. There are no specific difficulties associated with any of the activities proposed, which utilize standard construction methods.

10.1.7 Cost Effectiveness

This criterion is an evaluation of the overall cost effectiveness of an alternative or remedy.

Cost estimates for each alternative are shown in Tables 16 (Remedial Alternative 1) and 17 (Remedial Alternative 2).

The total cost for **Remedial Alternative 1** is $5,416,000.

The total cost for **Remedial Alternative 2** is $4,555,000 with approximately $10,000/year for annual inspections and reporting in accordance with the SMP and post-remediation monitoring. The costs associated with Remedial Alternative 1 are higher than Remedial Alternative 2 due to the additional support of excavation, deeper excavation, and additional off-Site disposal that will be required to achieve Track 1 UUSCOs throughout the Site. Remedial Alternative 2 includes long term costs associated with implementation of the SMP for the Site.

10.1.8 Community Acceptance

This criterion is evaluated after the public review of the remedy selection process as part of the final NYSDEC selection/approval of a remedy for a site.

1. Any public comment relative to these criteria will be considered by NYSDEC after the close of the public comment period.
2. Documentation of the public comments received is to be consistent with the citizen participation plan identified for a remedial program in accordance with applicable DEC policy.

No public comments were received during the comment period.

10.1.9 Green and Sustainable Remediation

Green and sustainable remediation practices are evaluated for the implementation of an alternative or remedy. Each remedial alternative includes the excavation and off-site disposal of on-site soil exceeding the appropriate SCO and the collection of endpoint samples. The magnitude of water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste generation, and material use would be similar, differing slightly in the amount of greenhouse gas emissions and waste generation. The Track 1 Unrestricted Use cleanup, which includes excavation and disposal of approximately 13,450 CY of soil will produce the most greenhouse gas emissions and waste. The Track 2 Restricted Residential Use Cleanup results in an very protective remedy while generating less greenhouse gas emissions and waste due to the reduced anticipated soil disposal volumes (9,600 CY). A detailed summary of each evaluation is provided below.

Alternative 1

Alternative 1 was evaluated with respect to green and sustainable remediation principles. An environmental footprint analysis using SEFA^{TM} which is a NYSDEC accepted environmental footprint analysis calculator. Two components of the remedy were evaluated: site preparation and the remedy. The site preparation for the Track 1 remedy includes the waste characterization investigation. Waste characterization sampling will be performed exclusively for the purpose of off-site disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws, rules and regulations and facility-specific permits. For the purpose of completing the SEFA^{TM} analysis, we have assumed that the amount of contaminated soil to be characterized, excavated and disposed of off-site for implementation of the remedy is approximately 13,450 CY.

The remedy component includes the excavation of 13,450 CY of contaminated soil, construction of a SOE system extending to depths of 20 feet bgs to facilitate the contaminated soil removal down to depths up to 14 ft bgs, monitoring well abandonment, the collection of confirmation soil samples for performance monitoring purposes. The Track 1 remedy would be completed in approximately 4 months.

Using the above identified information, the SEFA™ model estimated the following emissions and total energy usage for the implementation of a Track 1 remedy:

Remedial Alternatives	Alternative 1 – Track 1
Greenhouse Gas (GHG) Emissions (metric ton)	783.3
Total Energy Used (MMBTU)	10,124.1
Water Consumption (gallons)	N/A
Total Nox Emissions (metric ton)	10,179.3
Total Sox Emissions (metric ton)	2,242.6
Total PM10 Emissions (metric ton)	8,014.0

Details regarding the input and output of the SEFA™ model are provided in Appendix N.

Alternative 2

Alternative 2 was also evaluated with respect to green and sustainable remediation principles using SEFA™. The components of the remedy that were evaluated include site preparation, the Track 2 remedy across the Site and long-term monitoring. The site preparation for the Track 2 remedy includes the waste characterization investigation. Waste characterization sampling will be performed exclusively for the purpose of off-site disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws, rules and regulations and facility-specific permits. For the purpose of completing the SEFA™ analysis, we have assumed that the amount of contaminated soil to be characterized, excavated and disposed of off-site for implementation of the remedy as well as for construction is approximately 9,600 CY.

The remedy component as well as construction includes the excavation of 9,600 CY of contaminated soil in Track 2, construction of a SOE system extending to depths up to 20 feet bgs to facilitate the contaminated soil removal down to depths up to of 13 ft bgs, monitoring well abandonment, the collection of documentation soil samples. The Track 2 remedy would be completed under 3 months. A long-term monitoring includes annual cap inspections.

Using the above identified information, the SEFA™ model estimated the following emissions and total energy usage for the implementation of a Track 2 remedy:

Remedial Alternatives	Alternative 2 –Track 2
Greenhouse Gas (GHG) Emissions (metric ton)	561.4
Total Energy Used (MMBTU)	7,276.8
Water Consumption (gallons)	N/A
Total Nox Emissions (metric ton)	7,262.4

Remedial Alternatives	Alternative 2 –Track 2
Total Sox Emissions (metric ton)	1,658.8
Total PM10 Emissions (metric ton)	5,691.5

Details regarding the input and output of the SEFA™ model are provided in Appendix N.

10.1.10 Land Use

This criterion is an evaluation of the current, intended and reasonably anticipated future use of the Site and its surroundings, as it relates to an alternative or remedy, when unrestricted levels would not be achieved.

This evaluation has considered reasonably anticipated future uses of the Site and evaluates:

- Current use and historical and/or recent development patterns;
- Applicable zoning laws and maps;
- NYS Department of State's Brownfield Opportunity Areas (BOA) pursuant to section 970-r of the general municipal law;
- Applicable land use plans;
- Proximity to real property currently used for residential use, and to commercial, industrial, agricultural, and/or recreational areas;
- Environmental justice impacts, federal or state land use designations;
- Population growth patterns and projections;
- Accessibility to existing infrastructure;
- Proximity of the site to important cultural resources and natural resources, potential vulnerability of groundwater to contamination that might emanate from the site;
- Proximity to flood plains;
- Geography and geology; and
- Current ICs applicable to the Site.

Remedial Alternatives 1 and **2** are both compatible with land use and zoning and the regional land use patterns, which include the need for more housing and affordable housing. The Site location is not conducive to flooding nor will the remediation and redevelopment impact natural resources due to its highly urbanized environment. The Site is not located in an En-Zone area.

10.2 Selection of the Preferred Remedy

The Preferred Remedy for the Site, **Remedial Alternative 1** (Track 1), was selected for implementation since it adequately meets each of the evaluation criteria. In summary, the Preferred Remedy for the Site:

- Is protective of public health and the environment;
- Removes all soil with concentrations exceeding the UUSCOs up to a maximum depth of 14 ft bls over the entire footprint of the Site;
- Provides long-term effectiveness and permanence through source removal for all areas of the Site;
- Reduces the toxicity, mobility, or volume of impacted material through significant source removal;

- Provides short-term effectiveness, including minimal impacts to workers or the surrounding neighborhood through the implementation of ECs during construction;
- Is readily implemented with reduced potential to impacts adjacent structures;
- Can be implemented at similar cost than Remedial Alternative 2; and
- Is compatible with land use.

The Preferred Remedy for the Site is consistent with the approach for a Track 1 Unrestricted use scenario for the entire Site.

10.2.1 Preferred Remedy Land Use Factor Evaluation

A land use factor evaluation of the Preferred Remedy for the Site is provided below based on the following criteria as required by Article 27, Title 14 of the Environmental Conservation Law 27-1415.

10.2.1.1 Zoning

The current Site is within the C4-4D District and the surrounding area zoning is predominantly C1-3, which are commercial overlays mapped within residence districts.

C4 districts are mapped in regional commercial centers that are located outside of the central business districts. C4 districts with a D suffix are contextual districts in which the commercial and residential bulk and density regulations can differ from corresponding non-contextual districts. C4-4 districts are mapped in more densely built areas and have a floor area ratio (FAR) of 3.4. C4-4D districts have supplementary bulk regulations mandate that all developments maintain street wall continuity and a harmonious relationship with other buildings in the area.

The proposed mixed-use building with commercial and residential units with 20% of those being affordable and recreational facility is consistent with the current property zoning and patterns of development in the area.

10.2.1.2 Applicable Comprehensive Community Master Plans or Land Use Plans

The proposed redevelopment of the Site is consistent with the City's zoning laws and map.

10.2.1.3 Surrounding Property Uses

The area surrounding the Site is an urban area comprised of residential, mixed and commercial buildings. The surrounding properties include an apartment building to the north, commercial buildings to the east including a restaurant, mixed residential/commercial building and a self-storage building, a supermarket to the south and a fast-food restaurant to the west.

10.2.1.4 Citizen Participation

Citizen participation has been and will continue to be pursued throughout the remedial process in accordance with the Citizen Participation Plan (CPP) for the Site (Appendix H).

10.2.1.5 Environmental Justice

As established in DEC Commissioner Policy 29 on Environmental Justice (EJ) and Permitting (CP-29), potential EJ areas are 2000 U.S. Census block groups of 250 to 500 households each that, in the 2000 Census had populations that met or exceeded at least one of the following statistical thresholds:

a) At least 51.1% of the population in an urban area reported themselves to be members of minority groups; or

b) At least 33.8% of the population in a rural area reported themselves to be members of minority groups; or

c) At least 23.59% of the population in an urban or rural area had household incomes below the federal poverty level.

According to the NYSDEC database for environmental justice concerns, the Site is located in a Potential Environmental Justice Area (PEJA) and is surrounded by several EJ areas.

10.2.1.6 Environmental Zones

According to the NYSDEC database and as established by the NYS Department of Labor's State Data Center, the Site is not located within an Environmental Zone (En-Zone). En-Zones are established at census tracts with a poverty rate of at least 20 percent and an unemployment rate of at least 125 percent of the New York State unemployment rate, or a poverty rate of at least double the rate for the county in which the tract is located.

10.2.1.7 Land Use Designations

There are no federal or state land use designations related to the Site.

10.2.1.8 Population Growth Patterns

According to population growth patterns and projections, a potential future redevelopment of the Site into a mixed-use building with commercial and residential units with 20% of those being affordable and recreational facility will be supportive of the growing community.

10.2.1.9 Accessibility to Existing Infrastructure

The Site's location is accessible to existing infrastructure.

10.2.1.10 Proximity to Cultural Resources

There are no historic resources within a 600-foot radius of the Site. The proposed remedy would not result in significant adverse impacts to architectural or archaeological resources.

10.2.1.11 Proximity to Natural Resources

The Site is not located in, or adjacent to, regulated wetlands. The nearest surface water body is the Prospect Park Lake located approximately 2,780 feet southwest of the Site.

10.2.1.12 Groundwater Vulnerability

There are no known wellhead protection areas or specifically designated groundwater recharge areas in the vicinity of the Site. Groundwater flows to the east. Groundwater is not used as a source of drinking water.

10.2.1.13 Proximity to Floodplains

The Site is not located in the 100-year or 500-year flood zone.

10.2.1.14 Geography and Geology of the Site

The Site geography, geology and hydrogeology are described in Section 4.2. A groundwater contour map is presented on Figure 6.

10.2.1.15 Current Institutional Controls

There are currently no ICs on the property. The Site's selected Track 1 Unrestricted Use cleanup will also not have implementation of ICs (SMP and Environmental Easement) as part of the remedial action for the entire Site. A chain link fence currently surrounds the Site to prevent access.

10.3 Summary of Selected Remedial Actions

The elements of the selected Track 1 Unrestricted Use Cleanup are detailed below.

- Installation of support of excavation (SOE) to support the proposed remedial excavation depths. The SOE is comprised of drilled soldier piles, waler and timber lagging installed along the Site boundary. A temporary 1:1 earth berm (outside the property line) will be installed (along the north, south and west sides of the Site) until the foundation wall is braced by the proposed building first floor.
- For remedial purposes, the estimated excavation and disposal of soil to achieve Track 1 Unrestricted Use cleanup is approximately 13,450 CY. The limits and approximate depths of the remedial excavation ranging from 3 to 14 feet below grade and are shown on Figure 11. For construction purposes, the excavation and off-site disposal of soil is approximately 54,300 CY. The estimated depth of excavation for construction purposes is 37 feet below grade.
- Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during intrusive Site work.
- Appropriate off-site disposal of all materials removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport and disposal.
- To evaluate the performance of the remedy with respect to attainment of Track 1 UUSCOs, collection and analysis of post-excavation bottom confirmation endpoint samples at a frequency of one per 900 square feet as well as confirmation sidewall samples at a frequency of one per 30 linear feet to document that the SCOs were met. Based on this frequency, a total of 42 bottom endpoint samples and 11 sidewall samples would be required. The sidewall samples are located in between the remedial excavation grids. Sidewall samples are not required where excavation extends to the property line.
- Backfill and compaction of clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in (if needed) to replace the excavated soil and establish the designed grades at the Site. Backfill and compaction of clean fill meeting UUSCO, shall be in compliance with: (1) chemical limits and other specifications included in Table 18, (2) all Federal, State and local rules and regulations for handling and transport of material.

- Dewatering is not expected to be required to complete the remedial excavation because the depth to groundwater is much deeper (approximately 61 feet below grade) than the proposed excavation depths. In the event that limited shallow dewatering is required, it will be in compliance with city, state, and federal laws and regulations. Extracted groundwater will either be containerized for off-Site licensed or permitted disposal or will be treated on-Site under an NYSDEC SPDES equivalency permit and site connection permit from New York City Department of Environmental Protection to meet pretreatment requirements prior to discharge to a storm sewer system discharging to an outfall.
- Since all sources are being removed through extensive excavation as part of the Track 1 remedy, and depth the groundwater is much deeper than the proposed excavation, groundwater treatment is not required.
- As part of the Track 1 remedy, a soil vapor intrusion evaluation will be completed. The evaluation will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP. All deviations from the RAWP will be promptly reported to NYSDEC for approval and fully explained in the FER.

11.0 REMEDIAL ACTION PROGRAM

11.1 Governing Documents

11.1.1 Standards, Criteria and Guidance (SCGS)

The following standards, criteria, and guidance will be consulted and adhered to throughout the Remedial Action as applicable:

- 6 NYCRR Part 364 - NYS Waste Transporter Permits
- 6 NYCRR Part 360 - NYS Solid Waste Management Requirements
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes
- 6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities
- 6 NYCRR Part 375 - Environmental Remediation Programs
- 6 NYCRR Part 376 - Land Disposal Restrictions
- 6 NYCRR Part 613 - Petroleum Bulk Storage
- 6 NYCRR Part 750 - State Pollutant Discharge Elimination System (SPDES) Permits
- 29 CFR Part 1910.120 - Hazardous Waste Operations and Emergency Response
- CP-43 - Commissioner Policy on Groundwater Monitoring Well Decommissioning (December 2009)
- CP-49 - Climate Change and DEC Action (2022)
- CP-51 - Soil Cleanup Guidance (2010)
- DER-2 - Making Changes to Selected Remedies (April 2008)
- DER-10 - Technical Guidance for Site Investigation and Remediation (2010)
- DER-13 - Strategy for Evaluating Soil Vapor Intrusion at Remedial Sites in New York (2006)
- DER-23 - Citizen Participation Handbook for Remedial Programs (2010)
- DER-31 - Green Remediation (2010)
- DER-32 - Brownfield Cleanup Program Applications and Agreements (2017)
- DER-33 - Guide to Drafting and Recording Institutional Controls (2010)
- TAGM 3028 - "Contained In" Criteria for Environmental Media: Soil Action Levels (August 1997)
- TOGS 1.1.1 - Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations (1998, Addenda 2000, 2004 and 2023)
- New York State Standards and Specifications for Erosion and Sediment Control (2016)
- New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006; amended 2024)
- New York State Climate Act (2019)

NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (2023).

11.1.2 Green and Sustainable Remediation and Climate Resiliency

Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major Green and Sustainable Remediation (GSR) components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases, and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling, and increasing reuse of materials that would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible, including maximizing the planting of trees, shrubs, and other carbon dioxide sinks in redevelopment;
- Fostering green and healthy communities and working landscapes that balance ecological, economic, and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate GSR principles and techniques to the extent feasible in the future development at this site, any future on-site buildings shall be constructed, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

To evaluate the remedy with respect to GSR principles as part of the remedial design program, water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use estimation, and goals for the project related to these GSR metrics, as well as goals for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate.

The proposed redevelopment to be completed alongside the remediation will include 4 newly constructed buildings that will not utilize fossil fuel-powered boiler(s) for the HVAC systems. These buildings will utilize electricity for both heat and hot water and will result in no Site emissions. The proposed redevelopment and remediation of the Site will not have an adverse impact on any existing natural resources. The Site is not located in, or adjacent to, regulated wetlands. Prospect Park Lake is approximately 1.5 miles southwest from the Site. The Gowanus Canal is approximately 3.7 miles west of the Site. Since the Site is currently vacant, and the redevelopment will include NYCDEP-approved storm water management, there will not be significant adverse impacts to the Canal. The proposed redevelopment is not expected to generate more than 1,000 tons of solid waste per week and therefore will not have a significant adverse impact to the NYC solid waste management systems. The Site is not located in an En-Zone. The proposed mixed-use building will include commercial and residential units with approximately 20% of those being affordable and community facility.

To further incorporate green remediation principles and techniques to the extent feasible in the future development at this Site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier to

serve as the sealing under the foundation and which will also improve energy efficiency as an element of construction.

Additionally, the remedial design includes climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise have been identified, and measures to minimize the impact of climate change on potential identified vulnerabilities are summarized below:

Projected Hazard	Potential Implications
Sea Level Rise and Floodplain	**Current FEMA Flood Zones Maps**: The Project area is not located within the current 100-year flood plain or 500-year flood plain. The FEMA coastal flooding risk rating is relatively low, with a risk index score of 34.10 out of 100. **FEMA 2020 Flood Zones Maps and FEMA 2050 Flood Zones Maps**: The Site is not within the FEMA 2020 100-year flood plain or the FEMA 2050 500-year flood plain.
Precipitation	**2035**: 1.7% to 5.5% change in average annual precipitation. **2060**: 3.4% to 10.7% change in average annual precipitation.
Rising Temperatures	**2035**: 2.2 F to 3.0 F change in average annual temperature. **2060**: 4.3 F to 5.8 F change in average annual temperature.
Extreme Heat	Historical average 1 day over 100 F. **2035**: 3 days over 100 F. **2060**: 5 to 8 days over 100 F. The FEMA risk index rating for heat waves is very high, with a risk index score of 86.5 out of 100. The FEMA risk index rating for drought is very low, with a risk index score of 0.0 out of 100 (based on Agricultural [crop only] impacts).
Extreme Weather Events	**2035**: 1.5% to 9% change in 100-year storm intensity. **2060**: 3.0% to 17.5% change in 100-year storm intensity. The Site is not located in New York City (NYC) Hurricane Evacuation Zone; therefore the storm surge risk is low.
Seismic Activity	The potential impact due to seismic activity in the Site area is relatively low, with a risk index of 70.3 out of 100.
Hazardous Material/Toxic Chemical Spills	The NYSPILLS database does not indicate any on-site spill or releases. It is not anticipated that any petroleum bulk storage (PBS) will be included as part of redevelopment and remediation.
Wildfire	The USEPA Wildfire Conditions & Risk Map for Water Utilities reports fires larger than 1,000 acres throughout the period of 1984 through 2019. No wildfires have been reported within Kings County during this time period. The wildfire risk is low.
Landslide	The United States Geological Survey (USGS) Landslide Inventory summarized the landslide confidence levels from High confidence in extent or nature of landslide through possible landslide. The Site is not located within any of the landslide confidence areas.

Notes:

1.) The FEMA Risk Ratings are a comparison of the risk factors for the Site area to the rest of the United States.
2.) The FEMA Risk Index scores are calculated using data for a single hazard type and reflect an area's relative risk for that hazard type.
3.) The 2035 and 2060 scenarios are based on the USEPA Climate Scenarios Projection Maps. These scenarios define a range of future climate conditions that can be considered for each time period (short- and long-term), from the hottest (and driest) to the wettest model results. All climate models project warming, the extent of warming varies per scenario. Note that due to the inherent uncertainty in using models to project future climate conditions, all scenarios have been considered to evaluate the resilience to impacts that could result from possible future climates and high impact/low probability events.

Additionally, the American Society for Testing and Materials (ASTM) Standard Guide for Greener Cleanups will be taken into consideration during remediation implementation to minimize total energy use, air pollutants and greenhouse gas emissions, water use and impacts to water resources, recycling of materials and waste, and promote the protection of land and ecosystems.

In the FER, a Best Management Practices (BMPs) assessment and an environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), or a similar NYSDEC accepted tool. Further, progress with respect to GSR metrics will be tracked during implementation of the remedial action and reported in the FER, including a comparison to the goals established during the remedial design program.

11.1.3 Site Specific Health & Safety Plan (HASP)

The Site-specific HASP is included in Appendix I and the CAMP is included as Appendix J within the HASP. All remedial work performed under this plan will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by the Federal Occupational Safety and Health Administration (OSHA).

The Volunteer and associated parties preparing the remedial documents submitted to the State and those performing the construction work, are completely responsible for the preparation of an appropriate Health and Safety Plan and for the appropriate performance of work according to that plan and applicable laws.

The HASP and requirements defined in this RAWP pertain to all remedial and invasive work performed at the Site until the issuance of a Certificate of Completion.

The Roux Site Safety Coordinator will be determined prior to implementation of the remedial action. A resume will be provided to NYSDEC prior to the start of remedial construction.

11.1.4 Quality Assurance Project Plan (QAPP)/ Field Sampling Plan (FSP)

The QAPP/FSP (Appendix K) includes all procedures to be followed for sampling and analysis. The QAPP/FSP includes all requirements outlined in DER-10 Section 2.4.

11.1.5 Construction Quality Assurance Plan (CQAP)

Quality assurance/quality control procedures for all construction activities associated with implementation of the remedial action construction are established in the Construction Quality Assurance Plan (CQAP), which is included in this section of the RAWP. The CQAP describes the Site-specific construction quality assurance and control measures that will be performed during remediation that will be implemented at the Site during implementation of the RAWP. The CQAP includes a program for construction observation and testing to verify performance of the remedial construction in accordance with the RAWP.

In general, the work to be addressed by this CQAP consists of the excavation and proper management/disposal of impacted soils.

11.1.5.1 Organization/Personnel

The implementation of the remedial action construction will be sequenced based on construction requirements, environmental considerations, and logistic limitations posed by proximity of adjacent

structures. The project team is comprised of the Owner/Volunteer (Empire McKeever Heights LLC), contractors, and consultants specializing in one or more critical aspects of the project. It is understood by the project team that close coordination and proper sequencing of all activities occurring on the Site will be crucial to the success of the remediation. The project team and associated responsibilities are as follows. If changes are made to the project team, the CQAP will be amended.

Company	Project Role	Name (title)	Contact Info (email or phone)
Empire McKeever Heights LLC	Volunteer	Samuel Hoffman (Project Manager)	samuel@galaxycm.com (718) 246-4762
Galaxy Developers	General Contractor	Rafael Rabinowitz	rafael@rabskygroup.com 718) 246-4762
Roux	Environmental Consultant	Charles J. McGuckin, P.E. (Remedial Engineer)	cmcguckin@rouxinc.com (631) 232-2600
		Wendy Shen (Project Manager QA Officer)	wshen@rouxinc.com (631) 232-2600
		TBD (Field Team Leader)	(631) 232-2600
		James Hauri (Data Validator)	jhauri@rouxinc.com (781) 569-4054
To Be Determined	Surveying Firm	To Be Determined	To Be Determined
Alpha Analytical	Environmental Laboratory	Jennifer Byrnes (Project Manager)	jennifer.byrnes@pacelabs.com (716) 427-5228

11.1.5.2 Empire McKeever Heights LLC (Volunteer) – Site Redevelopment and Regulatory Interaction

Zelig Weiss, Redevelopment Project Manager/Remediation Oversight

Empire McKeever Heights LLC's Project Manager for the Site will coordinate communications with regulatory agencies and will provide general oversight of all aspects of the remediation. Empire McKeever Heights LLC will be responsible for the review and submission of all documents, reports, correspondence, etc., required by the RAWP and/or the BCA with the NYSDEC.

Empire McKeever Heights LLC's Project Manager will be responsible for community notifications and addressing concerns with the adjacent property owners and local community on all remediation-related issues. Empire McKeever Heights LLC will be immediately notified by the on-site team of any complaints or concerns regarding the work raised by the adjacent property owners and or the general public.

11.1.5.3 General Contractor/Soil Remedial Contractor- Galaxy Developers

Project Quality Control Officer

The General Contractor will be responsible for the quality assurance of all the tasks being implemented. The General Contractor will confirm that all components of the Site activities are conducted according to the requirements of the RAWP. The General Contractor will be responsible for verifying that the daily Site construction activities are in compliance with all the safety requirements and regulations governing the Site activity; however, each subcontractor is responsible for the health and safety of their own personnel. The

General Contractor will be responsible for managing the transportation and disposal of any contaminated waste and materials generated during the construction, including:

- Fill/Soil;
- Contaminated Concrete, Bricks or Other Construction Debris;
- Personal Protective Equipment and Other Miscellaneous Debris (If Any); and
- Construction Wastewater (If any).

The soil Remedial Contractor is responsible for the excavation and disposal of portions of the Site to the required depths, construction and demolition debris and all other contaminated wastes generated, transportation and disposal of non-contaminated construction and demolition debris (if any), and decontamination of equipment. The primary environmental obligations of the soil Remedial Contractor include safely managing all excavated materials, preventing the contaminated Site soils from being tracked off-site, dust/odor control and decontamination equipment, as necessary.

11.1.5.4 Roux Environmental Engineering and Geology. D.P.C.- RAWP and Environmental Monitoring Compliance

Charles J. McGuckin, P.E. – Remedial Engineer
Wendy Shen – Project Manager/ Quality Assurance Officer
TBD – Field Manager/Site Safety Officer (SSO)

Roux will coordinate all Site activities being implemented to achieve the remedial objectives defined in the RAWP. Roux will provide continual review of all quality control measures implemented by the contractors to ensure compliance with the Site's remedial objectives and the Site-specific HASP. As such, Roux will provide oversight services for the duration of the remedial activities.

Roux will provide ambient air quality monitoring for VOCs and particulates during all intrusive Site activities as part of the CAMP for the Site. CAMP monitoring data will be reported daily to the SSO and will be maintained on-site. CAMP monitoring data will also be provided to NYSDEC and NYSDOH Project Managers with the daily reports by the end of the next day. Any Action level exceedances will be reported to the SSO, the Empire McKeever Heights LLC, and General Contractor project managers and appropriate communication (with NYSDEC and NYSDOH) and action taken. All CAMP monitoring records will be included in the overall FER that will be submitted to the NYSDEC and NYSDOH and will include all of the CAMP data collected, daily monitoring station location maps, and copies of the action limit reports (if any). If an action limit report is generated due to VOC exceedances, the NYSDEC and NYSDOH will be notified within 24 hours of the exceedance. A brief summary of CAMP activities, including any action limit reports generated, will be provided in the daily report.

The Quality Assurance Officer is responsible for conducting reviews, inspections, and audits to ensure the data collection is conducted in accordance with the QAPP/FSP. The Quality Assurance Officer's responsibilities range from ensuring effective field equipment decontamination procedures and proper sample collection to the review of all laboratory analytical data for completeness and usefulness. The Quality Assurance Officer reports to the Project Manager and makes independent recommendations to the field team.

All on-site quality control persons identified in the CQAP will provide daily briefings and/or reports to Roux on-site personnel, identifying the tasks completed, the remedial measures achieved, and any other issues of concern. Additionally, Mr. Charles J. McGuckin, the "Remedial Engineer," a professional engineer licensed in the State of New York, will be responsible for certifying that the remediation construction was completed in substantial conformance with the approved RAWP and/or any NYSDEC-approved field changes.

11.1.5.5 Environmental Laboratory

The need for an environmental laboratory is specific to soil endpoint sampling and clean backfill sampling. Alpha Laboratories of Westborough, Massachusetts (Alpha) will be utilized for all remediation construction-related analytical requirements. Alpha is a NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory. All results will be reported in electronic format deliverables prepared in accordance with NYSDEC requirements. Formal laboratory qualifications and QA/QC information packages for Eurofins and any other analytical laboratories proposed for the project will be submitted to the NYSDEC or disposal facilities, if requested.

11.1.5.6 Surveying Firm – To Be Determined

Personnel to Be Determined, Construction Quality Control

A NYS-licensed surveying firm will be contracted to provide lines, grades, boundaries, benchmarks, topographic surveys, as-built drawings, and any other survey work required for the proper execution and documentation of the work as required by the RAWP.

11.1.5.7 Data Validation – James Hauri, Roux

A DUSR will be prepared to evaluate the endpoint samples by a data validation third party independent from the laboratory performing the analysis in accordance with Appendix 2B of DER-10.

11.1.5.8 Waste Disposal Facilities

Waste from the Site will be transported to appropriately permitted waste disposal facilities. The waste disposal facilities selected for this project will be determined once the bidding process is completed. The selected waste disposal facilities will be determined based on the analytical results of the waste characterization sampling completed at the Site.

If any is generated, non-impacted construction debris will be transported to a registered construction and demolition disposal facility.

11.1.5.9 Waste Transporter and Disposal Facility Qualifications

A qualifications package for each vendor contracted to transport waste from the Site to the designated soil disposal facilities and each designated disposal facility will be included in the FER. The package will include the following:

- Proof of insurance and all current necessary waste transport permits for the waste type(s) being transported.
- Letters of commitment from all waste haulers and from all transfer, treatment, storage and disposal facilities to be used for the project. The letters of commitment shall specifically identify the types and quantities of waste that the facility will be able to accept, the permit numbers for all facilities

where the waste will be accepted, and all waste characterization requirements, if additional to waste characterization samples already collected. In the event that a facility (such as a privately-owned treatment works) is prohibited from issuing a letter of commitment without a sample of the waste, a conditional-type letter will be acceptable. Such a conditional letter shall specifically state what types and quantities of waste the facility will accept.

- For each waste hauler:
  - Name and federal and state identification numbers, as applicable;
  - Address;
  - Name of responsible contact for the hauler;
  - Telephone number for the contact;
  - List of types and sizes of all transport vehicles and equipment to be used;
  - A description of proposed transportation route, method and procedures for hauling waste material, including type of vehicles that will be used for each type of waste; and
  - Copies of any and all necessary permits and authorizations for each type of waste transported.
- For each transfer, treatment, storage and disposal facility, the Contractor shall submit the following information:
  - Facility name and federal and state identification numbers;
  - Facility location;
  - Name of responsible contact for the facility;
  - Telephone number for contact;
  - Signed letter of agreement to accept waste;
  - Unit of measure utilized at facility for costing purposes; and
  - Copies of all permits, licenses, letters of approval, and other authorizations to operate, held by the proposed facility as they pertain to receipt, and management of waste derived from this Contract.

11.1.5.10 Construction Quality Control Testing

Implementation of quality control testing and measurement will be performed by the contractors conducting the specific Site tasks. The quality control officers will be responsible for providing documentation of all testing and measurement results to Roux. Roux will be responsible for verifying that all quality control testing has been conducted in compliance with the RAWP and as specified herein.

Prior to initial quality control testing procedures:

1. Verify that the testing procedures are within the manufacturer's recommendations.
2. Verify that the facilities' testing equipment is available and comply with testing standards.
3. Check testing instrument calibrations against certified standards.
4. Verify the recording forms, including all the test documentation requirements that have been prepared.

Qualifications of all independent environmental testing firms and laboratories will be submitted to Roux and Empire McKeever Heights LLC for approval prior to any quality control testing and/or lab analysis as an obligation of this CQAP.

Specific task-driven testing/certification obligations as they relate to environmental aspects of the project are as follows:

- A NYS-licensed surveyor will conduct all of the necessary measurements and provide associated documentation to verify that the excavation limits are achieved.
- All endpoint sampling will be surveyed in the field by a surveyor or the use of a GPS equipment.
- In-Situ waste characterization will be completed once the RAWP is approved and prior to the start of the remedial action to supplement the RI samples. The in-situ waste characterization sampling and analysis will allow the excavated impacted soils to be direct loaded for waste transport and disposal, to the extent practicable. Waste characterization analysis parameters and frequency for any additional samples will be determined by the waste disposal facility's acceptance requirements. Results of the waste characterization program will be provided to the disposal facility for review, along with data generated during the RI and previous on-site investigations.
- The CAMP requires continuous real-time monitoring of VOCs and particulates during all intrusive Site activities. This monitoring equipment will be inspected periodically throughout each day to check and manually record the concentrations of VOCs and particulates and to ensure that the equipment is working properly. The equipment will be repaired, recalibrated, or replaced, as necessary. The periodic measurements will be used to identify any potential risks of off-site migration. This monitoring data will be collected and logged for review daily by Roux and made available for regulatory agency review. Action Limit Reports will be completed to document any and all action level exceedances and will be submitted to NYSDEC and NYSDOH, as defined in the CAMP.

All testing data will be managed in accordance with the above requirements, the QAPP/FSP, and will be included in the FER to be prepared by Roux upon completion of all remedial objectives defined in the RAWP.

11.1.5.11 Project Coordination

During implementation of the remedial action construction, progress meetings/conference calls will be conducted periodically to assess the progress of the work, overall progress to date, quality control requirements, environmental and construction health and safety requirements, and future progress expectations. Those in attendance will include representatives from the Volunteer, the General Contractor, Roux and other subcontractors, as necessary. This will provide the opportunity for all Site tasks to be integrated and discussed collectively and provide for coordination of all Site activities to maintain the overall construction schedule. Routine task meetings will also be conducted on an as-needed basis to insure proper communication between the contractors, tradesman, and supervisory personnel.

11.1.6 Soil/Material Management Plan (SOMP)

The SoMP is included in Section 12.5 of this RAWP.

11.1.7 Stormwater Pollution Prevention and Soil Erosion and Sediment Control Plans

A Stormwater Pollution Prevention Plan (SWPPP) as well as a Soil Erosion and Sedimentation Control (SESC) Plan was prepared by the Site Owner's selected Contractor and approved by Roux and is included as Appendix O. The stormwater pollution prevention and erosion and sediment controls will be in conformance with the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-25-001) requirements. The soil erosion and sediment controls will be in conformance with

the New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, the New York State Stormwater Design Manual, dated January 2015.

As necessary, hay bales will be placed at locations upgradient of excavation areas to control stormwater runoff and surface water from entering or exiting the excavation. Catch basin inlets immediately adjacent to the work area will be protected to prevent disturbed soil from entering. Construction water will be managed in accordance with the SoMP described in Section 10.6.

Details related to erosion and sediment controls to be followed during construction will be prepared by the Site civil engineer and will be submitted to NYSDEC prior to construction.

11.1.8 Community Air Monitoring Plan (CAMP)

All invasive work will be completed in accordance with the CAMP that is included at Appendix J.

11.1.9 Contractors Site Operations Plan (SOP)

The Remedial Engineer will review all plans and submittals for this remedial project (including those listed above and contractor and sub-contractor document submittals) and will confirm that they are in compliance with this RAWP. The Remedial Engineer is responsible to ensure that all later document submittals for this remedial project, including contractor and sub-contractor document submittals, are in compliance with this RAWP. All remedial documents will be submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work.

11.1.10 Citizen Participation Plan

No changes will be made to approved Fact Sheets authorized for release by NYSDEC without written consent of the NYSDEC. No other information, such as brochures and flyers, will be included with the Fact Sheet mailing. Fact sheets will be sent electronically by the NYSDEC project manager.

A certification of mailing will be sent by the Volunteer to the NYSDEC project manager following the distribution of all Fact Sheets and notices that includes: (1) certification that the Fact Sheets were mailed, (2) the date they were mailed; (3) a copy of the Fact Sheet; (4) a list of recipients (site contact list); and (5) a statement that the repository was inspected on (specific date) and that it contained all of applicable project documents.

The approved Citizen Participation Plan for this project is attached in Appendix H.

Document repositories have been established at the following locations and contain all applicable project documents:

Brooklyn Public Library
Crown Heights Branch
560 New York Avenue
Brooklyn, NY 11225
Phone: 718-773-1180
Manager, Janelle Welch

Brooklyn Community Board District 9
890 Nostrand Avenue
Brooklyn, NY 11225
Phone: 718-778-9279
Chairperson: Fred P. Baptiste
District Manager: Dante B. Arnwine
Bk09-1@cb.nyc.gov

Access project documents through the DECinfo Locator: https://www.dec.ny.gov/data/DecDocs/C224343/

11.2 General Remedial Construction Information

11.2.1 Project Organization

A copy of professional profiles for the Project Principal, Remedial Engineer, Quality Assurance Officer, Project Manager, and Field Manager/SSO (resumes are provided for a number of staff that may oversee the field work) for Roux are presented in Appendix L.

An organization chart is included in Figure 13.

11.2.2 Remedial Engineer

The Remedial Engineer for this project will be Charles J. McGuckin, P. E. The Remedial Engineer is a registered professional engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the remedial program for the project (NYSDEC BCP Site No. C224343). The Remedial Engineer will certify in the FER that the remedial activities were observed by qualified environmental professionals under her supervision and that the remediation requirements set forth in the Remedial Action Work Plan and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan. Other Remedial Engineer certification requirements are listed later in this RAWP.

The Remedial Engineer will coordinate the work of other contractors and subcontractors involved in all aspects of remedial construction, including soil excavation, stockpiling, characterization, removal and disposal, air monitoring, emergency spill response services, import of back fill material, and management of waste transport and disposal. The Remedial Engineer will be responsible for all appropriate communication with NYSDEC and NYSDOH.

The Remedial Engineer will review all pre-remedial plans submitted by contractors for compliance with this Remedial Action Work Plan and will certify compliance in the Final Engineering Report.

The Remedial Engineer will provide the certifications listed in Section 14.1 in the Final Engineering Report

11.2.3 Remedial Action Construction Schedule

A schedule for the major elements of the remedial construction and portions of the redevelopment construction are presented in Section 15.

11.2.4 Work Hours

The hours for operation of remedial construction will conform to the New York City Department of Buildings construction code requirements or according to specific variances issued by that agency. NYSDEC will be notified by the Volunteer of any variances issued by the Department of Buildings. NYSDEC reserves the right to deny alternate remedial construction hours.

11.2.5 Site Security

Security for the work, equipment, materials, supplies, facilities, personnel, and incidentals will be provided throughout the performance of the work at the Site. The Site will be fully fenced with construction fencing conforming to New York City Department of Buildings requirements. This fencing will be maintained throughout the remedial construction work. Temporary fencing and barricades will be used to delineate and secure areas of ongoing remediation activities. Site security personnel will be employed as needed.

11.2.6 Traffic Control

All construction work will take place between 7 A.M. and 6 P.M. from Monday to Friday. The contractors may work longer hours and/or weekends, as permitted by the proper authorities. If work beyond these hours or on weekends is required, the proper authorities will be notified. Disturbances to the local community will be minimized to the extent practical.

For any trucking required, the proposed truck routes for ingress and egress to the Site are shown in Figure 14.

All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes. These are the most appropriate routes and take into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility, to the extent practicable; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site.

The contractors operating on the Site will be responsible for providing all necessary personnel and materials (i.e., traffic lanes, safety cones, etc.) to control traffic entering and exiting the Site and for coordinating traffic control measures with the New York City Police Department, as necessary. Contractors operating on the Site shall be responsible for all applicable NYCDOT traffic control and notification requirements and incorporating those elements into this Traffic Control Plan.

11.2.7 Contingency Plan

The Contingency Plan is described in Section 12.5.11.

11.2.8 Worker Training and Monitoring

All excavation work will be performed in accordance with the Site-specific HASP and CAMP. Removal of impacted soil will be performed by qualified contractors and trained personnel (Minimum 40HR OSHA HAZWOPER). In the event that removal of UST is required, work will be performed by a qualified contractor

and trained personnel (Minimum 40HR OSHA HAZWOPER) in accordance with DER-10, NYSDEC PBS regulations and NYC Fire Department regulations.

11.2.9 Agency Approvals

The Volunteer will address all State Environmental Quality Review Act (SEQRA) requirements for this Site, as appropriate for future redevelopment. All permits or government approvals required for remedial construction have been, or will be, obtained prior to the start of remedial construction.

The potential future end use for the Site is in conformance with the zoning for the property as determined by New York City Department of Planning.

A complete list of all local, regional and national governmental permits, certificates, or other approvals or authorizations required to perform the remedial work is attached in Table 19. This list will be updated in the Final Engineering Report.

11.2.10 NYSDEC BCP Signage

A BCP project sign is not required for this Site.

11.2.11 Pre-Construction Meeting with NYSDEC

A project kick-off meeting will be conducted with the Volunteer, Roux, NYSDEC, the General Contractor, and the selected Remedial Contractor prior to the commencement of any intrusive remedial activities proposed in this RAWP.

11.2.12 Emergency Contact Information

The Site-specific HASP (Appendix I) will define the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency. Since the contractors have not yet been selected, the emergency contact list will be prepared prior to the start of work and the HASP will be updated.

11.2.13 Remedial Action Costs

The total cost for Remedial Alternative 1 is estimated to be $5,316,000. An itemized and detailed summary of estimated costs for all remedial activity is attached as Tables 16 and 17. This will be revised based on actual costs and submitted as an Appendix to the Final Engineering Report.

11.3 Site Preparation

11.3.1 Mobilization

The soil contractors shall supply any labor and materials required for the removal and disposal of contaminated soil. Mobilization and Site preparation activities include:

1. Mobilization of equipment to the work area.
2. Installation/maintenance of the perimeter construction fencing, temporary fencing and traffic barricades to delineate the work zone and act as a work Site security measure. Security personnel will be on-site as needed.
3. Implementation of erosion and sediment control measures in accordance with the New York Guidelines for Urban Erosion and Sediment Control.

4. Set-up of decontamination facilities.

11.3.2 Monitoring Well / Vapor Point Decommissioning

Existing groundwater monitoring wells will be properly decommissioned in accordance with NYSDEC Commissioners Policy CP-43. Similarly, existing soil vapor points will be fully removed during remediation.

11.3.3 Erosion and Sedimentation Controls

Implementation of erosion and sediment controls will be in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control. Construction water will be managed in accordance with the SoMP described in Section 12.5.

11.3.4 Stabilized Construction Entrances/Truck Wash

Stabilized construction entrances will be installed at all points of vehicle ingress and egress to the Site. The truck wash stone pad will be sloped back into the site to avoid offsite runoff. Truck tires will be cleaned using dry brush methods where feasible. Spray washing of tires will be employed as needed to keep prevent offsite tracking of soil.

Any soil spilled on the sidewalk or street immediately adjacent to the Site will be promptly removed and the street will be cleaned.

11.3.5 Utility Marker and Easements Layout

The Volunteer and its contractors are solely responsible for the identification of utilities that might be affected by work under the RAWP and implementation of all required, appropriate, or necessary health and safety measures during performance of work under this RAWP. The Volunteer and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The Volunteer and its contractors must obtain any local, State or Federal permits or approvals pertinent to such work that may be required to perform work under this RAWP. Approval of this RAWP by NYSDEC does not constitute satisfaction of these requirements.

The presence of utilities and easements on the Site has been investigated by the Remedial Engineer. It has been determined that no risk or impediment to the planned work under this RAWP is posed by utilities or easements on the Site.

11.3.6 Structural Stability/Support Of Excavation

Appropriate management of structural stability of on-site or off-site structures during on-site activities that include excavation is the sole responsibility of the Volunteer and its contractors. A variety of support of excavation elements including drilled soldier piles, waler, timber lagging and temporary 1:1 earth berm will be designed as a critical part of the remedy to reach the required remedial and redevelopment excavation depths and to prevent impacts from off-site sources. The Volunteer and its contractors must obtain any local, State or Federal permits or approvals that may be required to perform this work under this RAWP. Further, the Volunteer and its contractors are solely responsible for the implementation of all required, appropriate, or necessary health and safety measures during performance of this work under the approved RAWP.

11.3.7 Equipment and Material Staging

An equipment and materials staging area will be established in a designated area on-site.

11.3.8 Decontamination Area

A temporary decontamination pad will be constructed to decontaminate excavation equipment upon completion of the remedial excavation. The decontamination pad will be sized to accommodate the largest construction vehicle used and located prior to the stabilized construction egress. The decontamination pad may be integrated with the stabilized construction entrance. Dry decontamination will be employed to the extent practical. Removed soil will be disposed with the last loads of impacted soils. All decon water used as necessary will be collected and drummed for disposal. The decontamination area will be adequately sloped toward a sump to contain waste material.

11.3.9 Site Fencing

The Site will be remain fenced and enclosed from public access at all times.

11.3.10 Demobilization

Demobilization from the Site will include:

- Removal and restoration of off-site equipment and materials storage areas;
- Removal of all temporary fencing and barricades;
- Restoration of disturbed access areas to pre-remediation conditions, as appropriate;
- Removal of sediment and erosion control measures and disposal of materials in accordance with acceptable rules and regulations;
- Equipment decontamination, as required; and
- General refuse disposal.

11.4 Reporting

All daily and monthly Reports will be included in the Final Engineering Report.

11.4.1 Daily Reports

Daily reports will be submitted to NYSDEC and NYSDOH Project Managers by the end of the next day following the reporting period and will include:

- An update of progress made during the reporting day;
- Locations of work and quantities of material imported and exported from the Site;
- References to alpha-numeric map for Site activities;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP results, including excursions;
- A list of all samples collected, if any;
- An explanation of notable Site conditions;
- A look ahead portion that describes immediate future work; and

- Photos of site activity.

Daily reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the RAWP or other sensitive or time critical information. However, such conditions must also be included in the daily reports. Emergency conditions and changes to the RAWP will be addressed directly to NYSDEC Project Manager via personal communication.

These reports will include a summary of air sampling results, odor and dust problems and corrective actions, and all complaints received from the public.

A Site map for use in identifying locations described in reports submitted to NYSDEC is attached on Figure 2.

The NYSDEC assigned project number will appear on all reports.

11.4.2 Monthly Reports

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers by the 10th of the month following the end of the month of the reporting period and will include:

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (i.e., tons of material exported and imported, etc.);
- Description of approved activity modifications, including changes of work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable; and
- An update of the remedial schedule including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays.

11.4.3 Other Reporting

Photographs will be taken of all remedial activities and submitted to NYSDEC in digital (JPEG) format. Photos will illustrate all remedial program elements and will be of acceptable quality. Representative photos of the Site prior to any Remedial Actions will be provided. Representative photos will be provided of each contaminant source, source area and Site structures before, during and after remediation. Photos will be included in the daily reports as needed, and a comprehensive collection of photos will be included in the Final Engineering Report.

Progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the FER, including a comparison to the goals established during the remedial program. Regular updates to the metrics used (SEFA, SiteWise™ or otherwise approved method) should be included. The Climate Screening process and results will be documented in the form of a completed checklist and brief letter report. If the Climate Screening results indicate that a Climate Vulnerability Assessment (CVA) is necessary, a complete CVA Report will be developed. The CVA Report will be included as an Appendix or Attachment in the FER and/or submitted as a standalone report.

Job-Site record keeping for all remedial work will be appropriately documented. These records will be maintained on-site at all times during the project and be available for inspection by NYSDEC and NYSDOH staff.

11.4.4 Complaint Management Plan

If an odor or dust complaint is received, the following procedure will be implemented:

1. Work in the affected area will be halted, and the source of odors/dust will be identified.
2. NYSDEC, NYSDOH, and the Volunteer will be notified of the complaint.
3. Nuisance odors, if any, will be abated through covering/containerizing excavated materials, backfilling open excavations in a timely manner; and/or using a foam unit or other appropriate measures.
4. As described in NYSDEC DER-10, Appendix 1B – Fugitive Dust Control and discussed in Section 10.6.13 of this RAWP, nuisance dust, if any, will be abated through applying water on haul roads; wetting equipment and excavation faces; spraying water on buckets during excavation and dumping; hauling materials in properly tarped or watertight containers; restricting vehicle speeds to 10 mph; covering excavated areas and material after excavation activity ceases; and reducing the excavation size and/or number of excavations.
5. Work will resume in the affected area when the nuisance odors/dust have been abated, as determined by the Roux on-site personnel.

11.4.5 Deviations from the Remedial Action Work Plan

Deviations from the RAWP will be reported to NYSDEC for approval and fully explained in the FER.

12.0 REMEDIAL ACTION IMPLEMENTATION

12.1 Material Removal From Site

All contaminated soils exceeding the UUSCOs are planned to be removed from the Site. The materials and waste management efforts will consider greener and sustainable approaches related to both the purchase of greener products and material reuse or recycling versus disposal wherever practical.

A summary of the excavation depths, soil removal volume, and soil samples yielding analytical results is included in Section 12.3 below. Following remedial excavation, post-excavation confirmation endpoint samples will be collected in accordance with Section 10.4.1, the QAPP, and Table 20.

12.2 Soil Cleanup Objectives

The Soil Cleanup Objectives for this Site are listed in Table 18. The SCOs for this Site are the Track 1 UUSCOs. Soil and materials management on-site and off-site will be conducted in accordance with the SoMP as described below.

Tables 2 through 9 present all soil samples that exceed the UUSCOs proposed for this Remedial Action. Figure 8 shows all soil samples that exceed the UUSCOs proposed for this Remedial Action.

UST closures will, at a minimum, conform to criteria defined in DER-10.

12.3 Remedial Performance Evaluation (Post Excavation Endpoint Sampling)

Endpoint sampling and reporting will be conducted in accordance with DER-10 and the QAPP and is discussed in the sections below.

A confirmation sample means a sample taken during the course of a remedial action to determine whether cleanup requirements have been achieved or whether further remediation is required.

A documentation sample means a sample taken after remedial action is complete to document the level of contamination remaining.

12.3.1 End-Point Sampling Frequency

A summary of the proposed Track 1 bottom and sidewall confirmation endpoint designations, sample depths, and analytical parameters is summarized in Table 20.

Bottom Sampling

Bottom confirmation sampling will be conducted at a frequency of one sample per approximately 900 square feet of excavation area to document the soil quality remaining on-site after remedial excavation is completed per guidance provided in NYSDEC DER-10 5.4.

A total of 42 confirmation samples will be collected at the Site within the Track 1 area and will be analyzed for the full suite of parameters (VOCs, SVOCs, metals, pesticides, PCBs, and ECs). Samples will be

distributed throughout the Site, in a grid-like fashion, and will be biased toward impacts, if any are observed. Locations of endpoint confirmation samples for Remedial Alternative 1 are shown in Figure 11.

Sidewall Sampling

As part of the remedial action, sidewall confirmation endpoint samples will be collected to properly confirm the remaining sidewall soil quality. Sidewall samples will be collected at a frequency of one sidewall sample per 30 linear feet (11 sidewall samples total) in between the excavated grid areas. The frequency of sidewall sampling proposed for this alternative is consistent with the guidance provided in NYSDEC DER-10 5.4. Locations of sidewall confirmation samples for Remedial Alternative 1 are shown in Figure 11.

12.3.2 Methodology

Endpoint samples will be collected in accordance with DER-10 Section 5.4(b). Each sample will be inspected for visual evidence of contamination (i.e., staining, presence of petroleum or odors) and field screened for VOCs using a PID. Soil samples to be submitted for analysis will be placed in a laboratory sample jar, placed in an iced cooler and transported to the laboratory.

12.3.3 Reporting of Results

The laboratory will report analytical results for endpoint samples in ASP Category B deliverable packages. An EDD in the required NYSDEC format will also be provided by the laboratory.

All endpoint sample data generated for the remedial action will be logged in a database and organized to facilitate data review and evaluation. The electronic dataset will include the data flags provided in accordance with USEPA Laboratory Data Validation Functional Guidelines for Evaluating Organic Analysis and Inorganic Analyses, as well as additional comments of the data review for ASP analyses. The data flags include such items as: 1) concentration below required detection limit; 2) estimated concentration due to poor recovery below required detection limit; 3) estimated concentration due to poor spike recovery; and 4) concentration of chemical also found in laboratory blank.

12.3.4 QA/QC

QA/QC samples serve as checks on both the sampling and measurement systems and assist in determining the overall data quality with regard to representation, accuracy, and precision. The QAPP/FSP, included as Appendix K to this RAWP, describes QA/QC procedures and sampling for the project.

12.3.5 DUSR

A DUSR will be prepared to evaluate the endpoint samples by a party independent from the laboratory performing the analysis in accordance with Appendix 2B of DER-10. The QAPP/FSP, included as Appendix K to this RAWP, describes the DUSR to be prepared for the project.

12.3.6 Reporting of Endpoint Data in FER

Chemical laboratories used for all endpoint sample results and contingency sampling will be NYSDOH ELAP certified. Endpoint sampling frequency is described in Section 12.3.1. The FER will provide a tabular and map summary of all endpoint sample results and exceedances of SCOs.

12.4 Estimated Material Removal Quantities

The estimated quantity of soil/fill to be removed from the Site is 54,300 CY for construction purposes and approximately 13,450 CY for remedial purposes (see Figure 11). The estimated quantity of soil to be imported into the Site for backfill and cover soil is 3,000 cubic yards (RCA to be used behind the SOE). The estimated quantity of soil/fill expected to be reused/relocated on Site is 0 cubic yards.

12.5 Soil/Materials Management Plan

The following sections provide the Soil/Materials Management Plan (SoMP) to be implemented during the Remedial Action.

12.5.1 Soil Screening Methods

Visual, olfactory, and PID soil screening and assessment will be performed by a qualified environmental professional or experienced field geologist under the direction of the Remedial Engineer during all remedial and development excavations into known or potentially contaminated material. Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during the remedy, prior to issuance of the COC.

All primary contaminant sources (including but not limited to tanks and hotspots) uncovered during the remedial action will be surveyed by a surveyor licensed to practice in the State of New York. This information will be provided on maps in the Final Engineering Report.

Resumes will be provided for all personnel responsible for field screening (i.e., those representing the Remedial Engineer) of invasive work for unknown contaminant sources during remediation and development work.

12.5.2 Stockpile Methods

Although direct loading of trucks will be performed to the extent practical, stockpiles, if any, will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC.

Stockpiles, if any, will always be kept covered with appropriately anchored tarps when not actively used. Stockpiles will be routinely inspected, and damaged tarp covers will be promptly replaced.

Soil stockpiles, if any, will be continuously encircled with silt fences or hay bales. Hay bales will be used as needed near catch basins and other discharge points.

Water will be available on-site at suitable supply and pressure for use in dust control.

12.5.3 Materials Excavation and Load Out

The Remedial Engineer or a qualified environmental professional under her supervision will oversee all invasive work and the excavation and load-out of all excavated material.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site. The Remedial Engineer or their designated representative will be responsible for ensuring that all outbound trucks will be free of Site soil clinging to their exterior before leaving the Site until the remedial construction is complete.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-site sediment tracking.

The Remedial Engineer or their designated representative will be responsible for ensuring that all egress points for truck and equipment transport from the Site will be clean of dirt and other materials derived from the Site during Site remediation and development. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

The Remedial Engineer will ensure that Site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this RAWP.

If required, each hotspot and structure to be remediated (USTs, vaults and associated piping, transformers, etc.) will be removed and endpoint remedial performance sampling completed before excavations related to Site development commence proximal to the hotspot or structure.

Mechanical processing of historic fill and contaminated soil on-site is prohibited.

12.5.4 Materials Transport Off-Site

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Truck transport routes are as described in Section 11.2.6. All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

Cleaning of trucks prior to exiting the Site is discussed in Section 11.3.8.

12.5.5 Materials Disposal Off-Site

The disposal locations will be determined prior to implementation of the remedial action and will be reported to the NYSDEC Project Manager.

The total remedial quantity of material expected to be disposed of off-site is approximately 13,450 in-place CY of soil exceeding UUSCOs across the Site.

All soil/fill/solid waste that is excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated off-site management of materials from this Site is prohibited without formal NYSDEC approval.

Material that does not meet Track 1 UUSCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-15 Registration Facility).

The required documentation will be obtained and reported by the Remedial Engineer, as summarized in Section 11.1.5.9. These documents will be included in the FER.

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the Division of Materials Management (DMM) in NYSDEC to be Construction and Demolition (C/D) materials with contamination not typical of virgin soils. These soils may be sent to a permitted Part 360 landfill. They may be sent to a permitted C/D processing facility without permit modifications only upon prior notification of NYSDEC Region 2 DMM. In this case, as dictated by DMM, special procedures will include, at a minimum, a letter to the C/D facility that provides a detailed explanation that the material is derived from a DER remediation Site, that the soil material is contaminated and that it must not be redirected to on-site or off-site Soil Recycling Facilities. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported.

The Final Engineering Report will include an accounting of the destination of all material removed from the Site during this Remedial Action, including excavated soil, contaminated soil, urban fill, solid waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the FER.

A Bill of Lading system or equivalent will be used for off-site movement of non-hazardous wastes and contaminated soils. This information will be reported in the Final Engineering Report.

12.5.6 Materials Reuse On-Site

Although not planned, on-site soil may be reused for backfill. In the event this occurs, chemical criteria for on-site reuse of material are listed in Table 18. The Remedial Engineer will ensure that procedures defined for materials reuse in this RAWP are followed and that unacceptable material will not remain on-site.

A "Request to Import/Reuse Fill Material" form will be filed with the NYSDEC project manager for review and approval prior to material reuse on the site. A copy of the form is presented in Appendix M.

Contaminated on-site material, including contaminated fill material and contaminated soil, removed for grading or other purposes will not be reused within a cover soil layer (if required), within landscaping berms, or as backfill for subsurface utility lines.

12.5.7 Fluids Management

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Liquids discharged into the New York City sewer system will be addressed through approval by NYCDEP.

Dewatered fluids will not be recharged back to the land surface or subsurface of the Site. Dewatering fluids will be managed off-Site.

Discharge of water generated during remedial construction to surface waters (i.e., a local pond, stream, river and/or storm sewer) is prohibited without a SPDES permit.

12.5.8 Demarcation

Engineering controls are not required for the proposed Track 1 Unrestricted Use cleanup. In the event a Track 1 is not achieved, it will be required for the Track 2 Restricted Residential Use cleanup, in which case, a land survey will be completed by a New York State licensed surveyor to define the top elevation of residual contaminated soils in the Track 2 Remedial area.

In the event a Track 2 is achieved, after the completion of soil removal and any other invasive remedial activities and prior to backfilling, a land survey will be performed by a New York State licensed surveyor. The survey will define the top elevation of residual contaminated soils. The underside of the slab will serve as a physical demarcation layer. The survey will measure the grade covered by the demarcation layer. This survey and the demarcation layer placed on this grade surface will constitute the physical and written record of the upper surface of the 'Residuals Management Zone' in the SMP. A map showing the survey results will be included in the FER and the SMP.

12.5.9 Backfill From Off-Site Sources

All materials proposed for import onto the Site will be approved by the Remedial Engineer and will be in compliance with provisions in this RAWP prior to receipt at the Site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) and DER-10, section 5.4(e) will be brought in to replace the excavated soil and establish the designed grades at the Site, if necessary. Any backfill requiring sampling will be analyzed for the full suite of Part 375 parameters and ECs.

Solid waste, material from industrial sites, spill sites, other environmental remediation sites or other potentially contaminated sites will not be imported to the Site. Material from other environmental remediation sites will not be imported to the Site without prior approval of NYSDEC.

The Final Engineering Report will include the following certification by the Remedial Engineer: "I certify that all import of soils from off-site, including source evaluation, approval and sampling, has been performed in a manner that is consistent with the methodology defined in the Remedial Action Work Plan."

All imported soil will meet NYSDEC approved backfill or cover soil quality objectives for this Site. These NYSDEC approved backfill or cover soil quality objectives for Track 1 are the UUSCOs and Track 2 are the lower of the RRSCOs or PGWSCOs, and are listed in Table 18. Non-compliant soil will not be imported onto the Site without prior approval by NYSDEC. Nothing in the approved RAWP or its approval by NYSDEC should be construed as an approval for this purpose.

Soils that meet ”general fill” requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Nothing in this RAWP should be construed as an approval for this purpose.

A “Request to Import/Reuse Fill Material” form will be filed with the NYSDEC project manager for review and approval prior to import to the site. A copy of the form is presented in Appendix M.

Backfill material that may be used for this Site includes soil, gravel or stone.

12.5.10 Stormwater Pollution Prevention

Stormwater pollution prevention measures are discussed in Section 11.1.7.

12.5.11 Contingency Plan

In the event that any unknown underground tanks or other previously unidentified contaminant sources are found during on-site remedial excavation, sampling will be performed on product, sediment and surrounding soils, etc. Chemical analytical work will be for full suite of parameters (VOCs, SVOCs, metals, pesticides, PCBs, and ECs), or a more limited list as approved by NYSDEC. Analyses will not be otherwise limited without NYSDEC approval. Discovery of underground storage tanks will be handled in accordance with NYSDEC DER-10, Section 5.5.

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC’s Project Manager. These findings will also be included in daily and monthly reports and in the FER.

12.5.11.1 Extreme Storm Preparedness and Response Contingency Plan

Damage from flooding or storm surge can include dislocation of soil and stockpiled materials, dislocation of site structures and construction materials and equipment, and dislocation of support of excavation structures. Damage from wind during an extreme storm event can create unsafe or unstable structures, damage safety structures and cause downed power lines creating dangerous site conditions and loss of power. In the event of emergency conditions caused by an extreme storm event, the Volunteer will undertake the following steps for site preparedness prior to the event and response after the event.

Storm Preparedness

Preparations in advance of an extreme storm event will include the following: containerized hazardous materials and fuels will be removed from the property; loose materials will be secured to prevent dislocation and blowing by wind or water; heavy equipment such as excavators and generators will be removed from excavated areas, trenches and depressions on the property to high ground or removed from the property; an inventory of the property with photographs will be performed to establish conditions for the site and equipment prior to the event; stockpile covers for soil and fill will be secured by adding weights such as sandbags for added security and worn or ripped stockpile covers will be replaced with competent covers; stockpiled hazardous wastes will be removed from the property; stormwater management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, hay bales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to NYSDEC at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911.

Petroleum spills will be reported to NYSDEC within 2 hours of identification and consistent with State regulations. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed.

Dewatering will be performed as needed and in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified, as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Stormwater control systems and structures will be inspected and maintained, as necessary.

If soil or fill materials are discharged off site to adjacent properties, property owners and NYSDEC will be notified, and corrective measure plan designed to remove and clean dislocated material will be submitted to NYSDEC and implemented following approval by NYSDEC and granting of site access by the property owner. Impacted off-site areas may require characterization based on site conditions, at the discretion of NYSDEC.

If on-site petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYSDEC's Spill Hotline at (800) 457-7362 within statutory defined timelines. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYSDEC.

Storm Response Reporting

A site inspection report will be submitted to NYSDEC at the completion of site inspection. An inspection report will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the NYSDEC project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number.

Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of on-site or off-site exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYSDEC; description of corrective actions; schedule for corrective actions.

This report should be completed and submitted to NYSDEC project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

12.5.12 Community Air Monitoring Plan

CAMP will be conducted during any intrusive activities until Track 1 UUSCOs are met throughout the Site. The CAMP is included as Appendix J. A map showing the location of mobile sampling stations will be provided in each daily CAMP report.

A Special Requirements CAMP may be necessary at the Site due to the proximity of the adjacent properties. A provision for the Special Requirements CAMP is also included as Appendix J.

Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the daily report.

12.5.13 Odor, Dust and Nuisance Control Plan

The FER will include the following certification by the Remedial Engineer: “I certify that all invasive work during the remediation and all invasive development work were conducted in accordance with dust and odor suppression methodology defined in the Remedial Action Work Plan.”

12.5.13.1 Odor Control Plan

This odor control plan is capable of controlling emissions of nuisance odors off-site and on-site. Specific odor control methods to be used on a routine basis will include limiting open excavation areas and covering excavated soil (i.e., with polyethylene sheeting or in covered roll off containers). If nuisance odors are identified, work will be halted, and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project. Implementation of all odor controls, including the halt of work, will be the responsibility of the Volunteer’s Remedial Engineer, who is responsible for certifying the Final Engineering Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils (if foam is used, it will be immediately removed after use). If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) use of chemical odorants in spray or misting systems; and (e) use of staff to monitor odors in surrounding neighborhoods.

Where odor nuisances have developed during remedial work and cannot be corrected, or where the release of nuisance odors cannot otherwise be avoided due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering excavation and handling areas under tented containment structures equipped with appropriate air venting/filtering systems.

12.5.13.2 Dust Control Plan

A dust suppression plan that addresses dust management during invasive on-site work, will include, at a minimum, the items listed below and will comply with NYSDEC DER-10 Appendix 1B – Fugitive Dust Control:

- Dust suppression will be achieved through applying water on haul roads; wetting equipment and excavation faces; spraying water on buckets during excavation and dumping; hauling materials in properly tarped or watertight containers; restricting vehicle speeds to 10 mph; covering excavated areas and material after excavation activity ceases; and reducing the excavation size and/or number of excavations.
- Clearing and grubbing will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to limit dust generation.

12.5.13.3 Other Nuisances

A plan for rodent control will be developed and utilized by the contractor prior to and during Site clearing and Site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work and will conform, at a minimum, to NYCDEP noise control standards.

12.6 Post-Remediation Soil Vapor Intrusion Evaluation

As part of the Track 1 remedy, a soil vapor intrusion evaluation will be completed. The evaluation will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion, if required.

13.0 RESIDUAL CONTAMINATION TO REMAIN ONSITE

Since a Track 1 is proposed, all site soils exceeding the UUSCOs will be excavated and disposed of offsite, therefore residual contaminated soil is not anticipated to exist beneath the Site after the remedy is complete, As a result, Engineering and Institutional Controls (ECs and ICs) are not required to protect human health and the environment.

The FER will report the results of the confirmation endpoint samples collected from the Site in tabular and map form.

In the event that a Track 1 is not achieved, the proposed fallback is a Track 2; in that case, ICs will be required as described below.

13.1 Institutional Controls

Two elements have been designed to ensure continual and proper management of residual contamination in perpetuity unless a Track 1 remedy is ultimately achieved: an Environmental Easement and a Site Management Plan (SMP).

All as-built drawings, diagrams, calculation and manufacturer documentation for treatment systems will be presented in the FER. A Site-specific Environmental Easement will be recorded with Kings County NYC Office of the City Register to provide an enforceable means of ensuring the continual and proper management of residual contamination and protection of public health and the environment in perpetuity or until released in writing by NYSDEC. It requires that the grantor of the Environmental Easement and the grantor's successors and assignees adhere to all Institutional Controls (ICs) placed on this Site by this NYSDEC-approved remedy. ICs provide restrictions on Site usage and mandate operation, maintenance, monitoring and reporting measures for all ICs. The SMP describes appropriate methods and procedures to ensure compliance with all ICs that are required by the Environmental Easement. Once the SMP has been approved by the NYSDEC, compliance with the SMP is required by the grantor of the Environmental Easement and grantor's successors and assigns.

13.1.1 Environmental Easement

An Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, is required when residual contamination is left on-Site after the Remedial Action is complete. As part of this remedy, an Environmental Easement approved by NYSDEC will be filed and recorded with the Kings County Office of the City Register. The Environmental Easement will be submitted as part of the Final Engineering Report.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with Kings County before the Certificate of Completion can be issued by NYSDEC. A series of Institutional Controls are required under this remedy to implement, maintain and monitor these Engineering Control systems, prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restricting the use of the Site to restricted residential use(s) only. These Institutional Controls are requirements or restrictions placed on the Site that are listed in, and required by, the Environmental Easement. Institutional Controls can, generally, be subdivided between controls that support Engineering Controls, and those that place general restrictions on Site usage or other requirements.

Institutional Controls in both of these groups are closely integrated with the SMP, which provides all of the methods and procedures to be followed to comply with this remedy.

The Institutional Controls are:

- Compliance with the Environmental Easement by the Grantee and the Grantee's successors and adherence of all elements of the SMP is required; and
- Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in the SMP.

Adherence to these Institutional Controls for the Site is mandated by the Environmental Easement and will be implemented under the SMP (discussed in the next section). The Controlled Property (Site) will also have a series of Institutional Controls in the form of Site restrictions and requirements. The Site restrictions that apply to the Controlled Property are:

- Vegetable gardens and farming on the Controlled Property are prohibited;
- Use of groundwater underlying the Controlled Property is prohibited without treatment rendering it safe for intended purpose;
- All future activities on the Controlled Property that will disturb residual contaminated material are prohibited unless they are conducted in accordance with the soil management provisions in the SMP;
- The Controlled Property may be used for restricted residential use only, provided the long-term Institutional Controls included in the SMP are employed;
- The Controlled Property may not be used for a higher level of use, such as residential use without an amendment or extinguishment of this Environmental Easement; and
- Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow. This annual statement must be certified by an expert that the NYSDEC finds acceptable.

13.1.2 Site Management Plan

Site Management is the last phase of remediation and begins with the approval of the FER and issuance of the Certificate of Completion (COC) for the Remedial Action. Since the proposed Track for the Site is a Track 1, a SMP will not be required. In the event a Track 1 is not achieved, the SMP will be submitted as a separate document and prior to the submission of the FER. Site Management continues in perpetuity or until released in writing by NYSDEC. The property owner is responsible to ensure that all Site Management responsibilities defined in the Environmental Easement and the SMP are performed.

The SMP is intended to provide a detailed description of the procedures required to manage residual contamination left in place at the Site following completion of the Remedial Action in accordance with the BCA with the NYSDEC. This includes: (1) development, implementation, and management of all Institutional Controls and (2) submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communication of Site information to NYSDEC.

To address these needs, this SMP will include four plans: (1) an Institutional Control Plan for implementation and management of ICs and (2) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC.

The SMP will be prepared in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation and the guidelines provided by NYSDEC.

Site management activities, reporting, and IC certification will be scheduled on a certification period basis. The certification period will be annually. The SMP will be based on the certifying period relative to the date of issuance of the COC. The first submission will be due 16 months after the issuance of the COC, and annually (or at another frequency as approved by NYSDEC) thereafter.

No exclusions for handling of residual contaminated soils will be provided in the SMP. All handling of residual contaminated material will be subject to provisions contained in the SMP.

14.0 FINAL ENGINEERING REPORT

A Final Engineering Report (FER) will be submitted to NYSDEC following implementation of the Remedial Action defined in this RAWP. The FER provides the documentation that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The FER will provide a comprehensive account of the locations and characteristics of all material removed from the Site including the surveyed map(s) of all sources. The Final Engineering Report will include as-built drawings for all constructed elements, calculation and manufacturer documentation for treatment systems, certifications, manifests, bills of lading as well as the complete SMP (if a Track 1 is not achieved). The FER will provide a description of the changes in the Remedial Action from the elements provided in the RAWP and associated design documents. The FER will provide a tabular summary of all performance evaluation sampling results and all material characterization results and other sampling, and chemical analysis performed as part of the Remedial Action. The FER will provide test results demonstrating that all mitigation and remedial systems are functioning properly (if a Track 1 is not achieved). The FER will be prepared in conformance with DER-10.

Where determined to be necessary by NYSDEC, a Financial Assurance Plan will be required to ensure the sufficiency of revenue to perform long-term operations, maintenance and monitoring tasks defined in the Site Management Plan and Environmental Easement (if a Track 1 is not achieved). This determination will be made by NYSDEC in the context of the FER review.

The FER will include written and photographic documentation of all remedial work performed under this remedy.

The FER will include an itemized tabular description of actual costs incurred during all aspects of the Remedial Action.

The FER will provide a thorough summary of all residual contamination left on the Site after the remedy is complete (if a Track 1 is not achieved). Residual contamination includes all contamination that exceeds the Track 1 Unrestricted Use SCO in 6NYCRR Part 375-6. A table that shows exceedances from Track 1 Unrestricted SCOs for all soil/fill remaining at the Site after the Remedial Action and a map that shows the location and summarizes exceedances from Track 1 Unrestricted SCOs for all soil/fill remaining at the Site after the Remedial Action will be included in the FER.

The FER will provide a thorough summary of all residual contamination that exceeds the SCOs defined for the Site in the RAWP and must provide an explanation for why the material was not removed as part of the Remedial Action. A table that shows residual contamination in excess of Site SCOs and a map that shows residual contamination in excess of Site SCOs will be included in the FER.

The FER will include an accounting of the destination of all material removed from the Site, including excavated contaminated soil, historic fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. It will provide an accounting of the origin and chemical quality of all material imported onto the Site.

The FER must include a discussion of the green remediation practices/technologies employed throughout the remedial program. A final footprint analysis using a DER accepted model, and any tracking methods used through the construction including restoration activities. Before approval of a FER and issuance of a COC, all project reports must be submitted in digital form on electronic media (PDF).

14.1 Certifications

The following certification will appear in front of the Executive Summary of the Final Engineering Report. The FER will be prepared, stamped and the following certification signed by an individual licensed or otherwise authorized in accordance with article 145 of the education law to practice the profession of engineering. The certification will include the following statements:

I, Charles J. McGuckin, certify that I am currently a registered professional engineer licensed by the State of New York, I had primary direct responsibility for implementation of the remedial program activities, and I certify that the Remedial Action Work Plan was implemented and that all construction activities were completed in substantial conformance with the Department-approved Remedial Action Work Plan.

I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the Remedial Action Work Plan and in all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established for the remedy.

I certify that all use restrictions, Institutional Controls, Engineering Controls, and/or any operation and maintenance requirements applicable to the Site are contained in an environmental easement created and recorded pursuant ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded.

I certify that a Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by Department.

I certify that all data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

It is a violation of Article 145 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.

15.0 SCHEDULE

A detailed tentative schedule for the proposed Remedial Action is presented below.

Remedial Action Element or Deliverable	Duration (Months)	Cumulative Duration (Months)
Address NYSDEC/NYSDOH Comments and/or Public Comments		(May 2026)
NYSDEC Approves RAWP, prepares Decision Document and Issues Fact Sheet Regarding Proposed Remedy	1	1 (June 2026)
Contractor Mobilization and Support of Excavation (SOE) Construction	1	2 (July 2026)
Remedial Construction	5	7 (December 2026)
Preparation and Submittal of Draft FER	1	8 (January 2027)
NYSDEC Approval of FER, and issuance of Certificate of Completion	2	10 (March 2027)
Monthly BCP Reporting	On-going for duration of project until FER/SMP is submitted.	

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Table 19 - List of Required Permits
Table 20 - List of Confirmation Endpoint Samples

Table 1. Summary of Water Level Data, 73-99 Empire Blvd, Brooklyn, NY

August 4 and 5, 2025							
Well Number	**Northing**	**Easting**	**Elevation of Grade (NAVD88)**	**Top of Casing Elevation (NAVD88)**	**Depth to Water (ft below top of casing)**	**Depth of Well (ft below top of casing)**	**Groundwater Elevation (NAVD88)**
MW-1	181073.9150	995518.1440	73.07	72.71	61.20	105.10	11.51
MW-2	181192.8200	995571.9080	72.72	72.29	61.21	97.18	11.08
MW-3	181081.1060	995578.4050	72.66	72.36	61.30	95.23	11.06

Note:

1. NAVD88- North American Vertical Datum 1988
2. Ft- Feet

Notes Utilized Throughout Tables
Soil Tables
J - Estimated value
J+ - Estimated value, high bias
J- - Estimated value, low bias
U - The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit
UJ - Analyte was not detected. The associated reported quantitation limit is an estimate
R - Sample results rejected by validator
UJ - Analyte was not detected. The associated reported quantitation limit is an estimate
ft bls - Feet below land surface
FD - Duplicate sample
mg/kg - Milligrams per kilogram
ng/g - Nanograms per gram
NYSDEC - New York State Department of Environmental Conservation
SCO - Soil Cleanup Objectives
-- No SCO available
Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use SCO
Shaded data indicates that parameter was detected above the NYSDEC Part 375 Restricted Residential SCO
Red data indicates that parameter was detected above the NYSDEC Part 375 Protection of Groundwater SCO
Groundwater Tables
J - Estimated Value
U - The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit
R - Sample results rejected by validator
UJ - Analyte was not detected. The associated reported quantitation limit is an estimate
FD - Duplicate
NA - Compound was not analyzed for by laboratory
µg/L - Micrograms per liter
NYSDEC - New York State Department of Environmental Conservation
AWQSGVs - Ambient Water-Quality Standards and Guidance Values
-- No NYSDEC AWQSGV available
Bold data indicates that parameter was detected above the NYSDEC AWQSGVs
Soil Vapor/Ambient Air
J - Estimated value
U - The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit
UJ - Analyte was not detected. The associated reported quantitation limit is an estimate
FD - Duplicate sample
ug/m3 - Micrograms per cubic meter
Bold data indicates that parameter was detected

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-1	RXSB-1	RXSB-2	RXSB-2
				Sample Date:	07/31/2025	07/31/2025	07/31/2025	07/31/2025
				Sample Depth (ft bls):	8 - 10	10 - 12	6 - 8	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00082 U	0.0006 U	0.00087 U	0.00062 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00082 U	0.0006 U	0.00087 U	0.00062 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00082 U	0.0006 U	0.00087 U	0.00062 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00082 U	0.0006 U	0.00087 U	0.00062 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.005 U	0.0036 U	0.0052 U	0.0037 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.13 U	0.096 U	0.14 U	0.1 U
2,2-Dichloropropane	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
2-Chlorotoluene	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
2-Hexanone	--	--	--	MG/KG	0.016 U	0.012 U	0.017 U	0.012 U
4-Chlorotoluene	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
4-Ethyltoluene	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
Acetone	0.05	100	0.05	MG/KG	0.0084 J	0.012 U	0.013 J	0.01 J
Acrylonitrile	--	--	--	MG/KG	0.0066 UJ	0.0048 UJ	0.007 UJ	0.005 UJ
Benzene	**0.06**	4.8	0.06	MG/KG	0.00082 U	0.0006 U	0.00087 U	0.0003 J
Bromobenzene	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-1	RXSB-1	RXSB-2	RXSB-2
			Sample Date:		07/31/2025	07/31/2025	07/31/2025	07/31/2025
			Sample Depth (ft bls):		8 - 10	10 - 12	6 - 8	6 - 8
			Normal Sample or Field Duplicate:		N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
Bromodichloromethane	--	--	--	MG/KG	0.00082 U	0.0006 U	0.00087 U	0.00062 U
Bromoform	--	--	--	MG/KG	0.0066 U	0.0048 U	0.007 U	0.005 U
Bromomethane	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
Carbon Disulfide	--	--	--	MG/KG	0.016 U	0.012 U	0.017 U	0.012 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00082 U	0.0006 U	0.00087 U	0.00062 U
Chloroethane	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
Chloroform	0.37	49	0.37	MG/KG	0.0025 U	0.00036 J	0.0026 U	0.0019 U
Chloromethane	--	--	--	MG/KG	0.0066 UJ	0.0048 UJ	0.007 UJ	0.005 UJ
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00082 U	0.0006 U	0.00087 U	0.00062 U
Cymene	--	--	--	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
Dibromochloromethane	--	--	--	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
Dibromomethane	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.016 U	0.012 U	0.017 U	0.012 U
Dichloroethylenes	--	--	--	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
Ethylbenzene	**1**	41	1	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0066 U	0.0048 U	0.007 U	0.005 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
m,p-Xylene	--	--	--	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.016 U	0.012 U	0.017 U	0.012 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.016 UJ	0.012 UJ	0.017 UJ	0.012 UJ
Methylene Chloride	0.05	100	0.05	MG/KG	0.0082 U	0.006 U	0.0087 U	0.0062 U
Naphthalene	12	100	12	MG/KG	0.0066 U	0.0048 U	0.007 U	0.005 U
N-Butylbenzene	12	100	12	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
Styrene	--	--	--	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-1	RXSB-1	RXSB-2	RXSB-2
				Sample Date:	07/31/2025	07/31/2025	07/31/2025	07/31/2025
				Sample Depth (ft bls):	8 - 10	10 - 12	6 - 8	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0033 U	0.0024 U	0.0035 U	0.0025 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00082 U	0.0006 U	0.00087 U	0.00079 J
Toluene	**0.7**	100	0.7	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00082 U	0.0006 U	0.00087 U	0.00062 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0025 U	0.0018 U	0.0026 U	0.0019 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0082 U	0.006 U	0.0087 U	0.0062 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00082 U	0.0006 U	0.00087 U	0.00062 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0066 U	0.0048 U	0.007 U	0.005 U
Vinyl Acetate	--	--	--	MG/KG	0.016 U	0.012 U	0.017 U	0.012 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U
Xylenes	**0.26**	100	1.6	MG/KG	0.0016 U	0.0012 U	0.0017 U	0.0012 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-2	RXSB-3	RXSB-3	RXSB-4
				Sample Date:	07/31/2025	07/31/2025	07/31/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	7 - 9	9 - 11	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00061 U	0.00074 U	0.00063 U	0.00062 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00061 U	0.00074 U	0.00063 U	0.00062 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00061 U	0.00074 U	0.00063 U	0.00062 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00061 U	0.00074 U	0.00063 U	0.00062 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0037 U	0.0045 U	0.0038 U	0.0037 UJ
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.098 U	0.12 U	0.1 U	0.1 UJ
2,2-Dichloropropane	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
2-Chlorotoluene	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
2-Hexanone	--	--	--	MG/KG	0.012 U	0.015 U	0.013 U	0.012 U
4-Chlorotoluene	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
4-Ethyltoluene	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
Acetone	0.05	100	0.05	MG/KG	0.0094 J	0.022	0.013 U	0.012 U
Acrylonitrile	--	--	--	MG/KG	0.0049 UJ	0.006 UJ	0.0051 UJ	0.005 U
Benzene	**0.06**	4.8	0.06	MG/KG	0.00061 U	0.00074 U	0.00063 U	0.00062 U
Bromobenzene	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-2	RXSB-3	RXSB-3	RXSB-4
				Sample Date:	07/31/2025	07/31/2025	07/31/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	7 - 9	9 - 11	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
Bromodichloromethane	--	--	--	MG/KG	0.00061 U	0.00074 U	0.00063 U	0.00062 U
Bromoform	--	--	--	MG/KG	0.0049 U	0.006 U	0.0051 U	0.005 UJ
Bromomethane	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
Carbon Disulfide	--	--	--	MG/KG	0.012 U	0.015 U	0.013 U	0.012 UJ
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 UJ
Chlorobenzene	1.1	100	1.1	MG/KG	0.00061 U	0.00074 U	0.00063 U	0.00062 U
Chloroethane	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
Chloroform	0.37	49	0.37	MG/KG	0.0018 U	0.0022 U	0.0019 U	0.0019 U
Chloromethane	--	--	--	MG/KG	0.0049 UJ	0.006 UJ	0.0051 UJ	0.005 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00061 U	0.00074 U	0.00063 U	0.00062 U
Cymene	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
Dibromochloromethane	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
Dibromomethane	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.012 U	0.015 U	0.013 U	0.012 UJ
Dichloroethylenes	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
Ethylbenzene	**1**	41	1	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0049 U	0.006 U	0.0051 U	0.005 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
m,p-Xylene	--	--	--	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.012 U	0.015 U	0.013 U	0.012 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.012 UJ	0.015 UJ	0.013 UJ	0.012 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0061 U	0.0074 U	0.0063 U	0.0062 U
Naphthalene	12	100	12	MG/KG	0.0049 U	0.006 U	0.0051 U	0.005 U
N-Butylbenzene	12	100	12	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
Styrene	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-2	RXSB-3	RXSB-3	RXSB-4
				Sample Date:	07/31/2025	07/31/2025	07/31/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	7 - 9	9 - 11	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0024 U	0.003 U	0.0025 U	0.0025 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00061 U	0.00074 U	0.00063 U	0.0023
Toluene	**0.7**	100	0.7	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00061 U	0.00074 U	0.00063 U	0.00062 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0018 U	0.0022 U	0.0019 U	0.0019 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0061 U	0.0074 U	0.0063 U	0.0062 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00061 U	0.00074 U	0.00063 U	0.00062 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0049 U	0.006 U	0.0051 U	0.005 R
Vinyl Acetate	--	--	--	MG/KG	0.012 U	0.015 U	0.013 U	0.012 UJ
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U
Xylenes	**0.26**	100	1.6	MG/KG	0.0012 U	0.0015 U	0.0013 U	0.0012 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-4	RXSB-5	RXSB-5	RXSB-6
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	8 - 10	10 - 12	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00098 U	0.0011 U	0.00069 U	0.00082 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00098 U	0.0011 U	0.00069 U	0.00082 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00098 U	0.0011 U	0.00069 U	0.00082 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00098 U	0.0011 U	0.00069 U	0.00082 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0058 UJ	0.0066 UJ	0.0041 UJ	0.0049 R
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
1,2-Dichloropropane	--	--	--	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.16 UJ	0.18 UJ	0.11 UJ	0.13 UJ
2,2-Dichloropropane	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
2-Chlorotoluene	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
2-Hexanone	--	--	--	MG/KG	0.02 U	0.022 U	0.014 U	0.016 U
4-Chlorotoluene	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
4-Ethyltoluene	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
Acetone	0.05	100	0.05	MG/KG	0.02 U	0.022 U	0.014 U	0.016 U
Acrylonitrile	--	--	--	MG/KG	0.0078 U	0.0088 U	0.0055 U	0.0065 U
Benzene	**0.06**	4.8	0.06	MG/KG	0.00098 U	0.0011 U	0.00069 U	0.00082 U
Bromobenzene	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-4	RXSB-5	RXSB-5	RXSB-6
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	8 - 10	10 - 12	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
Bromodichloromethane	--	--	--	MG/KG	0.00098 U	0.0011 U	0.00069 U	0.00082 U
Bromoform	--	--	--	MG/KG	0.0078 UJ	0.0088 UJ	0.0055 UJ	0.0065 UJ
Bromomethane	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
Carbon Disulfide	--	--	--	MG/KG	0.02 UJ	0.022 UJ	0.014 UJ	0.016 UJ
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.002 UJ	0.0022 UJ	0.0014 UJ	0.0016 UJ
Chlorobenzene	1.1	100	1.1	MG/KG	0.00098 U	0.0011 U	0.00069 U	0.00082 U
Chloroethane	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
Chloroform	0.37	49	0.37	MG/KG	0.0029 U	0.0033 U	0.0021 U	0.0024 U
Chloromethane	--	--	--	MG/KG	0.0078 U	0.0088 U	0.0055 U	0.0065 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.002 U	0.0022 U	0.0014 U	0.00074 J
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00098 U	0.0011 U	0.00069 U	0.00082 U
Cymene	--	--	--	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
Dibromochloromethane	--	--	--	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
Dibromomethane	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.02 UJ	0.022 UJ	0.014 UJ	0.016 UJ
Dichloroethylenes	--	--	--	MG/KG	0.002 U	0.0022 U	0.0014 U	0.00074 J
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
Ethylbenzene	**1**	41	1	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0078 U	0.0088 U	0.0055 U	0.0065 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
m,p-Xylene	--	--	--	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.02 U	0.022 U	0.014 U	0.016 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.02 U	0.022 U	0.014 U	0.016 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0098 U	0.011 U	0.0069 U	0.0082 U
Naphthalene	12	100	12	MG/KG	0.0078 U	0.0088 U	0.0055 U	0.0065 U
N-Butylbenzene	12	100	12	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
N-Propylbenzene	3.9	100	3.9	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
Sec-Butylbenzene	11	100	11	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
Styrene	--	--	--	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-4	RXSB-5	RXSB-5	RXSB-6
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	8 - 10	10 - 12	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0039 U	0.0044 U	0.0028 U	0.0033 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00098 U	0.0011 U	0.00069 U	0.0014
Toluene	**0.7**	100	0.7	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00098 U	0.0011 U	0.00069 U	0.00082 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0029 U	0.0033 U	0.0021 U	0.0024 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0098 U	0.011 U	0.0069 U	0.0082 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00098 U	0.0011 U	0.00069 U	0.00082 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0078 R	0.0088 R	0.0055 R	0.0065 U
Vinyl Acetate	--	--	--	MG/KG	0.02 UJ	0.022 UJ	0.014 UJ	0.016 UJ
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U
Xylenes	**0.26**	100	1.6	MG/KG	0.002 U	0.0022 U	0.0014 U	0.0016 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-6	RXSB-7	RXSB-7	RXSB-8
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	3 - 5	5 - 7	7 - 9
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00095 U	0.00083 U	0.0009 U	0.00083 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00095 U	0.00083 U	0.0009 U	0.00083 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00095 U	0.00083 U	0.0009 U	0.00083 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00095 U	0.00083 U	0.0009 U	0.00083 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0057 UJ	0.005 UJ	0.0054 UJ	0.005 UJ
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.15 UJ	0.13 UJ	0.14 UJ	0.13 UJ
2,2-Dichloropropane	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
2-Chlorotoluene	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
2-Hexanone	--	--	--	MG/KG	0.019 U	0.017 U	0.018 U	0.017 U
4-Chlorotoluene	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
4-Ethyltoluene	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
Acetone	0.05	100	0.05	MG/KG	0.011 J	0.017 U	0.018 U	0.0086 J
Acrylonitrile	--	--	--	MG/KG	0.0076 U	0.0067 U	0.0072 U	0.0067 U
Benzene	**0.06**	4.8	0.06	MG/KG	0.00095 U	0.00049 J	0.0009 U	0.00038 J
Bromobenzene	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-6	RXSB-7	RXSB-7	RXSB-8
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	3 - 5	5 - 7	7 - 9
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
Bromodichloromethane	--	--	--	MG/KG	0.00095 U	0.00083 U	0.0009 U	0.00083 U
Bromoform	--	--	--	MG/KG	0.0076 UJ	0.0067 UJ	0.0072 UJ	0.0067 UJ
Bromomethane	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
Carbon Disulfide	--	--	--	MG/KG	0.019 UJ	0.017 UJ	0.018 UJ	0.017 UJ
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0019 UJ	0.0017 UJ	0.0018 UJ	0.0017 UJ
Chlorobenzene	1.1	100	1.1	MG/KG	0.00095 U	0.00083 U	0.0009 U	0.00083 U
Chloroethane	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
Chloroform	0.37	49	0.37	MG/KG	0.0028 U	0.0025 U	0.0027 U	0.0025 U
Chloromethane	--	--	--	MG/KG	0.0076 U	0.0067 U	0.0072 U	0.0067 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00095 U	0.00083 U	0.0009 U	0.00083 U
Cymene	--	--	--	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
Dibromochloromethane	--	--	--	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
Dibromomethane	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.019 UJ	0.017 UJ	0.018 UJ	0.017 UJ
Dichloroethylenes	--	--	--	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
Ethylbenzene	**1**	41	1	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0076 U	0.0067 U	0.0072 U	0.0067 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
m,p-Xylene	--	--	--	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.019 U	0.017 U	0.018 U	0.017 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.019 U	0.017 U	0.018 U	0.017 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0095 U	0.0083 U	0.009 U	0.0083 U
Naphthalene	12	100	12	MG/KG	0.0076 U	0.0067 U	0.0072 U	0.0067 U
N-Butylbenzene	12	100	12	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
Styrene	--	--	--	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-6	RXSB-7	RXSB-7	RXSB-8
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	3 - 5	5 - 7	7 - 9
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0038 U	0.0033 U	0.0036 U	0.0033 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00088 J	0.00083 U	0.0009 U	0.00083 U
Toluene	**0.7**	100	0.7	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00095 U	0.00083 U	0.0009 U	0.00083 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0028 U	0.0025 U	0.0027 U	0.0025 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0095 U	0.0083 U	0.009 U	0.0083 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00095 U	0.00083 U	0.0009 U	0.00083 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0076 U	0.0067 R	0.0072 R	0.0067 U
Vinyl Acetate	--	--	--	MG/KG	0.019 UJ	0.017 UJ	0.018 UJ	0.017 UJ
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U
Xylenes	**0.26**	100	1.6	MG/KG	0.0019 U	0.0017 U	0.0018 U	0.0017 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-8	RXSB-9	RXSB-9	RXSB-9
				Sample Date:	08/01/2025	03/13/2023	03/13/2023	03/13/2023
				Sample Depth (ft bls):	9 - 11	7 - 9	7 - 9	9 - 11
				Normal Sample or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.04 U	0.00055 U	0.00055 U	0.00063 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.04 U	0.00055 U	0.00055 U	0.00063 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.04 U	0.00055 U	0.00055 U	0.00063 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.081 U	0.0011 U	0.0011 U	0.0013 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.081 U	0.0011 U	0.0011 U	0.0013 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.081 U	0.0011 U	0.0011 U	0.0013 U
1,1-Dichloropropene	--	--	--	MG/KG	0.04 U	0.00055 U	0.00055 U	0.00063 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.16 U	0.0022 UJ	0.0022 UJ	0.0025 UJ
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.22	0.0022 U	0.0022 U	0.0025 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	3.6	0.0022 U	0.0022 U	0.0025 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.24 UJ	0.0033 U	0.0033 U	0.0038 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.081 U	0.0011 U	0.0011 U	0.0013 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.081 U	0.0011 U	0.0011 U	0.0013 U
1,2-Dichloropropane	--	--	--	MG/KG	0.081 U	0.0011 U	0.0011 U	0.0013 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	1.5	0.0022 U	0.0022 U	0.0025 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
1,3-Dichloropropane	--	--	--	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	6.5 UJ	0.089 U	0.088 U	0.1 U
2,2-Dichloropropane	--	--	--	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
2-Chlorotoluene	--	--	--	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
2-Hexanone	--	--	--	MG/KG	0.81 U	0.011 U	0.011 U	0.013 U
4-Chlorotoluene	--	--	--	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
4-Ethyltoluene	--	--	--	MG/KG	3.2	0.0022 U	0.0022 U	0.0025 U
Acetone	0.05	100	0.05	MG/KG	0.81 U	0.011 J	0.01 J	0.01 J
Acrylonitrile	--	--	--	MG/KG	0.32 U	0.0044 U	0.0044 U	0.005 U
Benzene	**0.06**	4.8	0.06	MG/KG	**0.24**	0.00055 U	0.00055 U	0.00063 U
Bromobenzene	--	--	--	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-8	RXSB-9	RXSB-9	RXSB-9
				Sample Date:	08/01/2025	03/13/2023	03/13/2023	03/13/2023
				Sample Depth (ft bls):	9 - 11	7 - 9	7 - 9	9 - 11
				Normal Sample or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
Bromodichloromethane	--	--	--	MG/KG	0.04 U	0.00055 U	0.00055 U	0.00063 U
Bromoform	--	--	--	MG/KG	0.32 UJ	0.0044 UJ	0.0044 UJ	0.005 UJ
Bromomethane	--	--	--	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
Carbon Disulfide	--	--	--	MG/KG	0.81 UJ	0.011 U	0.011 U	0.013 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.081 UJ	0.0011 U	0.0011 U	0.0013 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.04 U	0.00055 U	0.00055 U	0.00063 U
Chloroethane	--	--	--	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
Chloroform	0.37	49	0.37	MG/KG	0.12 U	0.0017 U	0.0016 U	0.0019 U
Chloromethane	--	--	--	MG/KG	0.32 U	0.0044 UJ	0.0044 UJ	0.005 UJ
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.081 U	0.0011 U	0.0011 U	0.0013 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.04 U	0.00055 U	0.00055 U	0.00063 U
Cymene	--	--	--	MG/KG	0.16	0.0011 U	0.0011 U	0.0013 U
Dibromochloromethane	--	--	--	MG/KG	0.081 U	0.0011 U	0.0011 U	0.0013 U
Dibromomethane	--	--	--	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.81 UJ	0.011 U	0.011 U	0.013 U
Dichloroethylenes	--	--	--	MG/KG	0.081 U	0.0011 U	0.0011 U	0.0013 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
Ethylbenzene	**1**	41	1	MG/KG	**1.3**	0.0011 U	0.0011 U	0.0013 U
Hexachlorobutadiene	--	--	--	MG/KG	0.32 U	0.0044 U	0.0044 U	0.005 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.3	0.0011 U	0.0011 U	0.0013 U
m,p-Xylene	--	--	--	MG/KG	5.6	0.0022 U	0.0022 U	0.0025 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.81 U	0.011 U	0.011 U	0.013 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.81 U	0.011 U	0.011 U	0.013 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.4 U	0.0055 UJ	0.0055 UJ	0.0063 UJ
Naphthalene	12	100	12	MG/KG	0.42	0.0044 U	0.0044 U	0.005 U
N-Butylbenzene	12	100	12	MG/KG	0.14	0.0011 U	0.0011 U	0.0013 U
N-Propylbenzene	3.9	100	3.9	MG/KG	0.49	0.0011 U	0.0011 U	0.0013 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	2.1	0.0011 U	0.0011 U	0.0013 U
Sec-Butylbenzene	11	100	11	MG/KG	0.091	0.0011 U	0.0011 U	0.0013 U
Styrene	--	--	--	MG/KG	0.081 U	0.0011 U	0.0011 U	0.0013 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-8	RXSB-9	RXSB-9	RXSB-9
				Sample Date:	08/01/2025	03/13/2023	03/13/2023	03/13/2023
				Sample Depth (ft bls):	9 - 11	7 - 9	7 - 9	9 - 11
				Normal Sample or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.16 U	0.0022 U	0.0022 U	0.0025 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.04 U	0.00055 U	0.00055 U	0.00063 U
Toluene	**0.7**	100	0.7	MG/KG	**0.8**	0.0011 U	0.0011 U	0.0013 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.04 U	0.00055 U	0.00055 U	0.00063 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.12 U	0.0017 U	0.0016 U	0.0019 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.081 U	0.0011 U	0.0011 U	0.0013 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.4 U	0.0055 U	0.0055 U	0.0063 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.04 U	0.00055 U	0.00055 U	0.00063 U
Trichlorofluoromethane	--	--	--	MG/KG	0.32 U	0.0044 U	0.0044 U	0.005 U
Vinyl Acetate	--	--	--	MG/KG	0.81 UJ	0.011 UJ	0.011 UJ	0.013 UJ
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.081 U	0.0011 U	0.0011 U	0.0013 U
Xylenes	**0.26**	100	1.6	MG/KG	**7.7**	0.0011 U	0.0011 U	0.0013 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-10	RXSB-10	RXSB-11	RXSB-11
				Sample Date:	03/13/2023	03/13/2023	07/28/2025	07/28/2025
				Sample Depth (ft bls):	5 - 8	8 - 11	6 - 8	13 - 15
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00057 U	0.0006 U	0.00051 U	0.00054 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00057 U	0.0006 U	0.00051 U	0.00054 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00057 U	0.0006 UJ	0.00051 U	0.00054 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0011 U	0.0012 UJ	0.001 U	0.0011 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0011 U	0.0012 U	0.001 U	0.0011 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0011 U	0.0012 U	0.001 U	0.0011 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00057 U	0.0006 U	0.00051 U	0.00054 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0023 UJ	0.0024 UJ	0.002 U	0.0021 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0034 U	0.0036 UJ	0.0031 U	0.0032 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0011 U	0.0012 UJ	0.001 U	0.0011 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0011 U	0.0012 U	0.001 U	0.0011 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0011 U	0.0012 U	0.001 U	0.0011 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.092 U	0.096 U	0.082 U	0.086 U
2,2-Dichloropropane	--	--	--	MG/KG	0.0023 U	0.0024 U	0.002 U	0.0021 U
2-Chlorotoluene	--	--	--	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U
2-Hexanone	--	--	--	MG/KG	0.011 U	0.012 UJ	0.01 UJ	0.011 UJ
4-Chlorotoluene	--	--	--	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U
4-Ethyltoluene	--	--	--	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U
Acetone	0.05	100	0.05	MG/KG	0.011 UJ	0.008 J	0.012 J	0.0069 J
Acrylonitrile	--	--	--	MG/KG	0.0046 U	0.0048 U	0.0041 UJ	0.0043 UJ
Benzene	**0.06**	4.8	0.06	MG/KG	0.00057 U	0.0006 U	0.00051 U	0.00054 U
Bromobenzene	--	--	--	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-10	RXSB-10	RXSB-11	RXSB-11
				Sample Date:	03/13/2023	03/13/2023	07/28/2025	07/28/2025
				Sample Depth (ft bls):	5 - 8	8 - 11	6 - 8	13 - 15
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.0023 U	0.0024 U	0.002 U	0.0021 U
Bromodichloromethane	--	--	--	MG/KG	0.00057 U	0.0006 U	0.00051 U	0.00054 U
Bromoform	--	--	--	MG/KG	0.0046 UJ	0.0048 UJ	0.0041 U	0.0043 U
Bromomethane	--	--	--	MG/KG	0.0023 U	0.0024 U	0.002 U	0.0021 U
Carbon Disulfide	--	--	--	MG/KG	0.011 U	0.012 U	0.01 U	0.011 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0011 U	0.0012 U	0.001 U	0.0011 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00057 U	0.0006 UJ	0.00051 U	0.00054 U
Chloroethane	--	--	--	MG/KG	0.0023 U	0.0024 U	0.002 U	0.0021 U
Chloroform	0.37	49	0.37	MG/KG	0.0017 U	0.0018 U	0.0015 U	0.0016 U
Chloromethane	--	--	--	MG/KG	0.0046 UJ	0.0048 UJ	0.0041 UJ	0.0043 UJ
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0011 U	0.0012 U	0.001 U	0.0011 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00057 U	0.0006 UJ	0.00051 U	0.00054 U
Cymene	--	--	--	MG/KG	0.0011 U	0.0012 UJ	0.001 U	0.0011 U
Dibromochloromethane	--	--	--	MG/KG	0.0011 U	0.0012 U	0.001 U	0.0011 U
Dibromomethane	--	--	--	MG/KG	0.0023 U	0.0024 U	0.002 U	0.0021 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.011 U	0.012 U	0.01 U	0.011 U
Dichloroethylenes	--	--	--	MG/KG	0.0011 U	0.0012 U	0.001 U	0.0011 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0023 U	0.0024 U	0.002 U	0.0021 U
Ethylbenzene	**1**	41	1	MG/KG	0.0011 U	0.0018 J	0.001 U	0.0011 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0046 U	0.0048 UJ	0.0041 UJ	0.0043 UJ
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0011 U	0.0012 UJ	0.001 U	0.0011 U
m,p-Xylene	--	--	--	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.011 U	0.012 U	0.01 UJ	0.011 UJ
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.011 U	0.012 UJ	0.01 UJ	0.011 UJ
Methylene Chloride	0.05	100	0.05	MG/KG	0.0057 UJ	0.006 UJ	0.0051 U	0.0054 U
Naphthalene	12	100	12	MG/KG	0.0046 U	0.0048 UJ	0.0041 U	0.0043 U
N-Butylbenzene	12	100	12	MG/KG	0.0011 U	0.0012 UJ	0.001 U	0.0011 U
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0011 U	0.0012 UJ	0.001 U	0.0011 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0011 U	0.0012 J	0.001 U	0.0011 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0011 U	0.0012 UJ	0.001 U	0.0011 U
Styrene	--	--	--	MG/KG	0.0011 U	0.0012 UJ	0.001 U	0.0011 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0023 U	0.0024 UJ	0.002 U	0.0021 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-10	RXSB-10	RXSB-11	RXSB-11
				Sample Date:	03/13/2023	03/13/2023	07/28/2025	07/28/2025
				Sample Depth (ft bls):	5 - 8	8 - 11	6 - 8	13 - 15
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0023 U	0.0024 U	0.002 U	0.0021 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00057 U	0.0006 UJ	0.00051 U	0.00054 U
Toluene	**0.7**	100	0.7	MG/KG	0.0011 U	0.0012 UJ	0.001 U	0.0011 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00057 U	0.0006 U	0.00051 U	0.00054 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0017 U	0.0018 U	0.0015 U	0.0016 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0011 U	0.0012 UJ	0.001 U	0.0011 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0057 U	0.006 UJ	0.0051 U	0.0054 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00057 U	0.0006 U	0.00051 U	0.00054 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0046 U	0.0048 U	0.0041 U	0.0043 U
Vinyl Acetate	--	--	--	MG/KG	0.011 UJ	0.012 UJ	0.01 UJ	0.011 UJ
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0011 U	0.0012 U	0.001 UJ	0.0011 UJ
Xylenes	**0.26**	100	1.6	MG/KG	0.0011 U	0.0028 J	0.001 U	0.0011 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-12	RXSB-12	RXSB-13	RXSB-13
				Sample Date:	07/31/2025	07/31/2025	07/29/2025	07/29/2025
				Sample Depth (ft bls):	6 - 8	8 - 10	8 - 10	10 - 12
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00055 U	0.00072 UJ	0.00057 U	0.00062 UJ
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00055 U	0.00072 U	0.00057 U	0.00062 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00055 U	0.00072 U	0.00057 U	0.00062 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00055 U	0.00072 U	0.00057 U	0.00062 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0022 U	0.0029 UJ	0.0023 U	0.0025 UJ
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0022 U	0.0029 UJ	0.0023 U	0.0025 UJ
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 UJ
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0022 U	0.0029 UJ	0.0023 U	0.0025 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 UJ
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0033 U	0.0043 U	0.0034 U	0.0038 UJ
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0022 U	0.0029 UJ	0.0023 U	0.0025 UJ
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0022 U	0.0029 UJ	0.0023 U	0.0025 UJ
1,3-Dichloropropane	--	--	--	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0022 U	0.0029 UJ	0.0023 U	0.0025 UJ
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.088 U	0.12 U	0.091 U	0.1 U
2,2-Dichloropropane	--	--	--	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 U
2-Chlorotoluene	--	--	--	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 U
2-Hexanone	--	--	--	MG/KG	0.011 U	0.014 U	0.011 U	0.012 UJ
4-Chlorotoluene	--	--	--	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 UJ
4-Ethyltoluene	--	--	--	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 U
Acetone	0.05	100	0.05	MG/KG	0.0072 J	0.0084 J	0.011 U	0.0081 J
Acrylonitrile	--	--	--	MG/KG	0.0044 UJ	0.0058 UJ	0.0046 U	0.005 UJ
Benzene	**0.06**	4.8	0.06	MG/KG	0.00055 U	0.00072 U	0.00057 U	0.00062 U
Bromobenzene	--	--	--	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 UJ

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-12	RXSB-12	RXSB-13	RXSB-13
				Sample Date:	07/31/2025	07/31/2025	07/29/2025	07/29/2025
				Sample Depth (ft bls):	6 - 8	8 - 10	8 - 10	10 - 12
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 U
Bromodichloromethane	--	--	--	MG/KG	0.00055 U	0.00072 U	0.00057 U	0.00062 U
Bromoform	--	--	--	MG/KG	0.0044 U	0.0058 U	0.0046 U	0.005 UJ
Bromomethane	--	--	--	MG/KG	0.0022 U	0.0029 U	0.0023 UJ	0.0025 UJ
Carbon Disulfide	--	--	--	MG/KG	0.011 U	0.014 U	0.011 U	0.012 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00055 U	0.00072 U	0.00057 U	0.00062 U
Chloroethane	--	--	--	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 U
Chloroform	0.37	49	0.37	MG/KG	0.0016 U	0.0022 U	0.0017 U	0.0019 U
Chloromethane	--	--	--	MG/KG	0.0044 UJ	0.0058 UJ	0.0046 U	0.005 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00055 U	0.00072 U	0.00057 U	0.00062 U
Cymene	--	--	--	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
Dibromochloromethane	--	--	--	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
Dibromomethane	--	--	--	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.011 U	0.014 U	0.011 U	0.012 U
Dichloroethylenes	--	--	--	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 U
Ethylbenzene	**1**	41	1	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0044 U	0.0058 U	0.0046 U	0.005 UJ
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
m,p-Xylene	--	--	--	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.011 U	0.014 U	0.011 U	0.012 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.011 UJ	0.014 UJ	0.011 U	0.012 UJ
Methylene Chloride	0.05	100	0.05	MG/KG	0.0055 U	0.0072 U	0.0057 U	0.0062 U
Naphthalene	12	100	12	MG/KG	0.0044 U	0.0058 UJ	0.0046 U	0.005 UJ
N-Butylbenzene	12	100	12	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
Styrene	--	--	--	MG/KG	0.0011 U	0.0014 UJ	0.0011 U	0.0012 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-12	RXSB-12	RXSB-13	RXSB-13
				Sample Date:	07/31/2025	07/31/2025	07/29/2025	07/29/2025
				Sample Depth (ft bls):	6 - 8	8 - 10	8 - 10	10 - 12
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0022 U	0.0029 U	0.0023 U	0.0025 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00055 U	0.00072 U	0.00057 U	0.00062 U
Toluene	**0.7**	100	0.7	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00055 U	0.00072 U	0.00057 U	0.00062 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0016 U	0.0022 U	0.0017 U	0.0019 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0055 U	0.0072 U	0.0057 U	0.0062 UJ
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00055 U	0.00072 U	0.00057 U	0.00062 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0044 U	0.0058 U	0.0046 UJ	0.005 UJ
Vinyl Acetate	--	--	--	MG/KG	0.011 U	0.014 UJ	0.011 U	0.012 UJ
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U
Xylenes	**0.26**	100	1.6	MG/KG	0.0011 U	0.0014 U	0.0011 U	0.0012 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-14	RXSB-14	RXSB-14	SRI-1
				Sample Date:	07/30/2025	07/30/2025	07/30/2025	10/31/2025
				Sample Depth (ft bls):	8 - 10	10 - 12	10 - 12	0 - 2
				Normal Sample or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.0007 U	0.00056 U	0.00085 U	0.00082 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.0007 U	0.00056 U	0.00085 U	0.00082 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.0007 U	0.00056 U	0.00085 U	0.00082 UJ
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
1,1-Dichloropropene	--	--	--	MG/KG	0.0007 U	0.00056 U	0.00085 U	0.00082 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 UJ	0.0033 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 UJ	0.0033 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0042 U	0.0034 U	0.0051 UJ	0.0049 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.11 U	0.09 U	0.14 U	0.13 U
2,2-Dichloropropane	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
2-Chlorotoluene	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
2-Hexanone	--	--	--	MG/KG	0.014 U	0.011 U	0.017 UJ	0.016 U
4-Chlorotoluene	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
4-Ethyltoluene	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
Acetone	0.05	100	0.05	MG/KG	0.011 J	0.0096 J	0.017 U	0.016 U
Acrylonitrile	--	--	--	MG/KG	0.0056 U	0.0045 U	0.0068 U	0.0066 U
Benzene	**0.06**	4.8	0.06	MG/KG	0.0007 U	0.00056 U	0.00085 U	0.00082 U
Bromobenzene	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-14	RXSB-14	RXSB-14	SRI-1
				Sample Date:	07/30/2025	07/30/2025	07/30/2025	10/31/2025
				Sample Depth (ft bls):	8 - 10	10 - 12	10 - 12	0 - 2
				Normal Sample or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
Bromodichloromethane	--	--	--	MG/KG	0.0007 U	0.00056 U	0.00085 U	0.00082 U
Bromoform	--	--	--	MG/KG	0.0056 U	0.0045 U	0.0068 U	0.0066 U
Bromomethane	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 UJ
Carbon Disulfide	--	--	--	MG/KG	0.014 U	0.011 U	0.017 U	0.016 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.0007 U	0.00056 U	0.00085 U	0.00082 U
Chloroethane	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 UJ
Chloroform	0.37	49	0.37	MG/KG	0.0021 U	0.0017 U	0.0025 U	0.00064 J
Chloromethane	--	--	--	MG/KG	0.0056 U	0.0045 U	0.0068 U	0.0066 UJ
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.0007 U	0.00056 U	0.00085 U	0.00082 U
Cymene	--	--	--	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
Dibromochloromethane	--	--	--	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
Dibromomethane	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.014 U	0.011 U	0.017 U	0.016 U
Dichloroethylenes	--	--	--	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
Ethylbenzene	**1**	41	1	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0056 U	0.0045 U	0.0068 U	0.0066 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
m,p-Xylene	--	--	--	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.014 U	0.011 U	0.017 U	0.016 UJ
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.014 U	0.011 U	0.017 U	0.016 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.007 U	0.0056 U	0.0085 U	0.0082 UJ
Naphthalene	12	100	12	MG/KG	0.0056 U	0.0045 U	0.0068 U	0.0066 U
N-Butylbenzene	12	100	12	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
Styrene	--	--	--	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-14	RXSB-14	RXSB-14	SRI-1
				Sample Date:	07/30/2025	07/30/2025	07/30/2025	10/31/2025
				Sample Depth (ft bls):	8 - 10	10 - 12	10 - 12	0 - 2
				Normal Sample or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0028 U	0.0022 U	0.0034 U	0.0033 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.0007 U	0.00051 J	0.0008 J	0.00082 U
Toluene	**0.7**	100	0.7	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.0007 U	0.00056 U	0.00085 U	0.00082 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0021 U	0.0017 U	0.0025 U	0.0025 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.007 U	0.0056 U	0.0085 U	0.0082 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.0007 U	0.00056 U	0.00085 U	0.00082 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0056 U	0.0045 U	0.0068 U	0.0066 UJ
Vinyl Acetate	--	--	--	MG/KG	0.014 U	0.011 U	0.017 U	0.016 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 UJ
Xylenes	**0.26**	100	1.6	MG/KG	0.0014 U	0.0011 U	0.0017 U	0.0016 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-1	SRI-2	SRI-2	SRI-2
			Sample Date:		10/31/2025	10/31/2025	10/31/2025	10/31/2025
			Sample Depth (ft bls):		4 - 6	0 - 2	3 - 5	6 - 8
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00068 U	0.0006 U	0.0005 U	0.00066 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00068 U	0.0006 U	0.0005 U	0.00066 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00068 UJ	0.0006 UJ	0.0005 UJ	0.00066 UJ
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00068 U	0.0006 U	0.0005 U	0.00066 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0041 U	0.0036 U	0.003 U	0.004 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.11 U	0.096 U	0.08 U	0.1 U
2,2-Dichloropropane	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
2-Chlorotoluene	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
2-Hexanone	--	--	--	MG/KG	0.014 U	0.012 U	0.01 U	0.013 U
4-Chlorotoluene	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
4-Ethyltoluene	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
Acetone	0.05	100	0.05	MG/KG	0.014 U	0.012 U	0.01 U	0.013 U
Acrylonitrile	--	--	--	MG/KG	0.0055 U	0.0048 U	0.004 U	0.0053 U
Benzene	**0.06**	4.8	0.06	MG/KG	0.00068 U	0.0006 U	0.0005 U	0.00066 U
Bromobenzene	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-1	SRI-2	SRI-2	SRI-2
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	4 - 6	0 - 2	3 - 5	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
Bromodichloromethane	--	--	--	MG/KG	0.00068 U	0.0006 U	0.0005 U	0.00066 U
Bromoform	--	--	--	MG/KG	0.0055 U	0.0048 U	0.004 U	0.0053 U
Bromomethane	--	--	--	MG/KG	0.0027 UJ	0.0024 UJ	0.002 UJ	0.0026 UJ
Carbon Disulfide	--	--	--	MG/KG	0.014 U	0.012 U	0.01 U	0.013 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00068 U	0.0006 U	0.0005 U	0.00066 U
Chloroethane	--	--	--	MG/KG	0.0027 UJ	0.0024 UJ	0.002 UJ	0.0026 UJ
Chloroform	0.37	49	0.37	MG/KG	0.00058 J	0.00052 J	0.0004 J	0.00053 J
Chloromethane	--	--	--	MG/KG	0.0055 UJ	0.0048 UJ	0.004 UJ	0.0053 UJ
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00068 U	0.0006 U	0.0005 U	0.00066 U
Cymene	--	--	--	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
Dibromochloromethane	--	--	--	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
Dibromomethane	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.014 U	0.012 U	0.01 U	0.013 U
Dichloroethylenes	--	--	--	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
Ethylbenzene	**1**	41	1	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0055 U	0.0048 U	0.004 U	0.0053 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
m,p-Xylene	--	--	--	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.014 UJ	0.012 UJ	0.01 UJ	0.013 UJ
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.014 U	0.012 U	0.01 U	0.013 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0068 UJ	0.006 UJ	0.005 UJ	0.0066 UJ
Naphthalene	12	100	12	MG/KG	0.0055 U	0.0048 U	0.004 U	0.0053 U
N-Butylbenzene	12	100	12	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
Styrene	--	--	--	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-1	SRI-2	SRI-2	SRI-2
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	4 - 6	0 - 2	3 - 5	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0027 U	0.0024 U	0.002 U	0.0026 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00068 U	0.0006 U	0.0005 U	0.00066 U
Toluene	**0.7**	100	0.7	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00068 U	0.0006 U	0.0005 U	0.00066 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.002 U	0.0018 U	0.0015 U	0.002 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0068 U	0.006 U	0.005 U	0.0066 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00068 U	0.0006 U	0.0005 U	0.00066 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0055 UJ	0.0048 UJ	0.004 UJ	0.0053 UJ
Vinyl Acetate	--	--	--	MG/KG	0.014 U	0.012 U	0.01 U	0.013 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0014 UJ	0.0012 UJ	0.001 UJ	0.0013 UJ
Xylenes	**0.26**	100	1.6	MG/KG	0.0014 U	0.0012 U	0.001 U	0.0013 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-2	SRI-3	SRI-3	SRI-4
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	12 - 14	0 - 2	3 - 5	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00062 U	0.00077 U	0.0011 U	0.00083 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00062 U	0.00077 U	0.0011 U	0.00083 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00062 UJ	0.00077 UJ	0.0011 UJ	0.00083 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00062 U	0.00077 U	0.0011 U	0.00083 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0025 U	0.0031 U	0.00053 J	0.0033 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0037 U	0.0046 U	0.0067 U	0.005 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0025 U	0.0031 U	0.00067 J+	0.0033 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.099 U	0.12 U	0.18 U	0.13 UJ
2,2-Dichloropropane	--	--	--	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
2-Chlorotoluene	--	--	--	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
2-Hexanone	--	--	--	MG/KG	0.012 U	0.015 U	0.022 U	0.017 U
4-Chlorotoluene	--	--	--	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
4-Ethyltoluene	--	--	--	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
Acetone	0.05	100	0.05	MG/KG	0.012 U	0.015 U	0.022 U	0.017 U
Acrylonitrile	--	--	--	MG/KG	0.005 U	0.0062 U	0.0089 U	0.0067 U
Benzene	**0.06**	4.8	0.06	MG/KG	0.00062 U	0.00077 U	0.0011 U	0.00083 U
Bromobenzene	--	--	--	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-2	SRI-3	SRI-3	SRI-4
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	12 - 14	0 - 2	3 - 5	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
Bromodichloromethane	--	--	--	MG/KG	0.00062 U	0.00077 U	0.0011 U	0.00083 U
Bromoform	--	--	--	MG/KG	0.005 U	0.0062 U	0.0089 U	0.0067 U
Bromomethane	--	--	--	MG/KG	0.0025 UJ	0.0031 UJ	0.0044 UJ	0.0033 U
Carbon Disulfide	--	--	--	MG/KG	0.012 U	0.015 U	0.022 U	0.017 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00062 U	0.00077 U	0.0011 U	0.00083 U
Chloroethane	--	--	--	MG/KG	0.0025 UJ	0.0031 UJ	0.0044 UJ	0.0033 UJ
Chloroform	0.37	49	0.37	MG/KG	0.00049 J	0.00063 J	0.00096 J	0.0025 U
Chloromethane	--	--	--	MG/KG	0.005 UJ	0.0062 UJ	0.0089 UJ	0.0067 UJ
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00062 U	0.00077 U	0.0011 U	0.00083 U
Cymene	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
Dibromochloromethane	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
Dibromomethane	--	--	--	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.012 U	0.015 U	0.022 U	0.017 U
Dichloroethylenes	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
Ethylbenzene	**1**	41	1	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
Hexachlorobutadiene	--	--	--	MG/KG	0.005 U	0.0062 U	0.0089 U	0.0067 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
m,p-Xylene	--	--	--	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.012 UJ	0.015 UJ	0.022 UJ	0.017 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.012 U	0.015 U	0.022 U	0.017 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0062 UJ	0.0077 UJ	0.011 UJ	0.0083 U
Naphthalene	12	100	12	MG/KG	0.005 U	0.0062 U	0.0089 U	0.0067 U
N-Butylbenzene	12	100	12	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
Styrene	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-2	SRI-3	SRI-3	SRI-4
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	12 - 14	0 - 2	3 - 5	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0025 U	0.0031 U	0.0044 U	0.0033 UJ
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00062 U	0.00077 U	0.0011 U	0.00083 U
Toluene	**0.7**	100	0.7	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00062 U	0.00077 U	0.0011 U	0.00083 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0019 U	0.0023 U	0.0033 U	0.0025 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0062 U	0.0077 U	0.011 U	0.0083 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00062 U	0.00077 U	0.0011 U	0.00083 U
Trichlorofluoromethane	--	--	--	MG/KG	0.005 UJ	0.0062 UJ	0.0089 UJ	0.0067 U
Vinyl Acetate	--	--	--	MG/KG	0.012 U	0.015 U	0.022 U	0.017 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0012 UJ	0.0015 UJ	0.0022 UJ	0.0017 U
Xylenes	**0.26**	100	1.6	MG/KG	0.0012 U	0.0015 U	0.0022 U	0.0017 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-4	SRI-4	SRI-5	SRI-5
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	4 - 6	11 - 13	0 - 2	3 - 5
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00083 U	0.00052 U	0.0006 U	0.00064 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00083 U	0.00052 U	0.0006 U	0.00064 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00083 UJ	0.00052 UJ	0.0006 UJ	0.00064 UJ
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00083 U	0.00052 U	0.0006 U	0.00064 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.005 U	0.0031 U	0.0036 U	0.0038 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.13 U	0.083 U	0.096 U	0.1 U
2,2-Dichloropropane	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
2-Chlorotoluene	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
2-Hexanone	--	--	--	MG/KG	0.017 U	0.01 U	0.012 U	0.013 U
4-Chlorotoluene	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
4-Ethyltoluene	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
Acetone	0.05	100	0.05	MG/KG	0.017 U	0.01 U	0.012 U	0.013 U
Acrylonitrile	--	--	--	MG/KG	0.0066 U	0.0042 U	0.0048 U	0.0051 U
Benzene	**0.06**	4.8	0.06	MG/KG	0.00083 U	0.00052 U	0.0006 U	0.00064 U
Bromobenzene	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-4	SRI-4	SRI-5	SRI-5
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	4 - 6	11 - 13	0 - 2	3 - 5
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
Bromodichloromethane	--	--	--	MG/KG	0.00083 U	0.00052 U	0.0006 U	0.00064 U
Bromoform	--	--	--	MG/KG	0.0066 U	0.0042 U	0.0048 U	0.0051 U
Bromomethane	--	--	--	MG/KG	0.0033 UJ	0.0021 UJ	0.0024 UJ	0.0026 UJ
Carbon Disulfide	--	--	--	MG/KG	0.017 U	0.01 U	0.012 U	0.013 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00083 U	0.00052 U	0.0006 U	0.00064 U
Chloroethane	--	--	--	MG/KG	0.0033 UJ	0.0021 UJ	0.0024 UJ	0.0026 UJ
Chloroform	0.37	49	0.37	MG/KG	0.00075 J	0.00048 J	0.00049 J	0.00053 J
Chloromethane	--	--	--	MG/KG	0.0066 UJ	0.0042 UJ	0.0048 UJ	0.0051 UJ
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00083 U	0.00052 U	0.0006 U	0.00064 U
Cymene	--	--	--	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
Dibromochloromethane	--	--	--	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
Dibromomethane	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.017 U	0.01 U	0.012 U	0.013 U
Dichloroethylenes	--	--	--	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
Ethylbenzene	**1**	41	1	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0066 U	0.0042 U	0.0048 U	0.0051 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
m,p-Xylene	--	--	--	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.017 UJ	0.01 UJ	0.012 UJ	0.013 UJ
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.017 U	0.01 U	0.012 U	0.013 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0083 UJ	0.0052 UJ	0.006 UJ	0.0064 UJ
Naphthalene	12	100	12	MG/KG	0.0066 U	0.0042 U	0.0048 U	0.0051 U
N-Butylbenzene	12	100	12	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
Styrene	--	--	--	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-4	SRI-4	SRI-5	SRI-5
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	4 - 6	11 - 13	0 - 2	3 - 5
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0033 U	0.0021 U	0.0024 U	0.0026 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00083 U	0.00052 U	0.0006 U	0.00064 U
Toluene	**0.7**	100	0.7	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00083 U	0.00052 U	0.0006 U	0.00064 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0025 U	0.0016 U	0.0018 U	0.0019 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0083 U	0.0052 U	0.006 U	0.0064 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00083 U	0.00052 U	0.0006 U	0.00064 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0066 UJ	0.0042 UJ	0.0048 UJ	0.0051 UJ
Vinyl Acetate	--	--	--	MG/KG	0.017 U	0.01 U	0.012 U	0.013 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0017 UJ	0.001 UJ	0.0012 UJ	0.0013 UJ
Xylenes	**0.26**	100	1.6	MG/KG	0.0017 U	0.001 U	0.0012 U	0.0013 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-6	SRI-6	SRI-7	SRI-7
				Sample Date:	10/31/2025	10/31/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	0 - 2	2 - 4
				Normal Sample or Field Duplicate:	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00063 U	0.001 U	0.001 U	0.00068 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00063 U	0.001 U	0.001 U	0.00068 UJ
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00063 UJ	0.001 UJ	0.001 U	0.00068 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00063 U	0.001 U	0.001 U	0.00068 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0038 U	0.0063 U	0.0063 U	0.0041 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.1 U	0.17 U	0.17 UJ	0.11 U
2,2-Dichloropropane	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
2-Chlorotoluene	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 UJ
2-Hexanone	--	--	--	MG/KG	0.013 U	0.021 U	0.021 U	0.014 UJ
4-Chlorotoluene	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
4-Ethyltoluene	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
Acetone	0.05	100	0.05	MG/KG	0.013 U	0.021 U	0.019 J	0.014 UJ
Acrylonitrile	--	--	--	MG/KG	0.005 U	0.0083 U	0.0084 U	0.0055 U
Benzene	**0.06**	4.8	0.06	MG/KG	0.00063 U	0.001 U	0.001 U	0.00068 U
Bromobenzene	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-6	SRI-6	SRI-7	SRI-7
				Sample Date:	10/31/2025	10/31/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	0 - 2	2 - 4
				Normal Sample or Field Duplicate:	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
Bromodichloromethane	--	--	--	MG/KG	0.00063 U	0.001 U	0.001 U	0.00068 U
Bromoform	--	--	--	MG/KG	0.005 U	0.0083 U	0.0084 U	0.0055 U
Bromomethane	--	--	--	MG/KG	0.0025 UJ	0.0042 UJ	0.0042 U	0.0027 U
Carbon Disulfide	--	--	--	MG/KG	0.013 U	0.021 U	0.021 U	0.014 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 UJ
Chlorobenzene	1.1	100	1.1	MG/KG	0.00063 U	0.001 U	0.001 U	0.00068 U
Chloroethane	--	--	--	MG/KG	0.0025 UJ	0.0042 UJ	0.0042 U	0.0027 U
Chloroform	0.37	49	0.37	MG/KG	0.00064 J	0.001 J	0.00048 J	0.00019 J
Chloromethane	--	--	--	MG/KG	0.005 UJ	0.0083 UJ	0.0084 U	0.0055 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00063 U	0.001 U	0.001 U	0.00068 U
Cymene	--	--	--	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
Dibromochloromethane	--	--	--	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
Dibromomethane	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.013 U	0.021 U	0.021 UJ	0.014 UJ
Dichloroethylenes	--	--	--	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
Ethylbenzene	**1**	41	1	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
Hexachlorobutadiene	--	--	--	MG/KG	0.005 U	0.0083 U	0.0084 U	0.0055 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
m,p-Xylene	--	--	--	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.013 UJ	0.021 UJ	0.021 U	0.014 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.013 U	0.021 U	0.021 U	0.014 UJ
Methylene Chloride	0.05	100	0.05	MG/KG	0.0063 UJ	0.01 UJ	0.01 U	0.0068 U
Naphthalene	12	100	12	MG/KG	0.005 U	0.0083 U	0.0018 J	0.0055 U
N-Butylbenzene	12	100	12	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 UJ
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
Styrene	--	--	--	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-6	SRI-6	SRI-7	SRI-7
				Sample Date:	10/31/2025	10/31/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	0 - 2	2 - 4
				Normal Sample or Field Duplicate:	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0025 U	0.0042 U	0.0042 U	0.0027 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00063 U	0.001 U	0.001 U	0.00068 U
Toluene	**0.7**	100	0.7	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00063 U	0.001 U	0.001 U	0.00068 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0019 U	0.0031 U	0.0032 U	0.002 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0063 U	0.01 U	0.01 UJ	0.0068 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00063 U	0.001 U	0.001 U	0.00068 U
Trichlorofluoromethane	--	--	--	MG/KG	0.005 UJ	0.0083 UJ	0.0084 U	0.0055 UJ
Vinyl Acetate	--	--	--	MG/KG	0.013 U	0.021 U	0.021 U	0.014 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0013 UJ	0.0021 UJ	0.0021 U	0.0014 U
Xylenes	**0.26**	100	1.6	MG/KG	0.0013 U	0.0021 U	0.0021 U	0.0014 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-7	SRI-8	SRI-8
				Sample Date:	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	11 - 13	0 - 2	3 - 5
				Normal Sample or Field Duplicate:	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units			
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00061 U	0.00097 U	0.00093 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00061 UJ	0.00097 UJ	0.00093 UJ
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00061 U	0.00097 UJ	0.00093 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0012 U	0.0019 U	0.0019 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0012 U	0.0019 U	0.0019 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0012 U	0.0019 U	0.0019 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00061 U	0.00097 UJ	0.00093 UJ
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0024 U	0.0039 R	0.0037 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0024 U	0.0039 U	0.0037 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0024 U	0.0039 UJ	0.0037 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0024 U	0.0039 R	0.0037 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0024 U	0.0039 UJ	0.0037 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0037 U	0.0058 UJ	0.0056 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0012 U	0.0019 U	0.0019 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0024 U	0.0039 UJ	0.0037 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0012 U	0.0019 U	0.0019 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0012 U	0.0019 U	0.0019 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0024 U	0.0039 UJ	0.0037 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0024 U	0.0039 UJ	0.0037 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0024 U	0.0039 U	0.0037 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0024 U	0.0039 UJ	0.0037 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0024 U	0.0039 UJ	0.0037 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.098 U	0.15 U	0.15 U
2,2-Dichloropropane	--	--	--	MG/KG	0.0024 U	0.0039 UJ	0.0037 UJ
2-Chlorotoluene	--	--	--	MG/KG	0.0024 UJ	0.0039 UJ	0.0037 U
2-Hexanone	--	--	--	MG/KG	0.012 UJ	0.019 U	0.019 U
4-Chlorotoluene	--	--	--	MG/KG	0.0024 U	0.0039 UJ	0.0037 U
4-Ethyltoluene	--	--	--	MG/KG	0.0024 U	0.0039 UJ	0.0037 U
Acetone	0.05	100	0.05	MG/KG	0.012 UJ	0.019 UJ	0.019 UJ
Acrylonitrile	--	--	--	MG/KG	0.0049 U	0.0077 U	0.0075 U
Benzene	**0.06**	4.8	0.06	MG/KG	0.00061 U	0.00097 U	0.00093 U
Bromobenzene	--	--	--	MG/KG	0.0024 U	0.0039 UJ	0.0037 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-7	SRI-8	SRI-8
				Sample Date:	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	11 - 13	0 - 2	3 - 5
				Normal Sample or Field Duplicate:	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units			
Bromochloromethane	--	--	--	MG/KG	0.0024 U	0.0039 U	0.0037 U
Bromodichloromethane	--	--	--	MG/KG	0.00061 U	0.00097 U	0.00093 U
Bromoform	--	--	--	MG/KG	0.0049 U	0.0077 UJ	0.0075 U
Bromomethane	--	--	--	MG/KG	0.0024 U	0.0039 UJ	0.0037 UJ
Carbon Disulfide	--	--	--	MG/KG	0.012 U	0.019 U	0.019 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0012 UJ	0.0019 U	0.0019 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00061 U	0.00097 UJ	0.00093 U
Chloroethane	--	--	--	MG/KG	0.0024 U	0.0039 U	0.0037 U
Chloroform	0.37	49	0.37	MG/KG	0.00023 J	0.001 J	0.00072 J
Chloromethane	--	--	--	MG/KG	0.0049 U	0.0077 UJ	0.0075 UJ
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0012 U	0.0019 U	0.0019 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00061 U	0.00097 U	0.00093 U
Cymene	--	--	--	MG/KG	0.0012 U	0.0019 UJ	0.0019 U
Dibromochloromethane	--	--	--	MG/KG	0.0012 U	0.0019 U	0.0019 U
Dibromomethane	--	--	--	MG/KG	0.0024 U	0.0039 U	0.0037 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.012 UJ	0.019 UJ	0.019 UJ
Dichloroethylenes	--	--	--	MG/KG	0.0012 U	0.0019 U	0.0019 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0024 U	0.0039 U	0.0037 U
Ethylbenzene	**1**	41	1	MG/KG	0.0012 U	0.0019 UJ	0.0019 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0049 U	0.0077 R	0.0075 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0012 U	0.0019 UJ	0.0019 U
m,p-Xylene	--	--	--	MG/KG	0.0024 U	0.0039 UJ	0.0037 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.012 U	0.019 U	0.019 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.012 UJ	0.019 U	0.019 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0061 U	0.0097 U	0.0093 U
Naphthalene	12	100	12	MG/KG	0.0049 U	0.0077 UJ	0.0075 U
N-Butylbenzene	12	100	12	MG/KG	0.0012 UJ	0.0019 UJ	0.0019 UJ
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0012 U	0.0019 UJ	0.0019 UJ
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0012 U	0.0019 UJ	0.0019 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0012 U	0.0019 UJ	0.0019 UJ
Styrene	--	--	--	MG/KG	0.0012 U	0.0019 UJ	0.0019 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0024 U	0.0039 UJ	0.0037 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-7	SRI-8	SRI-8
				Sample Date:	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	11 - 13	0 - 2	3 - 5
				Normal Sample or Field Duplicate:	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units			
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0024 U	0.0039 U	0.0037 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00061 U	0.00097 UJ	0.00093 U
Toluene	**0.7**	100	0.7	MG/KG	0.0012 U	0.0019 U	0.0019 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00061 U	0.00097 U	0.00093 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0018 U	0.0029 U	0.0028 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0012 U	0.0019 UJ	0.0019 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0061 U	0.0097 UJ	0.0093 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00061 U	0.00097 U	0.00093 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0049 UJ	0.0077 UJ	0.0075 UJ
Vinyl Acetate	--	--	--	MG/KG	0.012 U	0.019 R	0.019 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0012 U	0.0019 UJ	0.0019 UJ
Xylenes	**0.26**	100	1.6	MG/KG	0.0012 U	0.0019 U	0.0019 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-9	SRI-9	SRI-9	SRI-10
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	0 - 2	3 - 5	0 - 2
			Normal Sample or Field Duplicate:		N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00081 U	0.00088 U	0.0005 U	0.001 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00081 UJ	0.00088 UJ	0.0005 UJ	0.001 UJ
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00081 U	0.00088 U	0.0005 U	0.001 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00081 UJ	0.00088 UJ	0.0005 UJ	0.001 UJ
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0049 U	0.0053 U	0.003 U	0.006 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.13 U	0.14 U	0.08 U	0.16 U
2,2-Dichloropropane	--	--	--	MG/KG	0.0032 UJ	0.0035 UJ	0.002 UJ	0.004 UJ
2-Chlorotoluene	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
2-Hexanone	--	--	--	MG/KG	0.016 U	0.018 U	0.01 U	0.02 U
4-Chlorotoluene	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
4-Ethyltoluene	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
Acetone	0.05	100	0.05	MG/KG	0.016 UJ	0.018 UJ	0.01 UJ	0.02 UJ
Acrylonitrile	--	--	--	MG/KG	0.0065 U	0.007 U	0.004 U	0.0081 U
Benzene	**0.06**	4.8	0.06	MG/KG	0.00081 U	0.00088 U	0.0005 U	0.001 U
Bromobenzene	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-9	SRI-9	SRI-9	SRI-10
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	3 - 5	0 - 2
				Normal Sample or Field Duplicate:	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
Bromodichloromethane	--	--	--	MG/KG	0.00081 U	0.00088 U	0.0005 U	0.001 U
Bromoform	--	--	--	MG/KG	0.0065 U	0.007 U	0.004 U	0.0081 U
Bromomethane	--	--	--	MG/KG	0.0032 UJ	0.0035 UJ	0.002 UJ	0.004 UJ
Carbon Disulfide	--	--	--	MG/KG	0.016 U	0.018 U	0.01 U	0.02 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00081 U	0.00088 U	0.0005 U	0.001 U
Chloroethane	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
Chloroform	0.37	49	0.37	MG/KG	0.00072 J	0.00076 J	0.00038 J	0.00081 J
Chloromethane	--	--	--	MG/KG	0.0065 UJ	0.007 UJ	0.004 UJ	0.0081 UJ
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00081 U	0.00088 U	0.0005 U	0.001 U
Cymene	--	--	--	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
Dibromochloromethane	--	--	--	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
Dibromomethane	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.016 UJ	0.018 UJ	0.01 UJ	0.02 UJ
Dichloroethylenes	--	--	--	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
Ethylbenzene	**1**	41	1	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0065 U	0.007 U	0.004 U	0.0081 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
m,p-Xylene	--	--	--	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.016 U	0.018 U	0.01 U	0.02 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.016 U	0.018 U	0.01 U	0.02 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0081 U	0.0088 U	0.005 U	0.01 U
Naphthalene	12	100	12	MG/KG	0.0065 U	0.007 U	0.004 U	0.0081 U
N-Butylbenzene	12	100	12	MG/KG	0.0016 UJ	0.0018 UJ	0.001 UJ	0.002 UJ
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0016 UJ	0.0018 UJ	0.001 UJ	0.002 UJ
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0016 UJ	0.0018 UJ	0.001 UJ	0.002 UJ
Styrene	--	--	--	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-9	SRI-9	SRI-9	SRI-10
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	3 - 5	0 - 2
				Normal Sample or Field Duplicate:	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0032 U	0.0035 U	0.002 U	0.004 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00081 U	0.00088 U	0.0005 U	0.001 U
Toluene	**0.7**	100	0.7	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00081 U	0.00088 U	0.0005 U	0.001 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0024 U	0.0026 U	0.0015 U	0.003 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0081 U	0.0088 U	0.005 U	0.01 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00081 U	0.00088 U	0.0005 U	0.001 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0065 UJ	0.007 UJ	0.004 UJ	0.0081 UJ
Vinyl Acetate	--	--	--	MG/KG	0.016 U	0.018 U	0.01 U	0.02 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0016 UJ	0.0018 UJ	0.001 UJ	0.002 UJ
Xylenes	**0.26**	100	1.6	MG/KG	0.0016 U	0.0018 U	0.001 U	0.002 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-10	SRI-10	SRI-11	SRI-11
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	3 - 5	10 - 12	0 - 2	4 - 6
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00072 U	0.00088 U	0.0018 U	0.00058 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00072 UJ	0.00088 UJ	0.0018 U	0.00058 UJ
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00072 U	0.00088 U	0.0018 U	0.00058 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00072 UJ	0.00088 UJ	0.0018 U	0.00058 UJ
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0029 U	0.00068 J	0.0072 U	0.0023 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0043 U	0.0053 U	0.011 U	0.0035 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.11 U	0.14 U	0.29 UJ	0.093 U
2,2-Dichloropropane	--	--	--	MG/KG	0.0029 UJ	0.0035 UJ	0.0072 U	0.0023 UJ
2-Chlorotoluene	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
2-Hexanone	--	--	--	MG/KG	0.014 U	0.018 U	0.036 U	0.012 U
4-Chlorotoluene	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
4-Ethyltoluene	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
Acetone	0.05	100	0.05	MG/KG	0.014 UJ	0.018 UJ	0.023 J	0.012 UJ
Acrylonitrile	--	--	--	MG/KG	0.0057 U	0.007 U	0.014 U	0.0047 U
Benzene	**0.06**	4.8	0.06	MG/KG	0.00072 U	0.00088 U	0.0018 U	0.00058 U
Bromobenzene	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-10	SRI-10	SRI-11	SRI-11
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	3 - 5	10 - 12	0 - 2	4 - 6
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
Bromodichloromethane	--	--	--	MG/KG	0.00072 U	0.00088 U	0.0018 U	0.00058 U
Bromoform	--	--	--	MG/KG	0.0057 U	0.007 U	0.014 U	0.0047 U
Bromomethane	--	--	--	MG/KG	0.0029 UJ	0.0035 UJ	0.0072 U	0.0023 UJ
Carbon Disulfide	--	--	--	MG/KG	0.014 U	0.018 U	0.036 U	0.012 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00072 U	0.00088 U	0.0018 U	0.00058 U
Chloroethane	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 UJ	0.0023 U
Chloroform	0.37	49	0.37	MG/KG	0.00055 J	0.00064 J	0.0054 U	0.00046 J
Chloromethane	--	--	--	MG/KG	0.0057 UJ	0.007 UJ	0.014 UJ	0.0047 UJ
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00072 U	0.00088 U	0.0018 U	0.00058 U
Cymene	--	--	--	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
Dibromochloromethane	--	--	--	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
Dibromomethane	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.014 UJ	0.018 UJ	0.036 U	0.012 UJ
Dichloroethylenes	--	--	--	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
Ethylbenzene	**1**	41	1	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0057 U	0.007 U	0.014 U	0.0047 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
m,p-Xylene	--	--	--	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.014 U	0.018 U	0.036 U	0.012 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.014 U	0.018 U	0.036 U	0.012 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0072 U	0.0088 U	0.018 U	0.0058 U
Naphthalene	12	100	12	MG/KG	0.0057 U	0.007 U	0.014 U	0.0047 U
N-Butylbenzene	12	100	12	MG/KG	0.0014 UJ	0.0018 UJ	0.0036 U	0.0012 UJ
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0014 UJ	0.0018 UJ	0.0036 U	0.0012 UJ
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0014 UJ	0.0018 UJ	0.0036 U	0.0012 UJ
Styrene	--	--	--	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0029 U	0.0035 U	0.0072 U	0.0023 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-10	SRI-10	SRI-11	SRI-11
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	3 - 5	10 - 12	0 - 2	4 - 6
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0029 U	0.0035 U	0.0072 UJ	0.0023 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00072 U	0.00088 U	0.0018 U	0.00058 U
Toluene	**0.7**	100	0.7	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00072 U	0.00088 U	0.0018 U	0.00058 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0022 U	0.0026 U	0.0054 U	0.0017 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0072 U	0.0088 U	0.018 U	0.0058 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00072 U	0.00088 U	0.0018 U	0.00058 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0057 UJ	0.007 UJ	0.014 U	0.0047 UJ
Vinyl Acetate	--	--	--	MG/KG	0.014 U	0.018 U	0.036 U	0.012 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0014 UJ	0.0018 UJ	0.0036 U	0.0012 UJ
Xylenes	**0.26**	100	1.6	MG/KG	0.0014 U	0.0018 U	0.0036 U	0.0012 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-11	SRI-12	SRI-12	SRI-12
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	11 - 13	0 - 2	4 - 6	7 - 9
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00074 U	0.0011 U	0.00079 U	0.00085 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00074 U	0.0011 UJ	0.00079 UJ	0.00085 UJ
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00074 U	0.0011 U	0.00079 U	0.00085 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00074 U	0.0011 UJ	0.00079 UJ	0.00085 UJ
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0044 U	0.0068 U	0.0047 U	0.0051 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
1,3-Dichloropropane	--	--	--	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.12 UJ	0.18 U	0.13 U	0.14 U
2,2-Dichloropropane	--	--	--	MG/KG	0.003 U	0.0046 UJ	0.0032 UJ	0.0034 UJ
2-Chlorotoluene	--	--	--	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
2-Hexanone	--	--	--	MG/KG	0.015 U	0.023 U	0.016 U	0.017 U
4-Chlorotoluene	--	--	--	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
4-Ethyltoluene	--	--	--	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
Acetone	0.05	100	0.05	MG/KG	0.015 U	0.023 UJ	0.016 UJ	0.017 UJ
Acrylonitrile	--	--	--	MG/KG	0.0059 U	0.0091 U	0.0063 U	0.0068 U
Benzene	**0.06**	4.8	0.06	MG/KG	0.00074 U	0.0011 U	0.00042 J	0.00085 U
Bromobenzene	--	--	--	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-11	SRI-12	SRI-12	SRI-12
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	11 - 13	0 - 2	4 - 6	7 - 9
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
Bromodichloromethane	--	--	--	MG/KG	0.00074 U	0.0011 U	0.00079 U	0.00085 U
Bromoform	--	--	--	MG/KG	0.0059 U	0.0091 U	0.0063 U	0.0068 U
Bromomethane	--	--	--	MG/KG	0.003 U	0.0046 UJ	0.0032 UJ	0.0034 UJ
Carbon Disulfide	--	--	--	MG/KG	0.015 U	0.023 U	0.016 U	0.017 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00074 U	0.0011 U	0.00079 U	0.00085 U
Chloroethane	--	--	--	MG/KG	0.003 UJ	0.0046 U	0.0032 U	0.0034 U
Chloroform	0.37	49	0.37	MG/KG	0.0022 U	0.00089 J	0.00067 J	0.00065 J
Chloromethane	--	--	--	MG/KG	0.0059 UJ	0.0091 UJ	0.0063 UJ	0.0068 UJ
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00074 U	0.0011 U	0.00079 U	0.00085 U
Cymene	--	--	--	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
Dibromochloromethane	--	--	--	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
Dibromomethane	--	--	--	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.015 U	0.023 UJ	0.016 UJ	0.017 UJ
Dichloroethylenes	--	--	--	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
Ethylbenzene	**1**	41	1	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0059 U	0.0091 U	0.0063 U	0.0068 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
m,p-Xylene	--	--	--	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.015 U	0.023 U	0.016 U	0.017 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.015 U	0.023 U	0.016 U	0.017 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0074 U	0.011 U	0.0079 U	0.0085 U
Naphthalene	12	100	12	MG/KG	0.0059 U	0.0091 U	0.0063 U	0.0068 U
N-Butylbenzene	12	100	12	MG/KG	0.0015 U	0.0023 UJ	0.0016 UJ	0.0017 UJ
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0015 U	0.0023 UJ	0.0016 UJ	0.0017 UJ
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0015 U	0.0023 UJ	0.0016 UJ	0.0017 UJ
Styrene	--	--	--	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.003 U	0.0046 U	0.0032 U	0.0034 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-11	SRI-12	SRI-12	SRI-12
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	11 - 13	0 - 2	4 - 6	7 - 9
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.003 UJ	0.0046 U	0.0032 U	0.0034 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00074 U	0.0011 U	0.00079 U	0.00085 U
Toluene	**0.7**	100	0.7	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00074 U	0.0011 U	0.00079 U	0.00085 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0022 U	0.0034 U	0.0024 U	0.0025 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0074 U	0.011 U	0.0079 U	0.0085 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00074 U	0.0011 U	0.00079 U	0.00085 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0059 U	0.0091 UJ	0.0063 UJ	0.0068 UJ
Vinyl Acetate	--	--	--	MG/KG	0.015 U	0.023 U	0.016 U	0.017 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0015 U	0.0023 UJ	0.0016 UJ	0.0017 UJ
Xylenes	**0.26**	100	1.6	MG/KG	0.0015 U	0.0023 U	0.0016 U	0.0017 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-12	SRI-13	SRI-13	SRI-13
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	11 - 13	0 - 2	4 - 6	7 - 9
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00058 U	0.00078 U	0.00068 U	0.0013 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00058 UJ	0.00078 UJ	0.00068 UJ	0.0013 UJ
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00058 U	0.00078 U	0.00068 U	0.0013 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00058 UJ	0.00078 UJ	0.00068 UJ	0.0013 UJ
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0035 U	0.0046 U	0.004 U	0.0081 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.093 U	0.12 U	0.11 U	0.22 U
2,2-Dichloropropane	--	--	--	MG/KG	0.0023 UJ	0.0031 UJ	0.0027 UJ	0.0054 UJ
2-Chlorotoluene	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
2-Hexanone	--	--	--	MG/KG	0.012 U	0.016 U	0.014 U	0.027 U
4-Chlorotoluene	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
4-Ethyltoluene	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
Acetone	0.05	100	0.05	MG/KG	0.012 UJ	0.016 UJ	0.014 UJ	0.027 UJ
Acrylonitrile	--	--	--	MG/KG	0.0046 U	0.0062 U	0.0054 U	0.011 U
Benzene	**0.06**	4.8	0.06	MG/KG	0.00058 U	0.00078 U	0.00068 U	0.0013 U
Bromobenzene	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-12	SRI-13	SRI-13	SRI-13
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	11 - 13	0 - 2	4 - 6	7 - 9
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Bromochloromethane	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
Bromodichloromethane	--	--	--	MG/KG	0.00058 U	0.00078 U	0.00068 U	0.0013 U
Bromoform	--	--	--	MG/KG	0.0046 U	0.0062 U	0.0054 U	0.011 U
Bromomethane	--	--	--	MG/KG	0.0023 UJ	0.0031 UJ	0.0027 UJ	0.0054 UJ
Carbon Disulfide	--	--	--	MG/KG	0.012 U	0.016 U	0.014 U	0.027 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00058 U	0.00078 U	0.00068 U	0.0013 U
Chloroethane	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
Chloroform	0.37	49	0.37	MG/KG	0.00046 J	0.00057 J	0.00053 J	0.00097 J
Chloromethane	--	--	--	MG/KG	0.0046 UJ	0.0062 UJ	0.0054 UJ	0.011 UJ
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00058 U	0.00078 U	0.00068 U	0.0013 U
Cymene	--	--	--	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
Dibromochloromethane	--	--	--	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
Dibromomethane	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.012 UJ	0.016 UJ	0.014 UJ	0.027 UJ
Dichloroethylenes	--	--	--	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
Ethylbenzene	**1**	41	1	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0046 U	0.0062 U	0.0054 U	0.011 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
m,p-Xylene	--	--	--	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.012 U	0.016 U	0.014 U	0.027 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.012 U	0.016 U	0.014 U	0.027 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0058 U	0.0078 U	0.0068 U	0.013 U
Naphthalene	12	100	12	MG/KG	0.0046 U	0.0062 U	0.0054 U	0.011 U
N-Butylbenzene	12	100	12	MG/KG	0.0012 UJ	0.0016 UJ	0.0014 UJ	0.0027 UJ
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0012 UJ	0.0016 UJ	0.0014 UJ	0.0027 UJ
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0012 UJ	0.0016 UJ	0.0014 UJ	0.0027 UJ
Styrene	--	--	--	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-12	SRI-13	SRI-13	SRI-13
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	11 - 13	0 - 2	4 - 6	7 - 9
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0023 U	0.0031 U	0.0027 U	0.0054 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00058 U	0.00078 U	0.00068 U	0.0013 U
Toluene	**0.7**	100	0.7	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00058 U	0.00078 U	0.00068 U	0.0013 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0017 U	0.0023 U	0.002 U	0.004 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0058 U	0.0078 U	0.0068 U	0.013 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00058 U	0.00078 U	0.00068 U	0.0013 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0046 UJ	0.0062 UJ	0.0054 UJ	0.011 UJ
Vinyl Acetate	--	--	--	MG/KG	0.012 U	0.016 U	0.014 U	0.027 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0012 UJ	0.0016 UJ	0.0014 UJ	0.0027 UJ
Xylenes	**0.26**	100	1.6	MG/KG	0.0012 U	0.0016 U	0.0014 U	0.0027 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units	Sample Designation: SRI-13 Sample Date: 10/30/2025 Sample Depth (ft bls): 11 - 13 Normal Sample or Field Duplicate: N
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00056 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00056 UJ
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00056 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0011 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0011 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0011 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00056 UJ
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0022 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0022 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0022 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0022 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0022 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0033 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0011 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0022 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0011 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0011 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0022 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0022 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0022 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0022 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0022 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.089 U
2,2-Dichloropropane	--	--	--	MG/KG	0.0022 UJ
2-Chlorotoluene	--	--	--	MG/KG	0.0022 U
2-Hexanone	--	--	--	MG/KG	0.011 U
4-Chlorotoluene	--	--	--	MG/KG	0.0022 U
4-Ethyltoluene	--	--	--	MG/KG	0.0022 U
Acetone	0.05	100	0.05	MG/KG	0.011 UJ
Acrylonitrile	--	--	--	MG/KG	0.0044 U
Benzene	**0.06**	4.8	0.06	MG/KG	0.00056 U
Bromobenzene	--	--	--	MG/KG	0.0022 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-13
				Sample Date:	10/30/2025
				Sample Depth (ft bls):	11 - 13
				Normal Sample or Field Duplicate:	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units	
Bromochloromethane	--	--	--	MG/KG	0.0022 U
Bromodichloromethane	--	--	--	MG/KG	0.00056 U
Bromoform	--	--	--	MG/KG	0.0044 U
Bromomethane	--	--	--	MG/KG	0.0022 UJ
Carbon Disulfide	--	--	--	MG/KG	0.011 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0011 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00056 U
Chloroethane	--	--	--	MG/KG	0.0022 U
Chloroform	0.37	49	0.37	MG/KG	0.00042 J
Chloromethane	--	--	--	MG/KG	0.0044 UJ
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0011 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00056 U
Cymene	--	--	--	MG/KG	0.0011 U
Dibromochloromethane	--	--	--	MG/KG	0.0011 U
Dibromomethane	--	--	--	MG/KG	0.0022 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.011 UJ
Dichloroethylenes	--	--	--	MG/KG	0.0011 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0022 U
Ethylbenzene	**1**	41	1	MG/KG	0.0011 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0044 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0011 U
m,p-Xylene	--	--	--	MG/KG	0.0022 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.011 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.011 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0056 U
Naphthalene	12	100	12	MG/KG	0.0044 U
N-Butylbenzene	12	100	12	MG/KG	0.0011 UJ
N-Propylbenzene	3.9	100	3.9	MG/KG	0.0011 UJ
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0011 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0011 UJ
Styrene	--	--	--	MG/KG	0.0011 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0022 U

Table 2. Summary of Volatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-13
				Sample Date:	10/30/2025
				Sample Depth (ft bls):	11 - 13
				Normal Sample or Field Duplicate:	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units	
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0022 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00056 U
Toluene	**0.7**	100	0.7	MG/KG	0.0011 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00056 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0017 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0011 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0056 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00056 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0044 UJ
Vinyl Acetate	--	--	--	MG/KG	0.011 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0011 UJ
Xylenes	**0.26**	100	1.6	MG/KG	0.0011 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-1	RXSB-1	RXSB-2	RXSB-2
				Sample Date:	07/31/2025	07/31/2025	07/31/2025	07/31/2025
				Sample Depth (ft bls):	8 - 10	10 - 12	6 - 8	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.029 U	0.031 U	0.029 U	0.028 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.12 U	0.12 U	0.12 U	0.11 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.18 U	0.18 U	0.17 U	0.17 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.93 U	0.98 U	0.93 U	0.89 U
2,4-Dinitrotoluene	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
2-Chloronaphthalene	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
2-Chlorophenol	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
2-Methylnaphthalene	--	--	--	MG/KG	0.23 U	0.24 U	0.23 U	0.22 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
2-Nitroaniline	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
2-Nitrophenol	--	--	--	MG/KG	0.42 U	0.44 U	0.42 U	0.4 U
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
3-Nitroaniline	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.5 U	0.53 U	0.5 U	0.48 U
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
4-Chloroaniline	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
4-Nitroaniline	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
4-Nitrophenol	--	--	--	MG/KG	0.27 UJ	0.29 UJ	0.27 UJ	0.26 UJ
Acenaphthene	20	100	98	MG/KG	0.033 J	0.16 U	0.15 U	0.15 U
Acenaphthylene	100	100	107	MG/KG	0.16 U	0.16 U	0.15 U	0.15 U
Acetophenone	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
Anthracene	100	100	1000	MG/KG	0.11 J	0.12 U	0.12 U	0.11 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-1	RXSB-1	RXSB-2	RXSB-2
				Sample Date:	07/31/2025	07/31/2025	07/31/2025	07/31/2025
				Sample Depth (ft bls):	8 - 10	10 - 12	6 - 8	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.29	0.12 U	0.031 J	0.084 J
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.24	0.16 U	0.15 U	0.093 J
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.31	0.12 U	0.036 J	0.11
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.15 J	0.16 U	0.15 U	0.062 J
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.1 J	0.12 U	0.12 U	0.034 J
Benzoic Acid	--	--	--	MG/KG	0.63 U	0.66 U	0.62 U	0.6 U
Benzyl Alcohol	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.44 U	0.47 U	0.44 U	0.42 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.21 U	0.22 U	0.21 U	0.2 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.18 U	0.18 U	0.17 U	0.17 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.23 U	0.24 U	0.23 U	0.22 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
Carbazole	--	--	--	MG/KG	0.026 J	0.2 U	0.19 U	0.18 U
Chrysene	**1**	3.9	1	MG/KG	0.29	0.12 U	0.03 J	0.084 J
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.041 J	0.12 U	0.12 U	0.11 U
Dibenzofuran	7	59	210	MG/KG	0.018 J	0.2 U	0.19 U	0.18 U
Diethyl Phthalate	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
Dimethyl Phthalate	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
Fluoranthene	100	100	1000	MG/KG	0.63	0.12 U	0.055 J	0.18 J
Fluorene	30	100	386	MG/KG	0.022 J	0.2 U	0.19 U	0.18 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.12 U	0.12 U	0.12 U	0.11 U
Hexachlorobutadiene	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.56 U	0.59 U	0.55 U	0.53 U
Hexachloroethane	--	--	--	MG/KG	0.16 U	0.16 U	0.15 U	0.15 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.15 J	0.16 U	0.15 U	0.062 J
Isophorone	--	--	--	MG/KG	0.18 U	0.18 U	0.17 U	0.17 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.28 U	0.3 U	0.28 U	0.27 U
Naphthalene	12	100	12	MG/KG	0.19 U	0.2 U	0.19 U	0.025 J
Nitrobenzene	--	--	--	MG/KG	0.18 U	0.18 U	0.17 U	0.17 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-1	RXSB-1	RXSB-2	RXSB-2
				Sample Date:	07/31/2025	07/31/2025	07/31/2025	07/31/2025
				Sample Depth (ft bls):	8 - 10	10 - 12	6 - 8	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.16 U	0.16 U	0.15 U	0.15 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.16 U	0.16 U	0.15 U	0.15 U
Phenanthrene	100	100	1000	MG/KG	0.48 J	0.12 UJ	0.034 J	0.11 J
Phenol	0.33	100	0.33	MG/KG	0.19 U	0.2 U	0.19 U	0.18 U
Pyrene	100	100	1000	MG/KG	0.58	0.12 U	0.05 J	0.17 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-2	RXSB-3	RXSB-3	RXSB-4
				Sample Date:	07/31/2025	07/31/2025	07/31/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	7 - 9	9 - 11	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.03 U	0.029 U	0.029 U	0.029 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.12 U	0.12 U	0.12 U	0.12 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.18 U	0.17 U	0.17 U	0.18 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.98 U	0.93 U	0.93 U	0.94 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
2-Chloronaphthalene	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
2-Chlorophenol	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
2-Methylnaphthalene	--	--	--	MG/KG	0.24 U	0.23 U	0.23 U	0.24 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
2-Nitroaniline	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
2-Nitrophenol	--	--	--	MG/KG	0.44 U	0.42 U	0.42 U	0.42 UJ
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
3-Nitroaniline	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.53 U	0.5 U	0.5 U	0.51 U
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
4-Chloroaniline	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
4-Nitroaniline	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
4-Nitrophenol	--	--	--	MG/KG	0.28 UJ	0.27 UJ	0.27 UJ	0.28 U
Acenaphthene	20	100	98	MG/KG	0.16 U	0.14 J	0.16 U	0.16 U
Acenaphthylene	100	100	107	MG/KG	0.16 U	0.16 U	0.16 U	0.16 U
Acetophenone	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
Anthracene	100	100	1000	MG/KG	0.12 U	0.26	0.12 U	0.12 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-2	RXSB-3	RXSB-3	RXSB-4
			Sample Date:		07/31/2025	07/31/2025	07/31/2025	08/01/2025
			Sample Depth (ft bls):		8 - 10	7 - 9	9 - 11	6 - 8
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.12 U	0.73	0.12 U	0.031 J
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.16 U	0.51	0.16 U	0.16 U
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.12 U	0.64	0.12 U	0.037 J
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.16 U	0.36	0.16 U	0.16 U
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.12 U	0.16	0.12 U	0.12 U
Benzoic Acid	--	--	--	MG/KG	0.66 U	0.63 U	0.63 U	0.64 U
Benzyl Alcohol	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.46 U	0.44 U	0.44 U	0.45 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.22 U	0.21 U	0.21 U	0.21 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.18 U	0.17 U	0.17 U	0.18 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.24 U	0.23 U	0.23 U	0.24 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
Carbazole	--	--	--	MG/KG	0.2 U	0.045 J	0.19 U	0.2 U
Chrysene	**1**	3.9	1	MG/KG	0.12 U	0.79	0.12 U	0.028 J
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.12 U	0.09 J	0.12 U	0.12 U
Dibenzofuran	7	59	210	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
Diethyl Phthalate	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
Dimethyl Phthalate	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
Fluoranthene	100	100	1000	MG/KG	0.12 U	1.2	0.12 U	0.056 J
Fluorene	30	100	386	MG/KG	0.2 U	0.11 J	0.19 U	0.2 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.12 U	0.12 U	0.12 U	0.12 U
Hexachlorobutadiene	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.58 R	0.56 R	0.55 R	0.56 U
Hexachloroethane	--	--	--	MG/KG	0.16 U	0.16 U	0.16 U	0.16 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.16 U	0.3	0.16 U	0.16 U
Isophorone	--	--	--	MG/KG	0.18 U	0.17 U	0.17 U	0.18 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.29 U	0.28 U	0.28 U	0.28 U
Naphthalene	12	100	12	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
Nitrobenzene	--	--	--	MG/KG	0.18 U	0.17 U	0.17 U	0.18 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-2	RXSB-3	RXSB-3	RXSB-4
				Sample Date:	07/31/2025	07/31/2025	07/31/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	7 - 9	9 - 11	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.16 U	0.16 U	0.16 U	0.16 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.16 U	0.16 U	0.16 U	0.16 U
Phenanthrene	100	100	1000	MG/KG	0.12 UJ	1.7 J	0.12 UJ	0.03 J
Phenol	0.33	100	0.33	MG/KG	0.2 U	0.19 U	0.19 U	0.2 U
Pyrene	100	100	1000	MG/KG	0.12 U	1.6	0.12 U	0.048 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-4	RXSB-5	RXSB-5	RXSB-6
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	8 - 10	10 - 12	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.027 U	0.03 U	0.028 U	0.029 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.11 U	0.12 U	0.11 U	0.12 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.18 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.86 UJ	0.97 UJ	0.9 UJ	0.94 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
2-Chloronaphthalene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
2-Chlorophenol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
2-Methylnaphthalene	--	--	--	MG/KG	0.21 U	0.24 U	0.22 U	0.23 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
2-Nitroaniline	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
2-Nitrophenol	--	--	--	MG/KG	0.39 UJ	0.44 UJ	0.4 UJ	0.42 UJ
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
3-Nitroaniline	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.46 U	0.52 U	0.49 U	0.51 U
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
4-Chloroaniline	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
4-Nitroaniline	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
4-Nitrophenol	--	--	--	MG/KG	0.25 U	0.28 U	0.26 U	0.27 U
Acenaphthene	20	100	98	MG/KG	0.14 U	0.16 U	0.15 U	0.034 J
Acenaphthylene	100	100	107	MG/KG	0.14 U	0.16 U	0.15 U	0.16 U
Acetophenone	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
Anthracene	100	100	1000	MG/KG	0.11 U	0.12 U	0.11 U	0.1 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-4	RXSB-5	RXSB-5	RXSB-6
			Sample Date:		08/01/2025	08/01/2025	08/01/2025	08/01/2025
			Sample Depth (ft bls):		8 - 10	8 - 10	10 - 12	6 - 8
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.11 U	0.12 U	0.074 J	0.3
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.14 U	0.16 U	0.073 J	0.3
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.11 U	0.12 U	0.091 J	0.37
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.14 U	0.16 U	0.042 J	0.18
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.11 U	0.12 U	0.11 U	0.11 J
Benzoic Acid	--	--	--	MG/KG	0.58 U	0.65 U	0.61 U	0.63 U
Benzyl Alcohol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.41 U	0.46 U	0.43 U	0.44 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.19 U	0.22 U	0.2 U	0.21 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.18 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.21 U	0.24 U	0.22 U	0.23 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
Carbazole	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.029 J
Chrysene	**1**	3.9	1	MG/KG	0.11 U	0.12 U	0.069 J	0.28
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.11 U	0.12 U	0.11 U	0.039 J
Dibenzofuran	7	59	210	MG/KG	0.18 U	0.2 U	0.19 U	0.022 J
Diethyl Phthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
Dimethyl Phthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
Fluoranthene	100	100	1000	MG/KG	0.11 U	0.12 U	0.13	0.65
Fluorene	30	100	386	MG/KG	0.18 U	0.2 U	0.19 U	0.021 J
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.11 U	0.12 U	0.11 U	0.12 U
Hexachlorobutadiene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.51 U	0.58 U	0.54 U	0.56 U
Hexachloroethane	--	--	--	MG/KG	0.14 U	0.16 U	0.15 U	0.16 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.14 U	0.16 U	0.044 J	0.19
Isophorone	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.18 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.26 U	0.29 U	0.27 U	0.28 U
Naphthalene	12	100	12	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
Nitrobenzene	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.18 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-4	RXSB-5	RXSB-5	RXSB-6
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	8 - 10	10 - 12	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.14 U	0.16 U	0.15 U	0.16 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.14 U	0.16 U	0.15 U	0.16 U
Phenanthrene	100	100	1000	MG/KG	0.11 U	0.12 U	0.062 J	0.47
Phenol	0.33	100	0.33	MG/KG	0.18 U	0.2 U	0.19 U	0.2 U
Pyrene	100	100	1000	MG/KG	0.11 U	0.12 U	0.12	0.57

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-6	RXSB-7	RXSB-7	RXSB-8
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	3 - 5	5 - 7	7 - 9
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.03 U	0.028 U	0.03 U	0.029 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.12 U	0.11 U	0.12 U	0.12 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.18 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.97 UJ	0.89 UJ	0.95 UJ	0.93 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
2-Chloronaphthalene	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
2-Chlorophenol	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
2-Methylnaphthalene	--	--	--	MG/KG	0.24 U	0.22 U	0.24 U	0.23 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
2-Nitroaniline	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
2-Nitrophenol	--	--	--	MG/KG	0.43 UJ	0.4 UJ	0.43 UJ	0.42 UJ
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
3-Nitroaniline	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.52 U	0.48 U	0.52 U	0.5 U
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
4-Chloroaniline	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
4-Nitroaniline	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
4-Nitrophenol	--	--	--	MG/KG	0.28 U	0.26 U	0.28 U	0.27 U
Acenaphthene	20	100	98	MG/KG	0.16 U	0.15 U	0.16 U	0.04 J
Acenaphthylene	100	100	107	MG/KG	0.16 U	0.15 U	0.16 U	0.16 U
Acetophenone	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
Anthracene	100	100	1000	MG/KG	0.12 U	0.11 U	0.12 U	0.1 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-6	RXSB-7	RXSB-7	RXSB-8
			Sample Date:		08/01/2025	08/01/2025	08/01/2025	08/01/2025
			Sample Depth (ft bls):		8 - 10	3 - 5	5 - 7	7 - 9
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.12 U	0.096 J	0.12 U	0.27
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.16 U	0.11 J	0.16 U	0.28
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.12 U	0.12	0.12 U	0.3
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.16 U	0.078 J	0.16 U	0.15 J
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.12 U	0.036 J	0.12 U	0.089 J
Benzoic Acid	--	--	--	MG/KG	0.65 U	0.6 U	0.64 U	0.63 U
Benzyl Alcohol	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.46 U	0.42 U	0.45 U	0.44 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.22 U	0.2 U	0.21 U	0.21 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.18 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.24 U	0.22 U	0.24 U	0.23 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
Carbazole	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
Chrysene	**1**	3.9	1	MG/KG	0.12 U	0.092 J	0.12 U	0.28
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.12 U	0.11 U	0.12 U	0.035 J
Dibenzofuran	7	59	210	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
Diethyl Phthalate	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
Dimethyl Phthalate	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
Fluoranthene	100	100	1000	MG/KG	0.12 U	0.17	0.12 U	0.5
Fluorene	30	100	386	MG/KG	0.2 U	0.18 U	0.2 U	0.028 J
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.12 U	0.11 U	0.12 U	0.12 U
Hexachlorobutadiene	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.58 U	0.53 U	0.57 U	0.56 U
Hexachloroethane	--	--	--	MG/KG	0.16 U	0.15 U	0.16 U	0.16 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.16 U	0.067 J	0.16 U	0.15 J
Isophorone	--	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.18 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.29 U	0.27 U	0.29 U	0.28 U
Naphthalene	12	100	12	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
Nitrobenzene	--	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.18 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-6	RXSB-7	RXSB-7	RXSB-8
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	3 - 5	5 - 7	7 - 9
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.16 U	0.15 U	0.16 U	0.16 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.16 U	0.15 U	0.16 U	0.16 U
Phenanthrene	100	100	1000	MG/KG	0.12 U	0.095 J	0.12 U	0.39
Phenol	0.33	100	0.33	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U
Pyrene	100	100	1000	MG/KG	0.12 U	0.17	0.12 U	0.52

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-8	RXSB-9	RXSB-9	RXSB-9
				Sample Date:	08/01/2025	03/13/2023	03/13/2023	03/13/2023
				Sample Depth (ft bls):	9 - 11	7 - 9	7 - 9	9 - 11
				Normal Sample or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.03 U	0.027 R	0.027 R	0.028 R
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.12 U	0.11 U	0.11 U	0.11 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.18 U	0.16 U	0.16 U	0.17 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.2 U	0.18 R	0.18 R	0.19 R
2,4-Dinitrophenol	--	--	--	MG/KG	0.97 UJ	0.86 UJ	0.86 UJ	0.9 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
2-Chloronaphthalene	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
2-Chlorophenol	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
2-Methylnaphthalene	--	--	--	MG/KG	0.24 U	0.22 U	0.22 U	0.22 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
2-Nitroaniline	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
2-Nitrophenol	--	--	--	MG/KG	0.44 UJ	0.39 U	0.39 U	0.41 U
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.2 U	0.18 R	0.18 R	0.19 R
3-Nitroaniline	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.52 U	0.47 UJ	0.47 UJ	0.49 UJ
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
4-Chloroaniline	--	--	--	MG/KG	0.2 U	0.18 R	0.18 R	0.19 R
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
4-Nitroaniline	--	--	--	MG/KG	0.2 U	0.18 R	0.18 R	0.19 R
4-Nitrophenol	--	--	--	MG/KG	0.28 U	0.25 U	0.25 U	0.26 U
Acenaphthene	20	100	98	MG/KG	0.16 U	0.14 U	0.14 U	0.15 U
Acenaphthylene	100	100	107	MG/KG	0.16 U	0.14 U	0.14 U	0.15 U
Acetophenone	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
Anthracene	100	100	1000	MG/KG	0.12 U	0.11 U	0.11 U	0.11 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-8	RXSB-9	RXSB-9	RXSB-9
			Sample Date:		08/01/2025	03/13/2023	03/13/2023	03/13/2023
			Sample Depth (ft bls):		9 - 11	7 - 9	7 - 9	9 - 11
			Normal Sample or Field Duplicate:		N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.12 U	0.047 J	0.11 J	0.12
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.16 U	0.14 U	0.088 J	0.1 J
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.12 U	0.046 J	0.1 J	0.12
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.16 U	0.14 U	0.027 J	0.069 J
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.12 U	0.11 U	0.039 J	0.037 J
Benzoic Acid	--	--	--	MG/KG	0.65 U	0.58 U	0.58 U	0.61 U
Benzyl Alcohol	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.46 U	0.41 U	0.41 U	0.43 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.22 U	0.19 U	0.19 U	0.2 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.18 U	0.16 U	0.16 U	0.17 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.24 U	0.22 U	0.22 U	0.22 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
Carbazole	--	--	--	MG/KG	0.2 U	0.18 R	0.18 R	0.19 R
Chrysene	**1**	3.9	1	MG/KG	0.12 U	0.047 J	0.11 J	0.12
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.12 U	0.11 U	0.11 U	0.11 U
Dibenzofuran	7	59	210	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
Diethyl Phthalate	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
Dimethyl Phthalate	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
Fluoranthene	100	100	1000	MG/KG	0.12 U	0.098 J	0.22 J	0.24
Fluorene	30	100	386	MG/KG	0.2 U	0.18 U	0.18 U	0.018 J
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.12 U	0.11 U	0.11 U	0.11 U
Hexachlorobutadiene	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.58 U	0.52 U	0.51 U	0.54 U
Hexachloroethane	--	--	--	MG/KG	0.16 U	0.14 U	0.14 U	0.15 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.16 U	0.14 U	0.026 J	0.063 J
Isophorone	--	--	--	MG/KG	0.18 U	0.16 U	0.16 U	0.17 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.29 U	0.26 U	0.26 U	0.27 U
Naphthalene	12	100	12	MG/KG	0.04 J	0.18 U	0.18 U	0.19 U
Nitrobenzene	--	--	--	MG/KG	0.18 U	0.16 U	0.16 U	0.17 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-8	RXSB-9	RXSB-9	RXSB-9
				Sample Date:	08/01/2025	03/13/2023	03/13/2023	03/13/2023
				Sample Depth (ft bls):	9 - 11	7 - 9	7 - 9	9 - 11
				Normal Sample or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.16 U	0.14 U	0.14 U	0.15 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.16 U	0.14 U	0.14 U	0.15 U
Phenanthrene	100	100	1000	MG/KG	0.12 U	0.066 J	0.18 J	0.2
Phenol	0.33	100	0.33	MG/KG	0.2 U	0.18 U	0.18 U	0.19 U
Pyrene	100	100	1000	MG/KG	0.12 U	0.099 J	0.26 J	0.23

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-10	RXSB-10	RXSB-11	RXSB-11
				Sample Date:	03/13/2023	03/13/2023	07/28/2025	07/28/2025
				Sample Depth (ft bls):	5 - 8	8 - 11	6 - 8	13 - 15
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.027 R	0.027 R	0.028 R	0.03 R
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.11 U	0.11 U	0.11 U	0.12 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.16 U	0.16 U	0.17 U	0.18 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.18 R	0.18 R	0.19 U	0.2 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.88 UJ	0.85 UJ	0.9 UJ	0.95 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
2-Chloronaphthalene	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
2-Chlorophenol	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
2-Methylnaphthalene	--	--	--	MG/KG	0.037 J	0.21 U	0.22 U	0.24 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
2-Nitroaniline	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
2-Nitrophenol	--	--	--	MG/KG	0.4 U	0.38 U	0.4 U	0.43 U
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.18 R	0.18 R	0.19 R	0.2 R
3-Nitroaniline	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.48 UJ	0.46 UJ	0.49 UJ	0.52 UJ
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
4-Chloroaniline	--	--	--	MG/KG	0.18 R	0.18 R	0.19 R	0.2 R
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
4-Nitroaniline	--	--	--	MG/KG	0.18 R	0.18 R	0.19 U	0.2 U
4-Nitrophenol	--	--	--	MG/KG	0.26 U	0.25 U	0.26 U	0.28 U
Acenaphthene	20	100	98	MG/KG	0.092 J	0.14 U	0.15 U	0.16 U
Acenaphthylene	100	100	107	MG/KG	0.046 J	0.14 U	0.15 U	0.16 U
Acetophenone	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
Anthracene	100	100	1000	MG/KG	0.21	0.11 U	0.11 U	0.12 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-10	RXSB-10	RXSB-11	RXSB-11
				Sample Date:	03/13/2023	03/13/2023	07/28/2025	07/28/2025
				Sample Depth (ft bls):	5 - 8	8 - 11	6 - 8	13 - 15
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.71	0.086 J	0.12	0.12 U
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.71	0.084 J	0.11 J	0.16 U
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.86	0.095 J	0.15	0.12 U
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.39	0.05 J	0.072 J	0.16 U
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.24	0.031 J	0.044 J	0.12 U
Benzoic Acid	--	--	--	MG/KG	0.59 U	0.58 R	0.61 U	0.64 U
Benzyl Alcohol	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.42 U	0.4 U	0.43 U	0.45 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.2 U	0.19 U	0.2 U	0.21 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.16 U	0.16 U	0.17 U	0.18 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.22 U	0.21 U	0.22 U	0.24 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
Carbazole	--	--	--	MG/KG	0.09 J	0.18 R	0.19 R	0.2 R
Chrysene	**1**	3.9	1	MG/KG	0.79	0.092 J	0.12	0.12 U
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.091 J	0.02 J	0.11 U	0.12 U
Dibenzofuran	7	59	210	MG/KG	0.069 J	0.18 U	0.19 U	0.2 U
Diethyl Phthalate	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
Dimethyl Phthalate	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
Fluoranthene	100	100	1000	MG/KG	1.6	0.16	0.24	0.12 U
Fluorene	30	100	386	MG/KG	0.066 J	0.18 U	0.19 U	0.2 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.11 U	0.11 U	0.11 U	0.12 U
Hexachlorobutadiene	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.52 U	0.51 U	0.54 R	0.57 R
Hexachloroethane	--	--	--	MG/KG	0.15 U	0.14 U	0.15 U	0.16 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.43	0.056 J	0.074 J	0.16 U
Isophorone	--	--	--	MG/KG	0.16 U	0.16 U	0.17 U	0.18 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.26 U	0.26 U	0.27 U	0.28 U
Naphthalene	12	100	12	MG/KG	0.071 J	0.18 U	0.19 U	0.2 U
Nitrobenzene	--	--	--	MG/KG	0.16 U	0.16 U	0.17 U	0.18 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-10	RXSB-10	RXSB-11	RXSB-11
				Sample Date:	03/13/2023	03/13/2023	07/28/2025	07/28/2025
				Sample Depth (ft bls):	5 - 8	8 - 11	6 - 8	13 - 15
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.15 U	0.14 U	0.15 U	0.16 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.15 U	0.14 U	0.15 U	0.16 U
Phenanthrene	100	100	1000	MG/KG	1.1	0.097 J	0.11	0.12 U
Phenol	0.33	100	0.33	MG/KG	0.18 U	0.18 U	0.19 U	0.2 U
Pyrene	100	100	1000	MG/KG	1.6	0.18	0.22	0.12 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-12	RXSB-12	RXSB-13	RXSB-13
				Sample Date:	07/31/2025	07/31/2025	07/29/2025	07/29/2025
				Sample Depth (ft bls):	6 - 8	8 - 10	8 - 10	10 - 12
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.027 U	0.03 U	0.028 U	0.027 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.11 U	0.12 U	0.11 U	0.11 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.16 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.88 U	0.98 U	0.9 U	0.86 U
2,4-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2-Chloronaphthalene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2-Chlorophenol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2-Methylnaphthalene	--	--	--	MG/KG	0.22 U	0.24 U	0.22 U	0.22 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2-Nitroaniline	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2-Nitrophenol	--	--	--	MG/KG	0.4 U	0.44 U	0.41 U	0.39 U
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
3-Nitroaniline	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.48 U	0.53 U	0.49 U	0.47 U
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
4-Chloroaniline	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
4-Nitroaniline	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
4-Nitrophenol	--	--	--	MG/KG	0.26 UJ	0.28 UJ	0.26 U	0.25 U
Acenaphthene	20	100	98	MG/KG	0.15 U	0.16 U	0.15 U	0.14 U
Acenaphthylene	100	100	107	MG/KG	0.15 U	0.16 U	0.15 U	0.14 U
Acetophenone	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Anthracene	100	100	1000	MG/KG	0.059 J	0.041 J	0.11 U	0.11 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-12	RXSB-12	RXSB-13	RXSB-13
				Sample Date:	07/31/2025	07/31/2025	07/29/2025	07/29/2025
				Sample Depth (ft bls):	6 - 8	8 - 10	8 - 10	10 - 12
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.25	0.099 J	0.043 J	0.11 U
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.28	0.1 J	0.15 U	0.14 U
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.33	0.1 J	0.047 J	0.11 U
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.18	0.058 J	0.024 J	0.14 U
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.11	0.035 J	0.11 U	0.11 U
Benzoic Acid	--	--	--	MG/KG	0.59 U	0.66 U	0.61 U	0.58 R
Benzyl Alcohol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.42 U	0.46 U	0.43 U	0.41 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.2 U	0.22 U	0.2 U	0.19 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.16 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.22 U	0.24 U	0.22 U	0.22 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Carbazole	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Chrysene	**1**	3.9	1	MG/KG	0.24	0.1 J	0.041 J	0.11 U
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.04 J	0.12 U	0.11 U	0.11 U
Dibenzofuran	7	59	210	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Diethyl Phthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Dimethyl Phthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Fluoranthene	100	100	1000	MG/KG	0.52	0.2	0.074 J	0.11 U
Fluorene	30	100	386	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.11 U	0.12 U	0.11 UJ	0.11 UJ
Hexachlorobutadiene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.52 U	0.58 U	0.54 UJ	0.52 UJ
Hexachloroethane	--	--	--	MG/KG	0.15 U	0.16 U	0.15 U	0.14 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.19	0.055 J	0.15 U	0.14 U
Isophorone	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.16 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.26 U	0.29 U	0.27 U	0.26 U
Naphthalene	12	100	12	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Nitrobenzene	--	--	--	MG/KG	0.16 U	0.18 U	0.17 UJ	0.16 UJ

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-12	RXSB-12	RXSB-13	RXSB-13
				Sample Date:	07/31/2025	07/31/2025	07/29/2025	07/29/2025
				Sample Depth (ft bls):	6 - 8	8 - 10	8 - 10	10 - 12
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.15 U	0.16 U	0.15 U	0.14 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.15 U	0.16 U	0.15 U	0.14 U
Phenanthrene	100	100	1000	MG/KG	0.24 J	0.19 J	0.038 J	0.11 U
Phenol	0.33	100	0.33	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Pyrene	100	100	1000	MG/KG	0.47	0.21	0.067 J	0.11 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-14	RXSB-14	RXSB-14	SRI-1
				Sample Date:	07/30/2025	07/30/2025	07/30/2025	10/31/2025
				Sample Depth (ft bls):	8 - 10	10 - 12	10 - 12	0 - 2
				Normal Sample or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.031 U	0.03 U	0.031 U	0.027 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.12 U	0.12 U	0.12 U	0.11 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.18 U	0.18 U	0.18 U	0.16 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.98 U	0.97 U	0.99 U	0.87 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
2-Chloronaphthalene	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
2-Chlorophenol	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
2-Methylnaphthalene	--	--	--	MG/KG	0.25 U	0.24 U	0.25 U	0.22 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
2-Nitroaniline	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
2-Nitrophenol	--	--	--	MG/KG	0.44 U	0.44 U	0.45 U	0.39 UJ
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
3-Nitroaniline	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 UJ
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.53 U	0.53 U	0.54 U	0.47 UJ
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
4-Chloroaniline	--	--	--	MG/KG	0.2 UJ	0.2 UJ	0.21 UJ	0.18 R
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
4-Nitroaniline	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
4-Nitrophenol	--	--	--	MG/KG	0.29 U	0.28 U	0.29 U	0.25 U
Acenaphthene	20	100	98	MG/KG	0.16 U	0.16 U	0.16 U	0.044 J
Acenaphthylene	100	100	107	MG/KG	0.16 U	0.16 U	0.16 U	0.048 J
Acetophenone	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
Anthracene	100	100	1000	MG/KG	0.12 U	0.12 U	0.12 U	0.15

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-14	RXSB-14	RXSB-14	SRI-1
				Sample Date:	07/30/2025	07/30/2025	07/30/2025	10/31/2025
				Sample Depth (ft bls):	8 - 10	10 - 12	10 - 12	0 - 2
				Normal Sample or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.12 U	0.12 U	0.12 U	0.47
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.16 U	0.16 U	0.16 U	0.44
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.12 U	0.12 U	0.12 U	0.55
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.16 U	0.16 U	0.16 U	0.28
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.12 U	0.12 U	0.12 U	0.16
Benzoic Acid	--	--	--	MG/KG	0.66 U	0.66 U	0.67 U	0.59 U
Benzyl Alcohol	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.47 U	0.46 U	0.47 U	0.41 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.22 U	0.22 U	0.22 U	0.2 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.18 U	0.18 U	0.18 U	0.16 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.25 U	0.24 U	0.25 U	0.22 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 UJ
Carbazole	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.05 J
Chrysene	**1**	3.9	1	MG/KG	0.12 U	0.12 U	0.12 U	0.46
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.12 U	0.12 U	0.12 U	0.067 J
Dibenzofuran	7	59	210	MG/KG	0.2 U	0.2 U	0.21 U	0.028 J
Diethyl Phthalate	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
Dimethyl Phthalate	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.2 UJ	0.2 UJ	0.21 UJ	0.18 U
Fluoranthene	100	100	1000	MG/KG	0.12 U	0.12 U	0.12 U	0.95
Fluorene	30	100	386	MG/KG	0.2 U	0.2 U	0.21 U	0.041 J
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.12 U	0.12 U	0.12 U	0.11 U
Hexachlorobutadiene	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 UJ
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.59 U	0.58 U	0.59 U	0.52 U
Hexachloroethane	--	--	--	MG/KG	0.16 U	0.16 U	0.16 U	0.14 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.16 U	0.16 U	0.16 U	0.26
Isophorone	--	--	--	MG/KG	0.18 U	0.18 U	0.18 U	0.16 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.3 U	0.29 U	0.3 U	0.26 U
Naphthalene	12	100	12	MG/KG	0.2 U	0.2 U	0.21 U	0.045 J
Nitrobenzene	--	--	--	MG/KG	0.18 U	0.18 U	0.18 U	0.16 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-14	RXSB-14	RXSB-14	SRI-1
				Sample Date:	07/30/2025	07/30/2025	07/30/2025	10/31/2025
				Sample Depth (ft bls):	8 - 10	10 - 12	10 - 12	0 - 2
				Normal Sample or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.16 U	0.16 U	0.16 U	0.14 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.16 U	0.16 U	0.16 U	0.14 U
Phenanthrene	100	100	1000	MG/KG	0.12 U	0.12 U	0.12 U	0.62
Phenol	0.33	100	0.33	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U
Pyrene	100	100	1000	MG/KG	0.12 U	0.12 U	0.12 U	0.85

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-1	SRI-2	SRI-2	SRI-2
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	4 - 6	0 - 2	3 - 5	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.029 U	0.029 U	0.028 U	0.14 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.12 U	0.12 U	0.11 U	0.55 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.17 U	0.18 U	0.16 U	0.82 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.92 UJ	0.94 UJ	0.88 UJ	4.4 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
2-Chloronaphthalene	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
2-Chlorophenol	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
2-Methylnaphthalene	--	--	--	MG/KG	0.16 J	0.23 U	0.027 J	1.1 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
2-Nitroaniline	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
2-Nitrophenol	--	--	--	MG/KG	0.41 UJ	0.42 UJ	0.4 UJ	2 UJ
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
3-Nitroaniline	--	--	--	MG/KG	0.19 UJ	0.19 UJ	0.18 UJ	0.91 UJ
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.5 UJ	0.51 UJ	0.48 UJ	2.4 UJ
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
4-Chloroaniline	--	--	--	MG/KG	0.19 R	0.19 R	0.18 R	0.91 R
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
4-Nitroaniline	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
4-Nitrophenol	--	--	--	MG/KG	0.27 U	0.27 U	0.26 U	1.3 U
Acenaphthene	20	100	98	MG/KG	0.63	0.16 U	0.22	0.73 U
Acenaphthylene	100	100	107	MG/KG	0.37	0.16 U	0.042 J	0.73 U
Acetophenone	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
Anthracene	100	100	1000	MG/KG	1.5	0.05 J	0.52	0.55 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-1	SRI-2	SRI-2	SRI-2
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	4 - 6	0 - 2	3 - 5	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	**3.7**	0.15	**1.1**	0.13 J
Benzo(A)Pyrene	**1**	1	22	MG/KG	**3.3**	0.14 J	0.96	0.73 U
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	**4.1**	0.18	**1.2**	0.55 U
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	2.3	0.097 J	0.63	0.11 J
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	**1.3**	0.048 J	0.34	0.55 U
Benzoic Acid	--	--	--	MG/KG	0.62 U	0.63 U	0.6 U	3 U
Benzyl Alcohol	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.055 J	0.44 U	0.42 U	2.1 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.21 U	0.21 U	0.2 U	0.99 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.17 U	0.18 U	0.16 U	0.82 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.23 U	0.23 U	0.22 U	1.1 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.19 UJ	0.19 UJ	0.18 UJ	0.91 UJ
Carbazole	--	--	--	MG/KG	0.37	0.027 J	0.095 J	0.91 U
Chrysene	**1**	3.9	1	MG/KG	**3.2**	0.16	1	0.1 J
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	**0.52**	0.027 J	0.14	0.55 U
Dibenzofuran	7	59	210	MG/KG	0.37	0.19 U	0.081 J	0.91 U
Diethyl Phthalate	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
Dimethyl Phthalate	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
Fluoranthene	100	100	1000	MG/KG	5.7	0.26	2.4	0.2 J
Fluorene	30	100	386	MG/KG	0.46	0.19 U	0.14 J	0.91 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.12 U	0.12 U	0.11 U	0.55 U
Hexachlorobutadiene	--	--	--	MG/KG	0.19 UJ	0.19 UJ	0.18 UJ	0.91 UJ
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.55 U	0.56 U	0.52 U	2.6 U
Hexachloroethane	--	--	--	MG/KG	0.15 U	0.16 U	0.15 U	0.73 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	**2.2**	0.087 J	**0.59**	0.73 U
Isophorone	--	--	--	MG/KG	0.17 U	0.18 U	0.16 U	0.82 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.28 U	0.28 U	0.26 U	1.3 U
Naphthalene	12	100	12	MG/KG	0.38	0.19 U	0.062 J	0.91 U
Nitrobenzene	--	--	--	MG/KG	0.17 U	0.18 U	0.16 U	0.82 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-1	SRI-2	SRI-2	SRI-2
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	4 - 6	0 - 2	3 - 5	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.15 U	0.16 U	0.15 U	0.73 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.15 U	0.16 U	0.15 U	0.73 U
Phenanthrene	100	100	1000	MG/KG	4.8	0.17	1.9	0.16 J
Phenol	0.33	100	0.33	MG/KG	0.19 U	0.19 U	0.18 U	0.91 U
Pyrene	100	100	1000	MG/KG	5.2	0.25	2.1	0.18 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-2	SRI-3	SRI-3	SRI-4
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	12 - 14	0 - 2	3 - 5	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.028 U	0.029 U	0.028 U	0.027 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.11 U	0.12 U	0.11 U	0.11 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.16 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.88 UJ	0.94 UJ	0.91 UJ	0.86 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 R
2,6-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2-Chloronaphthalene	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2-Chlorophenol	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2-Methylnaphthalene	--	--	--	MG/KG	0.22 U	0.031 J	0.29	0.56
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2-Nitroaniline	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2-Nitrophenol	--	--	--	MG/KG	0.4 UJ	0.42 UJ	0.41 UJ	0.39 UJ
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
3-Nitroaniline	--	--	--	MG/KG	0.18 UJ	0.19 UJ	0.19 UJ	0.18 UJ
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.48 UJ	0.51 UJ	0.5 UJ	0.47 R
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
4-Chloroaniline	--	--	--	MG/KG	0.18 R	0.19 R	0.19 R	0.18 R
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
4-Nitroaniline	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
4-Nitrophenol	--	--	--	MG/KG	0.26 U	0.27 U	0.27 U	0.25 U
Acenaphthene	20	100	98	MG/KG	0.15 U	0.028 J	1.1	0.96 J
Acenaphthylene	100	100	107	MG/KG	0.15 U	0.24	0.054 J	0.15
Acetophenone	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
Anthracene	100	100	1000	MG/KG	0.11 U	0.17	1.5	2.7 J-

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-2	SRI-3	SRI-3	SRI-4
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	12 - 14	0 - 2	3 - 5	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.11 U	0.79	**2**	**4.5 J-**
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.15 U	0.87	**1.7**	**3.4 J-**
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.11 U	**1.1**	**2**	**4.8 J-**
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.15 U	0.75	1	2.2 J-
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.11 U	0.42	0.68	**1.3 J-**
Benzoic Acid	--	--	--	MG/KG	0.59 U	0.63 U	0.62 U	0.58 R
Benzyl Alcohol	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.42 U	0.44 U	0.096 J	0.18 J
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.2 U	0.21 U	0.2 U	0.19 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.16 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.22 U	0.23 U	0.23 U	0.22 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.18 UJ	0.19 UJ	0.19 UJ	0.18 UJ
Carbazole	--	--	--	MG/KG	0.18 U	0.05 J	0.59	1.5 J-
Chrysene	**1**	3.9	1	MG/KG	0.11 U	0.81	**1.9**	**3.9 J-**
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.11 U	0.16	0.24	**0.6 J**
Dibenzofuran	7	59	210	MG/KG	0.18 U	0.036 J	0.59	1.3 J-
Diethyl Phthalate	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
Dimethyl Phthalate	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
Fluoranthene	100	100	1000	MG/KG	0.11 U	1.3	4.5	11
Fluorene	30	100	386	MG/KG	0.18 U	0.034 J	0.71	0.97 J
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.11 U	0.12 U	0.11 U	0.11 U
Hexachlorobutadiene	--	--	--	MG/KG	0.18 UJ	0.19 UJ	0.19 UJ	0.18 UJ
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.52 U	0.56 U	0.54 U	0.51 UJ
Hexachloroethane	--	--	--	MG/KG	0.15 U	0.16 U	0.15 U	0.14 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.15 U	**0.67**	**0.97**	**2.2 J-**
Isophorone	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.16 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.26 U	0.28 U	0.03 J	0.26 U
Naphthalene	12	100	12	MG/KG	0.18 U	0.11 J	0.52	1.1 J-
Nitrobenzene	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.16 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-2	SRI-3	SRI-3	SRI-4
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	12 - 14	0 - 2	3 - 5	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.15 U	0.16 U	0.15 U	0.14 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.15 U	0.16 U	0.15 U	0.14 U
Phenanthrene	100	100	1000	MG/KG	0.11 U	0.48	5.5	12
Phenol	0.33	100	0.33	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
Pyrene	100	100	1000	MG/KG	0.11 U	1.3	3.9	6.5

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-4	SRI-4	SRI-5	SRI-5
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	4 - 6	11 - 13	0 - 2	3 - 5
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.027 U	0.029 U	0.029 U	0.028 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.11 U	0.12 U	0.12 U	0.11 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.17 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.88 UJ	0.94 UJ	0.92 UJ	0.89 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2-Chloronaphthalene	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2-Chlorophenol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2-Methylnaphthalene	--	--	--	MG/KG	0.029 J	0.23 U	0.23 U	0.22 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2-Nitroaniline	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
2-Nitrophenol	--	--	--	MG/KG	0.39 UJ	0.42 UJ	0.42 UJ	0.4 UJ
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
3-Nitroaniline	--	--	--	MG/KG	0.18 UJ	0.2 UJ	0.19 UJ	0.18 UJ
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.47 UJ	0.51 UJ	0.5 UJ	0.48 UJ
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
4-Chloroaniline	--	--	--	MG/KG	0.18 R	0.2 R	0.19 R	0.18 R
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
4-Nitroaniline	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
4-Nitrophenol	--	--	--	MG/KG	0.26 U	0.27 U	0.27 U	0.26 U
Acenaphthene	20	100	98	MG/KG	0.065 J	0.027 J	0.042 J	0.035 J
Acenaphthylene	100	100	107	MG/KG	0.059 J	0.036 J	0.15 U	0.034 J
Acetophenone	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Anthracene	100	100	1000	MG/KG	0.16	0.066 J	0.12	0.12

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-4	SRI-4	SRI-5	SRI-5
			Sample Date:		10/31/2025	10/31/2025	10/31/2025	10/31/2025
			Sample Depth (ft bls):		4 - 6	11 - 13	0 - 2	3 - 5
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.49	0.28	0.3	0.37
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.49	0.27	0.3	0.36
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.63	0.34	0.34	0.45
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.35	0.18	0.21	0.24
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.16	0.11 J	0.13	0.12
Benzoic Acid	--	--	--	MG/KG	0.59 U	0.63 U	0.62 U	0.6 U
Benzyl Alcohol	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.42 U	0.44 U	0.44 U	0.42 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.2 U	0.21 U	0.21 U	0.2 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.17 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.22 U	0.23 U	0.23 U	0.22 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.18 UJ	0.2 UJ	0.19 UJ	0.18 UJ
Carbazole	--	--	--	MG/KG	0.13 J	0.021 J	0.045 J	0.033 J
Chrysene	**1**	3.9	1	MG/KG	0.52	0.3	0.3	0.36
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.077 J	0.046 J	0.045 J	0.055 J
Dibenzofuran	7	59	210	MG/KG	0.071 J	0.2 U	0.027 J	0.026 J
Diethyl Phthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Dimethyl Phthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Fluoranthene	100	100	1000	MG/KG	1.1	0.53	0.63	0.76
Fluorene	30	100	386	MG/KG	0.073 J	0.2 U	0.035 J	0.028 J
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.11 U	0.12 U	0.12 U	0.11 U
Hexachlorobutadiene	--	--	--	MG/KG	0.18 UJ	0.2 UJ	0.19 UJ	0.18 UJ
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.52 U	0.56 U	0.55 U	0.53 U
Hexachloroethane	--	--	--	MG/KG	0.14 U	0.16 U	0.15 U	0.15 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.31	0.16	0.18	0.21
Isophorone	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.17 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.26 U	0.28 U	0.28 U	0.27 U
Naphthalene	12	100	12	MG/KG	0.34	0.026 J	0.025 J	0.034 J
Nitrobenzene	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.17 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-4	SRI-4	SRI-5	SRI-5
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	4 - 6	11 - 13	0 - 2	3 - 5
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.14 U	0.16 U	0.15 U	0.15 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.14 U	0.16 U	0.15 U	0.15 U
Phenanthrene	100	100	1000	MG/KG	1	0.27	0.49	0.47
Phenol	0.33	100	0.33	MG/KG	0.18 U	0.2 U	0.19 U	0.18 U
Pyrene	100	100	1000	MG/KG	0.95	0.52	0.55	0.7

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-6	SRI-6	SRI-7	SRI-7
				Sample Date:	10/31/2025	10/31/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	0 - 2	2 - 4
				Normal Sample or Field Duplicate:	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.027 U	0.14 U	0.029 U	0.029 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.11 U	0.54 U	0.11 U	0.12 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.16 U	0.82 U	0.17 U	0.17 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.85 UJ	4.4 UJ	0.92 UJ	0.92 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
2-Chloronaphthalene	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
2-Chlorophenol	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
2-Methylnaphthalene	--	--	--	MG/KG	0.021 J	1.1 U	0.041 J	0.23 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
2-Nitroaniline	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
2-Nitrophenol	--	--	--	MG/KG	0.38 UJ	2 UJ	0.41 UJ	0.42 UJ
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
3-Nitroaniline	--	--	--	MG/KG	0.18 UJ	0.91 UJ	0.19 U	0.19 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.46 UJ	2.4 UJ	0.5 UJ	0.5 UJ
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
4-Chloroaniline	--	--	--	MG/KG	0.18 R	0.91 R	0.19 UJ	0.19 UJ
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
4-Nitroaniline	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
4-Nitrophenol	--	--	--	MG/KG	0.25 U	1.3 U	0.27 U	0.27 U
Acenaphthene	20	100	98	MG/KG	0.047 J	0.73 U	0.11 J	0.15 U
Acenaphthylene	100	100	107	MG/KG	0.26 J	0.73 U	0.14 J	0.15 U
Acetophenone	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
Anthracene	100	100	1000	MG/KG	0.55 J	0.54 U	0.37	0.12 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-6	SRI-6	SRI-7	SRI-7
				Sample Date:	10/31/2025	10/31/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	0 - 2	2 - 4
				Normal Sample or Field Duplicate:	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	**1.6 J**	0.58 J	**1.1**	0.025 J
Benzo(A)Pyrene	**1**	1	22	MG/KG	**1.2 J**	0.56 J	0.92	0.15 U
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	**1.6 J**	0.68 J	**1.3**	0.12 U
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.81 J	0.42 J	0.67	0.15 U
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.45 J	0.25 J	0.36	0.12 U
Benzoic Acid	--	--	--	MG/KG	0.58 U	2.9 U	0.62 U	0.62 U
Benzyl Alcohol	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.91 U	0.07 J	0.19 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.4 U	2.1 U	0.44 U	0.44 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.19 U	0.98 U	0.21 U	0.21 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.16 U	0.82 U	0.17 U	0.17 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.21 U	1.1 U	0.23 U	0.23 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.18 UJ	0.91 UJ	0.19 UJ	0.19 UJ
Carbazole	--	--	--	MG/KG	0.077 J	0.91 U	0.22	0.19 U
Chrysene	**1**	3.9	1	MG/KG	**1.4 J**	0.57 J	1	0.022 J
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.21 J	0.1 J	0.15	0.12 U
Dibenzofuran	7	59	210	MG/KG	0.073 J	0.91 U	0.066 J	0.19 U
Diethyl Phthalate	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
Dimethyl Phthalate	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
Fluoranthene	100	100	1000	MG/KG	2.6 J	0.89 J	2.4	0.032 J
Fluorene	30	100	386	MG/KG	0.1 J	0.91 U	0.12 J	0.19 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.11 U	0.54 U	0.11 U	0.12 U
Hexachlorobutadiene	--	--	--	MG/KG	0.18 UJ	0.91 UJ	0.19 UJ	0.19 UJ
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.51 U	2.6 U	0.55 U	0.55 U
Hexachloroethane	--	--	--	MG/KG	0.14 U	0.73 U	0.15 U	0.15 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	**0.79 J**	0.42 J	**0.64**	0.15 U
Isophorone	--	--	--	MG/KG	0.16 U	0.82 U	0.17 U	0.17 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.034 J	1.3 U	0.28 U	0.28 U
Naphthalene	12	100	12	MG/KG	0.089 J	0.91 U	0.062 J	0.19 U
Nitrobenzene	--	--	--	MG/KG	0.16 U	0.82 U	0.17 U	0.17 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-6	SRI-6	SRI-7	SRI-7
				Sample Date:	10/31/2025	10/31/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	0 - 2	2 - 4
				Normal Sample or Field Duplicate:	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.14 U	0.73 U	0.15 U	0.15 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.14 U	0.73 U	0.15 U	0.15 U
Phenanthrene	100	100	1000	MG/KG	1.8 J	0.62 J	1.5	0.025 J
Phenol	0.33	100	0.33	MG/KG	0.18 U	0.91 U	0.19 U	0.19 U
Pyrene	100	100	1000	MG/KG	2.3 J	0.86 J	1.9	0.037 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-7	SRI-8	SRI-8	SRI-9
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	11 - 13	0 - 2	3 - 5	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.18 U	0.19 U	0.19	0.18 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.027 U	0.029 UJ	0.029 U	0.027 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.11 U	0.12 U	0.11 U	0.11 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.16 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.87 UJ	0.93 UJ	0.92 UJ	0.86 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2-Chloronaphthalene	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2-Chlorophenol	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2-Methylnaphthalene	--	--	--	MG/KG	0.22 U	0.23 U	0.14 J	0.21 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2-Nitroaniline	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
2-Nitrophenol	--	--	--	MG/KG	0.39 UJ	0.42 UJ	0.41 UJ	0.38 UJ
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
3-Nitroaniline	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.47 UJ	0.5 UJ	0.5 UJ	0.46 UJ
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
4-Chloroaniline	--	--	--	MG/KG	0.18 UJ	0.19 UJ	0.19 UJ	0.18 UJ
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
4-Nitroaniline	--	--	--	MG/KG	0.18 U	0.19 U	0.081 J	0.18 U
4-Nitrophenol	--	--	--	MG/KG	0.25 U	0.27 U	0.27 U	0.25 U
Acenaphthene	20	100	98	MG/KG	0.14 U	0.16 U	0.073 J	0.041 J
Acenaphthylene	100	100	107	MG/KG	0.14 U	0.084 J	0.26	0.036 J
Acetophenone	--	--	--	MG/KG	0.18 U	0.19 U	0.03 J	0.18 U
Anthracene	100	100	1000	MG/KG	0.11 U	0.074 J	0.36	0.063 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-7	SRI-8	SRI-8	SRI-9
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	11 - 13	0 - 2	3 - 5	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.11 U	0.27	**1.1**	0.34 J
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.14 U	0.26	0.93	0.33 J
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.11 U	0.36	**1.4**	0.45 J
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.14 U	0.18	0.63	0.24 J
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.11 U	0.084 J	0.38	0.12
Benzoic Acid	--	--	--	MG/KG	0.59 U	0.63 R	0.62 U	0.58 U
Benzyl Alcohol	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.19 U	0.07 J	0.18 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.41 U	0.44 U	0.025 J	0.41 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.2 U	0.21 U	0.21 U	0.19 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.16 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.22 U	0.23 U	0.23 U	0.21 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.18 UJ	0.19 UJ	0.097 J	0.18 UJ
Carbazole	--	--	--	MG/KG	0.18 U	0.022 J	0.23	0.028 J
Chrysene	**1**	3.9	1	MG/KG	0.11 U	0.28	**1.1**	0.34 J
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.11 U	0.039 J	0.15	0.047 J
Dibenzofuran	7	59	210	MG/KG	0.18 U	0.19 U	0.095 J	0.022 J
Diethyl Phthalate	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
Dimethyl Phthalate	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.19 U	0.059 J	0.18 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
Fluoranthene	100	100	1000	MG/KG	0.042 J	0.42	2.3	0.67 J
Fluorene	30	100	386	MG/KG	0.18 U	0.023 J	0.1 J	0.024 J
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.11 U	0.12 U	0.11 U	0.11 U
Hexachlorobutadiene	--	--	--	MG/KG	0.18 UJ	0.19 UJ	0.19 UJ	0.18 UJ
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.52 U	0.56 UJ	0.55 U	0.51 U
Hexachloroethane	--	--	--	MG/KG	0.14 U	0.16 U	0.15 U	0.14 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.14 U	0.16	**0.66**	0.23 J
Isophorone	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.16 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.26 U	0.28 U	0.27 U	0.26 U
Naphthalene	12	100	12	MG/KG	0.18 U	0.19 U	0.16 J	0.026 J
Nitrobenzene	--	--	--	MG/KG	0.16 U	0.18 U	0.17 U	0.16 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-7	SRI-8	SRI-8	SRI-9
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	11 - 13	0 - 2	3 - 5	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.14 U	0.16 U	0.15 U	0.14 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.14 U	0.16 U	0.15 U	0.14 U
Phenanthrene	100	100	1000	MG/KG	0.031 J	0.19	1.5	0.37 J
Phenol	0.33	100	0.33	MG/KG	0.18 U	0.19 U	0.19 U	0.18 U
Pyrene	100	100	1000	MG/KG	0.037 J	0.43	1.8	0.6 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-9	SRI-9	SRI-10	SRI-10
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	3 - 5	0 - 2	3 - 5
				Normal Sample or Field Duplicate:	FD	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.027 U	0.026 U	0.03 U	0.027 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.11 U	0.1 U	0.12 U	0.11 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.16 U	0.16 U	0.18 U	0.16 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.85 UJ	0.84 UJ	0.94 UJ	0.86 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
2-Chloronaphthalene	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
2-Chlorophenol	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
2-Methylnaphthalene	--	--	--	MG/KG	0.21 U	0.21 U	0.043 J	0.21 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
2-Nitroaniline	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
2-Nitrophenol	--	--	--	MG/KG	0.38 UJ	0.38 UJ	0.42 UJ	0.38 UJ
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
3-Nitroaniline	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.46 UJ	0.46 UJ	0.51 UJ	0.46 UJ
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
4-Chloroaniline	--	--	--	MG/KG	0.18 UJ	0.18 UJ	0.2 UJ	0.18 UJ
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
4-Nitroaniline	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
4-Nitrophenol	--	--	--	MG/KG	0.25 U	0.24 U	0.28 U	0.25 U
Acenaphthene	20	100	98	MG/KG	0.14 U	0.14 U	0.087 J	0.14 U
Acenaphthylene	100	100	107	MG/KG	0.14 U	0.14 U	0.25	0.14 U
Acetophenone	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
Anthracene	100	100	1000	MG/KG	0.11 U	0.1 U	0.34	0.11 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-9	SRI-9	SRI-10	SRI-10
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	3 - 5	0 - 2	3 - 5
				Normal Sample or Field Duplicate:	FD	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.028 J	0.1 U	0.84	0.051 J
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.14 U	0.14 U	0.72	0.048 J
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.031 J	0.1 U	0.98	0.058 J
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.14 U	0.14 U	0.48	0.034 J
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.11 U	0.1 U	0.32	0.11 U
Benzoic Acid	--	--	--	MG/KG	0.58 U	0.57 U	0.64 U	0.58 U
Benzyl Alcohol	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.4 U	0.4 U	0.45 U	0.41 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.19 U	0.19 U	0.21 U	0.19 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.16 U	0.16 U	0.18 U	0.16 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.21 U	0.21 U	0.24 U	0.21 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.18 UJ	0.085 J	0.2 UJ	0.18 UJ
Carbazole	--	--	--	MG/KG	0.18 U	0.18 U	0.16 J	0.18 U
Chrysene	**1**	3.9	1	MG/KG	0.023 J	0.1 U	0.8	0.044 J
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.11 U	0.1 U	0.12	0.11 U
Dibenzofuran	7	59	210	MG/KG	0.18 U	0.18 U	0.067 J	0.18 U
Diethyl Phthalate	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
Dimethyl Phthalate	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
Fluoranthene	100	100	1000	MG/KG	0.044 J	0.1 U	1.7	0.083 J
Fluorene	30	100	386	MG/KG	0.18 U	0.18 U	0.12 J	0.18 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.11 U	0.1 U	0.12 U	0.11 U
Hexachlorobutadiene	--	--	--	MG/KG	0.18 UJ	0.18 UJ	0.2 UJ	0.18 UJ
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.51 U	0.5 U	0.56 U	0.51 U
Hexachloroethane	--	--	--	MG/KG	0.14 U	0.14 U	0.16 U	0.14 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.14 U	0.14 U	0.48	0.031 J
Isophorone	--	--	--	MG/KG	0.16 U	0.16 U	0.18 U	0.16 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.26 U	0.25 U	0.28 U	0.26 U
Naphthalene	12	100	12	MG/KG	0.18 U	0.18 U	0.057 J	0.18 U
Nitrobenzene	--	--	--	MG/KG	0.16 U	0.16 U	0.18 U	0.16 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-9	SRI-9	SRI-10	SRI-10
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	3 - 5	0 - 2	3 - 5
				Normal Sample or Field Duplicate:	FD	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.14 U	0.14 U	0.16 U	0.14 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.14 U	0.14 U	0.16 U	0.14 U
Phenanthrene	100	100	1000	MG/KG	0.023 J	0.1 U	1.3	0.035 J
Phenol	0.33	100	0.33	MG/KG	0.18 U	0.18 U	0.2 U	0.18 U
Pyrene	100	100	1000	MG/KG	0.041 J	0.1 U	1.4	0.078 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-10	SRI-11	SRI-11	SRI-11
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	10 - 12	0 - 2	4 - 6	11 - 13
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.028 U	0.029 U	0.028 U	0.03 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.11 U	0.12 U	0.11 U	0.12 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.17 U	0.18 U	0.17 U	0.18 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.9 UJ	0.94 UJ	0.91 UJ	0.97 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
2-Chloronaphthalene	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
2-Chlorophenol	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
2-Methylnaphthalene	--	--	--	MG/KG	0.23 U	0.24 U	0.054 J	0.24 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
2-Nitroaniline	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
2-Nitrophenol	--	--	--	MG/KG	0.41 UJ	0.42 UJ	0.41 UJ	0.44 UJ
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
3-Nitroaniline	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.49 UJ	0.51 UJ	0.49 UJ	0.53 UJ
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
4-Chloroaniline	--	--	--	MG/KG	0.19 UJ	0.2 UJ	0.19 UJ	0.2 UJ
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
4-Nitroaniline	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
4-Nitrophenol	--	--	--	MG/KG	0.26 U	0.27 U	0.26 U	0.28 U
Acenaphthene	20	100	98	MG/KG	0.15 U	0.16 U	0.11 J	0.16 U
Acenaphthylene	100	100	107	MG/KG	0.15 U	0.16 U	0.7	0.16 U
Acetophenone	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
Anthracene	100	100	1000	MG/KG	0.11 U	0.12 U	1.3	0.044 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-10	SRI-11	SRI-11	SRI-11
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		10 - 12	0 - 2	4 - 6	11 - 13
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.11 U	0.065 J	**2.1**	0.12
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.15 U	0.064 J	**1.5**	0.11 J
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.11 U	0.086 J	**2.1**	0.15
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.15 U	0.045 J	0.79	0.072 J
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.11 U	0.12 U	0.6	0.039 J
Benzoic Acid	--	--	--	MG/KG	0.61 U	0.63 U	0.61 U	0.66 U
Benzyl Alcohol	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.43 U	0.45 U	0.038 J	0.46 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.2 U	0.21 U	0.2 U	0.22 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.17 U	0.18 U	0.17 U	0.18 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.23 U	0.24 U	0.23 U	0.24 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.19 UJ	0.2 UJ	0.19 UJ	0.2 UJ
Carbazole	--	--	--	MG/KG	0.19 U	0.2 U	0.52	0.026 J
Chrysene	**1**	3.9	1	MG/KG	0.11 U	0.073 J	**1.9**	0.12
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.11 U	0.12 U	0.24	0.12 U
Dibenzofuran	7	59	210	MG/KG	0.19 U	0.2 U	0.55	0.2 U
Diethyl Phthalate	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
Dimethyl Phthalate	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
Fluoranthene	100	100	1000	MG/KG	0.11 U	0.1 J	5	0.32
Fluorene	30	100	386	MG/KG	0.19 U	0.2 U	0.3	0.022 J
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.11 U	0.12 U	0.11 U	0.12 U
Hexachlorobutadiene	--	--	--	MG/KG	0.19 UJ	0.2 UJ	0.19 UJ	0.2 UJ
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.54 U	0.56 U	0.54 U	0.58 U
Hexachloroethane	--	--	--	MG/KG	0.15 U	0.16 U	0.15 U	0.16 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.15 U	0.043 J	**0.91**	0.07 J
Isophorone	--	--	--	MG/KG	0.17 U	0.18 U	0.17 U	0.18 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.27 U	0.28 U	0.04 J	0.29 U
Naphthalene	12	100	12	MG/KG	0.19 U	0.2 U	0.087 J	0.2 U
Nitrobenzene	--	--	--	MG/KG	0.17 U	0.18 U	0.17 U	0.18 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-10	SRI-11	SRI-11	SRI-11
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	10 - 12	0 - 2	4 - 6	11 - 13
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.15 U	0.16 U	0.15 U	0.16 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.15 U	0.16 U	0.15 U	0.16 U
Phenanthrene	100	100	1000	MG/KG	0.11 U	0.069 J	5.8	0.27
Phenol	0.33	100	0.33	MG/KG	0.19 U	0.2 U	0.19 U	0.2 U
Pyrene	100	100	1000	MG/KG	0.11 U	0.11 J	3.7	0.26

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-12	SRI-12	SRI-12	SRI-12
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	4 - 6	7 - 9	11 - 13
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.028 U	0.034 U	0.028 U	0.03 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.11 U	0.13 U	0.11 U	0.12 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.16 U	0.2 U	0.17 U	0.18 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.88 UJ	1.1 UJ	0.91 UJ	0.96 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
2-Chloronaphthalene	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
2-Chlorophenol	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
2-Methylnaphthalene	--	--	--	MG/KG	0.22 U	0.27 U	0.23 U	0.24 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
2-Nitroaniline	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
2-Nitrophenol	--	--	--	MG/KG	0.4 UJ	0.48 UJ	0.41 UJ	0.43 UJ
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
3-Nitroaniline	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.48 UJ	0.58 UJ	0.49 UJ	0.52 UJ
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
4-Chloroaniline	--	--	--	MG/KG	0.18 UJ	0.22 UJ	0.19 UJ	0.2 UJ
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
4-Nitroaniline	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
4-Nitrophenol	--	--	--	MG/KG	0.26 U	0.31 U	0.27 U	0.28 U
Acenaphthene	20	100	98	MG/KG	0.15 U	0.18 U	0.15 U	0.16 U
Acenaphthylene	100	100	107	MG/KG	0.15 U	0.18 U	0.06 J	0.16 U
Acetophenone	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
Anthracene	100	100	1000	MG/KG	0.11 U	0.13 U	0.11 U	0.12 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-12	SRI-12	SRI-12	SRI-12
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	4 - 6	7 - 9	11 - 13
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.11 U	0.13 U	0.27	0.12 U
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.15 U	0.18 U	0.36	0.16 U
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.11 U	0.13 U	0.44	0.12 U
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.15 U	0.18 U	0.26	0.16 U
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.11 U	0.13 U	0.15	0.12 U
Benzoic Acid	--	--	--	MG/KG	0.6 U	0.73 U	0.62 U	0.64 U
Benzyl Alcohol	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.42 U	0.51 U	0.43 U	0.45 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.2 U	0.24 U	0.2 U	0.22 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.16 U	0.2 U	0.17 U	0.18 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.22 U	0.27 U	0.23 U	0.24 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.18 UJ	0.22 UJ	0.19 UJ	0.2 UJ
Carbazole	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
Chrysene	**1**	3.9	1	MG/KG	0.11 U	0.13 U	0.26	0.12 U
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.11 U	0.13 U	0.053 J	0.12 U
Dibenzofuran	7	59	210	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
Diethyl Phthalate	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
Dimethyl Phthalate	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
Fluoranthene	100	100	1000	MG/KG	0.11 U	0.13 U	0.37	0.12 U
Fluorene	30	100	386	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.11 U	0.13 U	0.11 U	0.12 U
Hexachlorobutadiene	--	--	--	MG/KG	0.18 UJ	0.22 UJ	0.19 UJ	0.2 UJ
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.52 U	0.64 U	0.54 U	0.57 U
Hexachloroethane	--	--	--	MG/KG	0.15 U	0.18 U	0.15 U	0.16 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.15 U	0.18 U	0.26	0.16 U
Isophorone	--	--	--	MG/KG	0.16 U	0.2 U	0.17 U	0.18 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.26 U	0.32 U	0.27 U	0.29 U
Naphthalene	12	100	12	MG/KG	0.18 U	0.22 U	0.023 J	0.2 U
Nitrobenzene	--	--	--	MG/KG	0.16 U	0.2 U	0.17 U	0.18 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-12	SRI-12	SRI-12	SRI-12
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	4 - 6	7 - 9	11 - 13
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.15 U	0.18 U	0.15 U	0.16 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.15 U	0.18 U	0.15 U	0.16 U
Phenanthrene	100	100	1000	MG/KG	0.11 U	0.13 U	0.089 J	0.12 U
Phenol	0.33	100	0.33	MG/KG	0.18 U	0.22 U	0.19 U	0.2 U
Pyrene	100	100	1000	MG/KG	0.11 U	0.13 U	0.35	0.12 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-13	SRI-13	SRI-13	SRI-13
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	4 - 6	7 - 9	11 - 13
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.028 U	0.028 U	0.031 U	0.029 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.11 U	0.11 U	0.12 U	0.12 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.17 U	0.16 U	0.19 U	0.17 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.9 UJ	0.88 UJ	1 UJ	0.93 UJ
2,4-Dinitrotoluene	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
2-Chloronaphthalene	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
2-Chlorophenol	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
2-Methylnaphthalene	--	--	--	MG/KG	0.22 U	0.1 J	0.25 U	0.23 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
2-Nitroaniline	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
2-Nitrophenol	--	--	--	MG/KG	0.4 UJ	0.4 UJ	0.45 UJ	0.42 UJ
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
3-Nitroaniline	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.49 UJ	0.48 UJ	0.54 UJ	0.5 UJ
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
4-Chloroaniline	--	--	--	MG/KG	0.19 UJ	0.18 UJ	0.21 UJ	0.19 UJ
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
4-Nitroaniline	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
4-Nitrophenol	--	--	--	MG/KG	0.26 U	0.26 U	0.29 U	0.27 U
Acenaphthene	20	100	98	MG/KG	0.019 J	0.34	0.17 U	0.16 U
Acenaphthylene	100	100	107	MG/KG	0.045 J	0.15	0.17 U	0.16 U
Acetophenone	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
Anthracene	100	100	1000	MG/KG	0.084 J	0.73	0.12 U	0.12 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units	Sample Designation: SRI-13	Sample Date: 10/30/2025	Sample Depth (ft bls): 0 - 2	Normal Sample or Field Duplicate: N
					SRI-13	SRI-13	SRI-13	SRI-13
					10/30/2025	10/30/2025	10/30/2025	10/30/2025
					4 - 6	7 - 9	11 - 13	
					N	N	N	
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.31	**1.2**	0.11 J	0.12 U
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.29	0.98	0.11 J	0.16 U
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.38	**1.3**	0.14	0.12 U
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.19	0.63	0.065 J	0.16 U
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.12	0.39	0.042 J	0.12 U
Benzoic Acid	--	--	--	MG/KG	0.61 U	0.6 U	0.68 U	0.63 U
Benzyl Alcohol	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.43 U	0.037 J	0.48 U	0.44 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.2 U	0.2 U	0.23 U	0.21 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.17 U	0.16 U	0.19 U	0.17 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.22 U	0.22 U	0.25 U	0.23 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.19 UJ	0.18 UJ	0.21 UJ	0.19 UJ
Carbazole	--	--	--	MG/KG	0.033 J	0.28	0.21 U	0.19 U
Chrysene	**1**	3.9	1	MG/KG	0.32	**1.1**	0.12	0.12 U
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG	0.044 J	0.14	0.12 U	0.12 U
Dibenzofuran	7	59	210	MG/KG	0.02 J	0.27	0.21 U	0.19 U
Diethyl Phthalate	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
Dimethyl Phthalate	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
Fluoranthene	100	100	1000	MG/KG	0.71	3.2	0.25	0.12 U
Fluorene	30	100	386	MG/KG	0.026 J	0.25	0.21 U	0.19 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.11 U	0.11 U	0.12 U	0.12 U
Hexachlorobutadiene	--	--	--	MG/KG	0.19 UJ	0.18 UJ	0.21 UJ	0.19 UJ
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.54 U	0.53 U	0.6 U	0.55 U
Hexachloroethane	--	--	--	MG/KG	0.15 U	0.15 U	0.17 U	0.16 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.18	**0.62**	0.067 J	0.16 U
Isophorone	--	--	--	MG/KG	0.17 U	0.16 U	0.19 U	0.17 U
M+P MethylPhenol	0.33	100	0.33	MG/KG	0.27 U	0.26 U	0.3 U	0.28 U
Naphthalene	12	100	12	MG/KG	0.19 U	0.18	0.21 U	0.19 U
Nitrobenzene	--	--	--	MG/KG	0.17 U	0.16 U	0.19 U	0.17 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-13	SRI-13	SRI-13	SRI-13
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	4 - 6	7 - 9	11 - 13
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.15 U	0.15 U	0.17 U	0.16 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.15 U	0.15 U	0.17 U	0.16 U
Phenanthrene	100	100	1000	MG/KG	0.4	3.2	0.16	0.12 U
Phenol	0.33	100	0.33	MG/KG	0.19 U	0.18 U	0.21 U	0.19 U
Pyrene	100	100	1000	MG/KG	0.58	2.5	0.21	0.12 U

Table 4. Summary of Metals in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-1	RXSB-1	RXSB-2	RXSB-2	RXSB-2	RXSB-3
			Sample Date:		07/31/2025	07/31/2025	07/31/2025	07/31/2025	07/31/2025	07/31/2025
			Sample Depth (ft bls):		8 - 10	10 - 12	6 - 8	6 - 8	8 - 10	7 - 9
			Normal Sample or Field Duplicate:		N	N	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Aluminum	--	--	--	MG/KG	9160	12100	10700 J	6200 J	8890	6860
Antimony	--	--	--	MG/KG	4.48 U	4.78 U	4.54 U	4.37 U	4.87 U	4.66 U
Arsenic	13	16	16	MG/KG	3.63	5.38	3.34	2.48	3.19	3.11
Barium	350	400	820	MG/KG	54.9	50.9	37.5	45.3	28.6	43.8
Beryllium	7.2	72	47	MG/KG	0.527	0.436 J	0.471	0.43 J	0.319 J	0.424 J
Cadmium	2.5	4.3	7.5	MG/KG	0.099 J	0.068 J	0.059 J	0.14 J	0.974 U	0.099 J
Calcium	--	--	--	MG/KG	7880	904	933 J	2820 J	549	3700
Chromium, Hexavalent	**1**	110	19	MG/KG	0.938 U	0.994 U	0.327 J	0.916 U	0.574 J	0.404 J
Chromium, Total	30	180	--	MG/KG	18.6	17.8	16.2	16.3	12.1	19
Cobalt	--	--	--	MG/KG	5.41	3.08	5.33	6.05	2.82	4.85
Copper	**50**	270	1720	MG/KG	23.7	7.65	12.2 J	36.2 J	7.72	35.2
Cyanide	27	27	40	MG/KG	1.1 R	1.2 R	1.1 R	0.37 J	1.2 R	1.1 R
Iron	--	--	--	MG/KG	17400	18900	15200	14000	10100	12800
Lead	**63**	400	450	MG/KG	28.3	11.8	17.3 J	53.3 J	7.25	58.7
Magnesium	--	--	--	MG/KG	2510	1760	2160	2590	2120	1800
Manganese	1600	2000	2000	MG/KG	344	149	188 J	376 J	72.8	256
Mercury	**0.18**	0.81	0.73	MG/KG	0.092	0.079 U	0.081 U	0.129 J	0.082 U	0.169
Nickel	**30**	310	130	MG/KG	15.4	8.7	11.4 J	19.3 J	8.8	12
Potassium	--	--	--	MG/KG	845	418	530 J	1000 J	596	605
Selenium	3.9	180	4	MG/KG	1.79 U	0.326 J	1.82 U	1.75 U	1.95 U	1.86 U
Silver	2	180	8.3	MG/KG	0.448 U	0.478 U	0.454 U	0.437 U	0.487 U	0.466 U
Sodium	--	--	--	MG/KG	180	115 J	102 J	106 J	195 U	186 U
Thallium	--	--	--	MG/KG	1.79 U	1.91 U	1.82 U	1.75 U	1.95 U	1.86 U
Vanadium	--	--	--	MG/KG	25.1	28.4	25.9	21.2	18.4	20
Zinc	**109**	10000	2480	MG/KG	35.6	25	25.6 J	47.2 J	23.8	41.8

Table 4. Summary of Metals in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-3	RXSB-4	RXSB-4	RXSB-5	RXSB-5	RXSB-6
			Sample Date:		07/31/2025	08/01/2025	08/01/2025	08/01/2025	08/01/2025	08/01/2025
			Sample Depth (ft bls):		9 - 11	6 - 8	8 - 10	8 - 10	10 - 12	6 - 8
			Normal Sample or Field Duplicate:		N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Aluminum	--	--	--	MG/KG	9840	8790	9680	8550	4340	6910
Antimony	--	--	--	MG/KG	4.55 U	4.55 U	4.37 U	4.67 UJ	4.42 U	4.52 U
Arsenic	13	16	16	MG/KG	3.78	3.9	4.18	4.41	3.79	4.64
Barium	350	400	820	MG/KG	28.7	45.4	38.9	43.2	28	46.5
Beryllium	7.2	72	47	MG/KG	0.72	0.428 J	0.581	0.397 J	0.224 J	0.327 J
Cadmium	2.5	4.3	7.5	MG/KG	0.074 J	0.91 U	0.873 U	0.935 U	0.884 U	0.904 U
Calcium	--	--	--	MG/KG	797	1250	895	1540 J	8800	6450
Chromium, Hexavalent	**1**	110	19	MG/KG	0.274 J	0.968 U	0.884 U	0.539 J	0.383 J	0.941 U
Chromium, Total	30	180	--	MG/KG	14.9	15.4	18.7	12.2	9.59	13.6
Cobalt	--	--	--	MG/KG	11.4	6.2	5.48	4.43	4.44	6.44
Copper	**50**	270	1720	MG/KG	25.9	17.1	25.8	10.1	26.6	36.4
Cyanide	27	27	40	MG/KG	1.1 R	1.4	1.1 U	1.2 U	1.1 U	1.1 U
Iron	--	--	--	MG/KG	20600	15500 J	14100 J	12700 J	9630 J	12900 J
Lead	**63**	400	450	MG/KG	9.91	17.2	16.1	21.1 J	39.8	**154**
Magnesium	--	--	--	MG/KG	2370	2270	3850	1660	6030	4170
Manganese	1600	2000	2000	MG/KG	388	255	226	265	197	280
Mercury	**0.18**	0.81	0.73	MG/KG	0.078 U	0.103	0.086 U	0.084 U	**0.297**	0.18
Nickel	**30**	310	130	MG/KG	19.7	13.8	27.3	9.42	21.3	20.1
Potassium	--	--	--	MG/KG	608	706	1400	404	1090	947
Selenium	3.9	180	4	MG/KG	1.82 U	1.82 U	0.343 J	0.376 J	1.77 U	1.81 U
Silver	2	180	8.3	MG/KG	0.455 U	0.455 U	0.437 U	0.467 U	0.442 U	0.452 U
Sodium	--	--	--	MG/KG	182 U	182 U	175 U	187 U	116 J	181 U
Thallium	--	--	--	MG/KG	1.82 U	1.82 U	0.907 J	1.87 U	1.77 U	1.81 U
Vanadium	--	--	--	MG/KG	27.7	23.1	25.8	19.4	14.8	20.6
Zinc	**109**	10000	2480	MG/KG	29.4	28.7	48.4	28.7	46.5	49

Table 4. Summary of Metals in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-6	RXSB-7	RXSB-7	RXSB-8	RXSB-8	RXSB-9
			Sample Date:		08/01/2025	08/01/2025	08/01/2025	08/01/2025	08/01/2025	03/13/2023
			Sample Depth (ft bls):		8 - 10	3 - 5	5 - 7	7 - 9	9 - 11	7 - 9
			Normal Sample or Field Duplicate:		N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Aluminum	--	--	--	MG/KG	9520	4730	10800	9450	9350	7010
Antimony	--	--	--	MG/KG	4.89 U	4.36 U	4.77 U	4.44 U	4.78 U	4.19 U
Arsenic	13	16	16	MG/KG	4.93	2.84	3.98	3.36	4.05	3.06
Barium	350	400	820	MG/KG	51	30.4	48.3	47.5	64.1	47.7
Beryllium	7.2	72	47	MG/KG	0.459 J	0.24 J	0.43 J	0.471	0.514	0.388 J
Cadmium	2.5	4.3	7.5	MG/KG	0.978 U	0.873 U	0.954 U	0.889 U	0.956 U	0.118 J
Calcium	--	--	--	MG/KG	1640	3820	2020	1650	1100	2240
Chromium, Hexavalent	**1**	110	19	MG/KG	0.989 U	0.895 U	0.963 U	0.257 J	0.986 U	0.373 J
Chromium, Total	30	180	--	MG/KG	15.7	9.85	18.4	19	11.5	19.9
Cobalt	--	--	--	MG/KG	7.4	4.71	7.52	7.81	4	6.95
Copper	**50**	270	1720	MG/KG	19.8	39.2	18	18.9	10	20.8
Cyanide	27	27	40	MG/KG	1.2 U	1.1 U	1.2 U	1.1 U	1.2 U	1 U
Iron	--	--	--	MG/KG	14600 J	10200 J	16800 J	15800 J	14500 J	13400
Lead	**63**	400	450	MG/KG	46.2	41.3	28.5	21.1	28.2	33.4
Magnesium	--	--	--	MG/KG	2960	1830	2720	3270	1490	2900
Manganese	1600	2000	2000	MG/KG	271	203	305	298	305	277
Mercury	**0.18**	0.81	0.73	MG/KG	0.139	0.085	0.078 J	0.09 U	0.101	0.076 J
Nickel	**30**	310	130	MG/KG	26.8	16.9	13.9	20.3	7.86	23.2
Potassium	--	--	--	MG/KG	889	638	896	1160	440	935
Selenium	3.9	180	4	MG/KG	0.412 J	1.75 U	1.91 U	1.78 U	0.383 J	0.318 J
Silver	2	180	8.3	MG/KG	0.489 U	0.436 U	0.477 U	0.444 U	0.478 U	0.419 U
Sodium	--	--	--	MG/KG	196 U	175 U	128 J	122 J	191 U	133 J
Thallium	--	--	--	MG/KG	1.96 U	1.75 U	1.91 U	0.804 J	1.91 U	0.465 J
Vanadium	--	--	--	MG/KG	25.9	14.3	26.7	25.4	18.7	21.9
Zinc	**109**	10000	2480	MG/KG	44.4	28.1	31.7	36.7	25.7	38.1

Table 4. Summary of Metals in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-9	RXSB-9	RXSB-10	RXSB-10	RXSB-11	RXSB-11
			Sample Date:		03/13/2023	03/13/2023	03/13/2023	03/13/2023	07/28/2025	07/28/2025
			Sample Depth (ft bls):		7 - 9	9 - 11	5 - 8	8 - 11	6 - 8	13 - 15
			Normal Sample or Field Duplicate:		FD	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Aluminum	--	--	--	MG/KG	7190	8840	5280	4820	8510	9300
Antimony	--	--	--	MG/KG	4.21 U	4.42 U	4.27 U	4.22 U	4.44 UJ	4.78 U
Arsenic	13	16	16	MG/KG	2.86	3.66	3.8	2.3	4.6	4.42
Barium	350	400	820	MG/KG	48.1	46.8	75.1	37.4	66	42.8
Beryllium	7.2	72	47	MG/KG	0.394 J	0.231 J	0.275 J	0.288 J	0.613	0.439 J
Cadmium	2.5	4.3	7.5	MG/KG	0.12 J	0.234 J	0.217 J	0.21 J	0.174 J	0.113 J
Calcium	--	--	--	MG/KG	2410	13400	33200	2280 J	2610	1330
Chromium, Hexavalent	**1**	110	19	MG/KG	0.875 U	0.195 J	0.3 J	0.86 U	0.399 J	0.34 J
Chromium, Total	30	180	--	MG/KG	19.4	15.2	14.5	26.7 J	20.9	16
Cobalt	--	--	--	MG/KG	6.28	9.01	6.77	6.62	8.05	4.92
Copper	**50**	270	1720	MG/KG	22.4	49.2	29.1	22.2 J	31.7	12
Cyanide	27	27	40	MG/KG	1 U	1 U	1 U	0.99 U	1 U	1.1 U
Iron	--	--	--	MG/KG	14500	18700	11800	13200	19600	14100
Lead	**63**	400	450	MG/KG	43.3	**520**	**162**	18.3	11.7	18.3
Magnesium	--	--	--	MG/KG	2850	5380	2730	3340	3850	2120
Manganese	1600	2000	2000	MG/KG	274	268	283	293	496	232
Mercury	**0.18**	0.81	0.73	MG/KG	0.116 J	0.142	**0.351**	0.083	0.091 U	0.072 J
Nickel	**30**	310	130	MG/KG	21.4	28.4	**33.3**	**39.6**	21.6	12.9
Potassium	--	--	--	MG/KG	1210	1180	1070	1230	1410	572
Selenium	3.9	180	4	MG/KG	0.238 J	0.288 J	0.299 J	1.69 U	1.78 UJ	1.91 U
Silver	2	180	8.3	MG/KG	0.421 U	0.442 U	0.427 U	0.422 U	0.444 U	0.478 U
Sodium	--	--	--	MG/KG	130 J	466	168 J	139 J	183	118 J
Thallium	--	--	--	MG/KG	0.451 J	0.592 J	0.406 J	0.461 J	1.78 U	1.91 U
Vanadium	--	--	--	MG/KG	25	67	21	24.7	31.4	24.2
Zinc	**109**	10000	2480	MG/KG	44.2	108	78	49.3	37.4	27

Table 4. Summary of Metals in Soil, 73-99 Empire Boulevard, Brooklyn, New York

Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units	RXSB-12 07/31/2025 6 - 8 N	RXSB-12 07/31/2025 8 - 10 N	RXSB-13 07/29/2025 8 - 10 N	RXSB-13 07/29/2025 10 - 12 N	RXSB-14 07/30/2025 8 - 10 N	RXSB-14 07/30/2025 10 - 12 N
Sample Designation:					RXSB-12	RXSB-12	RXSB-13	RXSB-13	RXSB-14	RXSB-14
Sample Date:					07/31/2025	07/31/2025	07/29/2025	07/29/2025	07/30/2025	07/30/2025
Sample Depth (ft bls):					6 - 8	8 - 10	8 - 10	10 - 12	8 - 10	10 - 12
Normal Sample or Field Duplicate:					N	N	N	N	N	N
Aluminum	--	--	--	MG/KG	6120	9720	6240	9740	12400	11300
Antimony	--	--	--	MG/KG	4.48 U	4.7 UJ	4.49 U	4.14 UJ	4.86 UJ	4.77 UJ
Arsenic	13	16	16	MG/KG	2.94	3.76 J	3.84	3.62	5.83	6.87 J
Barium	350	400	820	MG/KG	47.3	56	31.9	31.9	44.6	52.6
Beryllium	7.2	72	47	MG/KG	0.432 J	0.455 J	0.422 J	0.574	0.43 J	0.346 J
Cadmium	2.5	4.3	7.5	MG/KG	0.152 J	0.08 J	0.343 J	0.376 J	0.972 U	0.953 U
Calcium	--	--	--	MG/KG	1630	1620 J	18800	1230 J	1350	1130
Chromium, Hexavalent	**1**	110	19	MG/KG	0.191 J	0.99 U	0.393 J	0.361 J	0.271 J	0.208 J
Chromium, Total	30	180	--	MG/KG	15.7	14.2	11.4	16.7	18	17.1
Cobalt	--	--	--	MG/KG	5.84	4.68	5.27	7.45	5.8	4.21
Copper	**50**	270	1720	MG/KG	36.7	12.9	19.5	11.9	11.6	11.5
Cyanide	27	27	40	MG/KG	1.1 R	1.2 R	1.1 U	1.1 U	1.2 UJ	1.2 UJ
Iron	--	--	--	MG/KG	16000	14300	10600	16100	20900	18600
Lead	**63**	400	450	MG/KG	52.1	**90.4 J**	31	12.2	17.5	18.3
Magnesium	--	--	--	MG/KG	2410	1980	11700	2310	1980	1820
Manganese	1600	2000	2000	MG/KG	491	215	231	286	200	139
Mercury	**0.18**	0.81	0.73	MG/KG	0.146	0.099	0.078	0.073 U	0.087 U	0.077 U
Nickel	**30**	310	130	MG/KG	19.1	15.2	21.8	16.4	10.8	10.1
Potassium	--	--	--	MG/KG	1260	660	933	677	578	474
Selenium	3.9	180	4	MG/KG	1.79 U	1.88 U	1.79 U	1.66 UJ	1.94 U	1.91 U
Silver	2	180	8.3	MG/KG	0.448 U	0.47 U	0.449 U	0.414 U	0.486 U	0.477 U
Sodium	--	--	--	MG/KG	97.8 J	188 U	179 U	166 U	194 U	191 U
Thallium	--	--	--	MG/KG	1.79 U	1.88 U	1.79 U	1.66 UJ	1.94 U	1.91 U
Vanadium	--	--	--	MG/KG	23.2	22	17.1	24.6	29.6	27.4
Zinc	**109**	10000	2480	MG/KG	41.5	35.6	42	29	27.3	31.2

Table 4. Summary of Metals in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-14	SRI-1	SRI-1	SRI-2	SRI-2	SRI-2
			Sample Date:		07/30/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025
			Sample Depth (ft bls):		10 - 12	0 - 2	4 - 6	0 - 2	3 - 5	6 - 8
			Normal Sample or Field Duplicate:		FD	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Aluminum	--	--	--	MG/KG	11000	6900	7860	6680	4120	7780
Antimony	--	--	--	MG/KG	4.74 UJ	4.34 U	4.53 U	4.66 U	4.48 U	4.26 U
Arsenic	13	16	16	MG/KG	5.64 J	4.23	4.69	3.1	1.93	3.99
Barium	350	400	820	MG/KG	38.2	49.2	75.1	58.4	34.3	59.4
Beryllium	7.2	72	47	MG/KG	0.336 J	0.359 J	0.429 J	0.296 J	0.209 J	0.332 J
Cadmium	2.5	4.3	7.5	MG/KG	0.06 J	0.092 J	0.906 U	0.216 J	0.143 J	0.238 J
Calcium	--	--	--	MG/KG	1060	1820	32200	19700	1290	2340
Chromium, Hexavalent	**1**	110	19	MG/KG	0.277 J	0.881 U	0.928 U	0.944 U	0.193 J	0.256 J
Chromium, Total	30	180	--	MG/KG	17	12	16.9	12.6	9.78	14
Cobalt	--	--	--	MG/KG	4.9	5.57	5.87	4.57	4.13	5.58
Copper	**50**	270	1720	MG/KG	14.2	30	46.7	21	25.4	26.5
Cyanide	27	27	40	MG/KG	1.2 UJ	1.1 U	1.1 U	1.1 UJ	1.1 U	1.1 U
Iron	--	--	--	MG/KG	17600	14600	17000	9410	9380	12900
Lead	**63**	400	450	MG/KG	20.4	51.9	**388**	29.5	**63.9**	**105**
Magnesium	--	--	--	MG/KG	2080	2120	3960	3040	1570	2290
Manganese	1600	2000	2000	MG/KG	140	251	396	233	207	177
Mercury	**0.18**	0.81	0.73	MG/KG	0.092 U	**0.334**	**0.224**	0.091 J	0.105	**0.754**
Nickel	**30**	310	130	MG/KG	11.5	16.4	19.2	14.8	12	16.8
Potassium	--	--	--	MG/KG	464	870	1200	1450	742	915
Selenium	3.9	180	4	MG/KG	1.9 U	0.301 J	1.81 U	1.86 U	1.79 U	1.7 U
Silver	2	180	8.3	MG/KG	0.474 U	0.434 U	0.453 U	0.466 U	0.448 U	0.426 U
Sodium	--	--	--	MG/KG	190 U	145 J	323	284	179 U	92.9 J
Thallium	--	--	--	MG/KG	1.9 U	1.74 U	1.81 U	1.86 U	1.79 U	1.7 U
Vanadium	--	--	--	MG/KG	26.5	18.8	23.3	17.6	14.6	21.2
Zinc	**109**	10000	2480	MG/KG	29.4	43.1	71.6	39.4	39.8	56

Table 4. Summary of Metals in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-2	SRI-3	SRI-3	SRI-4	SRI-4	SRI-4
			Sample Date:		10/31/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025
			Sample Depth (ft bls):		12 - 14	0 - 2	3 - 5	0 - 2	4 - 6	11 - 13
			Normal Sample or Field Duplicate:		N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Aluminum	--	--	--	MG/KG	9220	8460	3190	5180	7000	8900
Antimony	--	--	--	MG/KG	4.37 U	4.71 U	8.76 U	4.23 UJ	4.34 U	4.47 U
Arsenic	13	16	16	MG/KG	3.74	3.65	4.68	2.31	2.42	3.09
Barium	350	400	820	MG/KG	26.6	57.5	80.1	32.4	44.6	54.2
Beryllium	7.2	72	47	MG/KG	0.459	0.339 J	0.247 J	0.274 J	0.322 J	0.338 J
Cadmium	2.5	4.3	7.5	MG/KG	0.055 J	0.217 J	1.75 U	0.156 J	0.161 J	0.189 J
Calcium	--	--	--	MG/KG	714	5510	128000	3060 J	22400	1260
Chromium, Hexavalent	**1**	110	19	MG/KG	0.324 J	0.949 U	0.925 U	0.882 U	0.201 J	0.946 U
Chromium, Total	30	180	--	MG/KG	16.6	14.4	7.52	12.4	13.7	16.5
Cobalt	--	--	--	MG/KG	10.6	5.94	4.1	5.66	4.99	6.38
Copper	**50**	270	1720	MG/KG	14.8	21.4	34.4	15.9	20.3	19.4
Cyanide	27	27	40	MG/KG	1 U	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U
Iron	--	--	--	MG/KG	16000	10900	8420	9010	10100	14000
Lead	**63**	400	450	MG/KG	8.82	**94.2**	**652**	18.8	20.1	**95.7**
Magnesium	--	--	--	MG/KG	2630	2630	1200	2960	2460	2640
Manganese	1600	2000	2000	MG/KG	335	174	234	241	317	180
Mercury	**0.18**	0.81	0.73	MG/KG	0.073 U	**0.684**	**2.46**	0.073 U	0.075 J	0.114
Nickel	**30**	310	130	MG/KG	25.5	28.7	17.4	**37.8**	17.5	15.8
Potassium	--	--	--	MG/KG	740	799	644	1880 J	988	937
Selenium	3.9	180	4	MG/KG	1.75 U	1.88 U	0.745 J	1.69 U	1.73 U	1.79 U
Silver	2	180	8.3	MG/KG	0.437 U	0.471 U	0.876 U	0.423 U	0.434 U	0.447 U
Sodium	--	--	--	MG/KG	175 U	102 J	1640	123 J	309	179 U
Thallium	--	--	--	MG/KG	1.75 U	1.88 U	3.5 U	1.69 U	1.73 U	1.79 U
Vanadium	--	--	--	MG/KG	23.9	20.1	13.1	16.6	17.3	24
Zinc	**109**	10000	2480	MG/KG	25.3	65.8	88.3	40.8	52.8	70.9

Table 4. Summary of Metals in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-5	SRI-5	SRI-6	SRI-6	SRI-7	SRI-7
			Sample Date:		10/31/2025	10/31/2025	10/31/2025	10/31/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	3 - 5	0 - 2	0 - 2	0 - 2	2 - 4
			Normal Sample or Field Duplicate:		N	N	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Aluminum	--	--	--	MG/KG	8250	6010	5270	5860	5300	10400
Antimony	--	--	--	MG/KG	4.47 U	4.37 U	4.2 U	4.4 U	4.49 U	4.4 U
Arsenic	13	16	16	MG/KG	6.01	3.43	3.43	4.37	3.94	4.82
Barium	350	400	820	MG/KG	70.5	44.4	40.2	46.3	70.4	55.8
Beryllium	7.2	72	47	MG/KG	0.482	0.338 J	0.264 J	0.39 J	0.288 J	0.576
Cadmium	2.5	4.3	7.5	MG/KG	0.264 J	0.096 J	0.362 J	0.379 J	0.497 J	0.1 J
Calcium	--	--	--	MG/KG	27500	2600	5920	5700	9480	1810
Chromium, Hexavalent	**1**	110	19	MG/KG	0.932 U	0.905 U	0.871 U	0.885 U	**1.7**	0.937 U
Chromium, Total	30	180	--	MG/KG	21.2	12.2	11.6	11.4	15.2	14.8
Cobalt	--	--	--	MG/KG	8.04	5.24	6.04	6.58	5.03	6.96
Copper	**50**	270	1720	MG/KG	29.9	35.9	**55.7 J**	**78.6 J**	26.1	17.5
Cyanide	27	27	40	MG/KG	1.1 U	1.1 U	0.26 J	1 U	1.1 UJ	1.1 UJ
Iron	--	--	--	MG/KG	13000	13000	11600	10400	10900	16000
Lead	**63**	400	450	MG/KG	38	**69.5**	**103**	**110**	**153**	**127**
Magnesium	--	--	--	MG/KG	3620	2280	2940	2720	2600	2890
Manganese	1600	2000	2000	MG/KG	1080	271	287	221	235	438
Mercury	**0.18**	0.81	0.73	MG/KG	0.06 J	0.143	**0.237**	**0.289**	0.155	0.079 J
Nickel	**30**	310	130	MG/KG	**47.9**	16.8	24.6	22	20.4	24
Potassium	--	--	--	MG/KG	1340	849	914	865	1100	773
Selenium	3.9	180	4	MG/KG	0.798 J	0.395 J	1.68 U	1.76 U	0.364 J	0.329 J
Silver	2	180	8.3	MG/KG	0.447 U	0.437 U	0.42 U	0.44 U	0.449 U	0.44 U
Sodium	--	--	--	MG/KG	202	175 U	130 J	186 J	284	109 J
Thallium	--	--	--	MG/KG	1.79 U	1.75 U	1.68 U	1.76 U	1.8 U	1.76 U
Vanadium	--	--	--	MG/KG	20.9	17.3	16.7	18	16.1	23.1
Zinc	**109**	10000	2480	MG/KG	49.4	50.3	95.5 J	**135 J**	109	43.4

Table 4. Summary of Metals in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-7	SRI-8	SRI-8	SRI-9	SRI-9	SRI-9
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		11 - 13	0 - 2	3 - 5	0 - 2	0 - 2	3 - 5
			Normal Sample or Field Duplicate:		N	N	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Aluminum	--	--	--	MG/KG	7410	6980	9030	6100	4930	7180
Antimony	--	--	--	MG/KG	4.17 U	4.58 UJ	4.4 U	4.19 U	4.25 U	4.28 U
Arsenic	13	16	16	MG/KG	2.57	4.62	9.77	5.09	4.47	3.17
Barium	350	400	820	MG/KG	33.1	94.1	229	49.6	38.3	68.2
Beryllium	7.2	72	47	MG/KG	0.399 J	0.32 J	0.669	0.39 J	0.331 J	0.483
Cadmium	2.5	4.3	7.5	MG/KG	0.115 J	0.917 U	0.88 U	0.102 J	0.074 J	0.11 J
Calcium	--	--	--	MG/KG	732	30900	63300	5450	5320	2210
Chromium, Hexavalent	**1**	110	19	MG/KG	0.879 U	0.27 J	**2.07**	**1.78 J**	0.872 U	0.857 U
Chromium, Total	30	180	--	MG/KG	15.6	17.1	19.3	13.7	11.2	18.4
Cobalt	--	--	--	MG/KG	7.32	4.56	5.28	5.64	5.07	8.35
Copper	**50**	270	1720	MG/KG	16.2	27.1 J	45.8	46.6 J	31 J	38.2
Cyanide	27	27	40	MG/KG	1 UJ	1.1 UJ	0.32 J	1.1 UJ	1 UJ	1 UJ
Iron	--	--	--	MG/KG	13000	11000	10400	12600	10800	20200
Lead	**63**	400	450	MG/KG	6.12	**148**	**464**	**89 J**	55.8 J	10.3
Magnesium	--	--	--	MG/KG	3070	3110	3490	2920 J	1830 J	3320
Manganese	1600	2000	2000	MG/KG	380	200	178	271	225	643
Mercury	**0.18**	0.81	0.73	MG/KG	0.078 U	0.08	0.12	**0.384 J**	**0.221 J**	0.087 U
Nickel	**30**	310	130	MG/KG	26.9	13.9	13.4	24.2 J	15.2 J	24.4
Potassium	--	--	--	MG/KG	1320	1060	1330	883	719	1500
Selenium	3.9	180	4	MG/KG	1.67 U	1.83 U	0.442 J	1.68 U	1.7 U	1.71 U
Silver	2	180	8.3	MG/KG	0.417 U	0.458 U	0.44 U	0.419 U	0.425 U	0.428 U
Sodium	--	--	--	MG/KG	167 U	461	1060	288	247	351
Thallium	--	--	--	MG/KG	1.67 U	1.83 U	1.76 U	1.68 U	1.7 U	1.71 U
Vanadium	--	--	--	MG/KG	20.6	23.3	23	17.8	15.2	30.4
Zinc	**109**	10000	2480	MG/KG	29.1	91.5 J	**314**	67.4 J	44 J	39.8

Table 4. Summary of Metals in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-10	SRI-10	SRI-10	SRI-11	SRI-11	SRI-11
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	3 - 5	10 - 12	0 - 2	4 - 6	11 - 13
			Normal Sample or Field Duplicate:		N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Aluminum	--	--	--	MG/KG	7370	6080	8430	6560	8260	12500
Antimony	--	--	--	MG/KG	4.47 U	4.2 U	4.34 U	4.61 U	4.36 U	4.86 U
Arsenic	13	16	16	MG/KG	4.47	3.37	2.61	8.66	4.75	7.2
Barium	350	400	820	MG/KG	61.1	32	40.3	47.5	77	33.7
Beryllium	7.2	72	47	MG/KG	0.356 J	0.31 J	0.494	0.357 J	0.385 J	0.424 J
Cadmium	2.5	4.3	7.5	MG/KG	0.894 U	0.065 J	0.108 J	0.922 U	0.322 J	0.076 J
Calcium	--	--	--	MG/KG	45900	2220	815	22100	1920	1220
Chromium, Hexavalent	**1**	110	19	MG/KG	0.272 J	0.194 J	0.909 U	0.964 U	0.912 U	0.212 J
Chromium, Total	30	180	--	MG/KG	9.88	11.5	17.4	16.7	17	17
Cobalt	--	--	--	MG/KG	3.78	3.96	6.15	5.78	6.68	4.71
Copper	**50**	270	1720	MG/KG	**58.5**	18.6	18.6	20.3	34.7	10.8
Cyanide	27	27	40	MG/KG	1.2 UJ	1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.2 UJ
Iron	--	--	--	MG/KG	9370	10900	15300	9680	15300	21900
Lead	**63**	400	450	MG/KG	35.2	25.5	15.2	20	**157**	16.3
Magnesium	--	--	--	MG/KG	3320	2330	2900	2870	3630	1800
Manganese	1600	2000	2000	MG/KG	222	197	290	296	326	196
Mercury	**0.18**	0.81	0.73	MG/KG	0.087 U	0.067 J	**0.89**	0.119	**0.826**	0.074 J
Nickel	**30**	310	130	MG/KG	12.4	16.5	16.5	21.6	**31**	9.17
Potassium	--	--	--	MG/KG	1060	645	1110	948	1710	484
Selenium	3.9	180	4	MG/KG	1.79 U	1.68 U	1.74 U	1.84 U	0.307 J	0.493 J
Silver	2	180	8.3	MG/KG	0.447 U	0.42 U	0.434 U	0.461 U	0.436 U	0.486 U
Sodium	--	--	--	MG/KG	327	168 U	102 J	164 J	378	195 U
Thallium	--	--	--	MG/KG	1.79 U	1.68 U	1.74 U	1.84 U	1.74 U	1.95 U
Vanadium	--	--	--	MG/KG	16.2	17.3	25.2	19.6	25.5	27.8
Zinc	**109**	10000	2480	MG/KG	86.6	29.9	28.5	39.2	**150**	27.1

Table 4. Summary of Metals in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-12	SRI-12	SRI-12	SRI-12	SRI-13	SRI-13
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	4 - 6	7 - 9	11 - 13	0 - 2	4 - 6
			Normal Sample or Field Duplicate:		N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Aluminum	--	--	--	MG/KG	7900	12700	13400	10700	6940	4890
Antimony	--	--	--	MG/KG	4.26 U	5.42 U	4.62 U	4.78 U	4.46 U	4.4 U
Arsenic	13	16	16	MG/KG	4.24	4.4	4.24	3.89	7.67	3.93
Barium	350	400	820	MG/KG	47.3	46.7	45.4	30.3	82.2	58.8
Beryllium	7.2	72	47	MG/KG	0.388 J	0.51 J	0.588	0.324 J	0.432 J	0.278 J
Cadmium	2.5	4.3	7.5	MG/KG	0.109 J	1.08 U	0.079 J	0.956 U	0.125 J	0.125 J
Calcium	--	--	--	MG/KG	2000	1080	1140	709	9530	3290
Chromium, Hexavalent	**1**	110	19	MG/KG	0.903 U	1.09 U	0.393 J	0.741 J	0.911 U	0.908 U
Chromium, Total	30	180	--	MG/KG	13.9	20	24.6	14.9	15.5	11.8
Cobalt	--	--	--	MG/KG	6.63	7.86	8.42	6.58	6.41	5.86
Copper	**50**	270	1720	MG/KG	38.5	15.7	19	9.44	34.2	28.2
Cyanide	27	27	40	MG/KG	1 UJ	1.2 UJ	1.1 UJ	1.2 UJ	1 UJ	1.1 UJ
Iron	--	--	--	MG/KG	16200	20000	22500	14000	12800	10800
Lead	**63**	400	450	MG/KG	**91.9**	15.2	16.5	9.36	**321**	**964**
Magnesium	--	--	--	MG/KG	2210	2920	3100	2230	3110	2830
Manganese	1600	2000	2000	MG/KG	309	325	424	226	310	278
Mercury	**0.18**	0.81	0.73	MG/KG	**0.371**	0.059 J	0.088 U	0.089 U	**0.875**	**0.891**
Nickel	**30**	310	130	MG/KG	13.6	14.1	16.3	11.8	**33.4**	29.6
Potassium	--	--	--	MG/KG	769	883	904	520	1520	1010
Selenium	3.9	180	4	MG/KG	1.71 U	0.429 J	1.85 U	1.91 U	1.78 U	1.76 U
Silver	2	180	8.3	MG/KG	0.426 U	0.542 U	0.462 U	0.478 U	0.446 U	0.44 U
Sodium	--	--	--	MG/KG	126 J	217 U	133 J	191 U	176 J	112 J
Thallium	--	--	--	MG/KG	1.71 U	2.17 U	1.85 U	1.91 U	1.78 U	1.76 U
Vanadium	--	--	--	MG/KG	21.3	31.2	35.2	26.9	20.6	16.2
Zinc	**109**	10000	2480	MG/KG	43.4	29.5	31.1	28.6	**121**	75.4

Table 4. Summary of Metals in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-13	SRI-13
				Sample Date:	10/30/2025	10/30/2025
				Sample Depth (ft bls):	7 - 9	11 - 13
				Normal Sample or Field Duplicate:	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units		
Aluminum	--	--	--	MG/KG	10800	13100
Antimony	--	--	--	MG/KG	4.84 U	4.49 U
Arsenic	13	16	16	MG/KG	6.84	5.06
Barium	350	400	820	MG/KG	88.9	33.3
Beryllium	7.2	72	47	MG/KG	0.77	0.417 J
Cadmium	2.5	4.3	7.5	MG/KG	0.194 J	0.062 J
Calcium	--	--	--	MG/KG	2370	996
Chromium, Hexavalent	**1**	110	19	MG/KG	1.02 U	0.402 J
Chromium, Total	30	180	--	MG/KG	29.9	21.6
Cobalt	--	--	--	MG/KG	10.9	8.09
Copper	**50**	270	1720	MG/KG	36.1	15.1
Cyanide	27	27	40	MG/KG	1.2 UJ	1.1 UJ
Iron	--	--	--	MG/KG	20700	17600
Lead	**63**	400	450	MG/KG	**430**	11.3
Magnesium	--	--	--	MG/KG	5070	2950
Manganese	1600	2000	2000	MG/KG	536	212
Mercury	**0.18**	0.81	0.73	MG/KG	**0.313**	0.092 U
Nickel	**30**	310	130	MG/KG	**50.6**	21.1
Potassium	--	--	--	MG/KG	2380	825
Selenium	3.9	180	4	MG/KG	1.93 U	1.8 U
Silver	2	180	8.3	MG/KG	0.484 U	0.449 U
Sodium	--	--	--	MG/KG	122 J	180 U
Thallium	--	--	--	MG/KG	1.93 U	1.8 U
Vanadium	--	--	--	MG/KG	38.2	33.5
Zinc	**109**	10000	2480	MG/KG	**114**	33.2

Table 5. Summary of Polychlorinated Biphenyls in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-1	RXSB-1	RXSB-2	RXSB-2	RXSB-2
			Sample Date:		07/31/2025	07/31/2025	07/31/2025	07/31/2025	07/31/2025
			Sample Depth (ft bls):		8 - 10	10 - 12	6 - 8	6 - 8	8 - 10
			Normal Sample or Field Duplicate:		N	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.0566 U	0.0575 U	0.0569 U	0.0548 U	0.059 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.0566 U	0.0575 U	0.0569 U	0.0548 U	0.059 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.0566 U	0.0575 U	0.0569 U	0.0548 U	0.059 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.0566 U	0.0575 U	0.0569 U	0.0548 U	0.059 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.0566 U	0.0575 U	0.0569 U	0.0548 U	0.059 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.0566 U	0.0575 U	0.0569 U	0.0548 U	0.059 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.0566 U	0.0575 U	0.0569 U	0.0548 U	0.059 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.0566 U	0.0575 U	0.0569 U	0.0548 U	0.059 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.0566 U	0.0575 U	0.0569 U	0.0548 U	0.059 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.0566 U	0.0575 U	0.0569 U	0.0548 U	0.059 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-3	RXSB-3	RXSB-4	RXSB-4	RXSB-5
			Sample Date:		07/31/2025	07/31/2025	08/01/2025	08/01/2025	08/01/2025
			Sample Depth (ft bls):		7 - 9	9 - 11	6 - 8	8 - 10	8 - 10
			Normal Sample or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.0546 U	0.0586 U	0.0594 U	0.054 U	0.0579 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.0546 U	0.0586 U	0.0594 U	0.054 U	0.0579 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.0546 U	0.0586 U	0.0594 U	0.054 U	0.0579 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.0546 U	0.0586 U	0.0594 U	0.054 U	0.0579 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.0546 U	0.0586 U	0.0594 U	0.054 U	0.0579 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.0546 U	0.0586 U	0.0594 U	0.054 U	0.0579 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.0546 U	0.0586 U	0.0594 U	0.054 U	0.0579 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.0546 U	0.0586 U	0.0594 U	0.054 U	0.0579 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.0546 U	0.0586 U	0.0594 U	0.054 U	0.0579 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.0546 U	0.0586 U	0.0594 U	0.054 U	0.0579 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-5	RXSB-6	RXSB-6	RXSB-7	RXSB-7
			Sample Date:		08/01/2025	08/01/2025	08/01/2025	08/01/2025	08/01/2025
			Sample Depth (ft bls):		10 - 12	6 - 8	8 - 10	3 - 5	5 - 7
			Normal Sample or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.0544 U	0.0584 U	0.057 U	0.0532 U	0.0574 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.0544 U	0.0584 U	0.057 U	0.0532 U	0.0574 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.0544 U	0.0584 U	0.057 U	0.0532 U	0.0574 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.0544 U	0.0584 U	0.057 U	0.0532 U	0.0574 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.0544 U	0.0584 U	0.057 U	0.0532 U	0.0574 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.0544 U	0.0584 U	0.057 U	0.0532 U	0.0574 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.0544 U	0.0584 U	0.057 U	0.0532 U	0.0574 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.0544 U	0.0584 U	0.057 U	0.0532 U	0.0574 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.0544 U	0.0584 U	0.057 U	0.0532 U	0.0574 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.0544 U	0.0584 U	0.057 U	0.0532 U	0.0574 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-8	RXSB-8	RXSB-9	RXSB-9	RXSB-9
			Sample Date:		08/01/2025	08/01/2025	03/13/2023	03/13/2023	03/13/2023
			Sample Depth (ft bls):		7 - 9	9 - 11	7 - 9	7 - 9	9 - 11
			Normal Sample or Field Duplicate:		N	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.0575 U	0.0564 U	0.0352 U	0.0347 U	0.0365 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.0575 U	0.0564 U	0.0352 U	0.0347 U	0.0365 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.0575 U	0.0564 U	0.0352 U	0.0347 U	0.0365 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.0575 U	0.0564 U	0.0352 U	0.0347 U	0.0365 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.0575 U	0.0564 U	0.0352 U	0.0347 U	0.0365 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.0575 U	0.0564 U	0.0352 U	0.0347 U	0.0365 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.0575 U	0.0564 U	0.0352 U	0.0347 U	0.0365 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.0575 U	0.0564 U	0.0352 U	0.0347 U	0.0365 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.0575 U	0.0564 U	0.0352 U	0.0347 U	0.0365 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.0575 U	0.0564 U	0.0352 U	0.0347 U	0.0365 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-10	RXSB-10	RXSB-11	RXSB-11	RXSB-12
			Sample Date:		03/13/2023	03/13/2023	07/28/2025	07/28/2025	07/31/2025
			Sample Depth (ft bls):		5 - 8	8 - 11	6 - 8	13 - 15	6 - 8
			Normal Sample or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.0361 U	0.0345 U	0.0539 U	0.06 U	0.055 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.0361 U	0.0345 U	0.0539 U	0.06 U	0.055 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.0361 U	0.0345 U	0.0539 U	0.06 U	0.055 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.0361 U	0.0345 U	0.0539 U	0.06 U	0.055 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.0361 U	0.0345 U	0.0539 U	0.06 U	0.055 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.0361 U	0.0345 U	0.0539 U	0.06 U	0.055 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.0361 U	0.0345 U	0.0539 U	0.06 U	0.055 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.0361 U	0.0345 U	0.0539 U	0.06 U	0.055 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.0361 U	0.0345 U	0.0539 U	0.06 U	0.055 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.0361 U	0.0345 U	0.0539 U	0.06 U	0.055 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-12	RXSB-13	RXSB-13	RXSB-14	RXSB-14
			Sample Date:		07/31/2025	07/29/2025	07/29/2025	07/30/2025	07/30/2025
			Sample Depth (ft bls):		8 - 10	8 - 10	10 - 12	8 - 10	10 - 12
			Normal Sample or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.0566 U	0.0537 U	0.052 U	0.0592 U	0.0574 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.0566 U	0.0537 U	0.052 U	0.0592 U	0.0574 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.0566 U	0.0537 U	0.052 U	0.0592 U	0.0574 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.0566 U	0.0537 U	0.052 U	0.0592 U	0.0574 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.0566 U	0.0537 U	0.052 U	0.0592 U	0.0574 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.0566 U	0.0537 U	0.052 U	0.0592 U	0.0574 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.0566 U	0.0537 U	0.052 U	0.0592 U	0.0574 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.0566 U	0.0537 U	0.052 U	0.0592 U	0.0574 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.0566 U	0.0537 U	0.052 U	0.0592 U	0.0574 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.0566 U	0.0537 U	0.052 U	0.0592 U	0.0574 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-14	SRI-1	SRI-1	SRI-2	SRI-2
			Sample Date:		07/30/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025
			Sample Depth (ft bls):		10 - 12	0 - 2	4 - 6	0 - 2	3 - 5
			Normal Sample or Field Duplicate:		FD	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.0592 U	0.0523 U	0.0556 U	0.0539 U	0.0552 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.0592 U	0.0523 U	0.0556 U	0.0539 U	0.0552 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.0592 U	0.0523 U	0.0556 U	0.0539 U	0.0552 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.0592 U	0.0523 U	0.0556 U	0.0539 U	0.0552 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.0592 U	0.0523 U	0.0556 U	0.0539 U	0.0552 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.0592 U	0.0523 U	0.0556 U	0.0539 U	0.0552 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.0592 U	0.0523 U	0.0556 U	0.0733	0.0552 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.0592 U	0.0523 U	0.0556 U	0.0539 U	0.0552 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.0592 U	0.0523 U	0.0556 U	0.0539 U	0.0552 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.0592 U	0.0523 U	0.0556 U	0.0733	0.0552 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-2	SRI-2	SRI-3	SRI-3	SRI-4
			Sample Date:		10/31/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025
			Sample Depth (ft bls):		6 - 8	12 - 14	0 - 2	3 - 5	0 - 2
			Normal Sample or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.0554 U	0.0525 U	0.0577 U	0.0559 U	0.0513 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.0554 U	0.0525 U	0.0577 U	0.0559 U	0.0513 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.0554 U	0.0525 U	0.0577 U	0.0559 U	0.0513 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.0554 U	0.0525 U	0.0577 U	0.0559 U	0.0513 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.0554 U	0.0525 U	0.0577 U	0.0559 U	0.0513 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.0554 U	0.0525 U	0.0577 U	0.0559 U	0.0513 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.0554 U	0.0525 U	0.0577 U	0.0559 U	0.0513 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.0554 U	0.0525 U	0.0577 U	0.0559 U	0.0513 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.0554 U	0.0525 U	0.0577 U	0.0559 U	0.0513 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.0554 U	0.0525 U	0.0577 U	0.0559 U	0.0513 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-4	SRI-4	SRI-5	SRI-5	SRI-6
			Sample Date:		10/31/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025
			Sample Depth (ft bls):		4 - 6	11 - 13	0 - 2	3 - 5	0 - 2
			Normal Sample or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.0533 U	0.0545 U	0.0572 U	0.0558 U	0.0506 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.0533 U	0.0545 U	0.0572 U	0.0558 U	0.0506 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.0533 U	0.0545 U	0.0572 U	0.0558 U	0.0506 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.0533 U	0.0545 U	0.0572 U	0.0558 U	0.0506 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.0533 U	0.0545 U	0.0572 U	0.0558 U	0.0506 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.0533 U	0.0545 U	0.0572 U	0.0558 U	0.0506 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.0533 U	0.0545 U	0.0572 U	0.0558 U	0.0506 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.0533 U	0.0545 U	0.0572 U	0.0558 U	0.0506 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.0533 U	0.0545 U	0.0572 U	0.0558 U	0.0506 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.0533 U	0.0545 U	0.0572 U	0.0558 U	0.0506 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-6	SRI-7	SRI-7	SRI-7	SRI-8
			Sample Date:		10/31/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	0 - 2	2 - 4	11 - 13	0 - 2
			Normal Sample or Field Duplicate:		FD	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.054 U	0.0568 U	0.0386 U	0.0504 U	0.0541 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.054 U	0.0568 U	0.0386 U	0.0504 U	0.0541 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.054 U	0.0568 U	0.0386 U	0.0504 U	0.0541 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.054 U	0.0568 U	0.0386 U	0.0504 U	0.0541 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.054 U	0.0568 U	0.0386 U	0.0504 U	0.0541 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.054 U	0.0568 U	0.0386 U	0.0504 U	0.0541 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.054 U	0.0293 J	0.0386 U	0.0504 U	0.0541 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.054 U	0.0568 U	0.0386 U	0.0504 U	0.0541 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.054 U	0.0175 J	0.0386 U	0.0504 U	0.0541 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.054 U	0.0468 J	0.0386 U	0.0504 U	0.0541 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-8	SRI-9	SRI-9	SRI-9	SRI-10
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		3 - 5	0 - 2	0 - 2	3 - 5	0 - 2
			Normal Sample or Field Duplicate:		N	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.0552 U	0.0505 U	0.0542 U	0.0488 U	0.057 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.0552 U	0.0505 U	0.0542 U	0.0488 U	0.057 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.0552 U	0.0505 U	0.0542 U	0.0488 U	0.057 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.0552 U	0.0505 U	0.0542 U	0.0488 U	0.057 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.0552 U	0.0505 U	0.0542 U	0.0488 U	0.057 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.0255 J	0.0505 U	0.0542 U	0.0488 U	0.0208 J
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.0129 J	0.0505 U	0.0542 U	0.0488 U	0.057 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.0552 U	0.0505 U	0.0542 U	0.0488 U	0.057 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.0552 U	0.0505 U	0.0542 U	0.0488 U	0.057 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.0384 J	0.0505 U	0.0542 U	0.0488 U	0.0208 J

Table 5. Summary of Polychlorinated Biphenyls in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-10	SRI-10	SRI-11	SRI-11	SRI-11
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		3 - 5	10 - 12	0 - 2	4 - 6	11 - 13
			Normal Sample or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.0495 U	0.0528 U	0.0567 U	0.0532 U	0.0614 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.0495 U	0.0528 U	0.0567 U	0.0532 U	0.0614 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.0495 U	0.0528 U	0.0567 U	0.0532 U	0.0614 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.0495 U	0.0528 U	0.0567 U	0.0532 U	0.0614 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.0495 U	0.0528 U	0.0567 U	0.0532 U	0.0614 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.0495 U	0.0528 U	0.0567 U	0.0532 U	0.0614 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.0495 U	0.0528 U	0.0567 U	0.0532 U	0.0614 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.0495 U	0.0528 U	0.0567 U	0.0532 U	0.0614 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.0495 U	0.0528 U	0.0567 U	0.0532 U	0.0614 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.0495 U	0.0528 U	0.0567 U	0.0532 U	0.0614 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-12	SRI-12	SRI-12	SRI-12	SRI-13
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	4 - 6	7 - 9	11 - 13	0 - 2
			Normal Sample or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.0526 U	0.0664 U	0.0563 U	0.0603 U	0.0539 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.0526 U	0.0664 U	0.0563 U	0.0603 U	0.0539 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.0526 U	0.0664 U	0.0563 U	0.0603 U	0.0539 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.0526 U	0.0664 U	0.0563 U	0.0603 U	0.0539 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.0526 U	0.0664 U	0.0563 U	0.0603 U	0.0539 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.0526 U	0.0664 U	0.0563 U	0.0603 U	0.0539 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.0526 U	0.0664 U	0.0563 U	0.0603 U	0.0539 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.0526 U	0.0664 U	0.0563 U	0.0603 U	0.0539 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.0526 U	0.0664 U	0.0563 U	0.0603 U	0.0539 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.0526 U	0.0664 U	0.0563 U	0.0603 U	0.0539 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-13	SRI-13	SRI-13
				Sample Date:	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	4 - 6	7 - 9	11 - 13
				Normal Sample or Field Duplicate:	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units			
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.0554 U	0.0611 U	0.0563 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.0554 U	0.0611 U	0.0563 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.0554 U	0.0611 U	0.0563 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.0554 U	0.0611 U	0.0563 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.0554 U	0.0611 U	0.0563 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.0554 U	0.0611 U	0.0563 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.0554 U	0.0611 U	0.0563 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.0554 U	0.0611 U	0.0563 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.0554 U	0.0611 U	0.0563 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.0554 U	0.0611 U	0.0563 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-1	RXSB-1	RXSB-2	RXSB-2
				Sample Date:	07/31/2025	07/31/2025	07/31/2025	07/31/2025
				Sample Depth (ft bls):	8 - 10	10 - 12	6 - 8	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.191 U	0.201 U	0.191 U	0.188 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.191 U	0.201 U	0.191 U	0.188 U
Aldrin	0.005	0.097	0.19	MG/KG	0.00185 U	0.00188 U	0.0018 U	0.00183 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.000772 U	0.000784 U	0.000748 U	0.000762 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.00185 U	0.00188 U	0.0018 U	0.00183 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.00185 U	0.00188 U	0.0018 U	0.00183 U
Beta Endosulfan	2.4	24	102	MG/KG	0.00185 U	0.00188 U	0.0018 U	0.00183 U
Chlordane	--	--	--	MG/KG	0.0154 U	0.0157 U	0.015 U	0.0152 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00232 U	0.00235 U	0.00224 U	0.00229 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.00185 U	0.00188 U	0.0018 U	0.00183 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00116 U	0.00118 U	0.00112 U	0.00114 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000772 U	0.000784 U	0.000748 U	0.000762 U
Endrin	0.014	11	0.06	MG/KG	0.000772 U	0.000784 U	0.000748 U	0.000762 U
Endrin Aldehyde	--	--	--	MG/KG	0.00232 U	0.00235 U	0.00224 U	0.00229 U
Endrin Ketone	--	--	--	MG/KG	0.00185 U	0.00188 U	0.0018 U	0.00183 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.000772 U	0.000784 U	0.000748 U	0.000762 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000927 U	0.00094 U	0.000898 U	0.000914 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00348 U	0.00353 U	0.00337 U	0.00343 U
Methoxychlor	--	--	--	MG/KG	0.00348 U	0.00353 U	0.00337 U	0.00343 U
P,P'-DDD	0.0033	13	14	MG/KG	0.00185 U	0.00188 U	0.0018 U	0.00183 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.00185 U	0.00188 U	0.0018 U	0.00183 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.00185 U	0.00188 U	0.0018 U	0.00183 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.191 U	0.201 U	0.191 U	0.188 U
Toxaphene	--	--	--	MG/KG	0.0348 U	0.0353 U	0.0337 U	0.0343 U
trans-Chlordane	--	--	--	MG/KG	0.00232 U	0.00235 U	0.00224 U	0.00229 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-2	RXSB-3	RXSB-3	RXSB-4
				Sample Date:	07/31/2025	07/31/2025	07/31/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	7 - 9	9 - 11	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.205 U	0.194 U	0.196 U	0.197 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.205 U	0.194 U	0.196 U	0.197 U
Aldrin	0.005	0.097	0.19	MG/KG	0.0019 U	0.00185 U	0.00189 U	0.00188 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.00079 U	0.00077 U	0.000787 U	0.000785 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0019 U	0.00185 U	0.00189 U	0.00188 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.0019 U	0.00185 U	0.00189 U	0.00188 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0019 U	0.00185 U	0.00189 U	0.00188 U
Chlordane	--	--	--	MG/KG	0.0158 U	0.0154 U	0.0157 U	0.0157 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00237 U	0.00231 U	0.00236 U	0.00236 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.0019 U	0.00185 U	0.00189 U	0.00188 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00118 U	0.00115 U	0.00118 U	0.00118 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.00079 U	0.00077 U	0.000787 U	0.000785 U
Endrin	0.014	11	0.06	MG/KG	0.00079 U	0.00077 U	0.000787 U	0.000785 U
Endrin Aldehyde	--	--	--	MG/KG	0.00237 U	0.00231 U	0.00236 U	0.00236 U
Endrin Ketone	--	--	--	MG/KG	0.0019 U	0.00185 U	0.00189 U	0.00188 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.00079 U	0.00077 U	0.000787 U	0.000785 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000948 U	0.000924 U	0.000945 U	0.000942 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00356 U	0.00346 U	0.00354 U	0.00353 U
Methoxychlor	--	--	--	MG/KG	0.00356 U	0.00346 U	0.00354 U	0.00353 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0019 U	0.00185 U	0.00189 U	0.00188 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.0019 U	0.00185 U	0.00189 U	0.00188 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.0019 U	0.00185 U	0.00189 U	0.00188 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.205 U	0.194 U	0.196 U	0.197 U
Toxaphene	--	--	--	MG/KG	0.0356 U	0.0346 U	0.0354 U	0.0353 U
trans-Chlordane	--	--	--	MG/KG	0.00237 U	0.00231 U	0.00236 U	0.00236 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-4	RXSB-5	RXSB-5	RXSB-6
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	8 - 10	10 - 12	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.184 U	0.2 U	0.193 U	0.191 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.184 U	0.2 U	0.193 U	0.191 U
Aldrin	0.005	0.097	0.19	MG/KG	0.00173 U	0.00189 U	0.00183 U	0.00182 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.00072 U	0.000787 U	0.000764 U	0.000757 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.00173 U	0.00189 U	0.00183 U	0.00182 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.00173 U	0.00189 U	0.00183 U	0.00182 U
Beta Endosulfan	2.4	24	102	MG/KG	0.00173 U	0.00189 U	0.00183 U	0.00182 U
Chlordane	--	--	--	MG/KG	0.0144 U	0.0157 U	0.0153 U	0.0151 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00216 U	0.00236 U	0.00229 U	0.00227 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.00173 U	0.00189 U	0.00183 U	0.00182 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00108 U	0.00118 U	0.00115 U	0.00114 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.00072 U	0.000787 U	0.000764 U	0.000757 U
Endrin	0.014	11	0.06	MG/KG	0.00072 U	0.000787 U	0.000764 U	0.000757 U
Endrin Aldehyde	--	--	--	MG/KG	0.00216 U	0.00236 U	0.00229 U	0.00227 U
Endrin Ketone	--	--	--	MG/KG	0.00173 U	0.00189 U	0.00183 U	0.00182 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.00072 U	0.000787 U	0.000764 U	0.000757 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000864 U	0.000944 U	0.000917 U	0.000908 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00324 U	0.00354 U	0.00344 U	0.00341 U
Methoxychlor	--	--	--	MG/KG	0.00324 U	0.00354 U	0.00344 U	0.00341 U
P,P'-DDD	0.0033	13	14	MG/KG	0.00173 U	0.00189 U	0.00183 U	0.00182 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.00173 U	0.00189 U	0.00183 U	0.00182 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.00173 U	0.00189 U	0.00183 U	0.00182 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.184 U	0.2 U	0.193 U	0.191 U
Toxaphene	--	--	--	MG/KG	0.0324 U	0.0354 U	0.0344 U	0.0341 U
trans-Chlordane	--	--	--	MG/KG	0.00216 U	0.00236 U	0.00229 U	0.00227 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-6	RXSB-7	RXSB-7	RXSB-8
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	3 - 5	5 - 7	7 - 9
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.204 U	0.185 U	0.199 U	0.193 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.204 U	0.185 U	0.199 U	0.193 U
Aldrin	0.005	0.097	0.19	MG/KG	0.00188 U	0.00172 U	0.00186 U	0.00178 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.000782 U	0.000718 U	0.000776 U	0.00074 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.00188 U	0.00172 U	0.00186 U	0.00178 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.00188 U	0.00172 U	0.00186 U	0.00178 U
Beta Endosulfan	2.4	24	102	MG/KG	0.00188 U	0.00172 U	0.00186 U	0.00178 U
Chlordane	--	--	--	MG/KG	0.0156 U	0.0144 U	0.0155 U	0.0148 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00234 U	0.00216 U	0.00233 U	0.00222 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.00188 U	0.00172 U	0.00186 U	0.00178 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00117 U	0.00108 U	0.00116 U	0.00111 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000782 U	0.000718 U	0.000776 U	0.00074 U
Endrin	0.014	11	0.06	MG/KG	0.000782 U	0.000718 U	0.000776 U	0.00074 U
Endrin Aldehyde	--	--	--	MG/KG	0.00234 U	0.00216 U	0.00233 U	0.00222 U
Endrin Ketone	--	--	--	MG/KG	0.00188 U	0.00172 U	0.00186 U	0.00178 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.000782 U	0.000718 U	0.000776 U	0.00074 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000938 U	0.000862 U	0.000932 U	0.000888 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00352 U	0.00323 U	0.00349 U	0.00333 U
Methoxychlor	--	--	--	MG/KG	0.00352 U	0.00323 U	0.00349 U	0.00333 U
P,P'-DDD	0.0033	13	14	MG/KG	0.00188 U	0.00172 U	0.00186 U	0.00178 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.00188 U	0.00172 U	0.00186 U	0.00178 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.00188 U	0.00172 U	0.00186 U	0.00178 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.204 U	0.185 U	0.199 U	0.193 U
Toxaphene	--	--	--	MG/KG	0.0352 U	0.0323 U	0.0349 U	0.0333 U
trans-Chlordane	--	--	--	MG/KG	0.00234 U	0.00216 U	0.00233 U	0.00222 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-8	RXSB-9	RXSB-9	RXSB-9
				Sample Date:	08/01/2025	03/13/2023	03/13/2023	03/13/2023
				Sample Depth (ft bls):	9 - 11	7 - 9	7 - 9	9 - 11
				Normal Sample or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.201 U	0.181 U	0.182 U	0.188 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.201 U	0.181 U	0.182 U	0.188 U
Aldrin	0.005	0.097	0.19	MG/KG	0.0019 U	0.00166 U	0.0017 U	0.0018 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.000793 U	0.00069 U	0.00071 U	0.00075 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0019 U	0.00166 U	0.0017 U	0.0018 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.0019 U	0.00166 U	0.0017 U	0.0018 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0019 U	0.00166 U	0.0017 U	0.0018 U
Chlordane	--	--	--	MG/KG	0.0159 U	0.0138 U	0.0142 U	0.015 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00238 U	0.00207 U	0.00213 U	0.00225 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.0019 U	0.00166 U	0.0017 U	0.0018 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00119 U	0.00104 U	0.00106 U	0.00112 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000793 U	0.00069 U	0.00071 U	0.00075 U
Endrin	0.014	11	0.06	MG/KG	0.000793 U	0.00069 U	0.00071 U	0.00075 U
Endrin Aldehyde	--	--	--	MG/KG	0.00238 U	0.00207 U	0.00213 U	0.00225 U
Endrin Ketone	--	--	--	MG/KG	0.0019 U	0.00166 U	0.0017 U	0.0018 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.000793 U	0.00069 U	0.00071 U	0.00075 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000952 U	0.000828 U	0.000852 U	0.0009 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00357 U	0.0031 U	0.00319 U	0.00338 U
Methoxychlor	--	--	--	MG/KG	0.00357 U	0.0031 U	0.00319 U	0.00338 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0019 U	0.00166 U	0.0017 U	0.0018 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.0019 U	0.00166 U	0.0017 U	0.0018 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.0019 U	0.00166 U	0.0017 U	0.0018 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.201 U	0.181 U	0.182 U	0.188 U
Toxaphene	--	--	--	MG/KG	0.0357 U	0.031 U	0.0319 U	0.0338 U
trans-Chlordane	--	--	--	MG/KG	0.00238 U	0.00207 U	0.00213 U	0.00225 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-10	RXSB-10	RXSB-11	RXSB-11
				Sample Date:	03/13/2023	03/13/2023	07/28/2025	07/28/2025
				Sample Depth (ft bls):	5 - 8	8 - 11	6 - 8	13 - 15
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.18 U	0.176 U	0.185 U	0.198 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.18 U	0.176 U	0.185 U	0.198 U
Aldrin	0.005	0.097	0.19	MG/KG	0.00175 U	0.00164 U	0.00171 U	0.00187 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.00073 U	0.000684 U	0.000714 U	0.00078 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.00175 U	0.00164 U	0.00171 U	0.00187 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.00175 U	0.00164 U	0.00171 U	0.00187 U
Beta Endosulfan	2.4	24	102	MG/KG	0.00175 U	0.00164 U	0.00171 U	0.00187 U
Chlordane	--	--	--	MG/KG	0.0146 U	0.0137 U	0.0143 U	0.0156 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00219 U	0.00205 U	0.00214 U	0.00234 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.00175 U	0.00164 U	0.00171 U	0.00187 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.0011 U	0.00102 U	0.00107 U	0.00117 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000557 J	0.000684 U	0.000714 U	0.00078 U
Endrin	0.014	11	0.06	MG/KG	0.00073 U	0.000684 U	0.000714 U	0.00078 U
Endrin Aldehyde	--	--	--	MG/KG	0.00219 U	0.00205 U	0.00214 U	0.00234 U
Endrin Ketone	--	--	--	MG/KG	0.00175 U	0.00164 U	0.00171 U	0.00187 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.00073 U	0.000684 U	0.000714 U	0.00078 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000877 U	0.00082 U	0.000857 U	0.000936 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00329 U	0.00308 U	0.00321 U	0.00351 U
Methoxychlor	--	--	--	MG/KG	0.00329 U	0.00308 U	0.00321 U	0.00351 U
P,P'-DDD	0.0033	13	14	MG/KG	0.00175 U	0.00164 U	0.00171 U	0.00187 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.00175 U	0.00164 U	0.00171 U	0.00187 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.00175 U	0.00164 U	0.00171 U	0.00187 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.18 U	0.176 U	0.185 U	0.198 U
Toxaphene	--	--	--	MG/KG	0.0329 U	0.0308 U	0.0321 U	0.0351 U
trans-Chlordane	--	--	--	MG/KG	0.00219 U	0.00205 U	0.00214 U	0.00234 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-12	RXSB-12	RXSB-13	RXSB-13
				Sample Date:	07/31/2025	07/31/2025	07/29/2025	07/29/2025
				Sample Depth (ft bls):	6 - 8	8 - 10	8 - 10	10 - 12
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.186 U	0.201 U	0.189 U	0.178 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.186 U	0.201 U	0.189 U	0.178 U
Aldrin	0.005	0.097	0.19	MG/KG	0.00171 U	0.00192 U	0.00181 U	0.00166 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.000712 U	0.000799 U	0.000754 U	0.00069 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.00171 U	0.00192 U	0.00181 U	0.00166 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.00171 U	0.00192 U	0.00181 U	0.00166 U
Beta Endosulfan	2.4	24	102	MG/KG	0.00171 U	0.00192 U	0.00181 U	0.00166 U
Chlordane	--	--	--	MG/KG	0.0142 U	0.016 U	0.0151 U	0.0138 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00214 U	0.0024 U	0.00226 U	0.00207 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.00171 U	0.00192 U	0.00181 U	0.00166 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00107 U	0.0012 U	0.00113 U	0.00103 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000712 U	0.000799 U	0.000754 U	0.00069 U
Endrin	0.014	11	0.06	MG/KG	0.000712 U	0.000799 U	0.000754 U	0.00069 U
Endrin Aldehyde	--	--	--	MG/KG	0.00214 U	0.0024 U	0.00226 U	0.00207 U
Endrin Ketone	--	--	--	MG/KG	0.00171 U	0.00192 U	0.00181 U	0.00166 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.000712 U	0.000799 U	0.000754 U	0.00069 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000854 U	0.000959 U	0.000904 U	0.000828 U
Heptachlor Epoxide	--	--	--	MG/KG	0.0032 U	0.0036 U	0.00339 U	0.0031 U
Methoxychlor	--	--	--	MG/KG	0.0032 U	0.0036 U	0.00339 U	0.0031 U
P,P'-DDD	0.0033	13	14	MG/KG	0.00171 U	0.00192 U	0.00181 U	0.00166 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.00171 U	0.00192 U	0.00181 U	0.00166 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.00171 U	0.00192 U	0.00181 U	0.00166 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.186 U	0.201 U	0.189 U	0.178 U
Toxaphene	--	--	--	MG/KG	0.032 U	0.036 U	0.0339 U	0.031 U
trans-Chlordane	--	--	--	MG/KG	0.00214 U	0.0024 U	0.00226 U	0.00207 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-14	RXSB-14	RXSB-14	SRI-1
				Sample Date:	07/30/2025	07/30/2025	07/30/2025	10/31/2025
				Sample Depth (ft bls):	8 - 10	10 - 12	10 - 12	0 - 2
				Normal Sample or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.204 U	0.199 U	0.208 U	0.18 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.204 U	0.199 U	0.208 U	0.18 U
Aldrin	0.005	0.097	0.19	MG/KG	0.0019 U	0.00184 U	0.0019 U	0.00168 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.000791 U	0.000768 U	0.000794 U	0.000698 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0019 U	0.00184 U	0.0019 U	0.00168 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.0019 U	0.00184 U	0.0019 U	0.00168 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0019 U	0.00184 U	0.0019 U	0.00168 U
Chlordane	--	--	--	MG/KG	0.0158 U	0.0154 U	0.0159 U	0.014 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00237 U	0.0023 U	0.00238 U	0.0021 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.0019 U	0.00184 U	0.0019 U	0.00168 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00119 U	0.00115 U	0.00119 U	0.00105 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000791 U	0.000768 U	0.000794 U	0.000698 U
Endrin	0.014	11	0.06	MG/KG	0.000791 U	0.000768 U	0.000794 U	0.000698 U
Endrin Aldehyde	--	--	--	MG/KG	0.00237 UJ	0.0023 UJ	0.00238 U	0.0021 U
Endrin Ketone	--	--	--	MG/KG	0.0019 U	0.00184 U	0.0019 U	0.00168 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.000791 U	0.000768 U	0.000794 U	0.000698 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.00095 U	0.000921 U	0.000953 U	0.000838 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00356 U	0.00346 U	0.00357 U	0.00314 U
Methoxychlor	--	--	--	MG/KG	0.00356 U	0.00346 U	0.00357 U	0.00314 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0019 U	0.00184 U	0.0019 U	0.00168 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.0019 U	0.00184 U	0.0019 U	0.00168 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.0019 U	0.00184 U	0.0019 U	0.00168 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.204 U	0.199 U	0.208 U	0.18 U
Toxaphene	--	--	--	MG/KG	0.0356 U	0.0346 U	0.0357 U	0.0314 U
trans-Chlordane	--	--	--	MG/KG	0.00237 U	0.0023 U	0.00238 U	0.0021 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-1	SRI-2	SRI-2	SRI-2
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	4 - 6	0 - 2	3 - 5	6 - 8
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.189 U	0.194 U	0.188 U	0.185 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.189 U	0.194 U	0.188 U	0.185 U
Aldrin	0.005	0.097	0.19	MG/KG	0.00184 U	0.00113 J	0.00177 U	0.00172 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.000765 U	0.00077 U	0.000738 U	0.000718 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.00184 U	0.00185 U	0.00177 U	0.00172 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.00184 U	0.00185 U	0.00177 U	0.00172 U
Beta Endosulfan	2.4	24	102	MG/KG	0.00184 U	0.00185 U	0.00177 U	0.00172 U
Chlordane	--	--	--	MG/KG	0.0153 U	0.0307	0.0148 U	0.0144 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00229 U	0.00565	0.00222 U	0.00215 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.00184 U	0.00185 U	0.00177 U	0.00172 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00115 U	0.0033 J	0.00111 U	0.00108 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000765 U	0.00077 U	0.000738 U	0.000718 U
Endrin	0.014	11	0.06	MG/KG	0.000765 U	0.00077 U	0.000738 U	0.000718 U
Endrin Aldehyde	--	--	--	MG/KG	0.00229 U	0.00231 U	0.00222 U	0.00215 U
Endrin Ketone	--	--	--	MG/KG	0.00184 U	0.00185 U	0.00177 U	0.00172 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.000765 U	0.00077 U	0.000738 U	0.000718 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000918 U	0.000924 U	0.000886 U	0.000861 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00344 U	0.00346 U	0.00332 U	0.00323 U
Methoxychlor	--	--	--	MG/KG	0.00344 U	0.00346 U	0.00332 U	0.00323 U
P,P'-DDD	0.0033	13	14	MG/KG	0.00184 U	0.00185 U	0.00177 U	0.00172 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.00184 U	0.00157 J	0.00177 U	0.00172 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.00184 U	0.0031 J	0.00177 U	0.00172 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.189 U	0.194 U	0.188 U	0.185 U
Toxaphene	--	--	--	MG/KG	0.0344 U	0.0346 U	0.0332 U	0.0323 U
trans-Chlordane	--	--	--	MG/KG	0.00229 U	0.00277 J	0.00222 U	0.00215 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-2	SRI-3	SRI-3	SRI-4
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	12 - 14	0 - 2	3 - 5	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.181 U	0.195 U	0.19 U	0.182 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.181 U	0.195 U	0.19 U	0.182 U
Aldrin	0.005	0.097	0.19	MG/KG	0.00172 U	0.00186 U	0.00179 U	0.00173 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.000718 U	0.000776 U	0.000747 U	0.000719 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.00172 U	0.00186 U	0.00179 U	0.00173 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.00172 U	0.00186 U	0.00179 U	0.00173 U
Beta Endosulfan	2.4	24	102	MG/KG	0.00172 U	0.00186 U	0.00179 U	0.00173 U
Chlordane	--	--	--	MG/KG	0.0144 U	0.0155 U	0.0149 U	0.0144 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00215 U	0.00233 U	0.00224 U	0.00216 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.00172 U	0.00186 U	0.00179 U	0.00173 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00108 U	0.00116 U	0.00112 U	0.00108 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000718 U	0.000776 U	0.000747 U	0.000719 U
Endrin	0.014	11	0.06	MG/KG	0.000718 U	0.000776 U	0.000747 U	0.000719 U
Endrin Aldehyde	--	--	--	MG/KG	0.00215 U	0.00233 U	0.00224 U	0.00216 U
Endrin Ketone	--	--	--	MG/KG	0.00172 U	0.00186 U	0.00179 U	0.00173 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.000718 U	0.000776 U	0.000747 U	0.000719 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000861 U	0.000932 U	0.000896 U	0.000863 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00323 U	0.00349 U	0.00336 U	0.00324 U
Methoxychlor	--	--	--	MG/KG	0.00323 U	0.00349 U	0.00336 U	0.00324 U
P,P'-DDD	0.0033	13	14	MG/KG	0.00172 U	0.00186 U	0.00179 U	0.00173 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.00172 U	0.00186 U	0.00179 U	0.00173 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.00172 U	0.00186 U	0.00179 U	0.00173 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.181 U	0.195 U	0.19 U	0.182 U
Toxaphene	--	--	--	MG/KG	0.0323 U	0.0349 U	0.0336 U	0.0324 U
trans-Chlordane	--	--	--	MG/KG	0.00215 U	0.00233 U	0.00224 U	0.00216 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-4	SRI-4	SRI-5	SRI-5
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	4 - 6	11 - 13	0 - 2	3 - 5
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.184 U	0.193 U	0.19 U	0.184 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.184 U	0.193 U	0.19 U	0.184 U
Aldrin	0.005	0.097	0.19	MG/KG	0.00174 U	0.00178 U	0.0018 U	0.00172 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.000725 U	0.000741 U	0.00075 U	0.000717 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.00174 U	0.00178 U	0.0018 U	0.00172 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.00174 U	0.00178 U	0.0018 U	0.00172 U
Beta Endosulfan	2.4	24	102	MG/KG	0.00174 U	0.00178 U	0.0018 U	0.00172 U
Chlordane	--	--	--	MG/KG	0.0145 U	0.0148 U	0.015 U	0.0143 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00217 U	0.00222 U	0.00225 U	0.00215 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.00174 U	0.00178 U	0.0018 U	0.00172 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00109 U	0.00111 U	0.00112 U	0.00108 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000725 U	0.000741 U	0.00075 U	0.000717 U
Endrin	0.014	11	0.06	MG/KG	0.000725 U	0.000741 U	0.00075 U	0.000717 U
Endrin Aldehyde	--	--	--	MG/KG	0.00217 U	0.00222 U	0.00225 U	0.00215 U
Endrin Ketone	--	--	--	MG/KG	0.00174 U	0.00178 U	0.0018 U	0.00172 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.000725 U	0.000741 U	0.00075 U	0.000717 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.00087 U	0.000889 U	0.000899 U	0.00086 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00326 U	0.00333 U	0.00337 U	0.00322 U
Methoxychlor	--	--	--	MG/KG	0.00326 U	0.00333 U	0.00337 U	0.00322 U
P,P'-DDD	0.0033	13	14	MG/KG	0.00174 U	0.00178 U	0.0018 U	0.00172 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.00174 U	0.00178 U	0.0018 U	0.00172 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.00212	0.00178 U	0.0018 U	0.00172 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.184 U	0.193 U	0.19 U	0.184 U
Toxaphene	--	--	--	MG/KG	0.0326 U	0.0333 U	0.0337 U	0.0322 U
trans-Chlordane	--	--	--	MG/KG	0.00217 U	0.00222 U	0.00225 U	0.00215 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-6	SRI-6	SRI-7	SRI-7
				Sample Date:	10/31/2025	10/31/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	0 - 2	2 - 4
				Normal Sample or Field Duplicate:	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.179 U	0.182 U	0.192 U	0.194 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.179 U	0.182 U	0.192 U	0.194 U
Aldrin	0.005	0.097	0.19	MG/KG	0.00169 U	0.00173 U	0.0018 U	0.0018 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.000703 U	0.000722 U	0.000748 U	0.000751 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.00169 U	0.00173 U	0.0018 U	0.0018 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.00169 U	0.00173 U	0.0018 U	0.0018 U
Beta Endosulfan	2.4	24	102	MG/KG	0.00169 U	0.00173 U	0.0018 U	0.0018 U
Chlordane	--	--	--	MG/KG	0.0141 U	0.0144 U	0.0789	0.015 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00211 U	0.00217 U	0.00736 J	0.00225 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.00169 U	0.00173 U	0.0018 U	0.0018 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00105 U	0.00108 U	0.00112 U	0.00112 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000703 U	0.000722 U	0.000748 U	0.000751 U
Endrin	0.014	11	0.06	MG/KG	0.000703 U	0.000722 U	0.000748 U	0.000751 U
Endrin Aldehyde	--	--	--	MG/KG	0.00211 U	0.00217 U	0.00224 U	0.00225 U
Endrin Ketone	--	--	--	MG/KG	0.00169 U	0.00173 U	0.0018 U	0.0018 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.000703 U	0.000722 U	0.000748 U	0.000751 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000844 U	0.000866 U	0.000898 U	0.000901 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00316 U	0.00325 U	0.00154 J	0.00338 U
Methoxychlor	--	--	--	MG/KG	0.00316 U	0.00325 U	0.00337 U	0.00338 U
P,P'-DDD	0.0033	13	14	MG/KG	0.00169 U	0.00173 U	0.0018 U	0.0018 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.00169 U	0.00173 U	**0.00722**	0.0018 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.00169 U	0.00173 U	**0.0138**	0.0018 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.179 U	0.182 U	0.192 U	0.194 U
Toxaphene	--	--	--	MG/KG	0.0316 U	0.0325 U	0.0337 U	0.0338 U
trans-Chlordane	--	--	--	MG/KG	0.00211 U	0.00217 U	0.00562	0.00225 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-7	SRI-8	SRI-8	SRI-9
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	11 - 13	0 - 2	3 - 5	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.182 U	0.195 U	0.192 U	0.181 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.182 U	0.195 U	0.192 U	0.181 U
Aldrin	0.005	0.097	0.19	MG/KG	0.00166 U	0.00178 U	0.00176 U	0.00167 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.000693 U	0.00074 U	0.000732 U	0.000696 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.00166 U	0.00178 U	0.00176 U	0.00167 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.00166 U	0.00178 U	0.00176 U	0.00167 U
Beta Endosulfan	2.4	24	102	MG/KG	0.00166 U	0.00178 U	0.00176 U	0.00167 U
Chlordane	--	--	--	MG/KG	0.0139 U	0.0819	0.029 J	0.0139 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00208 U	0.0108	0.00242	0.00209 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.00166 U	0.00178 U	0.00176 U	0.00167 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00104 U	0.00111 U	0.0011 U	0.00104 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000693 U	0.00074 U	0.000732 U	0.000696 U
Endrin	0.014	11	0.06	MG/KG	0.000693 U	0.00074 U	0.000732 U	0.000696 U
Endrin Aldehyde	--	--	--	MG/KG	0.00208 U	0.00222 U	0.00219 U	0.00209 U
Endrin Ketone	--	--	--	MG/KG	0.00166 U	0.00178 U	0.00176 U	0.00167 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.000693 U	0.00074 U	0.000732 U	0.000696 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000832 U	0.000889 U	0.000878 U	0.000835 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00312 U	0.00333 U	0.00329 U	0.00313 U
Methoxychlor	--	--	--	MG/KG	0.00312 U	0.00333 U	0.00329 U	0.00313 U
P,P'-DDD	0.0033	13	14	MG/KG	0.00166 U	0.00178 U	0.00176 U	0.00167 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.00166 U	**0.00545**	**0.00346**	0.00167 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.00166 U	**0.0107**	**0.00514**	0.00167 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.182 U	0.195 U	0.192 U	0.181 U
Toxaphene	--	--	--	MG/KG	0.0312 U	0.0333 U	0.0329 U	0.0313 U
trans-Chlordane	--	--	--	MG/KG	0.00208 U	0.00734	0.00195 J	0.00209 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-9	SRI-9	SRI-10	SRI-10
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	3 - 5	0 - 2	3 - 5
				Normal Sample or Field Duplicate:	FD	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.18 U	0.177 U	0.192 U	0.175 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.18 U	0.177 U	0.192 U	0.175 U
Aldrin	0.005	0.097	0.19	MG/KG	0.00164 U	0.00169 U	0.00182 U	0.00165 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.000685 U	0.000703 U	0.00076 U	0.000686 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.00164 U	0.00169 U	0.00182 U	0.00165 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.00164 U	0.00169 U	0.00182 U	0.00165 U
Beta Endosulfan	2.4	24	102	MG/KG	0.00164 U	0.00169 U	0.00182 U	0.00165 U
Chlordane	--	--	--	MG/KG	0.0137 U	0.014 U	0.0152 U	0.0137 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00205 U	0.00211 U	0.00197 J	0.00206 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.00164 U	0.00169 U	0.00182 U	0.00165 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00103 U	0.00105 U	0.00114 U	0.00103 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000685 U	0.000703 U	0.00076 U	0.000686 U
Endrin	0.014	11	0.06	MG/KG	0.000685 U	0.000703 U	0.00076 U	0.000686 U
Endrin Aldehyde	--	--	--	MG/KG	0.00205 U	0.00211 U	0.00228 U	0.00206 U
Endrin Ketone	--	--	--	MG/KG	0.00164 U	0.00169 U	0.00182 U	0.00165 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.000685 U	0.000703 U	0.00076 U	0.000686 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000822 U	0.000843 U	0.000912 U	0.000823 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00308 U	0.00316 U	0.00342 U	0.00309 U
Methoxychlor	--	--	--	MG/KG	0.00308 U	0.00316 U	0.00342 U	0.00309 U
P,P'-DDD	0.0033	13	14	MG/KG	0.00164 U	0.00169 U	0.00182 U	0.00165 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.00164 U	0.00169 U	0.0012 J	0.00165 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.00164 U	0.00169 U	0.00245 J	0.00165 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.18 U	0.177 U	0.192 U	0.175 U
Toxaphene	--	--	--	MG/KG	0.0308 U	0.0316 U	0.0342 U	0.0309 U
trans-Chlordane	--	--	--	MG/KG	0.00205 U	0.00211 U	0.00156 J	0.00206 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-10	SRI-11	SRI-11	SRI-11
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	10 - 12	0 - 2	4 - 6	11 - 13
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.188 U	0.199 U	0.186 U	0.207 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.188 U	0.199 U	0.186 U	0.207 U
Aldrin	0.005	0.097	0.19	MG/KG	0.0018 U	0.00186 U	0.00174 U	0.00195 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.00075 U	0.000774 U	0.000725 U	0.000813 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0018 U	0.00186 U	0.00174 U	0.00195 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.0018 U	0.00186 U	0.00174 U	0.00195 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0018 U	0.00186 U	0.00174 U	0.00195 U
Chlordane	--	--	--	MG/KG	0.015 U	0.0155 U	0.0145 U	0.0163 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00225 U	0.00232 U	0.00217 U	0.00244 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.0018 U	0.00186 U	0.00174 U	0.00195 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00112 U	0.00116 U	0.00109 U	0.00122 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.00075 U	0.000774 U	0.000725 U	0.000813 U
Endrin	0.014	11	0.06	MG/KG	0.00075 U	0.000774 U	0.000725 U	0.000813 U
Endrin Aldehyde	--	--	--	MG/KG	0.00225 U	0.00232 U	0.00217 U	0.00244 U
Endrin Ketone	--	--	--	MG/KG	0.0018 U	0.00186 U	0.00174 U	0.00195 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.00075 U	0.000774 U	0.000725 U	0.000813 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000901 U	0.000928 U	0.00087 U	0.000976 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00338 U	0.00348 U	0.00326 U	0.00366 U
Methoxychlor	--	--	--	MG/KG	0.00338 U	0.00348 U	0.00326 U	0.00366 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0018 U	0.00186 U	0.00174 U	0.00195 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.0018 U	0.00186 U	0.00174 U	0.00195 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.0018 U	0.00186 U	0.00174 U	0.00195 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.188 U	0.199 U	0.186 U	0.207 U
Toxaphene	--	--	--	MG/KG	0.0338 U	0.0348 U	0.0326 U	0.0366 U
trans-Chlordane	--	--	--	MG/KG	0.00225 U	0.00232 U	0.00217 U	0.00244 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-12	SRI-12	SRI-12	SRI-12
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	4 - 6	7 - 9	11 - 13
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.187 U	0.224 U	0.192 U	0.205 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.187 U	0.224 U	0.192 U	0.205 U
Aldrin	0.005	0.097	0.19	MG/KG	0.00174 U	0.00205 U	0.00179 U	0.00187 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.000723 U	0.000853 U	0.000747 U	0.000779 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.00174 U	0.00205 U	0.00179 U	0.00187 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.00174 U	0.00205 U	0.00179 U	0.00187 U
Beta Endosulfan	2.4	24	102	MG/KG	0.00174 U	0.00205 U	0.00179 U	0.00187 U
Chlordane	--	--	--	MG/KG	0.0145 U	0.0171 U	0.0149 U	0.0156 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00217 U	0.00256 U	0.00224 U	0.00234 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.00174 U	0.00205 U	0.00179 U	0.00187 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00108 U	0.00128 U	0.00112 U	0.00117 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000723 U	0.000853 U	0.000747 U	0.000779 U
Endrin	0.014	11	0.06	MG/KG	0.000723 U	0.000853 U	0.000747 U	0.000779 U
Endrin Aldehyde	--	--	--	MG/KG	0.00217 U	0.00256 U	0.00224 U	0.00234 U
Endrin Ketone	--	--	--	MG/KG	0.00174 U	0.00205 U	0.00179 U	0.00187 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.000723 U	0.000853 U	0.000747 U	0.000779 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000868 U	0.00102 U	0.000897 U	0.000935 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00325 U	0.00384 U	0.00336 U	0.0035 U
Methoxychlor	--	--	--	MG/KG	0.00325 U	0.00384 U	0.00336 U	0.0035 U
P,P'-DDD	0.0033	13	14	MG/KG	0.00174 U	0.00205 U	0.00179 U	0.00187 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.00174 U	0.00205 U	0.00179 U	0.00187 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.00174 U	0.00205 U	0.00179 U	0.00187 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.187 U	0.224 U	0.192 U	0.205 U
Toxaphene	--	--	--	MG/KG	0.0325 U	0.0384 U	0.0336 U	0.035 U
trans-Chlordane	--	--	--	MG/KG	0.00217 U	0.00256 U	0.00224 U	0.00234 U

Table 6. Summary of Pesticides and Herbicides in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-13	SRI-13	SRI-13	SRI-13
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	4 - 6	7 - 9	11 - 13
				Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.189 U	0.188 U	0.211 U	0.194 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.189 U	0.188 U	0.211 U	0.194 U
Aldrin	0.005	0.097	0.19	MG/KG	0.00179 U	0.00175 U	0.00195 U	0.00186 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.000744 U	0.000728 U	0.000811 U	0.000773 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.00179 U	0.00175 U	0.00195 U	0.00186 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.00179 U	0.00175 U	0.00195 U	0.00186 U
Beta Endosulfan	2.4	24	102	MG/KG	0.00179 U	0.00175 U	0.00195 U	0.00186 U
Chlordane	--	--	--	MG/KG	0.0149 U	0.0146 U	0.0162 U	0.0155 U
cis-Chlordane	0.094	4.2	2.9	MG/KG	0.00223 U	0.00218 U	0.00243 U	0.00232 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.00179 U	0.00175 U	0.00195 U	0.00186 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.00112 U	0.00109 U	0.00122 U	0.00116 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000744 U	0.000728 U	0.000811 U	0.000773 U
Endrin	0.014	11	0.06	MG/KG	0.000744 U	0.000728 U	0.000811 U	0.000773 U
Endrin Aldehyde	--	--	--	MG/KG	0.00223 U	0.00218 U	0.00243 U	0.00232 U
Endrin Ketone	--	--	--	MG/KG	0.00179 U	0.00175 U	0.00195 U	0.00186 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.000744 U	0.000728 U	0.000811 U	0.000773 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000893 U	0.000874 U	0.000973 U	0.000928 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00335 U	0.00328 U	0.00365 U	0.00348 U
Methoxychlor	--	--	--	MG/KG	0.00335 U	0.00328 U	0.00365 U	0.00348 U
P,P'-DDD	0.0033	13	14	MG/KG	0.00179 U	0.00175 U	0.00195 U	0.00186 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	0.00179 U	0.00175 U	0.00195 U	0.00186 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.00179 U	0.00175 U	0.00195 U	0.00186 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.189 U	0.188 U	0.211 U	0.194 U
Toxaphene	--	--	--	MG/KG	0.0335 U	0.0328 U	0.0365 U	0.0348 U
trans-Chlordane	--	--	--	MG/KG	0.00223 U	0.00218 U	0.00243 U	0.00232 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-1	RXSB-1	RXSB-1	RXSB-2
			Sample Date:		07/31/2025	07/31/2025	07/31/2025	07/31/2025
			Sample Depth (ft bls):		8 - 10	8 - 10	10 - 12	6 - 8
			Normal Sample or Field Duplicate:		N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.8 U	0.798 U	0.8 U	0.798 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.8 U	0.798 U	0.8 U	0.798 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	2 U	2 U	2 U	2 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	2 U	2 U	2 U	2 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	5 U	4.99 U	5 U	4.99 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	5 U	4.99 U	5 U	4.99 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	1 U	0.998 U	1 U	0.998 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.8 U	0.798 U	0.8 U	0.798 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.8 U	0.798 U	0.8 U	0.798 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.4 U	0.399 U	0.4 U	0.399 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.4 U	0.399 U	0.4 U	0.399 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.8 U	0.798 U	0.8 U	0.798 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.4 U	0.399 U	0.4 U	0.399 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.4 U	0.399 U	0.4 U	0.399 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.8 U	0.798 U	0.8 U	0.798 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.2 U	0.2 U	0.098 J	0.089 J
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.2 U	0.2 U	0.206	0.2 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.2 U	0.2 U	0.12 J	0.2 U
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.2 U	0.2 U	0.081 J	0.2 U
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-1	RXSB-1	RXSB-1	RXSB-2
			Sample Date:		07/31/2025	07/31/2025	07/31/2025	07/31/2025
			Sample Depth (ft bls):		8 - 10	8 - 10	10 - 12	6 - 8
			Normal Sample or Field Duplicate:		N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.2 U	0.2 U	0.478	0.238
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.082 J	0.144 J	**1.15**	0.147 J
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.4 U	0.399 U	0.189 J	0.399 U
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.2 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.8 U	0.798 U	0.8 U	0.798 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.8 U	0.798 U	0.8 U	0.798 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-2	RXSB-3	RXSB-3	RXSB-4
			Sample Date:		07/31/2025	07/31/2025	07/31/2025	08/01/2025
			Sample Depth (ft bls):		8 - 10	7 - 9	9 - 11	6 - 8
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.797 U	0.799 U	0.801 U	0.799 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.797 U	0.799 U	0.801 U	0.799 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.99 U	2 U	2 U	2 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.99 U	2 U	2 U	2 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	4.98 U	4.99 U	5 U	4.99 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	4.98 U	4.99 U	5 U	4.99 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	0.996 U	0.999 U	1 U	0.998 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.797 U	0.799 U	0.801 U	0.799 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.797 U	0.799 U	0.801 U	0.799 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.398 U	0.4 U	0.4 U	0.399 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.398 U	0.4 U	0.4 U	0.399 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.797 U	0.799 U	0.801 U	0.799 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.398 U	0.4 U	0.4 U	0.399 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.398 U	0.4 U	0.4 U	0.399 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.797 U	0.799 U	0.801 U	0.046 J
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.199 U	0.083 J	0.2 U	0.031 J
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.104 J	0.11 J	0.2 U	0.039 J
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.033 J
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-2	RXSB-3	RXSB-3	RXSB-4
			Sample Date:		07/31/2025	07/31/2025	07/31/2025	08/01/2025
			Sample Depth (ft bls):		8 - 10	7 - 9	9 - 11	6 - 8
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.199 U	0.217	0.173 J	0.164 J
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.122 J	0.166 J	0.1 J	0.068 J
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.398 U	0.377 J	0.4 U	0.05 J
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.797 U	0.799 U	0.801 U	0.799 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.797 U	0.799 U	0.801 U	0.799 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-4	RXSB-5	RXSB-5	RXSB-5
			Sample Date:		08/01/2025	08/01/2025	08/01/2025	08/01/2025
			Sample Depth (ft bls):		8 - 10	8 - 10	8 - 10	10 - 12
			Normal Sample or Field Duplicate:		N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.795 U	0.8 U	0.8 U	0.798 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.795 U	0.8 U	0.8 U	0.798 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.99 U	2 U	2 U	2 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.99 U	2 U	2 U	2 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	4.97 U	5 U	5 U	4.99 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	4.97 U	5 U	5 U	4.99 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	0.993 U	1 U	1 U	0.998 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.795 U	0.8 U	0.8 U	0.798 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.795 U	0.8 U	0.8 U	0.798 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.397 U	0.4 U	0.4 U	0.399 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.397 U	0.4 U	0.4 U	0.399 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.795 U	0.8 U	0.8 U	0.798 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.397 U	0.4 U	0.4 U	0.399 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.397 U	0.4 U	0.4 U	0.399 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.058 J	0.8 U	0.8 U	0.798 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	1.92
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.184 J
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.035 J	0.014 J	0.014 J	0.024 J
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.041 J	0.024 J	0.02 J	0.036 J
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.038 J
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.199 U	0.066 J	0.053 J	0.059 J
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-4	RXSB-5	RXSB-5	RXSB-5
			Sample Date:		08/01/2025	08/01/2025	08/01/2025	08/01/2025
			Sample Depth (ft bls):		8 - 10	8 - 10	8 - 10	10 - 12
			Normal Sample or Field Duplicate:		N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.116 J	0.128 J	0.119 J	0.711
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.15 J	0.036 J	0.043 J	0.063 J
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.05 J	0.4 U	0.043 J	0.056 J
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.2 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.199 U	0.2 U	0.2 U	0.054 J
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.795 U	0.8 U	0.8 U	0.798 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.795 U	0.8 U	0.8 U	0.798 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-6	RXSB-6	RXSB-7	RXSB-7
			Sample Date:		08/01/2025	08/01/2025	08/01/2025	08/01/2025
			Sample Depth (ft bls):		6 - 8	8 - 10	3 - 5	5 - 7
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.795 U	0.796 U	0.798 U	0.798 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.795 U	0.796 U	0.798 U	0.798 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.99 U	1.99 U	1.99 U	2 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.99 U	1.99 U	1.99 U	2 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	4.97 U	4.98 U	4.99 U	4.99 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	4.97 U	4.98 U	4.99 U	4.99 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	0.993 U	0.995 U	0.997 U	0.998 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.795 U	0.796 U	0.798 U	0.798 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.795 U	0.796 U	0.798 U	0.798 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.397 U	0.398 U	0.399 U	0.399 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.397 U	0.398 U	0.399 U	0.399 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.795 U	0.796 U	0.798 U	0.798 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.397 U	0.398 U	0.399 U	0.399 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.397 U	0.398 U	0.399 U	0.399 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.795 U	0.796 U	0.798 U	0.798 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-6	RXSB-6	RXSB-7	RXSB-7
			Sample Date:		08/01/2025	08/01/2025	08/01/2025	08/01/2025
			Sample Depth (ft bls):		6 - 8	8 - 10	3 - 5	5 - 7
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.199 U	0.199 U	0.042 J	0.2 U
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.397 U	0.398 U	0.399 U	0.399 U
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.199 U	0.199 U	0.199 U	0.2 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.795 U	0.796 U	0.798 U	0.798 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.795 U	0.796 U	0.798 U	0.798 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-8	RXSB-8	RXSB-9	RXSB-9
			Sample Date:		08/01/2025	08/01/2025	03/13/2023	03/13/2023
			Sample Depth (ft bls):		7 - 9	9 - 11	7 - 9	7 - 9
			Normal Sample or Field Duplicate:		N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.798 U	0.798 U	0.804 U	0.785 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.798 U	0.798 U	0.804 U	0.785 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.99 U	2 U	2.01 U	1.96 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.99 U	2 U	2.01 U	1.96 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	4.99 U	4.99 U	5.03 U	4.91 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	4.99 U	4.99 U	5.03 U	4.91 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	0.997 U	0.998 U	1 U	0.982 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.798 U	0.798 U	0.804 U	0.785 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.798 U	0.798 U	0.804 U	0.785 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.399 U	0.399 U	0.402 U	0.393 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.399 U	0.399 U	0.402 U	0.393 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.798 U	0.798 U	0.804 U	0.785 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.399 U	0.399 U	0.402 U	0.393 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.399 U	0.399 U	0.402 U	0.393 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.798 U	0.798 U	0.804 U	0.785 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-8	RXSB-8	RXSB-9	RXSB-9
			Sample Date:		08/01/2025	08/01/2025	03/13/2023	03/13/2023
			Sample Depth (ft bls):		7 - 9	9 - 11	7 - 9	7 - 9
			Normal Sample or Field Duplicate:		N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.399 U	0.399 U	0.402 U	0.393 U
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.199 U	0.2 U	0.201 U	0.196 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.798 U	0.798 U	0.804 U	0.785 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.798 U	0.798 U	0.804 U	0.785 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-9	RXSB-10	RXSB-10	RXSB-11
			Sample Date:		03/13/2023	03/13/2023	03/13/2023	07/28/2025
			Sample Depth (ft bls):		9 - 11	5 - 8	8 - 11	6 - 8
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.791 U	0.795 U	0.799 U	0.796 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.791 U	0.795 U	0.799 U	0.796 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.98 U	1.99 U	2 U	1.99 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.98 U	1.99 U	2 U	1.99 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	4.94 U	4.97 U	4.99 U	4.97 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	4.94 U	4.97 U	4.99 U	4.97 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	0.988 U	0.994 U	0.998 U	0.995 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.791 U	0.795 U	0.799 U	0.796 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.791 U	0.795 U	0.799 U	0.796 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.395 U	0.397 U	0.399 U	0.398 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.395 U	0.397 U	0.399 U	0.398 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.791 U	0.795 U	0.799 U	0.796 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.395 U	0.397 U	0.399 U	0.398 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.395 U	0.397 U	0.399 U	0.398 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.791 U	0.795 U	0.799 U	0.796 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-9	RXSB-10	RXSB-10	RXSB-11
			Sample Date:		03/13/2023	03/13/2023	03/13/2023	07/28/2025
			Sample Depth (ft bls):		9 - 11	5 - 8	8 - 11	6 - 8
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.395 U	0.397 U	0.399 U	0.398 U
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.199 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.791 U	0.795 U	0.799 U	0.796 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.791 U	0.795 U	0.799 U	0.796 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-11	RXSB-12	RXSB-12	RXSB-13
			Sample Date:		07/28/2025	07/31/2025	07/31/2025	07/29/2025
			Sample Depth (ft bls):		13 - 15	6 - 8	8 - 10	8 - 10
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.798 U	0.799 U	0.798 U	0.796 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.798 U	0.799 U	0.798 U	0.796 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	2 U	2 U	2 U	0.087 J
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	2 U	2 U	2 U	1.99 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.199 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	4.99 U	4.99 U	4.99 U	4.98 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	4.99 U	4.99 U	4.99 U	4.98 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	0.998 U	0.999 U	0.998 U	0.996 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.798 U	0.799 U	0.798 U	0.034 J
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.798 U	0.799 U	0.798 U	0.031 J
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.199 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.199 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.199 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.399 U	0.4 U	0.399 U	0.398 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.399 U	0.4 U	0.399 U	0.398 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.798 U	0.799 U	0.798 U	0.796 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.399 U	0.4 U	0.399 U	0.398 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.399 U	0.4 U	0.399 U	0.398 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.022 J	0.2 U	0.2 U	0.199 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.798 U	0.799 U	0.798 U	0.043 J
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.375
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.041 J
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.199 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.199 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.199 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.014 J	0.2 U	0.2 U	0.016 J
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.199 U
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.018 J	0.2 U	0.2 U	0.018 J
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.199 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.026 J
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.199 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-11	RXSB-12	RXSB-12	RXSB-13
			Sample Date:		07/28/2025	07/31/2025	07/31/2025	07/29/2025
			Sample Depth (ft bls):		13 - 15	6 - 8	8 - 10	8 - 10
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.2 U	0.078 J	0.2 U	0.187 J
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.027 J	0.2 U	0.2 U	0.199 U
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.199 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.399 U	0.4 U	0.399 U	0.041 J
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.199 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.199 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.2 U	0.2 U	0.2 U	0.017 J
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.798 U	0.799 U	0.798 U	0.796 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.798 U	0.799 U	0.798 U	0.796 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-13	RXSB-14	RXSB-14	SRI-1
			Sample Date:		07/29/2025	07/30/2025	07/30/2025	10/31/2025
			Sample Depth (ft bls):		10 - 12	8 - 10	10 - 12	0 - 2
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.799 U	0.795 U	0.789 U	0.784 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.799 U	0.795 U	0.789 U	0.784 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	0.097 J	1.99 U	1.97 U	1.96 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	2 U	1.99 U	1.97 U	1.96 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	5 U	4.97 U	4.93 U	4.9 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	5 U	4.97 U	4.93 U	4.9 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	0.999 U	0.994 U	0.986 U	0.98 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.03 J	0.795 U	0.789 U	0.784 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.799 U	0.795 U	0.789 U	0.784 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.4 U	0.398 U	0.394 U	0.392 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.4 U	0.398 U	0.394 U	0.392 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.799 U	0.795 U	0.789 U	0.784 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.4 U	0.398 U	0.394 U	0.392 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.4 U	0.398 U	0.394 U	0.392 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.799 U	0.795 U	0.081 J	0.784 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.018 J	0.199 U	0.197 U	0.196 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.049 J
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.02 J	0.199 U	0.197 U	0.196 U
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.028 J	0.199 U	0.197 U	0.196 U
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		RXSB-13	RXSB-14	RXSB-14	SRI-1
			Sample Date:		07/29/2025	07/30/2025	07/30/2025	10/31/2025
			Sample Depth (ft bls):		10 - 12	8 - 10	10 - 12	0 - 2
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.256	0.199 U	0.073 J	0.153 J
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.2 U	0.037 J	0.047 J	0.075 J
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.4 U	0.398 U	0.066 J	0.392 U
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.2 U	0.199 U	0.197 U	0.196 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.799 U	0.795 U	0.789 U	0.784 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.799 U	0.795 U	0.789 U	0.38 J

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-1	SRI-2	SRI-2	SRI-2
			Sample Date:		10/31/2025	10/31/2025	10/31/2025	10/31/2025
			Sample Depth (ft bls):		4 - 6	0 - 2	3 - 5	6 - 8
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.794 U	0.797 U	0.798 U	0.799 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.794 U	0.797 U	0.798 U	0.799 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.98 U	1.99 U	2 U	2 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.98 U	1.99 U	2 U	2 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	4.96 U	4.98 U	4.99 U	4.99 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	4.96 U	4.98 U	4.99 U	4.99 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	0.992 U	0.996 U	0.998 U	0.999 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.794 U	0.797 U	0.798 U	0.799 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.794 U	0.797 U	0.798 U	0.799 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.397 U	0.398 U	0.399 U	0.399 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.397 U	0.398 U	0.399 U	0.399 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.794 U	0.797 U	0.798 U	0.799 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.397 U	0.398 U	0.399 U	0.399 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.397 U	0.398 U	0.399 U	0.399 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.794 U	0.797 U	0.798 U	0.799 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.198 U	0.036 J	0.2 U	0.2 U
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.04 J	0.038 J	0.038 J	0.044 J
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.198 U	0.036 J	0.2 U	0.034 J
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-1	SRI-2	SRI-2	SRI-2
			Sample Date:		10/31/2025	10/31/2025	10/31/2025	10/31/2025
			Sample Depth (ft bls):		4 - 6	0 - 2	3 - 5	6 - 8
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.048 J	0.149 J	0.094 J	0.198 J
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.198 U	0.066 J	0.066 J	0.06 J
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.397 U	0.398 U	0.04 J	0.076 J
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.198 U	0.199 U	0.2 U	0.2 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.794 U	0.797 U	0.798 U	0.799 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.147 J	0.261 J	0.798 U	0.799 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-2	SRI-3	SRI-3	SRI-4
			Sample Date:		10/31/2025	10/31/2025	10/31/2025	10/31/2025
			Sample Depth (ft bls):		12 - 14	0 - 2	3 - 5	0 - 2
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.788 U	0.801 U	0.794 U	0.792 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.788 U	0.801 U	0.794 U	0.792 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.97 U	2 U	1.98 U	1.98 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.97 U	2 U	1.98 U	1.98 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	4.92 U	5.01 U	4.96 U	4.95 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	4.92 U	5.01 U	4.96 U	4.95 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	0.984 U	1 U	0.992 U	0.99 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.788 U	0.801 U	0.794 U	0.792 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.788 U	0.801 U	0.794 U	0.792 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.394 U	0.401 U	0.397 U	0.396 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.394 U	0.401 U	0.397 U	0.396 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.788 U	0.801 U	0.794 U	0.792 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.394 U	0.401 U	0.397 U	0.396 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.394 U	0.401 U	0.397 U	0.396 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.788 U	0.801 U	0.794 U	0.792 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.039 J	0.066 J	0.048 J	0.04 J
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-2	SRI-3	SRI-3	SRI-4
			Sample Date:		10/31/2025	10/31/2025	10/31/2025	10/31/2025
			Sample Depth (ft bls):		12 - 14	0 - 2	3 - 5	0 - 2
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.118 J	0.34	0.198 U	0.083 J
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.197 U	0.2 U	0.143 J	0.198 U
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.394 U	0.401 U	0.058 J	0.396 U
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.197 U	0.2 U	0.198 U	0.198 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.788 U	0.801 U	0.794 U	0.792 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.788 U	0.278 J	0.115 J	0.146 J

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-4	SRI-4	SRI-5	SRI-5
			Sample Date:		10/31/2025	10/31/2025	10/31/2025	10/31/2025
			Sample Depth (ft bls):		4 - 6	11 - 13	0 - 2	3 - 5
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.793 U	0.793 U	0.789 U	0.802 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.793 U	0.793 U	0.789 U	0.802 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.98 U	1.98 U	1.97 U	2 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.98 U	1.98 U	1.97 U	2 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	4.95 U	4.95 U	4.93 U	5.01 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	4.95 U	4.95 U	4.93 U	5.01 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	0.991 U	0.991 U	0.987 U	1 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.793 U	0.793 U	0.789 U	0.802 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.793 U	0.793 U	0.789 U	0.802 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.396 U	0.396 U	0.395 U	0.401 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.396 U	0.396 U	0.395 U	0.401 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.793 U	0.793 U	0.789 U	0.802 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.396 U	0.396 U	0.395 U	0.401 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.396 U	0.396 U	0.395 U	0.401 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.793 U	0.793 U	0.789 U	0.802 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.198 U	0.198 U	0.034 J	0.044 J
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-4	SRI-4	SRI-5	SRI-5
			Sample Date:		10/31/2025	10/31/2025	10/31/2025	10/31/2025
			Sample Depth (ft bls):		4 - 6	11 - 13	0 - 2	3 - 5
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.059 J	0.048 J	0.148 J	0.134 J
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.198 U	0.198 U	0.043 J	0.058 J
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.396 U	0.396 U	0.395 U	0.044 J
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.198 U	0.198 U	0.197 U	0.2 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.793 U	0.793 U	0.789 U	0.802 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.793 U	0.793 U	0.789 U	0.573 J

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-6	SRI-6	SRI-7	SRI-7
			Sample Date:		10/31/2025	10/31/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	0 - 2	0 - 2	2 - 4
			Normal Sample or Field Duplicate:		N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.782 U	0.787 U	0.8 U	0.787 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.782 U	0.787 U	0.8 U	0.787 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.96 U	1.97 U	2 U	1.97 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.96 U	1.97 U	2 U	1.97 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	4.89 U	4.92 U	5 U	4.92 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	4.89 U	4.92 U	5 U	4.92 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	0.978 U	0.984 U	1 U	0.984 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.782 U	0.787 U	0.8 U	0.787 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.782 U	0.787 U	0.8 U	0.787 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.391 U	0.393 U	0.4 U	0.394 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.391 U	0.393 U	0.4 U	0.394 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.782 U	0.787 U	0.8 U	0.787 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.391 U	0.393 U	0.4 U	0.394 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.391 U	0.393 U	0.4 U	0.394 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.782 U	0.787 U	0.8 U	0.787 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.033 J	0.041 J	0.054 J	0.197 U
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-6	SRI-6	SRI-7	SRI-7
			Sample Date:		10/31/2025	10/31/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	0 - 2	0 - 2	2 - 4
			Normal Sample or Field Duplicate:		N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.07 J	0.069 J	0.268	0.051 J
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.045 J	0.051 J	0.126 J	0.197 U
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.391 U	0.393 U	0.04 J	0.394 U
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.196 U	0.197 U	0.2 U	0.197 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.782 U	0.787 U	0.8 U	0.787 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.782 U	1.56 J	1.35	4.91

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-7	SRI-8	SRI-8	SRI-9
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		11 - 13	0 - 2	3 - 5	0 - 2
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.784 U	0.804 U	0.842 U	0.811 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.784 U	0.804 U	0.842 U	0.811 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.96 U	2.01 U	2.1 U	2.03 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.96 U	2.01 U	2.1 U	2.03 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.196 U	0.201 U	0.21 U	0.203 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	4.9 U	5.02 U	5.26 U	5.07 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	4.9 U	5.02 U	5.26 U	5.07 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	0.979 U	1 U	1.05 U	1.01 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.784 U	0.804 U	0.842 U	0.811 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.784 U	0.804 U	0.842 U	0.811 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.196 U	0.201 U	0.21 U	0.203 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.196 U	0.201 U	0.187 J	0.203 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.196 U	0.201 U	0.21 U	0.203 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.392 U	0.402 U	0.421 U	0.405 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.392 U	0.402 U	0.421 U	0.405 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.784 U	0.804 U	0.842 U	0.811 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.392 U	0.402 U	0.421 U	0.405 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.392 U	0.402 U	0.421 U	0.405 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.196 U	0.201 U	0.21 U	0.041 J
Perfluorobutanoic Acid	--	--	--	NG/G	0.784 U	0.137 J	0.278 J	0.811 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.196 U	0.201 U	0.21 U	0.203 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.196 U	0.08 J	0.109 J	0.203 U
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.196 U	0.201 U	0.21 U	0.203 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.196 U	0.201 U	0.069 J	0.203 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.196 U	0.201 U	0.21 U	0.203 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.196 U	0.102 J	0.206 J	0.203 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.196 U	0.076 J	0.091 J	0.203 U
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.196 U	0.165 J	0.381	0.203 U
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.196 U	0.201 U	0.21 U	0.203 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.196 U	1.84	0.105 J	0.203 U
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.196 U	0.201 U	0.21 U	0.203 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-7	SRI-8	SRI-8	SRI-9
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		11 - 13	0 - 2	3 - 5	0 - 2
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.053 J	0.297	0.41	0.057 J
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.196 U	0.607	**1.28**	0.203 U
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.196 U	0.201 U	0.21 U	0.203 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.392 U	0.247 J	0.543	0.405 U
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.196 U	0.201 U	0.21 U	0.203 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.196 U	0.201 U	0.21 U	0.203 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.196 U	0.201 U	0.21 U	0.203 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.784 U	0.804 U	0.842 U	0.811 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.157 J	0.804 U	0.842 U	0.811 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-9	SRI-9	SRI-10	SRI-10
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	3 - 5	0 - 2	3 - 5
			Normal Sample or Field Duplicate:		FD	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.809 U	0.794 U	0.81 U	3.95 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.809 U	0.794 U	0.81 U	0.79 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	2.02 U	1.98 U	2.02 U	1.98 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	2.02 U	1.98 U	2.02 U	1.98 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	1.1 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	5.05 U	4.96 U	5.06 U	4.94 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	5.05 U	4.96 U	5.06 U	4.94 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	1.01 U	0.992 U	1.01 U	0.988 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.809 U	0.794 U	0.81 U	0.79 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.809 U	0.794 U	0.81 U	3.95 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	0.198 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	2.08 U	0.198 U	0.202 U	1.1 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	0.198 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.404 U	0.397 U	0.405 U	0.395 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.404 U	0.397 U	0.405 U	0.395 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.809 U	0.794 U	0.81 U	0.79 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.404 U	0.397 U	0.405 U	0.395 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.404 U	0.397 U	0.405 U	0.395 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.055 J	0.06 J	0.202 U	0.198 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.809 U	0.794 U	0.81 U	0.79 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.202 U	0.198 U	0.176 J	0.988 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.202 U	0.198 U	0.037 J	0.198 U
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	0.988 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	0.988 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	0.988 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	0.198 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.073 J	0.198 U	0.202 U	0.071 J
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	0.198 U
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	0.988 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	0.049 J
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	0.198 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-9	SRI-9	SRI-10	SRI-10
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	3 - 5	0 - 2	3 - 5
			Normal Sample or Field Duplicate:		FD	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.093 J	0.071 J	0.126 J	0.276 J
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.053 J	0.081 J	0.075 J	0.065 J
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	0.198 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.045 J	0.397 U	0.405 U	0.049 J
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	0.198 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	0.988 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.202 U	0.198 U	0.202 U	0.198 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.809 U	0.794 U	0.81 U	0.79 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.809 U	0.794 U	0.81 U	0.79 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-10	SRI-11	SRI-11	SRI-11
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		10 - 12	0 - 2	4 - 6	11 - 13
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.79 U	0.803 U	0.799 U	0.807 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.79 U	0.803 U	0.799 U	0.807 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.97 U	2.01 U	2 U	2.02 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	1.97 U	2.01 U	2 U	2.02 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	1.26 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	4.94 U	5.02 U	4.99 U	5.04 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	4.94 U	5.02 U	4.99 U	5.04 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	0.987 U	1 U	0.998 U	1.01 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.79 U	0.803 U	0.799 U	0.807 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.79 U	0.803 U	0.799 U	0.807 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	0.202 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	1.26 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	0.202 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.395 U	0.402 U	0.399 U	0.403 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.395 U	0.402 U	0.399 U	0.403 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.79 U	0.803 U	0.799 U	0.807 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.395 U	0.402 U	0.399 U	0.403 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.395 U	0.402 U	0.399 U	0.403 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	0.202 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.79 U	0.803 U	0.799 U	0.807 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.197 U	0.271	0.2 U	0.202 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	0.202 U
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	0.202 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	1.26 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	0.202 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	0.202 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.042 J	0.036 J	0.2 U	0.081 J
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	0.202 U
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	0.202 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	0.202 U
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	0.202 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-10	SRI-11	SRI-11	SRI-11
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		10 - 12	0 - 2	4 - 6	11 - 13
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.174 J	0.175 J	0.393	0.083 J
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.083 J	0.068 J	0.098 J	0.202 U
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	0.202 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.395 U	0.402 U	0.042 J	0.403 U
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	1.26 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	1.26 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.197 U	0.201 U	0.2 U	0.202 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.79 U	0.803 U	0.799 U	0.807 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.79 U	0.803 U	0.799 U	0.807 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-12	SRI-12	SRI-12	SRI-12
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	4 - 6	7 - 9	11 - 13
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.804 U	0.789 U	0.808 U	0.802 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.804 U	0.789 U	0.808 U	0.802 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	2.01 U	1.97 U	2.02 U	2 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	2.01 U	1.97 U	2.02 U	2 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	5.02 U	4.93 U	5.05 U	5.01 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	5.02 U	4.93 U	5.05 U	5.01 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	1 U	0.986 U	1.01 U	1 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.804 U	0.789 U	0.808 U	0.802 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.804 U	0.789 U	0.808 U	0.802 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.402 U	0.395 U	0.404 U	0.401 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.402 U	0.395 U	0.404 U	0.401 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.804 U	0.789 U	0.808 U	0.802 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.402 U	0.395 U	0.404 U	0.401 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.402 U	0.395 U	0.404 U	0.401 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.804 U	0.789 U	0.808 U	0.802 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.201 U	0.197 U	0.04 J	0.2 U
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-12	SRI-12	SRI-12	SRI-12
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	4 - 6	7 - 9	11 - 13
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.05 J	0.053 J	0.202 U	0.048 J
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.201 U	0.083 J	0.145 J	0.2 U
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.402 U	0.04 J	0.404 U	0.401 U
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.201 U	0.197 U	0.202 U	0.2 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.804 U	0.789 U	0.808 U	0.802 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.804 U	0.789 U	0.808 U	0.802 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-13	SRI-13	SRI-13	SRI-13
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	4 - 6	7 - 9	11 - 13
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	--	--	NG/G	0.804 U	0.795 U	0.801 U	0.804 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	--	--	NG/G	0.804 U	0.795 U	0.801 U	0.804 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	2.01 U	1.99 U	2 U	2.01 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	NG/G	2.01 U	1.99 U	2 U	2.01 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	--	--	NG/G	5.03 U	4.97 U	5.01 U	5.02 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	--	--	NG/G	5.03 U	4.97 U	5.01 U	5.02 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	--	--	NG/G	1 U	0.994 U	1 U	1 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	--	--	NG/G	0.804 U	0.795 U	0.801 U	0.804 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	--	--	NG/G	0.804 U	0.795 U	0.801 U	0.804 U
N-ethyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
N-methyl perfluoro-1-octanesulfonamide	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	--	--	NG/G	0.402 U	0.398 U	0.4 U	0.402 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	--	--	NG/G	0.402 U	0.398 U	0.4 U	0.402 U
Perfluoro(2-Propoxypropanoic) Acid	--	--	--	NG/G	0.804 U	0.795 U	0.801 U	0.804 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	--	--	NG/G	0.402 U	0.398 U	0.4 U	0.402 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	--	--	NG/G	0.402 U	0.398 U	0.4 U	0.402 U
Perfluorobutanesulfonic acid (PFBS)	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Perfluorobutanoic Acid	--	--	--	NG/G	0.804 U	0.795 U	0.801 U	0.804 U
Perfluorodecane Sulfonic Acid	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Perfluorodecanoic acid (PFDA)	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Perfluorododecane sulfonate (PFDoDS)	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Perfluorododecanoic acid (PFDoA)	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Perfluoroheptane Sulfonate (PFHPS)	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Perfluoroheptanoic acid (PFHpA)	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Perfluorohexanesulfonic acid (PFHxS)	--	--	--	NG/G	0.046 J	0.04 J	0.034 J	0.036 J
Perfluorohexanoic acid (PFHxA)	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Perfluorononanesulfonic Acid (PFNS)	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Perfluorononanoic acid (PFNA)	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Perfluorooctane Sulfonamide (FOSA)	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U

Table 7. Summary of Per- and Polyfluoroalkyl Substances in Soil, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:		SRI-13	SRI-13	SRI-13	SRI-13
			Sample Date:		10/30/2025	10/30/2025	10/30/2025	10/30/2025
			Sample Depth (ft bls):		0 - 2	4 - 6	7 - 9	11 - 13
			Normal Sample or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	NG/G	0.133 J	0.109 J	0.054 J	0.046 J
Perfluorooctanoic acid (PFOA)	**0.66**	33	0.8	NG/G	0.054 J	0.046 J	0.2 U	0.201 U
Perfluoropentanesulfonic Acid (PFPeS)	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Perfluoropentanoic Acid (PFPeA)	--	--	--	NG/G	0.402 U	0.398 U	0.4 U	0.402 U
Perfluorotetradecanoic acid (PFTA)	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Perfluorotridecanoic Acid (PFTriA)	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Perfluoroundecanoic Acid (PFUnA)	--	--	--	NG/G	0.201 U	0.199 U	0.2 U	0.201 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	--	--	NG/G	0.804 U	0.795 U	0.801 U	0.804 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	--	--	NG/G	0.804 U	0.795 U	0.801 U	0.804 U

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-1	RXSB-1	RXSB-1	RXSB-1	RXSB-1	RXSB-2
				Sample Date:	07/31/2025	07/31/2025	07/31/2025	07/31/2025	07/31/2025	07/31/2025
				Sample Depth (ft bls):	8 - 10	8 - 10	8 - 10	10 - 12	10 - 12	6 - 8
				Normal Sample or Field Duplicate:	N	N	FD	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	85.3	92.4	93.1	80.5	78	85.6

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-2	RXSB-2	RXSB-2	RXSB-2	RXSB-3	RXSB-3
				Sample Date:	07/31/2025	07/31/2025	07/31/2025	07/31/2025	07/31/2025	07/31/2025
				Sample Depth (ft bls):	6 - 8	6 - 8	8 - 10	8 - 10	7 - 9	7 - 9
				Normal Sample or Field Duplicate:	N	FD	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	83.9	87.3	80.1	82.3	84.2	86

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-3	RXSB-3	RXSB-4	RXSB-4	RXSB-4	RXSB-4
				Sample Date:	07/31/2025	07/31/2025	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	9 - 11	9 - 11	6 - 8	6 - 8	8 - 10	8 - 10
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	84	88.1	82.6	82.5	90.5	78.4

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-5	RXSB-5	RXSB-5	RXSB-5	RXSB-5	RXSB-6
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	8 - 10	8 - 10	8 - 10	10 - 12	10 - 12	6 - 8
				Normal Sample or Field Duplicate:	N	N	FD	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	81.6	85.2	82.4	86.1	86.1	85

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-6	RXSB-6	RXSB-6	RXSB-7	RXSB-7	RXSB-7
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025	08/01/2025	08/01/2025
				Sample Depth (ft bls):	6 - 8	8 - 10	8 - 10	3 - 5	3 - 5	5 - 7
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	84.6	80.9	80.5	89.4	90.5	83.1

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-7	RXSB-8	RXSB-8	RXSB-8	RXSB-8	RXSB-9
				Sample Date:	08/01/2025	08/01/2025	08/01/2025	08/01/2025	08/01/2025	03/13/2023
				Sample Depth (ft bls):	5 - 7	7 - 9	7 - 9	9 - 11	9 - 11	7 - 9
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	81.5	85.5	82.6	81.1	80.4	91.2

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-9	RXSB-9	RXSB-9	RXSB-9	RXSB-9	RXSB-10
				Sample Date:	03/13/2023	03/13/2023	03/13/2023	03/13/2023	03/13/2023	03/13/2023
				Sample Depth (ft bls):	7 - 9	7 - 9	7 - 9	9 - 11	9 - 11	5 - 8
				Normal Sample or Field Duplicate:	N	FD	FD	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	91.6	91.4	92.1	87.2	88.9	90

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-10	RXSB-10	RXSB-10	RXSB-11	RXSB-11	RXSB-11
				Sample Date:	03/13/2023	03/13/2023	03/13/2023	07/28/2025	07/28/2025	07/28/2025
				Sample Depth (ft bls):	5 - 8	8 - 11	8 - 11	6 - 8	6 - 8	13 - 15
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	90.5	93	92.9	87.7	87.1	82.4

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-11	RXSB-12	RXSB-12	RXSB-12	RXSB-12	RXSB-13
				Sample Date:	07/28/2025	07/31/2025	07/31/2025	07/31/2025	07/31/2025	07/29/2025
				Sample Depth (ft bls):	13 - 15	6 - 8	6 - 8	8 - 10	8 - 10	8 - 10
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	77.3	89.1	82.6	80.8	84.5	86.6

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-13	RXSB-13	RXSB-13	RXSB-14	RXSB-14	RXSB-14
				Sample Date:	07/29/2025	07/29/2025	07/29/2025	07/30/2025	07/30/2025	07/30/2025
				Sample Depth (ft bls):	8 - 10	10 - 12	10 - 12	8 - 10	8 - 10	10 - 12
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	84.4	91.3	80.2	81.1	87	81.5

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	RXSB-14	RXSB-14	SRI-1	SRI-1	SRI-1	SRI-1
				Sample Date:	07/30/2025	07/30/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	10 - 12	10 - 12	0 - 2	0 - 2	4 - 6	4 - 6
				Normal Sample or Field Duplicate:	N	FD	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	82.7	79.4	90.8	90.7	86.2	90

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-10	SRI-10	SRI-10	SRI-10	SRI-10	SRI-10
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	3 - 5	3 - 5	10 - 12	10 - 12
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	81.6	84.4	91.2	93	84.4	88

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-11	SRI-11	SRI-11	SRI-11	SRI-11	SRI-11
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	4 - 6	4 - 6	11 - 13	11 - 13
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	87	83	85.6	87.7	79	80.1

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-12	SRI-12	SRI-12	SRI-12	SRI-12	SRI-12
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	4 - 6	4 - 6	7 - 9	7 - 9
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	90.1	88.6	90.1	73.6	78.3	86.6

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-12	SRI-12	SRI-13	SRI-13	SRI-13	SRI-13
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	11 - 13	11 - 13	0 - 2	0 - 2	4 - 6	4 - 6
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	79.2	81	76.8	87.8	78.9	88.1

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-13	SRI-13	SRI-13	SRI-13	SRI-2	SRI-2
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	7 - 9	7 - 9	11 - 13	11 - 13	0 - 2	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	86.1	78.4	72.4	84.6	84.7	74.9

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-2	SRI-2	SRI-2	SRI-2	SRI-2	SRI-2
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	3 - 5	3 - 5	6 - 8	6 - 8	12 - 14	12 - 14
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	88.1	88.7	89.7	83.1	89.6	91.5

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-3	SRI-3	SRI-3	SRI-3	SRI-4	SRI-4
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	3 - 5	3 - 5	0 - 2	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	84.3	84.6	86.5	86.9	90.7	80.5

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-4	SRI-4	SRI-4	SRI-4	SRI-5	SRI-5
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	4 - 6	4 - 6	11 - 13	11 - 13	0 - 2	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	89.4	89.3	84.6	84.1	85.8	89.3

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-5	SRI-5	SRI-6	SRI-6	SRI-6	SRI-6
				Sample Date:	10/31/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025	10/31/2025
				Sample Depth (ft bls):	3 - 5	3 - 5	0 - 2	0 - 2	0 - 2	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N	FD	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	88.4	92.8	91.8	91.3	90.4	92

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-7	SRI-7	SRI-7	SRI-7	SRI-7	SRI-7
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	2 - 4	2 - 4	11 - 13	11 - 13
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	81.6	85.5	79.7	85.4	92.4	91

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-8	SRI-8	SRI-8	SRI-8	SRI-9	SRI-9
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	3 - 5	3 - 5	0 - 2	0 - 2
				Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units						
Total Solids	--	--	--	PERCENT	84.7	85.3	86.8	86.9	91.8	91.6

Table 8. Summary of General Chemistry in Soil, 73-99 Empire Boulevard, Brooklyn, New York

				Sample Designation:	SRI-9	SRI-9	SRI-9	SRI-9
				Sample Date:	10/30/2025	10/30/2025	10/30/2025	10/30/2025
				Sample Depth (ft bls):	0 - 2	0 - 2	3 - 5	3 - 5
				Normal Sample or Field Duplicate:	FD	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units				
Total Solids	--	--	--	PERCENT	91.6	91.7	93.3	93.3

Table 9. Summary of Volatile Organic Compounds in Groundwater, 73-99 Empire Boulevard, Brooklyn, New York

Parameter	NYSDEC Ambient Water Quality Standards and Guidance Values	Units	Sample Designation: MW-1	MW-2	MW-3	MW-3
			Sample Date: 08/05/2025	08/04/2025	08/05/2025	08/05/2025
			Normal Sample or Field Duplicate: N	N	N	FD
1,1,1,2-Tetrachloroethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
1,1,1-Trichloroethane (TCA)	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
1,1,2,2-Tetrachloroethane	5	UG/L	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	1	UG/L	1.5 U	1.5 U	1.5 U	1.5 U
1,1-Dichloroethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
1,1-Dichloroethene	5	UG/L	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloropropene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichlorobenzene	5	UG/L	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ
1,2,3-Trichloropropane	0.04	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
1,2,4,5-Tetramethylbenzene	5	UG/L	2 U	2 U	2 U	2 U
1,2,4-Trichlorobenzene	5	UG/L	2.5 UJ	2.5 U	2.5 UJ	2.5 UJ
1,2,4-Trimethylbenzene	5	UG/L	2.5 U	2.5 UJ	2.5 U	2.5 U
1,2-Dibromo-3-Chloropropane	0.04	UG/L	2.5 UJ	2.5 U	2.5 UJ	2.5 UJ
1,2-Dibromoethane (Ethylene Dibromide)	0.0006	UG/L	2 U	2 U	2 U	2 U
1,2-Dichlorobenzene	3	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethane	0.6	UG/L	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ
1,2-Dichloropropane	1	UG/L	1 U	1 UJ	1 U	1 U
1,3,5-Trimethylbenzene (Mesitylene)	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichlorobenzene	3	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichloropropane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
1,4-Dichlorobenzene	3	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
1,4-Diethyl Benzene	--	UG/L	2 U	2 U	2 U	2 U
1,4-Dioxane (P-Dioxane)	0.35	UG/L	250 U	250 UJ	250 U	250 U
2,2-Dichloropropane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
2-Chlorotoluene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
2-Hexanone	50	UG/L	5 UJ	5 UJ	5 UJ	5 UJ
4-Chlorotoluene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
4-Ethyltoluene	--	UG/L	2 U	2 U	2 U	2 U
Acetone	50	UG/L	6.2	3.4 J	6.1	4.5 J
Acrylonitrile	5	UG/L	5 U	5 U	5 U	5 U
Benzene	1	UG/L	0.5 U	0.5 U	0.5 U	0.5 U
Bromobenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U

Table 9. Summary of Volatile Organic Compounds in Groundwater, 73-99 Empire Boulevard, Brooklyn, New York

Parameter	NYSDEC Ambient Water Quality Standards and Guidance Values	Units	MW-1	MW-2	MW-3	MW-3
Sample Designation:			MW-1	MW-2	MW-3	MW-3
Sample Date:			08/05/2025	08/04/2025	08/05/2025	08/05/2025
Normal Sample or Field Duplicate:			N	N	N	FD
Bromochloromethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Bromodichloromethane	50	UG/L	0.64 J	0.82 J	0.24 J	0.25 J
Bromoform	50	UG/L	2 UJ	2 U	2 UJ	2 UJ
Bromomethane	5	UG/L	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ
Carbon Disulfide	60	UG/L	5 U	5 U	5 U	5 U
Carbon Tetrachloride	5	UG/L	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Chloroethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Chloroform	**7**	UG/L	**15**	**22**	**7.8**	**7.4**
Chloromethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Cis-1,2-Dichloroethylene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Cis-1,3-Dichloropropene	--	UG/L	0.5 U	0.5 UJ	0.5 U	0.5 U
Cymene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Dibromochloromethane	50	UG/L	0.21 J	0.5 U	0.5 U	0.5 U
Dibromomethane	5	UG/L	5 U	5 U	5 U	5 U
Dichlorodifluoromethane	5	UG/L	5 U	5 UJ	5 U	5 U
Dichloroethylenes	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Diethyl Ether (Ethyl Ether)	--	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Ethylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Hexachlorobutadiene	0.5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Isopropylbenzene (Cumene)	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
m,p-Xylene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Methyl Ethyl Ketone (2-Butanone)	50	UG/L	5 U	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	UG/L	5 U	5 UJ	5 U	5 U
Methylene Chloride	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Naphthalene	10	UG/L	2.5 UJ	2.5 U	2.5 UJ	2.5 UJ
N-Butylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
N-Propylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
O-Xylene (1,2-Dimethylbenzene)	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Sec-Butylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Styrene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
T-Butylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U

Table 9. Summary of Volatile Organic Compounds in Groundwater, 73-99 Empire Boulevard, Brooklyn, New York

		Sample Designation:	MW-1	MW-2	MW-3	MW-3
		Sample Date:	08/05/2025	08/04/2025	08/05/2025	08/05/2025
		Normal Sample or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Ambient Water Quality Standards and Guidance Values	Units				
Tert-Butyl Methyl Ether	10	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Tetrachloroethylene (PCE)	5	UG/L	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Total, 1,3-Dichloropropene (Cis And Trans)	0.4	UG/L	0.5 U	0.5 U	0.5 U	0.5 U
Trans-1,2-Dichloroethene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U
Trans-1,3-Dichloropropene	--	UG/L	0.5 U	0.5 UJ	0.5 U	0.5 U
Trans-1,4-Dichloro-2-Butene	5	UG/L	2.5 R	2.5 UJ	2.5 R	2.5 R
Trichloroethylene (TCE)	5	UG/L	0.26 J	0.97	0.58	0.56
Trichlorofluoromethane	5	UG/L	2.5 U	2.5 UJ	2.5 U	2.5 U
Vinyl Acetate	--	UG/L	5 U	5 UJ	5 U	5 U
Vinyl Chloride	2	UG/L	1 U	1 U	1 U	1 U
Xylenes	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U

Table 10. Summary of Semivolatile Organic Compounds in Groundwater, 73-99 Empire Boulevard, Brooklyn, New York

		Sample Designation:	MW-1	MW-2	MW-3	MW-3
		Sample Date:	08/05/2025	08/04/2025	08/05/2025	08/05/2025
		Normal Sample or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Ambient Water Quality Standards and Guidance Values	Units				
1,2,4,5-Tetrachlorobenzene	5	UG/L	10 UJ	10 U	10 UJ	10 UJ
1,2,4-Trichlorobenzene	5	UG/L	5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	3	UG/L	2 U	2 U	2 U	2 U
1,3-Dichlorobenzene	3	UG/L	2 U	2 U	2 U	2 U
1,4-Dichlorobenzene	3	UG/L	2 U	2 U	2 U	2 U
1,4-Dioxane (P-Dioxane)	**0.35**	UG/L	**0.359**	0.312	0.247 J	0.294
2,4,5-Trichlorophenol	--	UG/L	5 U	5 U	5 U	5 U
2,4,6-Trichlorophenol	--	UG/L	5 U	5 U	5 U	5 U
2,4-Dichlorophenol	5	UG/L	5 U	5 U	5 U	5 U
2,4-Dimethylphenol	50	UG/L	5 U	5 U	5 U	5 U
2,4-Dinitrophenol	10	UG/L	20 U	20 U	20 U	20 U
2,4-Dinitrotoluene	5	UG/L	5 U	5 U	5 U	5 U
2,6-Dinitrotoluene	**5**	UG/L	5 U	5 U	5 U	**22**
2-Chloronaphthalene	10	UG/L	0.2 U	0.2 U	0.2 U	0.2 U
2-Chlorophenol	--	UG/L	2 U	2 U	2 U	2 U
2-Methylnaphthalene	--	UG/L	0.1 U	0.1 U	0.1 U	0.1 U
2-Methylphenol (O-Cresol)	--	UG/L	5 U	5 U	5 U	5 U
2-Nitroaniline	5	UG/L	5 U	5 U	5 U	5 U
2-Nitrophenol	--	UG/L	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	5	UG/L	5 U	5 U	5 U	5 U
3-Nitroaniline	5	UG/L	5 U	5 U	5 U	5 U
4,6-Dinitro-2-Methylphenol	--	UG/L	10 U	10 U	10 U	10 U
4-Bromophenyl Phenyl Ether	--	UG/L	2 U	2 U	2 U	2 U
4-Chloro-3-Methylphenol	--	UG/L	2 U	2 U	2 U	2 U
4-Chloroaniline	5	UG/L	5 U	5 U	5 U	5 U
4-Chlorophenyl Phenyl Ether	--	UG/L	2 U	2 U	2 U	2 U
4-Nitroaniline	5	UG/L	5 U	5 U	5 U	5 U
4-Nitrophenol	--	UG/L	10 U	10 U	10 U	10 U
Acenaphthene	20	UG/L	0.04 J	0.1 U	0.1 UJ	0.03 J
Acenaphthylene	20	UG/L	0.05 J	0.1 U	0.1 U	0.1 U
Acetophenone	--	UG/L	5 U	5 U	5 U	5 U
Anthracene	50	UG/L	0.1	0.1 U	0.05 J	0.03 J

Table 10. Summary of Semivolatile Organic Compounds in Groundwater, 73-99 Empire Boulevard, Brooklyn, New York

			Sample Designation:	MW-1	MW-2	MW-3	MW-3
			Sample Date:	08/05/2025	08/04/2025	08/05/2025	08/05/2025
			Normal Sample or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Ambient Water Quality Standards and Guidance Values	Units					
Benzo(A)Anthracene	**0.002**	UG/L		**0.43**	0.1 U	**0.18**	**0.04 J**
Benzo(A)Pyrene	**0**	UG/L		**0.46**	0.1 U	**0.2**	0.1 U
Benzo(B)Fluoranthene	**0.002**	UG/L		**0.71**	0.1 U	**0.32**	0.1 U
Benzo(G,H,I)Perylene	--	UG/L		0.35	0.1 U	0.15	0.1 U
Benzo(K)Fluoranthene	**0.002**	UG/L		**0.19**	0.1 U	**0.09 J**	0.1 U
Benzoic Acid	--	UG/L		50 U	50 U	50 U	45 J
Benzyl Alcohol	--	UG/L		2 U	2 U	2 U	2 U
Benzyl Butyl Phthalate	50	UG/L		5 U	5 U	5 U	5 U
Biphenyl (Diphenyl)	5	UG/L		2 UJ	2 U	2 UJ	2 U
Bis(2-Chloroethoxy) Methane	5	UG/L		5 U	5 U	5 U	5 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	1	UG/L		2 U	2 U	2 U	2 U
Bis(2-Chloroisopropyl) Ether	5	UG/L		2 U	2 U	2 U	2 U
Bis(2-Ethylhexyl) Phthalate	5	UG/L		3 U	3 U	3 U	3 U
Carbazole	--	UG/L		2 U	2 U	2 U	2 U
Chrysene	**0.002**	UG/L		**0.47**	0.1 U	**0.22**	0.1 U
Dibenz(A,H)Anthracene	--	UG/L		0.09 J	0.1 U	0.04 J	0.1 U
Dibenzofuran	--	UG/L		2 U	2 U	2 U	2 U
Diethyl Phthalate	50	UG/L		5 U	5 U	5 U	5 U
Dimethyl Phthalate	50	UG/L		5 U	5 U	5 U	5 U
Di-N-Butyl Phthalate	50	UG/L		5 U	3.8 J	5 U	5 U
Di-N-Octylphthalate	--	UG/L		5 U	5 U	5 U	5 U
Fluoranthene	50	UG/L		1	0.1 U	0.46	0.1 U
Fluorene	50	UG/L		0.04 J	0.1 U	0.1 U	0.1 U
Hexachlorobenzene	0.04	UG/L		0.8 UJ	0.8 UJ	0.8 UJ	0.8 U
Hexachlorobutadiene	0.5	UG/L		0.5 UJ	0.5 U	0.5 UJ	0.5 U
Hexachlorocyclopentadiene	5	UG/L		20 U	20 R	20 U	20 U
Hexachloroethane	5	UG/L		0.8 U	0.8 U	0.8 U	0.8 U
Indeno(1,2,3-C,D)Pyrene	**0.002**	UG/L		**0.36**	0.1 UJ	**0.16**	0.1 U
Isophorone	50	UG/L		5 U	5 U	5 U	5 U
M+P MethylPhenol	--	UG/L		5 U	5 U	5 U	160
Naphthalene	10	UG/L		0.1 U	0.1 U	0.1 U	0.1 U
Nitrobenzene	**0.4**	UG/L		2 U	2 U	2 U	**49**

Table 10. Summary of Semivolatile Organic Compounds in Groundwater, 73-99 Empire Boulevard, Brooklyn, New York

		Sample Designation:	MW-1	MW-2	MW-3	MW-3
		Sample Date:	08/05/2025	08/04/2025	08/05/2025	08/05/2025
		Normal Sample or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Ambient Water Quality Standards and Guidance Values	Units				
N-Nitrosodi-N-Propylamine	--	UG/L	5 U	5 U	5 U	5 U
N-Nitrosodiphenylamine	50	UG/L	2 U	2 U	2 U	2 U
Pentachlorophenol	1	UG/L	0.8 UJ	0.8 U	0.8 UJ	0.46 J
Phenanthrene	50	UG/L	0.61 J	0.05 J	0.3 J	0.06 J
Phenol	**1**	UG/L	5 U	5 U	5 U	**11**
Pyrene	50	UG/L	0.85	0.1 U	0.4	0.1 U

Table 11. Summary of Metals in Groundwater, 73-99 Empire Boulevard, Brooklyn, New York

Sample Designation:			MW-1	MW-1	MW-2	MW-2	MW-3	MW-3	MW-3	MW-3
Sample Date:			08/05/2025	08/05/2025	08/04/2025	08/04/2025	08/05/2025	08/05/2025	08/05/2025	08/05/2025
Normal Sample or Field Duplicate:			N	N	N	N	N	N	FD	FD
Total or Dissolved:			Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Parameter	NYSDEC Ambient Water Quality Standards and Guidance Values	Units								
Aluminum	--	UG/L	615	27.1	220	10.6	77	6.27 J	58	10 U
Antimony	3	UG/L	4 U	4 U	4 U	0.5 J	4 U	4 U	4 U	4 U
Arsenic	25	UG/L	1.37	0.94	0.47 J	0.55	0.72	0.64	0.65	0.64
Barium	1000	UG/L	103.3	90.27	92.41	89.64	150.6	151.3	148.9	149
Beryllium	3	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cadmium	5	UG/L	0.08 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Calcium	--	UG/L	62500	49100	98800	101000	79900	62200	77300	60300
Chromium, Hexavalent	50	UG/L	3 J	NA	10 U	NA	4 J	NA	10 U	NA
Chromium, Total	50	UG/L	4.24	1.52	2.14	0.44 J	1.57	1.24	1.42	1.18
Cobalt	--	UG/L	0.91	0.34 J	0.59	0.45 J	0.32 J	0.23 J	0.31 J	0.23 J
Copper	200	UG/L	5.46	1.41	5.23	1.38	1.04	0.76 J	0.82 J	0.55 J
Cyanide	200	UG/L	2 J	NA	5 U	NA	2 J	NA	3 J	NA
Iron	**300**	UG/L	**1100**	50 U	**703**	50 U	141	50 U	114	50 U
Lead	25	UG/L	15.91	0.36 J	1.37	1 U	1.23	1 U	0.97 J	1 U
Magnesium	**35000**	UG/L	24000	20800	34500 J	**37900 J**	31900	**36600**	31100	31200
Manganese	300	UG/L	108	66.7	130.2	109.7	67.63	59.88	72.96	54.91
Mercury	0.7	UG/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	100	UG/L	6.61	3.38	7.96	17.71	4.06	3.34	3.66	3.69
Potassium	--	UG/L	9010	8010	4800	5280	4730	4610	4570	3950
Selenium	**10**	UG/L	5 U	5 U	**10.4**	**10.5**	3.09 J	2.51 J	2.63 J	2.38 J
Silver	50	UG/L	0.77	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Sodium	**20000**	UG/L	**58400**	**59700**	**93300**	**94100**	**70900**	**70300**	**69200**	**70400**
Thallium	0.5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vanadium	--	UG/L	4.9 J	2.28 J	5 U	5 U	5 U	5 U	5 U	5 U
Zinc	2000	UG/L	39.98	11.95	10 U	5.04 J	10 U	10 U	10 U	10 U

Table 12. Summary of Polychlorinated Biphenyls in Groundwater, 73-99 Empire Boulevard, Brooklyn, New York

		Sample Designation:	MW-1	MW-2	MW-3	MW-3
		Sample Date:	08/05/2025	08/04/2025	08/05/2025	08/05/2025
		Normal Sample or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Ambient Water Quality Standards and Guidance Values	Units				
PCB-1016 (Aroclor 1016)	--	UG/L	0.071 U	0.071 U	0.071 U	0.071 U
PCB-1221 (Aroclor 1221)	--	UG/L	0.071 U	0.071 U	0.071 U	0.071 U
PCB-1232 (Aroclor 1232)	--	UG/L	0.071 U	0.071 U	0.071 U	0.071 U
PCB-1242 (Aroclor 1242)	--	UG/L	0.071 U	0.071 U	0.071 U	0.071 U
PCB-1248 (Aroclor 1248)	--	UG/L	0.071 U	0.071 U	0.071 U	0.071 U
PCB-1254 (Aroclor 1254)	--	UG/L	0.071 U	0.071 U	0.071 U	0.071 U
PCB-1260 (Aroclor 1260)	--	UG/L	0.071 U	0.071 U	0.071 U	0.071 U
PCB-1262 (Aroclor 1262)	--	UG/L	0.071 U	0.071 U	0.071 U	0.071 U
PCB-1268 (Aroclor 1268)	--	UG/L	0.071 U	0.071 U	0.071 U	0.071 U
Polychlorinated Biphenyl (PCBs)	0.09	UG/L	0.071 U	0.071 U	0.071 U	0.071 U

Table 13. Summary of Pesticides and Herbicides in Groundwater, 73-99 Empire Boulevard, Brooklyn, New York

		Sample Designation:	MW-1	MW-2	MW-3	MW-3
		Sample Date:	08/05/2025	08/04/2025	08/05/2025	08/05/2025
		Normal Sample or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Ambient Water Quality Standards and Guidance Values	Units				
2,4-D (Dichlorophenoxyacetic Acid)	50	UG/L	10 U	10 U	10 U	10 U
Acetic acid, (2,4,5-trichlorophenoxy)-	35	UG/L	2 U	2 U	2 U	2 U
Aldrin	0	UG/L	0.014 U	0.014 U	0.014 U	0.014 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.01	UG/L	0.014 U	0.014 U	0.014 U	0.014 U
Alpha Endosulfan	--	UG/L	0.014 U	0.014 U	0.014 U	0.014 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.04	UG/L	0.02 U	0.02 U	0.02 U	0.02 U
Beta Endosulfan	--	UG/L	0.029 U	0.029 U	0.029 U	0.029 U
Chlordane	0.05	UG/L	0.143 U	0.143 U	0.143 U	0.143 U
cis-Chlordane	--	UG/L	0.02 U	0.02 U	0.02 U	0.02 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	UG/L	0.014 U	0.014 U	0.014 U	0.014 U
Dieldrin	0.004	UG/L	0.029 U	0.029 U	0.029 U	0.029 U
Endosulfan Sulfate	--	UG/L	0.029 U	0.029 U	0.029 U	0.029 U
Endrin	0	UG/L	0.029 U	0.029 U	0.029 U	0.029 U
Endrin Aldehyde	5	UG/L	0.03 U	0.03 U	0.03 U	0.03 U
Endrin Ketone	5	UG/L	0.029 U	0.029 U	0.029 U	0.029 U
Gamma Bhc (Lindane)	0.05	UG/L	0.014 U	0.014 U	0.014 U	0.014 U
Heptachlor	0.04	UG/L	0.014 U	0.014 U	0.014 U	0.014 U
Heptachlor Epoxide	0.03	UG/L	0.014 U	0.014 U	0.014 U	0.014 U
Methoxychlor	35	UG/L	0.143 U	0.143 U	0.143 U	0.143 U
P,P'-DDD	0.3	UG/L	0.029 U	0.029 U	0.029 U	0.029 U
P,P'-DDE	0.2	UG/L	0.029 U	0.029 U	0.029 U	0.029 U
P,P'-DDT	0.2	UG/L	0.029 U	0.029 U	0.029 U	0.029 U
Silvex (2,4,5-TP)	0.26	UG/L	2 U	2 U	2 U	2 U
Toxaphene	0.06	UG/L	0.2 U	0.2 U	0.2 U	0.2 U
trans-Chlordane	--	UG/L	0.02 U	0.02 U	0.02 U	0.02 U

Table 14. Summary of Per- and Polyfluoroalkyl Substances in Groundwater, 73-99 Empire Boulevard, Brooklyn, New York

	Sample Designation:		MW-1	MW-2	MW-3	MW-3
	Sample Date:		08/05/2025	08/04/2025	08/05/2025	08/05/2025
	Normal Sample or Field Duplicate:		N	N	N	FD
Parameter	NYSDEC Ambient Water Quality Standards and Guidance Values	Units				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	--	UG/L	0.00628 U	0.00624 U	0.00648 U	0.00692 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2Fts)	--	UG/L	0.00628 U	0.00624 U	0.00648 U	0.00692 U
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	UG/L	0.0157 U	0.0156 U	0.0162 U	0.0173 U
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	UG/L	0.0157 U	0.0156 U	0.0162 U	0.0173 U
2-(N-methyl perfluorooctanesulfonamido) acetic acid	--	UG/L	0.00157 U	0.00156 U	0.00162 U	0.00173 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	--	UG/L	0.0393 U	0.039 U	0.0405 U	0.0433 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	--	UG/L	0.0393 U	0.039 U	0.0405 U	0.0433 U
3-Perfluoropropyl propanoic acid (3:3 FTCA)	--	UG/L	0.00785 U	0.0078 U	0.0081 U	0.00865 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	--	UG/L	0.00628 U	0.00624 U	0.00648 U	0.00692 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	--	UG/L	0.00628 U	0.00624 U	0.00648 U	0.00692 U
N-ethyl perfluoro-1-octanesulfonamide	--	UG/L	0.00157 U	0.00156 U	0.00162 U	0.00173 U
N-ethyl perfluorooctanesulfonamidoacetic acid	--	UG/L	0.00157 U	0.00156 U	0.00162 U	0.00173 U
N-methyl perfluoro-1-octanesulfonamide	--	UG/L	0.00157 U	0.00156 U	0.00162 U	0.00173 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	--	UG/L	0.00314 U	0.00312 U	0.00324 U	0.00346 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	--	UG/L	0.00314 U	0.00312 U	0.00324 U	0.00346 U
Perfluoro(2-Propoxypropanoic) Acid	--	UG/L	0.00628 U	0.00624 U	0.00648 U	0.00692 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	--	UG/L	0.00314 U	0.00312 U	0.00324 U	0.00346 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	--	UG/L	0.00314 U	0.00312 U	0.00324 U	0.00346 U
Perfluorobutanesulfonic acid (PFBS)	--	UG/L	0.000919 J	0.00552	0.00232	0.00254
Perfluorobutanoic Acid	--	UG/L	0.00216 J	0.00902	0.00467 J	0.00468 J
Perfluorodecane Sulfonic Acid	--	UG/L	0.00157 U	0.00156 U	0.00162 U	0.00173 U
Perfluorodecanoic acid (PFDA)	--	UG/L	0.00157 U	0.00156 U	0.00162 U	0.00173 U
Perfluorododecane sulfonate (PFDoDS)	--	UG/L	0.00157 U	0.00156 U	0.00162 U	0.00173 U
Perfluorododecanoic acid (PFDoA)	--	UG/L	0.00157 U	0.00156 U	0.00162 U	0.00173 U
Perfluoroheptane Sulfonate (PFHPS)	--	UG/L	0.00157 U	0.000234 J	0.000275 J	0.00032 J
Perfluoroheptanoic acid (PFHpA)	--	UG/L	0.00355	0.00734	0.00736	0.00623
Perfluorohexanesulfonic acid (PFHxS)	--	UG/L	0.00198	0.00414	0.00411	0.00397
Perfluorohexanoic acid (PFHxA)	--	UG/L	0.00321	0.0116	0.00818	0.00842
Perfluorononanesulfonic Acid (PFNS)	--	UG/L	0.00157 U	0.00156 U	0.00162 U	0.00173 U
Perfluorononanoic acid (PFNA)	--	UG/L	0.000762 J	0.000328 J	0.000332 J	0.000381 J
Perfluorooctane Sulfonamide (FOSA)	--	UG/L	0.00157 U	0.00156 U	0.00162 U	0.00173 U
Perfluorooctanesulfonic acid (PFOS)	**0.0027**	UG/L	**0.00381**	0.00263	**0.00394**	**0.00367 J**

Table 14. Summary of Per- and Polyfluoroalkyl Substances in Groundwater, 73-99 Empire Boulevard, Brooklyn, New York

		Sample Designation:	MW-1	MW-2	MW-3	MW-3
		Sample Date:	08/05/2025	08/04/2025	08/05/2025	08/05/2025
		Normal Sample or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Ambient Water Quality Standards and Guidance Values	Units				
Perfluorooctanoic acid (PFOA)	**0.0067**	UG/L	**0.0262**	**0.0394**	**0.0383**	**0.0435**
Perfluoropentanesulfonic Acid (PFPeS)	--	UG/L	0.000298 J	0.000686 J	0.000413 J	0.000467 J
Perfluoropentanoic Acid (PFPeA)	--	UG/L	0.00338	0.0129	0.0103	0.0105
Perfluorotetradecanoic acid (PFTA)	--	UG/L	0.00157 U	0.00156 U	0.00162 U	0.00173 U
Perfluorotridecanoic Acid (PFTriA)	--	UG/L	0.00157 U	0.00156 U	0.00162 U	0.00173 U
Perfluoroundecanoic Acid (PFUnA)	--	UG/L	0.00157 U	0.00156 U	0.00162 U	0.00173 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	--	UG/L	0.00628 U	0.00624 U	0.00648 U	0.00692 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	--	UG/L	0.00628 U	0.00624 U	0.00648 U	0.00692 U

Table 15. Summary of Volatile Organic Compounds in Soil Vapor, 73-99 Empire Boulevard, Brooklyn, New York

Sample Designation:		AA-1	IA-1	IA-2	RXSV-1	RXSV-2	RXSV-3	RXSV-3	RXSV-4
Sample Date:		03/13/2023	03/13/2023	03/13/2023	08/04/2025	08/04/2025	08/04/2025	08/04/2025	08/04/2025
Normal Sample or Field Duplicate:		N	N	N	N	N	N	FD	N
Parameter	Units								
1,1,1-Trichloroethane (TCA)	UG/M3	0.109 U	0.109 U	0.109 U	1.09 U	2.07 U	1.09 U	1.09 U	**1.31**
1,1,2,2-Tetrachloroethane	UG/M3	1.37 U	1.37 U	1.37 U	1.37 U	2.61 U	1.37 U	1.37 U	1.37 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/M3	1.53 U	1.53 U	1.53 U	1.53 U	2.91 U	1.53 U	1.53 U	1.53 U
1,1,2-Trichloroethane	UG/M3	1.09 U	1.09 U	1.09 U	1.09 U	2.07 U	1.09 U	1.09 U	1.09 U
1,1-Dichloroethane	UG/M3	0.809 U	0.809 U	0.809 U	0.809 U	1.54 U	0.809 U	0.809 U	0.809 U
1,1-Dichloroethene	UG/M3	0.079 U	0.079 U	0.079 U	0.793 U	1.51 U	0.793 U	0.793 U	0.793 U
1,2,4-Trichlorobenzene	UG/M3	1.48 U	1.48 U	1.48 U	1.48 U	2.82 U	1.48 U	1.48 U	1.48 U
1,2,4-Trimethylbenzene	UG/M3	0.983 U	**1.24**	**3.16**	**1.3**	**3.75**	**3.99**	**3.14**	**2.79**
1,2-Dibromoethane (Ethylene Dibromide)	UG/M3	1.54 U	1.54 U	1.54 U	1.54 U	2.92 U	1.54 U	1.54 U	1.54 U
1,2-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	2.28 U	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	UG/M3	0.809 U	0.809 U	0.809 U	0.809 U	1.54 U	0.809 U	0.809 U	0.809 U
1,2-Dichloropropane	UG/M3	0.924 U	0.924 U	0.924 U	0.924 U	1.76 U	0.924 U	0.924 U	0.924 U
1,2-Dichlorotetrafluoroethane	UG/M3	1.4 U	1.4 U	1.4 U	1.4 U	2.66 U	1.4 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	UG/M3	0.983 U	0.983 U	0.983 U	0.983 U	1.87 U	0.983 U	0.983 U	0.983 U
1,3-Butadiene	UG/M3	0.442 U	0.442 U	**0.449**	0.442 U	0.841 U	0.442 U	0.442 U	0.442 U
1,3-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	2.28 U	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	2.28 U	1.2 U	1.2 U	1.2 U
1,4-Dioxane (P-Dioxane)	UG/M3	0.721 U	0.721 U	0.721 U	0.721 U	1.37 U	0.721 U	0.721 U	0.721 U
2,2,4-Trimethylpentane	UG/M3	0.934 U	0.934 U	0.934 U	**1.6**	**1.83**	**1.26**	0.934 U	**2.22**
2-Hexanone	UG/M3	0.82 U	0.82 U	0.82 U	0.82 U	**2.45**	**2.07**	**1.59**	**2.21**
4-Ethyltoluene	UG/M3	0.983 U	0.983 U	0.983 U	0.983 U	1.87 U	0.983 U	0.983 U	0.983 U
Acetone	UG/M3	**4.89**	**12.1**	**10.1**	**29.9**	**119**	**45.8**	**42.8**	**81.2**
Allyl Chloride (3-Chloropropene)	UG/M3	0.626 U	0.626 U	0.626 U	0.626 U	1.19 U	0.626 U	0.626 U	0.626 U
Benzene	UG/M3	**1.04**	**1.28**	**1.52**	**1.69**	**2.57**	**1.18**	**1.04**	**1.73**
Benzyl Chloride	UG/M3	1.04 U	1.04 U	1.04 U	1.04 U	1.97 U	1.04 U	1.04 U	1.04 U
Bromodichloromethane	UG/M3	1.34 U	**1.39**	1.34 U	1.34 U	2.55 U	1.34 U	1.34 U	1.34 U
Bromoform	UG/M3	2.07 UJ	2.07 UJ	2.07 UJ	2.07 U	3.93 U	2.07 U	2.07 U	2.07 U
Bromomethane	UG/M3	0.777 U	0.777 U	0.777 U	0.777 U	1.48 U	0.777 U	0.777 U	0.777 U
Carbon Disulfide	UG/M3	0.623 U	0.623 U	0.623 U	**2.49**	**46.4**	**65.7**	**26.9**	**7.57**
Carbon Tetrachloride	UG/M3	**0.566**	**1.8**	**1.74**	**1.35**	2.39 U	1.26 U	1.26 U	**3.23**
Chlorobenzene	UG/M3	0.921 U	0.921 U	0.921 U	0.921 U	1.75 U	0.921 U	0.921 U	0.921 U
Chloroethane	UG/M3	0.528 U	0.528 U	0.528 U	0.528 U	1 U	0.528 U	0.528 U	0.528 U
Chloroform	UG/M3	0.977 U	**25.2**	**16.2**	0.977 U	**9.13**	**6.89**	**8.11**	**1.47**
Chloromethane	UG/M3	**1.15**	**1.71**	**1.57**	**1.15**	0.785 U	0.413 U	0.413 U	**0.785**
Cis-1,2-Dichloroethylene	UG/M3	0.079 U	0.079 U	0.079 U	0.793 U	1.51 U	0.793 U	0.793 U	0.793 U

Table 15. Summary of Volatile Organic Compounds in Soil Vapor, 73-99 Empire Boulevard, Brooklyn, New York

Sample Designation:		AA-1	IA-1	IA-2	RXSV-1	RXSV-2	RXSV-3	RXSV-3	RXSV-4
Sample Date:		03/13/2023	03/13/2023	03/13/2023	08/04/2025	08/04/2025	08/04/2025	08/04/2025	08/04/2025
Normal Sample or Field Duplicate:		N	N	N	N	N	N	FD	N
Parameter	Units								
Cis-1,3-Dichloropropene	UG/M3	0.908 U	0.908 U	0.908 U	0.908 U	1.73 U	0.908 U	0.908 U	0.908 U
Cyclohexane	UG/M3	0.688 U	0.688 U	0.688 U	**0.854**	**5.68**	**2.11**	**1.41**	**1.71**
Dibromochloromethane	UG/M3	1.7 U	1.7 U	1.7 U	1.7 U	3.24 U	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	UG/M3	**2.28**	**2.32**	**2.35**	**2.1**	**1.9**	**2.17**	**2.21**	**2.07**
Ethanol	UG/M3	**11.7**	**627**	**710**	**122**	**62.4**	**93.1**	**16.4**	**47.1**
Ethyl Acetate	UG/M3	1.8 U	1.8 U	1.8 U	1.8 U	3.42 U	1.8 U	1.8 U	1.8 U
Ethylbenzene	UG/M3	0.869 U	0.869 U	0.869 U	0.869 U	**2.1**	**3.34**	**1.79**	**1.48**
Hexachlorobutadiene	UG/M3	2.13 U	2.13 U	2.13 U	2.13 U	4.05 U	2.13 U	2.13 U	2.13 U
Isopropanol	UG/M3	**1.72**	**90**	**95.9**	**12.2**	**12.6**	**8.23 J**	**4.77**	**8.73**
m,p-Xylene	UG/M3	1.74 U	**1.82**	**3.17**	**2.45**	**9.21**	**15.1**	**8.86**	**5.86**
Methyl Ethyl Ketone (2-Butanone)	UG/M3	1.47 U	1.47 U	1.47 U	**1.72**	**6.25**	**3.24**	**2.5**	**4.34**
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	UG/M3	2.05 U	2.05 U	2.05 U	2.05 U	3.89 U	2.05 U	2.05 U	2.05 U
Methylene Chloride	UG/M3	1.74 U	1.74 U	1.74 U	1.74 U	3.3 U	1.74 U	1.74 U	1.74 U
Naphthalene	UG/M3	NA	NA	NA	0.996 U	1.89 U	0.996 U	0.996 U	0.996 U
N-Heptane	UG/M3	0.82 U	0.82 U	0.82 U	**0.889**	**4.59**	**2.3**	**1.33**	**2.74**
N-Hexane	UG/M3	0.705 U	**0.744**	**0.832**	**3.19**	**11**	**4.19**	**2.07**	**3.25**
O-Xylene (1,2-Dimethylbenzene)	UG/M3	0.869 U	0.869 U	**1.26**	**1.14**	**4.86**	**6.17**	**3.92**	**2.74**
Styrene	UG/M3	0.852 U	0.852 U	0.852 U	0.852 U	1.62 U	0.852 U	0.852 U	0.852 U
Tert-Butyl Alcohol	UG/M3	1.52 U	**1.63**	**2.11**	**4.3**	**160**	**51.5**	**51.5**	**79.1**
Tert-Butyl Methyl Ether	UG/M3	0.721 U	0.721 U	0.721 U	0.721 U	1.37 U	0.721 U	0.721 U	0.721 U
Tetrachloroethylene (PCE)	UG/M3	**0.203**	**0.271**	**0.468**	1.36 U	**20.3**	**23.6**	**26**	**12.8**
Tetrahydrofuran	UG/M3	**1.49**	1.47 U	1.47 U	1.47 U	**5.43**	1.47 U	1.47 U	1.47 U
Toluene	UG/M3	**2.02**	**2.8**	**3.38**	**3.48**	**13.2**	**153**	**61**	**37.6**
Trans-1,2-Dichloroethene	UG/M3	0.793 U	0.793 U	0.793 U	0.793 U	1.51 U	0.793 U	0.793 U	0.793 U
Trans-1,3-Dichloropropene	UG/M3	0.908 U	0.908 U	0.908 U	0.908 U	1.73 U	0.908 U	0.908 U	0.908 U
Trichloroethylene (TCE)	UG/M3	0.107 U	0.107 U	0.107 U	1.07 U	2.04 U	1.07 U	1.07 U	1.07 U
Trichlorofluoromethane	UG/M3	**1.23**	**1.21**	**1.23**	1.12 U	2.14 U	**3.5**	**3.9**	**1.38**
Vinyl Bromide	UG/M3	0.874 U	0.874 U	0.874 U	0.874 U	1.66 U	0.874 U	0.874 U	0.874 U
Vinyl Chloride	UG/M3	0.051 U	**0.067**	0.051 U	0.511 U	0.971 U	0.511 U	0.511 U	0.511 U

Table 15. Summary of Volatile Organic Compounds in Soil Vapor, 73-99 Empire Boulevard, Brooklyn, New York

Sample Designation:		RXSV-5	RXSV-6
Sample Date:		03/13/2023	03/13/2023
Normal Sample or Field Duplicate:		N	N
Parameter	Units		
1,1,1-Trichloroethane (TCA)	UG/M3	1.09 U	1.46 U
1,1,2,2-Tetrachloroethane	UG/M3	1.37 U	1.83 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/M3	1.53 U	2.05 U
1,1,2-Trichloroethane	UG/M3	1.09 U	1.46 U
1,1-Dichloroethane	UG/M3	0.809 U	1.08 U
1,1-Dichloroethene	UG/M3	0.793 U	1.06 U
1,2,4-Trichlorobenzene	UG/M3	1.48 U	1.98 U
1,2,4-Trimethylbenzene	UG/M3	**1.21**	**1.48**
1,2-Dibromoethane (Ethylene Dibromide)	UG/M3	1.54 U	2.05 U
1,2-Dichlorobenzene	UG/M3	1.2 U	1.61 U
1,2-Dichloroethane	UG/M3	0.809 U	1.08 U
1,2-Dichloropropane	UG/M3	0.924 U	1.23 U
1,2-Dichlorotetrafluoroethane	UG/M3	1.4 U	1.87 U
1,3,5-Trimethylbenzene (Mesitylene)	UG/M3	0.983 U	1.31 U
1,3-Butadiene	UG/M3	**1.66**	**1.8**
1,3-Dichlorobenzene	UG/M3	1.2 U	1.61 U
1,4-Dichlorobenzene	UG/M3	1.2 U	1.61 U
1,4-Dioxane (P-Dioxane)	UG/M3	0.721 U	0.962 U
2,2,4-Trimethylpentane	UG/M3	0.934 U	**1.66**
2-Hexanone	UG/M3	0.82 U	1.09 U
4-Ethyltoluene	UG/M3	0.983 U	1.31 U
Acetone	UG/M3	**20.2**	**16.3**
Allyl Chloride (3-Chloropropene)	UG/M3	0.626 U	0.836 U
Benzene	UG/M3	**1.43**	**1.94**
Benzyl Chloride	UG/M3	1.04 U	1.38 U
Bromodichloromethane	UG/M3	1.34 U	1.79 U
Bromoform	UG/M3	2.07 UJ	2.76 UJ
Bromomethane	UG/M3	0.777 U	1.04 U
Carbon Disulfide	UG/M3	**1.63**	**2.47**
Carbon Tetrachloride	UG/M3	1.26 U	1.68 U
Chlorobenzene	UG/M3	0.921 U	1.23 U
Chloroethane	UG/M3	0.528 U	0.705 U
Chloroform	UG/M3	0.977 U	**1.64**
Chloromethane	UG/M3	0.413 U	0.551 U
Cis-1,2-Dichloroethylene	UG/M3	0.793 U	1.06 U

Table 15. Summary of Volatile Organic Compounds in Soil Vapor, 73-99 Empire Boulevard, Brooklyn, New York

Sample Designation:		RXSV-5	RXSV-6
Sample Date:		03/13/2023	03/13/2023
Normal Sample or Field Duplicate:		N	N
Parameter	Units		
Cis-1,3-Dichloropropene	UG/M3	0.908 U	1.21 U
Cyclohexane	UG/M3	0.688 U	0.919 U
Dibromochloromethane	UG/M3	1.7 U	2.27 U
Dichlorodifluoromethane	UG/M3	**2.27**	**2.36**
Ethanol	UG/M3	**13.9**	**19.2**
Ethyl Acetate	UG/M3	1.8 U	2.41 U
Ethylbenzene	UG/M3	**0.93**	**1.86**
Hexachlorobutadiene	UG/M3	2.13 U	2.85 U
Isopropanol	UG/M3	**2.48**	**2.8**
m,p-Xylene	UG/M3	**3.41**	**3.38**
Methyl Ethyl Ketone (2-Butanone)	UG/M3	**4.63**	1.97 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	UG/M3	2.05 U	2.74 U
Methylene Chloride	UG/M3	1.74 U	2.32 U
Naphthalene	UG/M3	NA	NA
N-Heptane	UG/M3	**2.07**	**1.9**
N-Hexane	UG/M3	**0.99**	**0.948**
O-Xylene (1,2-Dimethylbenzene)	UG/M3	**1.52**	**1.35**
Styrene	UG/M3	0.852 U	1.14 U
Tert-Butyl Alcohol	UG/M3	**7.64**	**6.76**
Tert-Butyl Methyl Ether	UG/M3	0.721 U	0.963 U
Tetrachloroethylene (PCE)	UG/M3	**14.3**	**19**
Tetrahydrofuran	UG/M3	1.47 U	**2.02**
Toluene	UG/M3	**10**	**52**
Trans-1,2-Dichloroethene	UG/M3	0.793 U	1.06 U
Trans-1,3-Dichloropropene	UG/M3	0.908 U	1.21 U
Trichloroethylene (TCE)	UG/M3	1.07 U	1.43 U
Trichlorofluoromethane	UG/M3	**1.24**	**1.5**
Vinyl Bromide	UG/M3	0.874 U	1.17 U
Vinyl Chloride	UG/M3	0.511 U	0.683 U

Table 16. Remedial Cost Estimate for Remedial Alternative 1
Track 1 Unrestricted Use Cleanup

Item	Description	Estimated Quantity	Unit		Unit Price		Cost
Capital Costs							
SITE PREPARATION							
	Mobilization/Demobilization	1	LS	$	50,000	$	50,000
	Perimeter Fencing, Site Security, Temporary Facilities, Soil Staging Area, Decon Pad	1	LS	$	100,000	$	100,000
	Demolition Debris Removal and Disposal	1	LS	$	250,000	$	250,000
	Permitting	1	LS	$	50,000	$	50,000
EXCAVATION/BACKFILL							
	Support of Excavation	16,000	SF	$	60	$	960,000
	Dewatering and Water Treatment	0	LS	$	300,000	$	-
	Soil Excavation and Handling	13,450	CY	$	40	$	538,000
	Import Certified-Clean Fill	0	CY	$	30	$	-
	Backfill and Compaction of Certified Clean Fill	0	CY	$	15	$	-
	Surveying	1	LS	$	50,000	$	50,000
TRANSPORTATION/DISPOSAL							
	Non-Hazardous Solid Waste Transportation and Disposal	20,175	tons	$	50	$	1,008,750
	SUBTOTAL REMEDIATION CONSTRUCTION COST					**$**	**3,006,750**
Supplemental Remedial Costs							
	In-Situ Waste Characterization	1	LS	$	300,000	$	300,000
	Clean Backfill Sampling for VOCs	0	each	$	100	$	-
	Clean Backfill Sampling for all other parameters	0	each	$	1,500	$	-
	Confirmation Sampling	53	each	$	2,500	$	132,500
	Data Usability Summary Report	1	LS	$	80,000	$	80,000
	Air Monitoring, Field Oversight, Engineering Support/Disposal Coordination	6	Month	$	50,000	$	300,000
	Vapor, Dust and Odor Suppression	6	Month	$	30,000	$	180,000
	Vapor Intrusion Investigation	1	LS	$	25,000	$	25,000
	SUBTOTAL SUPPLEMENTAL REMEDIATION COST					**$**	**1,017,500**
BCP Reporting/Record Keeping							
	Remedial Action Work Plan	1	LS	$	50,000	$	50,000
	Monthly Reporting, Fact Sheets, Citizen Participation Activities	6	Month	$	7,000	$	42,000
	Site Management Plan	0	LS	$	40,000	$	-
	Final Engineering Report	1	LS	$	50,000	$	50,000
	Subtotal BCP Reporting/Record Keeping Cost					**$**	**142,000**
	TOTAL REMEDIAL CONSTRUCTION, SUPPLEMENTAL AND BCP RECORD KEEPING/REPORTING					**$**	**4,166,250**
	CONTINGENCY, TAX				**30%**	**$**	**1,249,875**
	TOTAL					**$**	**5,416,125**
Annual Operation, Maintenance and Monitoring (OM&M) Cost for Years 1 and 2							
	Groundwater Sampling, Reporting	0	LS	$	15,000	$	-
	Soil Vapor Sampling, Reporting	0	LS	$	10,000	$	-
	Annual Inspection of Engineering Controls and Periodic Review Report	0	LS	$	10,000	$	-
	TOTAL ANNUAL MONITORING COST/YEAR FOR YEARS 1 AND 2					**$**	**-**

Table 17. Remedial Cost Estimate for Remedial Alternative 2
Track 2 Restricted Residential Use Cleanup

Item	Description	Estimated Quantity	Unit		Unit Price		Cost
Capital Costs							
SITE PREPARATION							
	Mobilization/Demobilization	1	LS	$	50,000	$	50,000
	Perimeter Fencing, Site Security, Temporary Facilities, Soil Staging Area, Decon Pad	1	LS	$	100,000	$	100,000
	Demolition Debris Removal and Disposal	1	LS	$	250,000	$	250,000
	Permitting	1	LS	$	50,000	$	50,000
EXCAVATION/BACKFILL							
	Support of Excavation	16,000	SF	$	60	$	960,000
	Dewatering and Water Treatment	0	LS	$	200,000	$	-
	Soil Excavation and Handling	9,600	CY	$	40	$	384,000
	Import Certified-Clean Fill	0	CY	$	30	$	-
	Backfill and Compaction of Certified Clean Fill	0	CY	$	15	$	-
	Surveying	1	LS	$	50,000	$	50,000
TRANSPORTATION/DISPOSAL							
	Non-Hazardous Solid Waste Transportation and Disposal	14,400	tons	$	50	$	720,000
	SUBTOTAL REMEDIATION CONSTRUCTION COST					**$**	**2,564,000**
Supplemental Remedial Costs							
	In-Situ Waste Characterization	1	LS	$	250,000	$	250,000
	Clean Backfill Sampling for VOCs	0	each	$	100	$	-
	Clean Backfill Sampling for all other parameters	0	each	$	1,500	$	-
	Documentation Sampling	42	each	$	2,500	$	105,000
	Data Usability Summary Report	1	LS	$	72,000	$	72,000
	Air Monitoring, Field Oversight, Engineering Support/Disposal Coordination	4	Month	$	50,000	$	200,000
	Vapor, Dust and Odor Suppression	4	Month	$	30,000	$	120,000
	Vapor Intrusion Investigation	1	LS	$	25,000	$	25,000
	SUBTOTAL SUPPLEMENTAL REMEDIATION COST					**$**	**772,000**
BCP Reporting/Record Keeping							
	Remedial Action Work Plan	1	LS	$	50,000	$	50,000
	Monthly Reporting, Fact Sheets, Citizen Participation Activities	4	Month	$	7,000	$	28,000
	Site Management Plan	1	LS	$	40,000	$	40,000
	Final Engineering Report	1	LS	$	50,000	$	50,000
	Subtotal BCP Reporting/Record Keeping Cost					**$**	**168,000**
	TOTAL REMEDIAL CONSTRUCTION, SUPPLEMENTAL AND BCP RECORD KEEPING/REPORTING					**$**	**3,504,000**
	CONTINGENCY, TAX				**30%**	**$**	**1,051,200**
	TOTAL					**$**	**4,555,200**
Annual Operation, Maintenance and Monitoring (OM&M) Cost for Years 1 and 2							
	Groundwater Sampling, Reporting	0	LS	$	15,000	$	-
	Soil Vapor Sampling, Reporting	0	LS	$	10,000	$	-
	Annual Inspection of Engineering Controls and Periodic Review Report	1	LS	$	10,000	$	10,000
	TOTAL ANNUAL MONITORING COST/YEAR FOR YEARS 1 AND 2					**$**	**10,000**

Table 18. Track 1 and Track 2 Soil Cleanup Objectives and Backfill/On-Site Soil Reuse Soil Cleanup Objectives
73-99 Empire Blvd, Brooklyn, NY

Parameter	Track 1 SCOs[1]	Track 2 SCOs[2]	Track 1 Backfill/On-Site Reu SCOs[3]	Track 2 Backfill/On-Site Reuse SCOs[4]
Volatile Organic Compounds (Concentrations in mg/kg)				
1,1,1-Trichloroethane	0.68	100	0.68	0.68
1,1-Dichloroethane	0.27	26	0.27	0.27
1,1-Dichloroethene	0.33	100	0.33	0.33
1,2,4-Trimethylbenzene	3.6	52	3.6	3.6
1,3,5-Trimethylbenzene	8.4	52	8.4	8.4
1,2-Dichlorobenzene	1.1	100	1.1	1.1
1,2-Dichloroethane	0.02	3.1	0.02	0.02
1,3-Dichlorobenzene	2.4	49	2.4	2.4
1,4-Dichlorobenzene	1.8	13	1.8	1.8
1,4-Dioxane	0.1	13	0.1	0.1
2-Butanone (MEK)	0.12	100	0.12	0.12
Acetone	0.05	100	0.05	0.05
Benzene	0.06	4.8	0.06	0.06
n-Butylbenzene	12	100	12	12
Carbon tetrachloride	0.76	2.4	0.76	0.76
Chlorobenzene	1.1	100	1.1	1.1
Chloroform	0.37	49	0.37	0.37
cis-1,2-Dichloroethene	0.25	100	0.25	0.25
Ethylbenzene	1	41	1	1
Methylene chloride	0.05	100	0.05	0.05
MTBE	0.93	100	0.93	0.93
n-Propylbenzene	3.9	100	3.9	3.9
sec-Butylbenzene	11	100	11	11
tert-Butylbenzene	5.9	100	5.9	5.9
Tetrachloroethene	1.3	19	1.3	1.3
Toluene	0.7	100	0.7	0.7
trans-1,2-Dichloroethene	0.19	100	0.19	0.19
Trichloroethene	0.47	21	0.47	0.47
Vinyl chloride	0.02	0.9	0.02	0.02
Xylenes (total)	0.26	100	0.26	1.6
Semivolatile Organic Compounds (Concentrations in mg/kg)				
1,4-Dioxane	0.1	13	0.1	0.1
2-Methylphenol	0.33	100	0.33	0.33
3&4-Methylphenol	0.33	100	0.33	0.33
Acenaphthene	20	100	20	98
Acenaphthylene	100	100	100	100
Anthracene	100	100	100	100
Benzo[a]anthracene	1	1	1	1
Benzo[a]pyrene	1	1	1	1
Benzo[b]fluoranthene	1	1	1	1
Benzo[g,h,i]perylene	100	100	100	100
Benzo[k]fluoranthene	0.8	3.9	0.8	1.7
Chrysene	1	3.9	1	1
Dibenzo[a,h]anthracene	0.33	0.33	0.33	0.33
Dibenzofuran	7	59	7	59
Fluoranthene	100	100	100	100
Fluorene	3	100	3	100
Hexachlorobenzene	0.33	1.2	0.33	1.2
Indeno[1,2,3-cd]pyrene	0.5	0.5	0.5	0.5
Naphthalene	12	100	12	12
Pentachlorophenol	0.8	6.7	0.8	0.8
Phenanthrene	100	100	100	100
Phenol	0.33	100	0.33	0.33
Pyrene	100	100	100	100
Metals (Concentrations in mg/kg)				
Arsenic	13	16	13	16
Barium	350	400	350	400
Beryllium	7.2	72	7.2	47
Cadmium	2.5	4.3	2.5	4.3
Chromium, Hexavalent	1	110	1	19
Chromium	30	180	30	180
Copper	50	270	50	270
Cyanide, Total	27	27	27	27
Lead	63	400	63	400
Manganese	1600	2000	1600	2000
Mercury	0.18	0.81	0.18	0.73
Nickel	30	310	30	130
Selenium	3.9	180	3.9	4
Silver	2	180	2	8.3
Zinc	109	10000	109	2480
Pesticides (Concentrations in mg/kg)				
4,4'-DDD	0.0033	13	0.0033	13
4,4'-DDE	0.0033	8.9	0.0033	8.9
4,4'-DDT	0.0033	7.9	0.0033	7.9
Aldrin	0.005	0.097	0.005	0.097

Table 18. Track 1 and Track 2 Soil Cleanup Objectives and Backfill/On-Site Soil Reuse Soil Cleanup Objectives
73-99 Empire Blvd, Brooklyn, NY

Parameter	Track 1 SCOs[1]	Track 2 SCOs[2]	Track 1 Backfill/On-Site Reu SCOs[3]	Track 2 Backfill/On-Site Reuse SCOs[4]
alpha-BHC	0.02	0.48	0.02	0.02
alpha-Chlordane	0.094	4.2	0.094	2.9
beta-BHC	0.036	0.36	0.036	0.09
delta-BHC	0.04	100	0.04	0.25
Dieldrin	0.005	0.2	0.005	0.1
Endosulfan I	2.4	24	2.4	24
Endosulfan II	2.4	24	2.4	24
Endosulfan sulfate	2.4	24	2.4	24
Endrin	0.014	11	0.014	0.06
gamma-BHC (Lindane)	0.1	1.3	0.1	0.1
Heptachlor	0.042	2.1	0.042	0.38
Total Polychlorinated Biphenyls (Concentrations in mg/kg)				
Total Polychlorinated Biphenyls	0.1	1	0.1	0.1
Perfluorinated Alkyl Acids (Concentrations in µg/kg)				
Perfluorobutanesulfonic acid	--	--	--	--
Perfluoropentansulfonic acid	--	--	--	--
Perfluorohexanesulfonic acid	--	--	--	--
Perfluoroheptanesulfonic acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorodecanesulfonic acid	--	--	--	--
Perfluorododecanesulfonic acid	--	--	--	--
Perfluorobutanoics acid	--	--	--	--
Perfluoropentanoic acid	--	--	--	--
Perfluorohexanoic acid	--	--	--	--
Perfluoroheptanoic acid	--	--	--	--
Perfluorooctanoic acid	--	--	--	--
Perfluorononanoic acid	--	--	--	--
Perfluorodecanoic acid	--	--	--	--
Perfluoroundecanoic acid	--	--	--	--
Perfluorododecanoic acid	--	--	--	--
Perfluorotridecanoic acid	--	--	--	--
Perfluorotetradecanoic acid	--	--	--	--
Perfluorooctanesulfonic acid	0.88 [4]	44 [4]	0.88 [4]	1.1 [4]
Perfluorooctanoic acid	0.66 [4]	33 [4]	0.66 [4]	0.8 [4]
1H,1H, 2H, 2H-Perfluorohexane sulfonic acid	--	--	--	--
1H,1H, 2H, 2H-Perfluorooctane sulfonic acid	--	--	--	--
1H,1H, 2H, 2H-Perfluorodecane sulfonic acid	--	--	--	--
Perfluroroctanesulfonamide	--	--	--	--
N-methyl perfluorooctanesulfonamide	--	--	--	--
N-ethyl perfluorooctanesulfonamide	--	--	--	--
N-methyl perfluorooctanesulfonamidoacetic acid	--	--	--	--
N-ethyl perfluorooctanesulfonamidoacetic acid	--	--	--	--
N-methyl perfluorooctanesulfonamidoethanol	--	--	--	--
N-ethyl perfluorooctanesulfonamidoethanol	--	--	--	--
Hexafluoropropylene oxide dimer acid	--	--	--	--
4,8-Dioxa-3H-perfluorononanoic acid	--	--	--	--
Perfluoro-3-methoxypropanoic acid	--	--	--	--
Perfluoro-4-methoxybutanoic acid	--	--	--	--
Nonafluoro-3,6-dioxaheptanoic acid	--	--	--	--
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	--	--	--	--
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	--	--	--	--
Perfluoro(2-ethoxyethane)sulfonic acid	--	--	--	--
3-Perfluoropropyl propanoic acid	--	--	--	--
2H,2H,3H,3H-Perfluorooctanoic acid	--	--	--	--

1- SCOs and Backfill/On-Site Reuse SCOs for the Track 1 remedy are the NYSDEC Part 375 Unrestricted Use SCOs.

2- SCOs for the Track 2 remedy are the NYSDEC Part 375 Restricted Residential Use SCOs.

3- Backfill/On-Site Reuse SCOs for the Track 1 remedy are the NYSDEC Part 375 Unrestricted Use SCOs.

4- Backfill/On-Site Reuse SCOs for the Track 2 remedy are the lower of the NYSDEC Part 375 Protection of Groundwater or Restricted Residential Use SCOs.
4 - SCOs for PFOS and PFOA not yet final. The guidance values shown are to be used until SCOs are in effect. Soil collected for onsite reuse will not be analyzed for Perfluorinated Alkyl Acids.
µg/kg - Micrograms per kilogram
mg/kg - Milligrams per kilogram
NYSDEC - New York State Department of Environmental Conservation
SCOs - Soil Cleanup Objectives

Table 19. List of Required Permits
73-99 Empire Blvd, Brooklyn, New York

Regulatory Agency	Permit
NYCCPC	Uniform Land Use Review Procedure (ULURP)
NYCDEP	Sewer Certification and Sewer Permit (for new building connection)
NYCDEP	Fire Hydrant Permit
NYCDOB	New Building (NB) Permit
NYCDOB	Fence Permit
NYCDOB	Foundation/Earthwork Permit
NYCDOB	Builder's Paving Plan
NYCDOB	Underground Plumbing Permit
NYCDOB	Underground Electrical Permit
NYCDOT	Lane Closures, Sidewalk Crossings

Note: This list only accounts for permits required from the street level and below. Permits for aboveground portions of the building are not listed.

NYCCPC - New York City City Planning Commission

NYCDEP - New York City Department of Environmental Protection

NYCDOB - New York City Department of Buildings

NYCDOT - New York City Department of Transportation

Table 20. Proposed Confirmation Endpoint Soil Sample Identifications and Depths
73-99 Empire Blvd, Brooklyn, New York

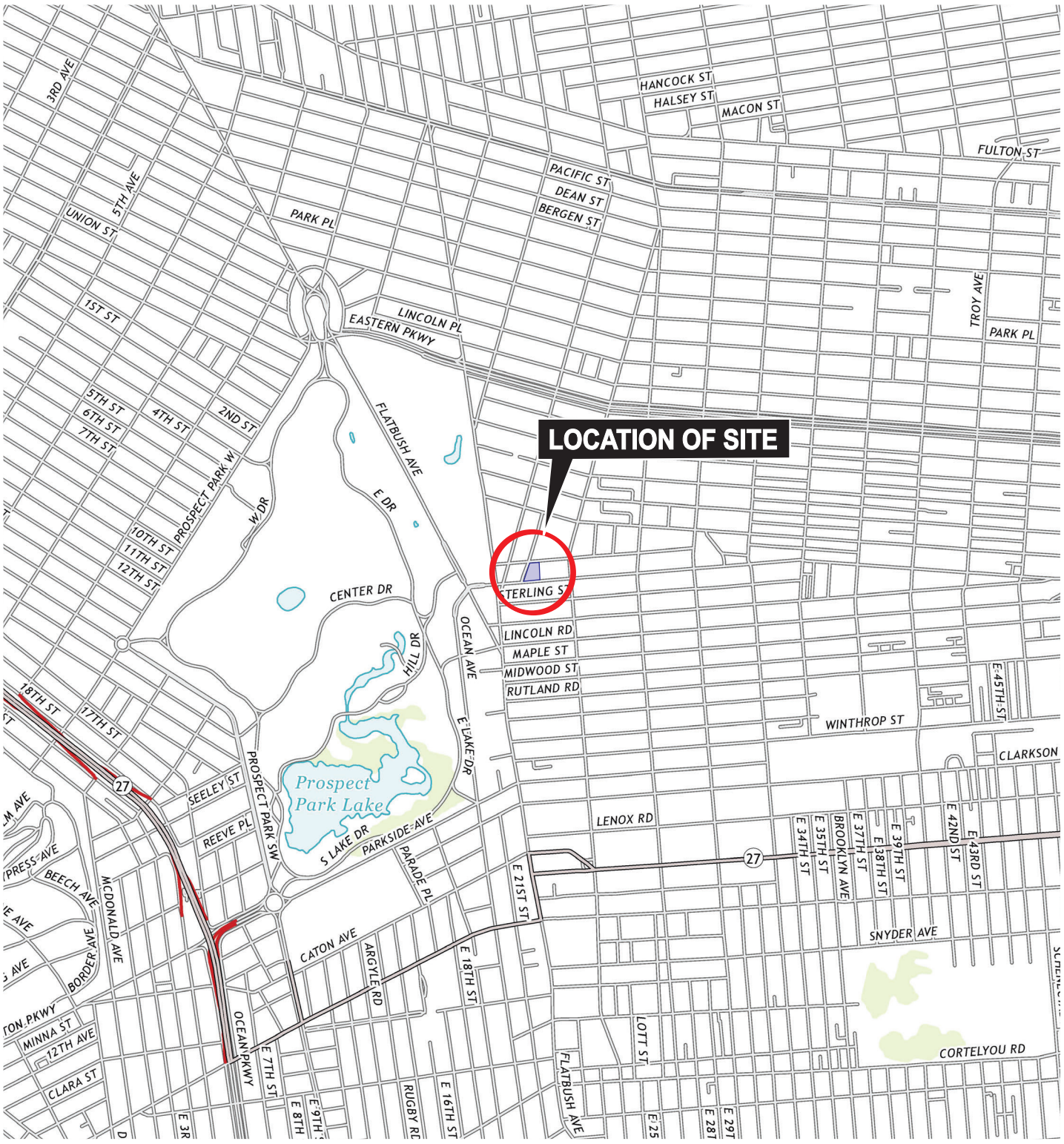
	Sample Identification	New Or Existing	Analyses	Proposed Remedial Excavation Depth (ft)	Sample Depth Interval (ft bls)	Remarks
Bottom Confirmation Soil Samples						
Proposed Track 1 Area						
1	BCS-1	New	Full Part 375 and ECs	7	7-9	Grid A
2	BCS-2	New	Full Part 375 and ECs	14	14-16	Grid B
3	BCS-3	New	Full Part 375 and ECs	9	9-11	Grid C
4	BCS-4	New	Full Part 375 and ECs	14	14-16	Grid D
5	BCS-5	New	Full Part 375 and ECs	14	14-16	Grid B
6	BCS-6	New	Full Part 375 and ECs	9	9-11	Grid C
7	BCS-7	New	Full Part 375 and ECs	9	9-11	Grid C
8	BCS-8	New	Full Part 375 and ECs	14	14-16	Grid D
9	BCS-9	New	Full Part 375 and ECs	14	14-16	Grid B
10	BCS-10	New	Full Part 375 and ECs	9	9-11	Grid C
11	BCS-11	New	Full Part 375 and ECs	14	14-16	Grid D
12	BCS-12	New	Full Part 375 and ECs	7	7-9	Grid A
13	BCS-13	New	Full Part 375 and ECs	7	7-9	Grid E
14	BCS-14	New	Full Part 375 and ECs	3	3-5	Grid F
15	BCS-15	New	Full Part 375 and ECs	12	12-14	Grid G
16	BCS-16	New	Full Part 375 and ECs	7	7-9	Grid A
17	BCS-17	New	Full Part 375 and ECs	7	7-9	Grid A
18	BCS-18	New	Full Part 375 and ECs	7	7-9	Grid E
19	BCS-19	New	Full Part 375 and ECs	3	3-5	Grid F
20	BCS-20	New	Full Part 375 and ECs	3	3-5	Grid F
21	BCS-21	New	Full Part 375 and ECs	12	12-14	Grid G
22	BCS-22	New	Full Part 375 and ECs	7	7-9	Grid H
23	BCS-23	New	Full Part 375 and ECs	7	7-9	Grid H
24	BCS-24	New	Full Part 375 and ECs	7	7-9	Grid E
25	BCS-25	New	Full Part 375 and ECs	3	3-5	Grid F
26	BCS-26	New	Full Part 375 and ECs	12	12-14	Grid G
27	BCS-27	New	Full Part 375 and ECs	7	7-9	Grid H
28	BCS-28	New	Full Part 375 and ECs	7	7-9	Grid H
29	BCS-29	New	Full Part 375 and ECs	14	14-16	Grid J
30	BCS-30	New	Full Part 375 and ECs	12	12-14	Grid K
31	BCS-31	New	Full Part 375 and ECs	12	12-14	Grid L
32	BCS-32	New	Full Part 375 and ECs	3	3-5	Grid I
33	BCS-33	New	Full Part 375 and ECs	3	3-5	Grid I
34	BCS-34	New	Full Part 375 and ECs	14	14-16	Grid J
35	BCS-35	New	Full Part 375 and ECs	12	12-14	Grid K
36	BCS-36	New	Full Part 375 and ECs	12	12-14	Grid K
37	BCS-37	New	Full Part 375 and ECs	12	12-14	Grid L
38	BCS-38	New	Full Part 375 and ECs	3	3-5	Grid I
39	BCS-39	New	Full Part 375 and ECs	3	3-5	Grid I
40	BCS-40	New	Full Part 375 and ECs	14	14-16	Grid J
41	BCS-41	New	Full Part 375 and ECs	12	12-14	Grid K
42	BCS-42	New	Full Part 375 and ECs	12	12-14	Grid L
Sidewall Confirmation Soil Samples						
In between Grids that Exceed 2ft difference in Excavation Depths						
1	SCS-1	New	Full Part 375 and ECs	7 and 14	11	Between Grids A and B
2	SCS-2	New	Full Part 375 and ECs	14 and 9	12	Between Grids B and C
3	SCS-3	New	Full Part 375 and ECs	9 and 14	12	Between Grids C and D
4	SCS-4	New	Full Part 375 and ECs	14 and 7	11	Between Grids B and E
5	SCS-5	New	Full Part 375 and ECs	9 and 3	6	Between Grids C and F
6	SCS-6	New	Full Part 375 and ECs	7 and 3	5	Between Grids E and F
7	SCS-7	New	Full Part 375 and ECs	3 and 12	8	Between Grids F and G
8	SCS-8	New	Full Part 375 and ECs	7 and 14	11	Between Grids E and J
9	SCS-9	New	Full Part 375 and ECs	3 and 12	8	Between Grids F and K
10	SCS-10	New	Full Part 375 and ECs	7 and 3	5	Between Grids H and I
11	SCS-11	New	Full Part 375 and ECs	7, 3 and 14	8	Between Grids H, I and J

Notes:

1. Locations are approximate. All end point samples will be biased toward impacted soil, if any is observed in the vicinity of the proposed location.
ft - feet
bls - below land surface
BCS - Bottom Confirmation Sample
SCS- Sidewall Confirmation Sample

FIGURES

Figure 1 - Site Location Map
Figure 2 - Site Plan
Figure 3 - Surrounding Land Use Map
Figure 4 - Tax Map
Figure 5 - Hydrogeologic Cross Sections
Figure 6 - Groundwater Flow Map
Figure 7 - Site Boundary with Sample Locations
Figure 8 - Summary of Exceedances in Soil
Figure 9 - Summary of Exceedances in Groundwater
Figure 10 - Summary of Detections in Soil Vapor
Figure 11 - Remedial Alternative 1- Track 1 Unrestricted Use Cleanup
Figure 12 - Remedial Alternative 2- Track 2 Restricted Residential Use Cleanup
Figure 13 - Organizational Chart
Figure 14 - Truck Routes



QUADRANGLE LOCATION

SOURCE:
USGS; 2016, Brooklyn, NY
7.5 Minute Topographic Quadrangle

N

0 2000’

Title:

SITE LOCATION MAP

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

ROUX

Compiled by: W.S.	Date: 12DEC25	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	1
Project Mgr.: W.S.	Project No.: 2861.0003Y000	
File: 2861.0003Y143.01.cdr		

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LEGEND

BCP SITE BOUNDARY

N

30' 0 30'

Title:

SITE PLAN

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

ROUX

Compiled by: W.S.	Date: 12DEC25	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	2
Project Mgr: W.S.	Project: 2861.0003Y000	
File: 2861.0003Y143.02.DWG		

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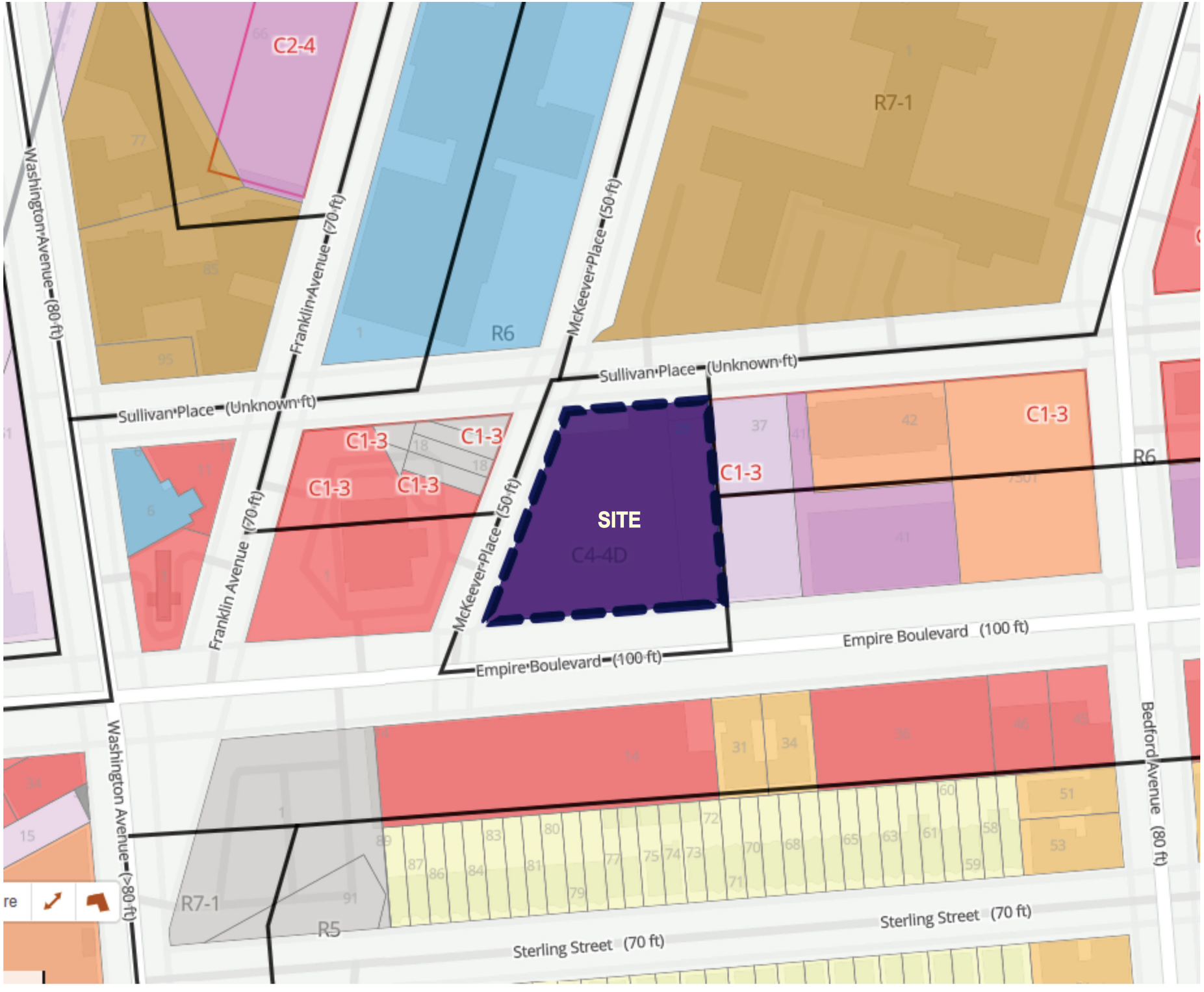

LEGEND

- ONE & TWO FAMILY BUILDING
- MULTI-FAMILY WALK UP BUILDINGS
- MULTI-FAMILY ELEVATOR BUILDINGS
- MIXED RESIDENTIAL & COMMERCIAL BUILDINGS
- COMMERCIAL & OFFICE BUILDINGS
- INDUSTRIAL & MANUFACTURING
- TRANSPORTATION & UTILITY
- PUBLIC FACILITIES & INSTITUTIONS
- PARKING FACILITIES

Title:

LAND USE MAP

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

ROUX

Compiled by: W.S.	Date: 12DEC25	FIGURE
Prepared by: G.M.	Scale: NOT TO SCALE	3
Project Mgr.: W.S.	Project No.: 2861.0003Y000	
File: 2861.0003Y143.03.cdr		

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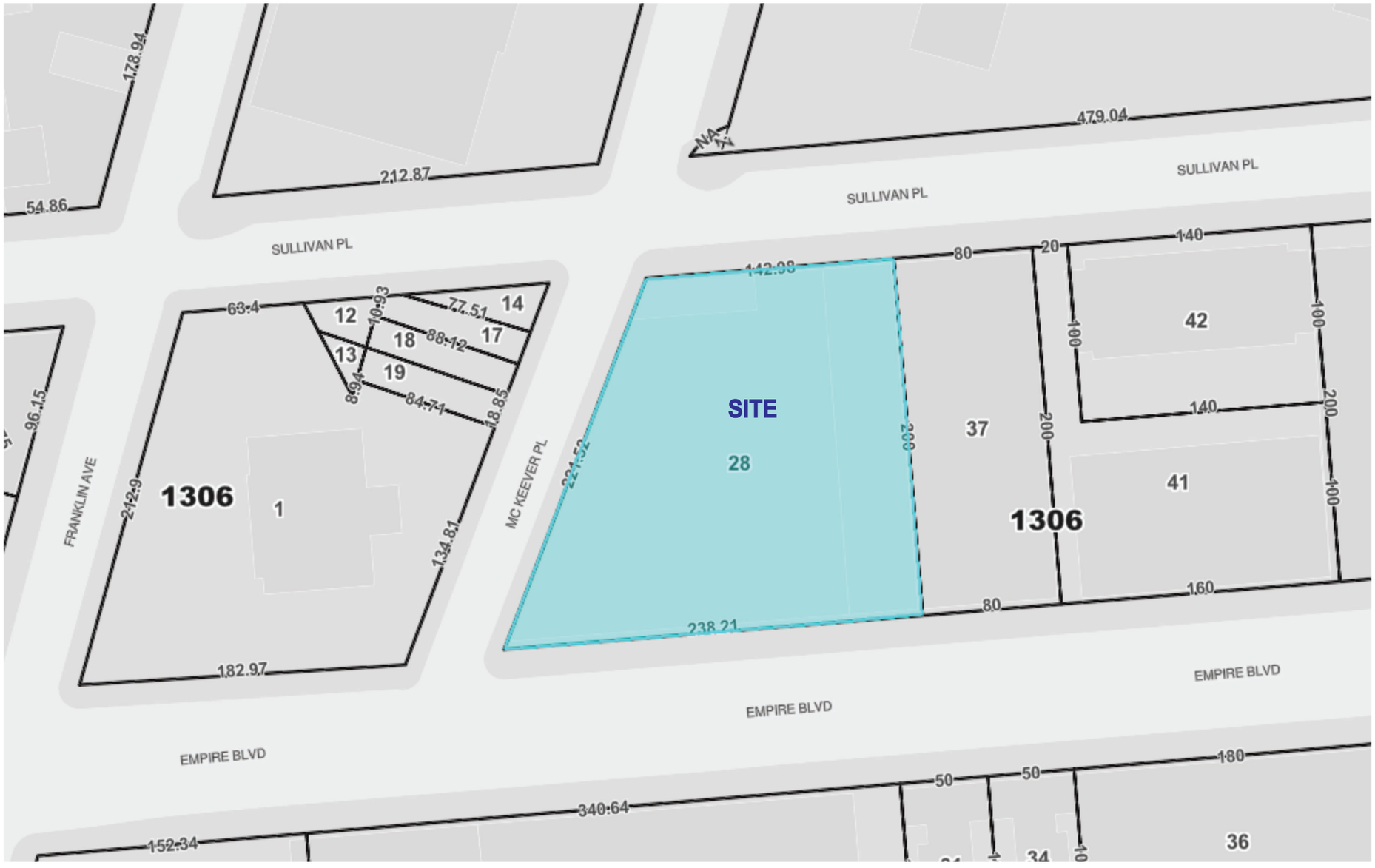

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Title:

TAX MAP

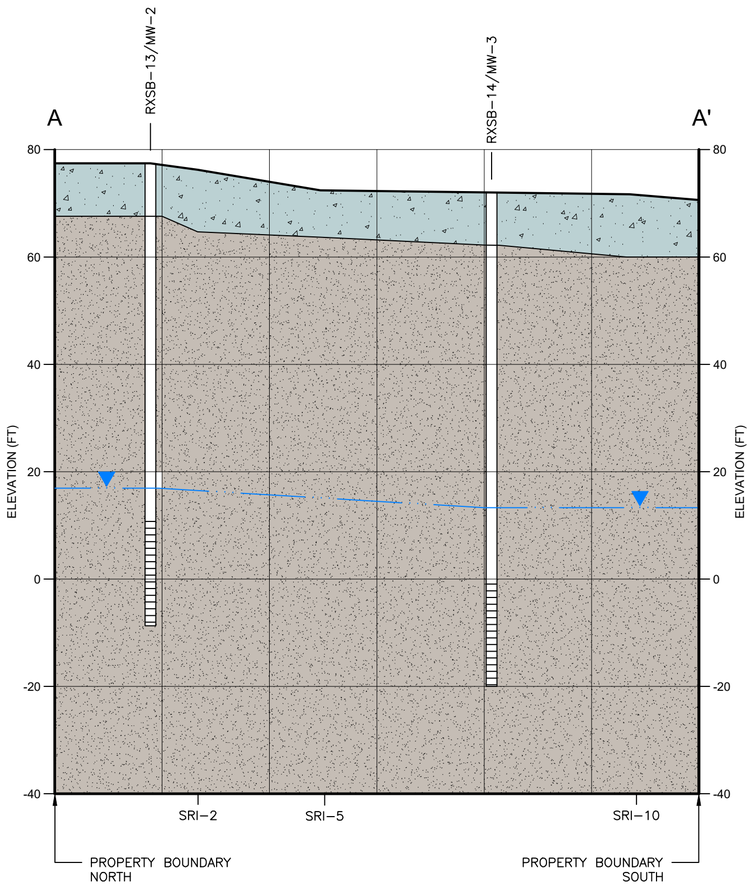
73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

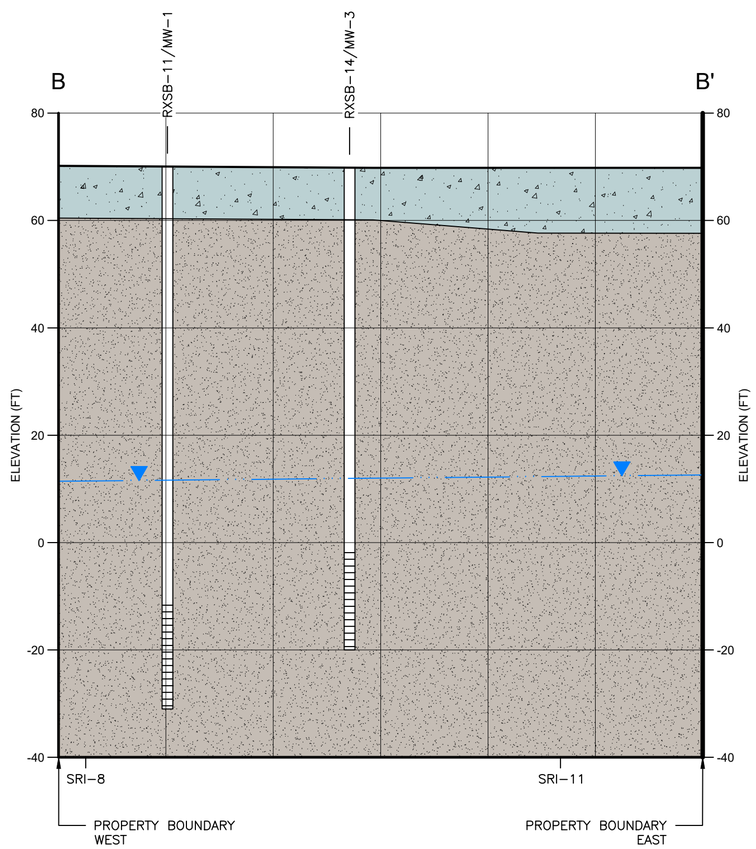
ROUX

Compiled by: W.S.	Date: 12DEC25	FIGURE
Prepared by: G.M.	Scale: NOT TO SCALE	4
Project Mgr.: W.S.	Project No.: 2861.0003Y000	
File: 2861.0003Y143.04.cdr		



CROSS SECTION A–A'

HORIZONTAL SCALE: 1" = 2'
VERTICAL SCALE: 1" = 5'

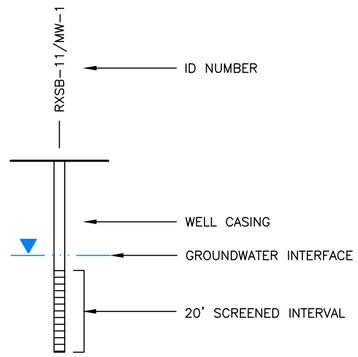


CROSS SECTION B–B'

HORIZONTAL SCALE: 1" = 2'
VERTICAL SCALE: 1" = 5'

LEGEND

- FILL MATERIAL CONSISTING OF VARYING AMOUNTS OF SAND, GRAVEL, BRICK, COBBLE AND ASHALT
- MEDIUM BROWN. FINE TO COARSE SAND, LITTLE FINE TO COARSE GRAVEL



CROSS SECTION LOCATIONS

LEGEND

- BCP SITE BOUNDARY
- APPROXIMATE LOCATION OF HYDRAULIC LIFTS/ REMNANTS
- RXSB–7 ROUX RI SOIL BORING LOCATION AND DESIGNATION WITHIN VACANT BUILDING
- RXSB–10 ROUX RI SOIL BORING LOCATION AND DESIGNATION WITHIN LAUNDROMAT
- RXSB–11/MW–1 ROUX RI SOIL BORING/ MONITORING WELL LOCATION AND DESIGNATION
- SRI–1 ROUX SUPPLEMENTAL RI BORINGS LOCATION AND DESIGNATION

Title:

CROSS SECTIONS A-A' AND B-B'

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

ROUX

Compiled by: W.S.	Date: 05JAN26	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	5
Project Mgr: W.S.	Project: 2861.0003Y000	
File: 2861.0003Y143.10.DWG		

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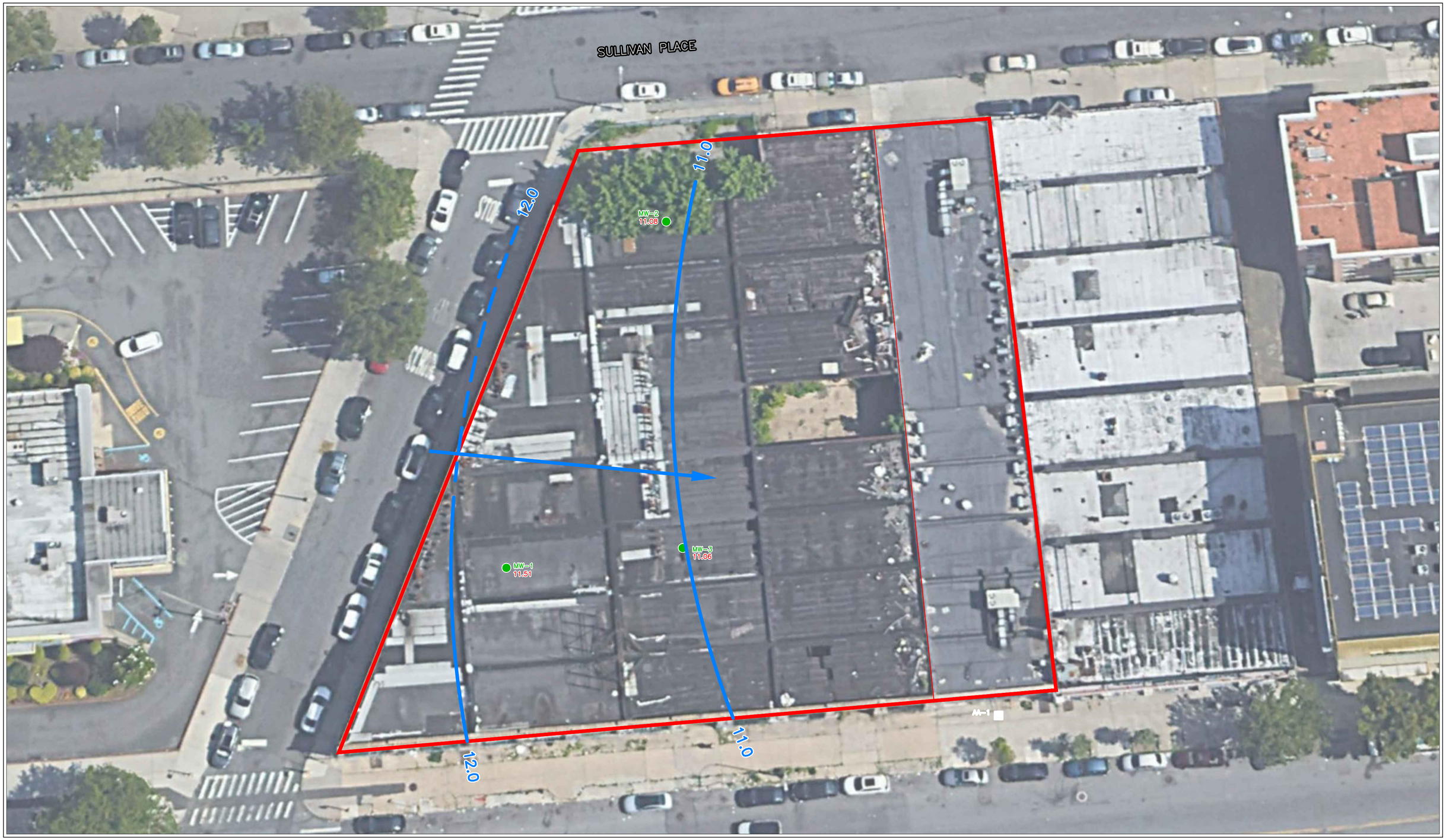

LEGEND

- BCP SITE BOUNDARY
- MW-1 — ROUX DEEP SOIL BORING/ MONITORING WELL LOCATION AND DESIGNATION
- 11.51 — GROUNDWATER ELEVATION IN FEET RELATIVE TO NAVD88
- 11.0 — LINE OF EQUAL GROUNDWATER ELEVATION IN FEET RELATIVE TO NAVD88 (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION

N

20' 0 20'

GROUNDWATER FLOW MAP

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

ROUX

Compiled by: W.S.	Date: 12DEC25
Prepared by: G.M.	Scale: AS SHOWN
Project Mgr: W.S.	Project: 2861.0003Y000
File: 2861.0003Y143.05.DWG	

FIGURE 6

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LEGEND

- BCP SITE BOUNDARY
- APPROXIMATE LOCATION OF HYDRAULIC LIFTS/ REMNANTS
- RXSB-7 ROUX RI SOIL BORING LOCATION AND DESIGNATION WITHIN VACANT BUILDING
- RXSB-10 ROUX RI SOIL BORING LOCATION AND DESIGNATION WITHIN LAUNDROMAT
- RXSB-11/ MW-1 ROUX RI SOIL BORING/ MONITORING WELL LOCATION AND DESIGNATION
- SRI-1 ROUX SUPPLEMENTAL RI BORINGS LOCATION AND DESIGNATION
- APPROXIMATE LOCATION OF AST (REMOVED)
- APPROXIMATE LOCATION OF FORMER GASOLINE UST (NOT DETECTED DURING GEOPHYSICAL SURVEY)
- A GRID AREA

N

20' 0 20'

Title:

SITE BOUNDARY WITH SAMPLE LOCATIONS

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

ROUX

Compiled by: W.S.	Date: 12DEC25	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	7
Project Mgr: W.S.	Project: 2861.0003Y000	
File: 2861.0003Y143.06.DWG		

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SRI-1	10/31/2025	10/31/2025
Depth (ft bls)	0 - 2	4 - 6
SVOCs		
Benzo(A)Anthracene	NE	3.7
Benzo(A)Pyrene	NE	3.3
Benzo(B)Fluoranthene	NE	4.1
Benzo(K)Fluoranthene	NE	1.3
Chrysene	NE	3.2
Dibenz(A,H)Anthracene	NE	0.52
Indeno(1,2,3-C,D)Pyrene	NE	2.2
Metals		
Lead	51.9	388
Mercury	0.334	0.224

RXSB-12	07/31/2025	07/31/2025
Depth (ft bls)	6 - 8	8 - 10
Metals		
Lead	NE (52.1)	90.4 J

SRI-8	10/30/2025	10/30/2025
Depth (ft bls)	0 - 2	3 - 5
SVOCs		
Benzo(A)Anthracene	0.27	1.1
Benzo(A)Pyrene	0.26	0.93
Benzo(B)Fluoranthene	0.36	1.4
Benzo(K)Fluoranthene	0.084 J	0.38
Chrysene	0.28	1.1
Dibenz(A,H)Anthracene	0.039 J	0.15
Indeno(1,2,3-C,D)Pyrene	0.16	0.66
Metals		
Chromium, Hexavalent	0.27 J	2.07
Copper	27.1	45.8
Lead	148	464
Mercury	0.08	0.12
Nickel	13.9	13.4
Zinc	91.5	314
Pesticides/Herbicides		
P,P'-DDE	0.00545	0.00346
P,P'-DDT	0.0107	0.00514
PFAS		
Perfluorooctanoic acid (PFOA)	NE	1.28

SRI-5	10/31/2025	10/31/2025
Depth (ft bls)	0 - 2	3 - 5
Metals		
Lead	NE	69.5
Nickel	47.9	NE

SRI-2	10/31/2025	10/31/2025	10/31/2025	10/31/2025
Depth (ft bls)	0 - 2	3 - 5	6 - 8	12 - 14
SVOCs				
Benzo(A)Anthracene	NE	1.1	NE	ND
Benzo(B)Fluoranthene	NE	1.2	ND	ND
Indeno(1,2,3-C,D)Pyrene	NE	0.59	ND	ND
Metals				
Lead	NE	63.9	105	NE
Mercury	NE	NE	0.754	ND

RXSB-5	08/01/2025	08/01/2025
Depth (ft bls)	8 - 10	10 - 12
Metals		
Mercury	ND (0.084U)	0.297

SRI-3	10/31/2025	10/31/2025
Depth (ft bls)	0 - 2	3 - 5
SVOCs		
Benzo(A)Anthracene	NE	2
Benzo(A)Pyrene	NE	1.7
Benzo(B)Fluoranthene	1.1	2
Chrysene	NE	1.9
Indeno(1,2,3-C,D)Pyrene	0.67	0.97
Metals		
Lead	94.2	652
Mercury	0.684	2.46

RXSB-6	08/01/2025	08/01/2025
Depth (ft bls)	6 - 8	8 - 10
Metals		
Lead	154	NE (46.2)

RXSB-9	03/13/2023	03/13/2023	03/13/2023
Depth (ft bls)	7 - 9	7 - 9 DUP	9 - 11
Metals			
Lead	NE (33.4)	NE (43.3)	520

SRI-4	10/31/2025	10/31/2025	10/31/2025
Depth (ft bls)	0 - 2	4 - 6	11 - 13
SVOCs			
Benzo(A)Anthracene	4.5 J-	NE	NE
Benzo(A)Pyrene	3.4 J-	NE	NE
Benzo(B)Fluoranthene	4.8 J-	NE	NE
Benzo(K)Fluoranthene	1.3 J-	NE	NE
Chrysene	3.9 J-	NE	NE
Dibenz(A,H)Anthracene	0.6 J	NE	NE
Indeno(1,2,3-C,D)Pyrene	2.2 J-	NE	NE
Metals			
Lead	NE	NE	95.7
Nickel	37.8	NE	NE

SRI-6	10/31/2025	10/31/2025
Depth (ft bls)	0 - 2	0 - 2 DUP
SVOCs		
Benzo(A)Anthracene	1.8 J	NE
Benzo(A)Pyrene	1.2 J	NE
Benzo(B)Fluoranthene	1.6 J	NE
Chrysene	1.4 J	NE
Indeno(1,2,3-C,D)Pyrene	0.79 J	NE
Metals		
Copper	55.7 J	78.6 J
Lead	103	110
Mercury	0.237	0.289
Zinc	NE	135 J

SRI-7	10/30/2025	10/30/2025	10/30/2025
Depth (ft bls)	0 - 2	2 - 4	11 - 13
SVOCs			
Benzo(A)Anthracene	1.1	NE	ND
Benzo(B)Fluoranthene	1.3	ND	ND
Indeno(1,2,3-C,D)Pyrene	0.64	ND	ND
Metals			
Chromium, Hexavalent	1.7	ND	ND
Lead	153	127	NE
Pesticides/Herbicides			
P,P'-DDE	0.00722	ND	ND
P,P'-DDT	0.0138	ND	ND

RXSB-10	03/13/2023	03/13/2023
Depth (ft bls)	5 - 8	8 - 11
Metals		
Lead	162	NE (18.3)
Mercury	0.351	NE (0.083)
Nickel	33.3	39.6

SRI-11	10/30/2025	10/30/2025	10/30/2025
Depth (ft bls)	0 - 2	4 - 6	11 - 13
SVOCs			
Benzo(A)Anthracene	NE	2.1	NE
Benzo(A)Pyrene	NE	1.5	NE
Benzo(B)Fluoranthene	NE	2.1	NE
Chrysene	NE	1.9	NE
Indeno(1,2,3-C,D)Pyrene	NE	0.91	NE
Metals			
Lead	NE	157	NE
Mercury	NE	0.235	NE
Nickel	NE	31	NE
Zinc	NE	150	NE

SRI-13	10/30/2025	10/30/2025	10/30/2025	10/30/2025
Depth (ft bls)	0 - 2	4 - 6	7 - 9	11 - 13
SVOCs				
Benzo(A)Anthracene	NE	1.2	NE	ND
Benzo(B)Fluoranthene	NE	1.3	NE	ND
Chrysene	NE	1.1	NE	ND
Indeno(1,2,3-C,D)Pyrene	NE	0.62	NE	ND
Metals				
Lead	321	964	430	NE
Mercury	0.875	0.891	0.313	ND
Nickel	33.4	NE	50.6	NE
Zinc	121	NE	114	NE

RXSB-1	07/31/2025	07/31/2025	07/31/2025
Depth (ft bls)	8 - 10	8 - 10 DUP	10 - 12
PFAS			
Perfluorooctanoic acid (PFOA)	NE (0.082J)	NE (0.144J)	1.15

SRI-9	10/30/2025	10/30/2025	10/30/2025
Depth (ft bls)	0 - 2	0 - 2 DUP	3 - 5
Metals			
Chromium, Hexavalent	1.78 J	ND	ND
Lead	89 J	NE	NE
Mercury	0.384 J	0.2 21 J	ND

SRI-10	10/30/2025	10/30/2025	10/30/2025
Depth (ft bls)	0 - 2	3 - 5	10 - 12
Metals			
Copper	58.5	NE	NE
Mercury	ND	NE	0.89

RXSB-8	08/01/2025	08/01/2025
Depth (ft bls)	7 - 9	9 - 11
VOCs		
Benzene	NE (0.0003&J)	0.24
Ethylbenzene	ND (0.0017U)	1.3
Toluene	ND (0.0017U)	0.8
Xylenes	ND (0.0017U)	7.7

SRI-12	10/30/2025	10/30/2025	10/30/2025	10/30/2025
Depth (ft bls)	0 - 2	4 - 6	7 - 9	11 - 13
Metals				
Lead	91.9	NE	NE	NE
Mercury	0.371	NE	ND	ND

LEGEND

- BCP SITE BOUNDARY
- APPROXIMATE LOCATION OF HYDRAULIC LIFTS/ REMNANTS
- RXSB-7 ROUX SOIL BORING LOCATION AND DESIGNATION WITHIN VACANT BUILDING
- RXSB-10 ROUX SOIL BORING LOCATION AND DESIGNATION WITHIN LAUNDROMAT
- RXSV-1 ROUX SOIL VAPOR LOCATION AND DESIGNATION
- RXSB-11/ MW-1 ROUX DEEP SOIL BORING/ MONITORING WELL LOCATION AND DESIGNATION
- IA-1 INDOOR AIR SAMPLING LOCATION AND DESIGNATION
- AA-1 OUTDOOR AIR SAMPLING LOCATION AND DESIGNATION
- SRI-1 ROUX SUPPLEMENTAL RI BORINGS LOCATION AND DESIGNATION

- APPROXIMATE LOCATION OF AST (REMOVED)
- APPROXIMATE LOCATION OF FORMER GASOLINE UST (NOT DETECTED DURING GEOPHYSICAL SURVEY)

Parameter	NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives	NYSDEC Part 375 Restricted Residential Soil Cleanup Objectives	NYSDEC Part 375 Protection of Groundwater Soil Cleanup Objectives	Units
VOCs				
Benzene	0.06	4.8	0.06	mg/kg
Ethylbenzene	1	41	1	mg/kg
Toluene	0.7	100	0.7	mg/kg
Xylenes	0.26	100	1.6	mg/kg
SVOCs	NE	NE	NE	mg/kg
Metals				
Lead	63	400	450	mg/kg
Mercury	0.18	0.81	0.73	mg/kg
Nickel	30	310	130	mg/kg
PCBs	ND	ND	ND	mg/kg
Pesticides/Herbicides	NE	NE	NE	mg/kg
PFAS				
Perfluorooctanesulfonic acid (PFOS)	0.88	44	1	ng/g
Perfluorooctanoic acid (PFOA)	0.66	33	0.8	ng/g

mg/kg – MILLIGRAMS PER KILOGRAM

ng/g – ANOGRAMS PER KILOGRAM

NYSDEC – NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

– – NO NYSDEC PART 375 SOIL CLEANUP OBJECTIVES AVAILABLE

J – ESTIMATED VALUE

J– – ESTIMATE VALUE (LOW BIASED)

U – BELOW DETECTION LIMIT

DUP – DUPLICATE SAMPLE

VOCs – VOLATILE ORGANIC COMPOUNDS

SVOCs – SEMIVOLATILE ORGANIC COMPOUNDS

PCBs – POLYCHLORINATED BIPHENYLS

PFAs – PER–AND POLYFLUOROALKYL SUBSTANCES

NE – NO EXCEEDANCE

ND – NO DETECTION

FT BLS – FEET BELOW LAND SURFACE

N

20' 0 20'

Title:

SUMMARY OF SOIL EXCEEDANCES

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

ROUX

Compiled by: W.S.	Date: 12/12/2025	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	8
Project Mgr: W.S.	Project: 2861.0003Y000	
File: 2861.0003Y143.07.DWG		

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MW-2	08/04/2025
VOCs	
Chloroform	**22**
Metals, Total	
Iron	**703**
Selenium	**10.4**
Sodium	**93300**
Metals, Dissolved	
Magnesium	**37900 J**
Selenium	**10.5**
Sodium	**94100**
PFAS	
Perfluorooctanoic acid (PFOA)	**0.0394**

MW-3	08/05/2025	08/05/2025 DUP
VOCs		
Chloroform	**7.8**	**7.4**
SVOCs		
2,6-Dinitrotoluene	ND	**22**
Benzo(A)Anthracene	**0.18**	**0.04 J**
Benzo(A)Pyrene	**0.2**	ND
Benzo(B)Fluoranthene	**0.32**	ND
Benzo(K)Fluoranthene	**0.09 J**	ND
Chrysene	**0.22**	ND
Indeno(1,2,3-C,D)Pyrene	**0.16**	ND
Nitrobenzene	ND	**49**
Phenol	ND	**11**
Metals, Total		
Sodium	**70900**	**69200**
Metals, Dissolved		
Magnesium	**36600**	NE
Sodium	**70300**	**70400**
PFAS		
Perfluorooctanesulfonic acid (PFOS)	**0.00394**	**0.00367 J**
Perfluorooctanoic acid (PFOA)	**0.0383**	**0.0435**

MW-1	08/05/2025
VOCs	
Chloroform	**15**
SVOCs	
1,4-Dioxane (P-Dioxane)	**0.359**
Benzo(A)Anthracene	**0.43**
Benzo(A)Pyrene	**0.46**
Benzo(B)Fluoranthene	**0.71**
Benzo(K)Fluoranthene	**0.19**
Chrysene	**0.47**
Indeno(1,2,3-C,D)Pyrene	**0.36**
Metals, Total	
Iron	**1100**
Sodium	**58400**
Metals, Dissolved	
Sodium	**59700**
PFAS	
Perfluorooctanesulfonic acid (PFOS)	**0.00381**
Perfluorooctanoic acid (PFOA)	**0.0262**

Parameter	NYSDEC AWQSGV	Units
VOCs		
Chloroform	**7**	µg/L
SVOCs		
1,4-Dioxane (P-Dioxane)	**0.35**	µg/L
2,6-Dinitrotoluene	**5**	µg/L
Benzo(A)Anthracene	**0.002**	µg/L
Benzo(A)Pyrene	**0**	µg/L
Benzo(B)Fluoranthene	**0.002**	µg/L
Benzo(K)Fluoranthene	**0.002**	µg/L
Chrysene	**0.002**	µg/L
Indeno(1,2,3-C,D)Pyrene	**0.002**	µg/L
Nitrobenzene	**0.4**	µg/L
Phenol	**1**	µg/L
Metals, Total		
Iron	**300**	µg/L
Selenium	**10**	µg/L
Sodium	**20000**	µg/L
Metals, Dissolved		
Magnesium	**35000**	µg/L
Selenium	**10**	µg/L
Sodium	**20000**	µg/L
PCBs	ND	µg/L
Pesticides	ND	µg/L
PFAS		
Perfluorooctanesulfonic acid (PFOS)	**0.0027**	µg/L
Perfluorooctanoic acid (PFOA)	**0.0067**	µg/L

CONCENTRATIONS IN µg/L

µg/L – MICROGRAMS PER LITER

NYSDEC – NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AWQSGVS – AMBIENT WATER–QUALITY STANDARDS AND GUIDANCE VALUES

– – NO NYSDEC AWQSGV AVAILABLE

J – ESTIMATED VALUE

DUP – DUPLICATE SAMPLE

VOCs – VOLATILE ORGANIC COMPOUNDS

SVOCs – SEMIVOLATILE ORGANIC COMPOUNDS

PCBs – POLYCHLORINATED BIPHENYLS

PFAs – PER– AND POLYFLUOROALKYL SUBSTANCES

NE – NO EXCEEDANCES

ND – NO DETECTION

N

20' 0 20'

LEGEND

- BCP SITE BOUNDARY
- APPROXIMATE LOCATION OF HYDRAULIC LIFTS/ REMNANTS
- RXSB–7 ROUX SOIL BORING LOCATION AND DESIGNATION WITHIN VACANT BUILDING
- RXSB–10 ROUX SOIL BORING LOCATION AND DESIGNATION WITHIN LAUNDROMAT
- RXSV–1 ROUX SOIL VAPOR LOCATION AND DESIGNATION
- RXSB–11/ MW–1 ROUX DEEP SOIL BORING/ MONITORING WELL LOCATION AND DESIGNATION
- IA–1 INDOOR AIR SAMPLING LOCATION AND DESIGNATION
- AA–1 OUTDOOR AIR SAMPLING LOCATION AND DESIGNATION
- APPROXIMATE LOCATION OF AST (REMOVED)
- APPROXIMATE LOCATION OF FORMER GASOLINE UST (NOT DETECTED DURING GEOPHYSICAL SURVEY)

Title:

SUMMARY OF GROUNDWATER EXCEEDANCES

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

ROUX	Compiled by: W.S.	Date: 12DEC25	FIGURE 9
	Prepared by: G.M.	Scale: AS SHOWN	
	Project Mgr: W.S.	Project: 2861.0003Y000	
	File: 2861.0003Y143.08.DWG		

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RXSV-3	08/04/2025	08/04/2025 DUP
VOCs		
1,2,4-Trimethylbenzene	**3.99**	**3.14**
2,2,4-Trimethylpentane	**1.26**	ND
2-Hexanone	**2.07**	**1.59**
Acetone	**45.8**	**42.8**
Benzene	**1.18**	**1.04**
Carbon Disulfide	**65.7**	**26.9**
Chloroform	**6.89**	**8.11**
Cyclohexane	**2.11**	**1.41**
Dichlorodifluoromethane	**2.17**	**2.21**
Ethanol	**93.1**	**16.4**
Ethylbenzene	**3.34**	**1.79**
Isopropanol	**8.23 J**	**4.77**
m,p-Xylene	**15.1**	**8.86**
Methyl Ethyl Ketone (2-Butanone)	**3.24**	**2.5**
N-Heptane	**2.3**	**1.33**
N-Hexane	**4.19**	**2.07**
O-Xylene (1,2-Dimethylbenzene)	**6.17**	**3.92**
Tert-Butyl Alcohol	**51.5**	**51.5**
Tetrachloroethylene (PCE)	**23.6**	**26**
Toluene	**153**	**61**
Trichlorofluoromethane	**3.5**	**3.9**

RXSV-2	08/04/2025
VOCs	
1,2,4-Trimethylbenzene	**3.75**
2,2,4-Trimethylpentane	**1.83**
2-Hexanone	**2.45**
Acetone	**119**
Benzene	**2.57**
Carbon Disulfide	**46.4**
Chloroform	**9.13**
Cyclohexane	**5.68**
Dichlorodifluoromethane	**1.9**
Ethanol	**62.4**
Ethylbenzene	**2.1**
Isopropanol	**12.6**
m,p-Xylene	**9.21**
Methyl Ethyl Ketone (2-Butanone)	**6.25**
N-Heptane	**4.59**
N-Hexane	**11**
O-Xylene (1,2-Dimethylbenzene)	**4.86**
Tert-Butyl Alcohol	**160**
Tetrachloroethylene (PCE)	**20.3**
Tetrahydrofuran	**5.43**
Toluene	**13.2**

RXSV-1	08/04/2025
VOCs	
1,2,4-Trimethylbenzene	**1.3**
2,2,4-Trimethylpentane	**1.6**
Acetone	**29.9**
Benzene	**1.69**
Carbon Disulfide	**2.49**
Carbon Tetrachloride	**1.35**
Chloromethane	**1.15**
Cyclohexane	**0.854**
Dichlorodifluoromethane	**2.1**
Ethanol	**122**
Isopropanol	**12.2**
m,p-Xylene	**2.45**
Methyl Ethyl Ketone (2-Butanone)	**1.72**
N-Heptane	**0.889**
N-Hexane	**3.19**
O-Xylene (1,2-Dimethylbenzene)	**1.14**
Tert-Butyl Alcohol	**4.3**
Toluene	**3.48**

RXSV-5	03/13/2023
VOCs	
1,2,4-Trimethylbenzene	**1.21**
1,3-Butadiene	**1.66**
Acetone	**20.2**
Benzene	**1.43**
Carbon Disulfide	**1.63**
Dichlorodifluoromethane	**2.27**
Ethanol	**13.9**
Ethylbenzene	**0.93**
Isopropanol	**2.48**
m,p-Xylene	**3.41**
Methyl Ethyl Ketone (2-Butanone)	**4.63**
N-Heptane	**2.07**
N-Hexane	**0.99**
O-Xylene (1,2-Dimethylbenzene)	**1.52**
Tert-Butyl Alcohol	**7.64**
Tetrachloroethylene (PCE)	**14.3**
Toluene	**10**
Trichlorofluoromethane	**1.24**

IA-1	03/13/2023
VOCs	
1,2,4-Trimethylbenzene	**1.24**
Acetone	**12.1**
Benzene	**1.28**
Bromodichloromethane	**1.39**
Carbon Tetrachloride	**1.8**
Chloroform	**25.2**
Chloromethane	**1.71**
Dichlorodifluoromethane	**2.32**
Ethanol	**627**
Isopropanol	**90**
m,p-Xylene	**1.82**
N-Hexane	**0.744**
Tert-Butyl Alcohol	**1.63**
Tetrachloroethylene (PCE)	**0.271**
Toluene	**2.8**
Trichlorofluoromethane	**1.21**
Vinyl Chloride	**0.067**

RXSV-6	03/13/2023
VOCs	
1,2,4-Trimethylbenzene	**1.48**
1,3-Butadiene	**1.8**
2,2,4-Trimethylpentane	**1.66**
Acetone	**16.3**
Benzene	**1.94**
Carbon Disulfide	**2.47**
Chloroform	**1.64**
Dichlorodifluoromethane	**2.36**
Ethanol	**19.2**
Ethylbenzene	**1.86**
Isopropanol	**2.8**
m,p-Xylene	**3.38**
N-Heptane	**1.9**
N-Hexane	**0.948**
O-Xylene (1,2-Dimethylbenzene)	**1.35**
Tert-Butyl Alcohol	**6.76**
Tetrachloroethylene (PCE)	**19**
Tetrahydrofuran	**2.02**
Toluene	**52**
Trichlorofluoromethane	**1.5**

IA-2	03/13/2023
VOCs	
1,2,4-Trimethylbenzene	**3.16**
1,3-Butadiene	**0.449**
Acetone	**10.1**
Benzene	**1.52**
Carbon Tetrachloride	**1.74**
Chloroform	**16.2**
Chloromethane	**1.57**
Dichlorodifluoromethane	**2.35**
Ethanol	**710**
Isopropanol	**95.9**
m,p-Xylene	**3.17**
N-Hexane	**0.832**
O-Xylene (1,2-Dimethylbenzene)	**1.26**
Tert-Butyl Alcohol	**2.11**
Tetrachloroethylene (PCE)	**0.468**
Toluene	**3.38**
Trichlorofluoromethane	**1.23**

RXSV-4	08/04/2025
VOCs	
1,1,1-Trichloroethane (TCA)	**1.31**
1,2,4-Trimethylbenzene	**2.79**
2,2,4-Trimethylpentane	**2.22**
2-Hexanone	**2.21**
Acetone	**81.2**
Benzene	**1.73**
Carbon Disulfide	**7.57**
Carbon Tetrachloride	**3.23**
Chloroform	**1.47**
Chloromethane	**0.785**
Cyclohexane	**1.71**
Dichlorodifluoromethane	**2.07**
Ethanol	**47.1**
Ethylbenzene	**1.48**
Isopropanol	**8.73**
m,p-Xylene	**5.86**
Methyl Ethyl Ketone (2-Butanone)	**4.34**
N-Heptane	**2.74**
N-Hexane	**3.25**
O-Xylene (1,2-Dimethylbenzene)	**2.74**
Tert-Butyl Alcohol	**79.1**
Tetrachloroethylene (PCE)	**12.8**
Toluene	**37.6**
Trichlorofluoromethane	**1.38**

AA-1	03/13/2023
VOCs	
Acetone	**4.89**
Benzene	**1.04**
Carbon Tetrachloride	**0.566**
Chloromethane	**1.15**
Dichlorodifluoromethane	**2.28**
Ethanol	**11.7**
Isopropanol	**1.72**
Tetrachloroethylene (PCE)	**0.203**
Tetrahydrofuran	**1.49**
Toluene	**2.02**
Trichlorofluoromethane	**1.23**

LEGEND

- BCP SITE BOUNDARY
- APPROXIMATE LOCATION OF HYDRAULIC LIFTS/ REMNANTS
- RXSB–7 ROUX SOIL BORING LOCATION AND DESIGNATION WITHIN VACANT BUILDING
- RXSB–10 ROUX SOIL BORING LOCATION AND DESIGNATION WITHIN LAUNDROMAT
- RXSV–1 ROUX SOIL VAPOR LOCATION AND DESIGNATION
- RXSB–11/MW–1 ROUX DEEP SOIL BORING/ MONITORING WELL LOCATION AND DESIGNATION
- IA–1 INDOOR AIR SAMPLING LOCATION AND DESIGNATION
- AA–1 OUTDOOR AIR SAMPLING LOCATION AND DESIGNATION
- APPROXIMATE LOCATION OF AST (REMOVED)
- APPROXIMATE LOCATION OF FORMER GASOLINE UST (NOT DETECTED DURING GEOPHYSICAL SURVEY)
- FORMER WAREHOUSE
- FORMER LAUNDROMAT

CONCENTRATIONS IN µg/m³

µg/m³ – MICROGRAMS PER CUBIC METER

VOCs – VOLATILE ORGANIC COMPOUNDS

ND – NO DETECTION

N

20' 0 20'

Title:

SUMMARY OF DETECTIONS IN SOIL VAPOR, INDOOR AIR (IA-1, IA-2) AND OUTDOOR AIR (AA-1)

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

ROUX

Compiled by: W.S.	Date: 5/18/2026	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	10
Project Mgr: W.S.	Project: 2861.0003Y000	
File: 2861.0003Y143.08.DWG		

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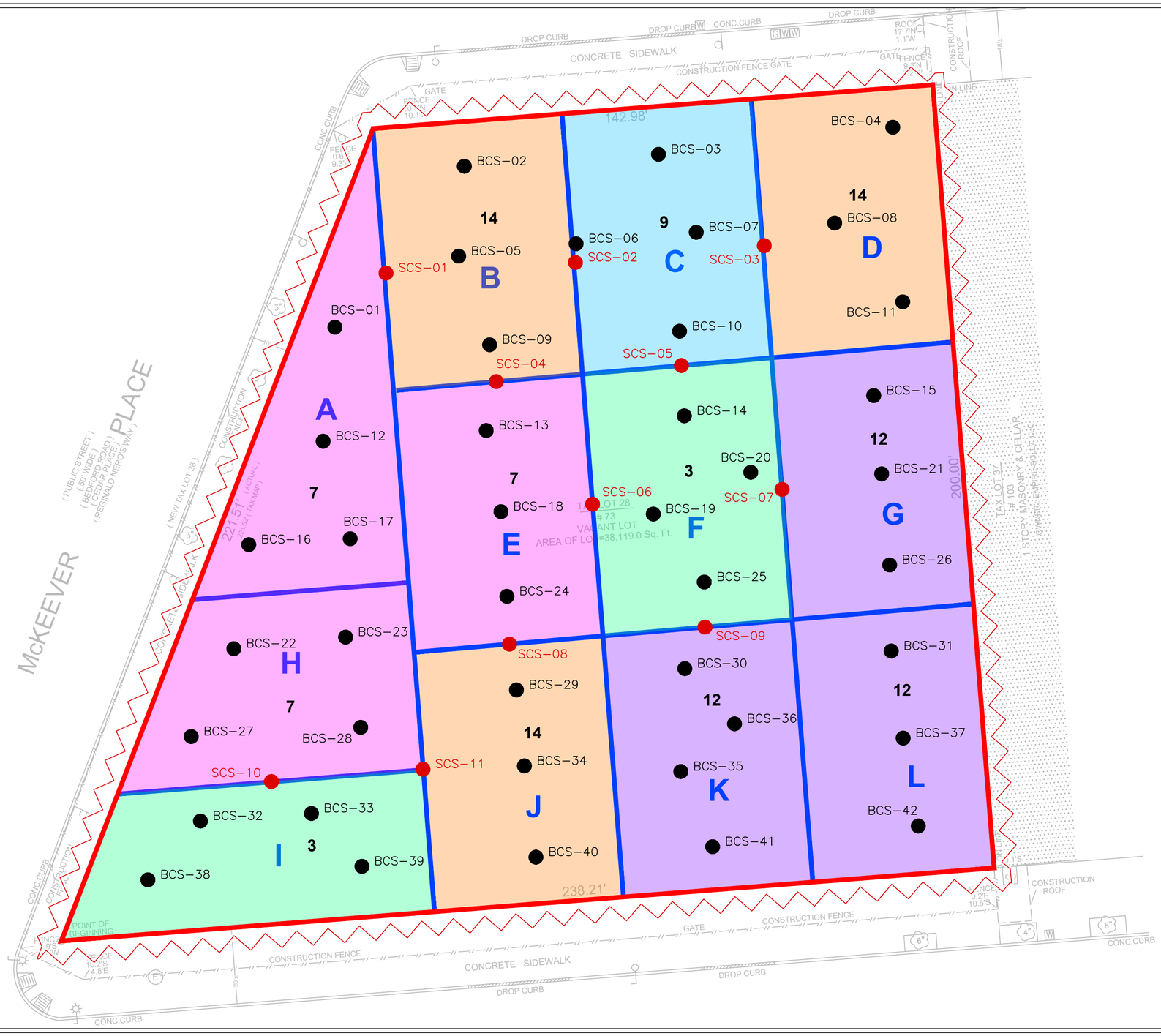

LEGEND

BCP SITE BOUNDARY	
3	PROPOSED TRACK 1 REMEDIAL EXCAVATION DEPTH TO 3 FT BLS
7	PROPOSED TRACK 1 REMEDIAL EXCAVATION DEPTH TO 7 FT BLS
9	PROPOSED TRACK 1 REMEDIAL EXCAVATION DEPTH TO 9 FT BLS
12	PROPOSED TRACK 1 REMEDIAL EXCAVATION DEPTH TO 12 FT BLS
14	PROPOSED TRACK 1 REMEDIAL EXCAVATION DEPTH TO 14 FT BLS
SUPPORT OF EXCAVATION	
A	GRID AREA
BCS-01	PROPOSED LOCATION OF TRACK 1 BOTTOM CONFIRMATION SAMPLE
SCS-01	PROPOSED LOCATION OF TRACK 1 SIDEWALL CONFIRMATION SAMPLE

N

20' 0 20'

Title:

REMEDIAL ALTERNATIVE 1 TRACK 1 UNRESTRICTED USE CLEANUP

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

ROUX

Compiled by: W.S.	Date: 2JAN26	FIGURE 11
Prepared by: G.M.	Scale: AS SHOWN	
Project Mgr: W.S.	Project: 2861.0003Y000	
File: 2861.0003Y143.09.DWG		

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LEGEND

	BCP SITE BOUNDARY
2	PROPOSED TRACK 2 REMEDIAL EXCAVATION DEPTH TO 2 FT BLS
3	PROPOSED TRACK 2 REMEDIAL EXCAVATION DEPTH TO 3 FT BLS
7	PROPOSED TRACK 2 REMEDIAL EXCAVATION DEPTH TO 7 FT BLS
10	PROPOSED TRACK 2 REMEDIAL EXCAVATION DEPTH TO 10 FT BLS
13	PROPOSED TRACK 2 REMEDIAL EXCAVATION DEPTH TO 13 FT BLS
	SUPPORT OF EXCAVATION
A	GRID AREA
BDS-01	PROPOSED LOCATION OF TRACK 2 BOTTOM DOCUMENTATION SAMPLE

N

20' 0 20'

Title:

REMEDIAL ALTERNATIVE 2
TRACK 2 RESTRICTED RESIDENTIAL USE CLEANUP

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

ROUX

Compiled by: W.S.	Date: 2JAN26	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	12
Project Mgr: W.S.	Project: 2861.0003Y000	
File: 2861.0003Y143.11.DWG		

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73-99 Empire Boulevard Site- Project Organization Chart

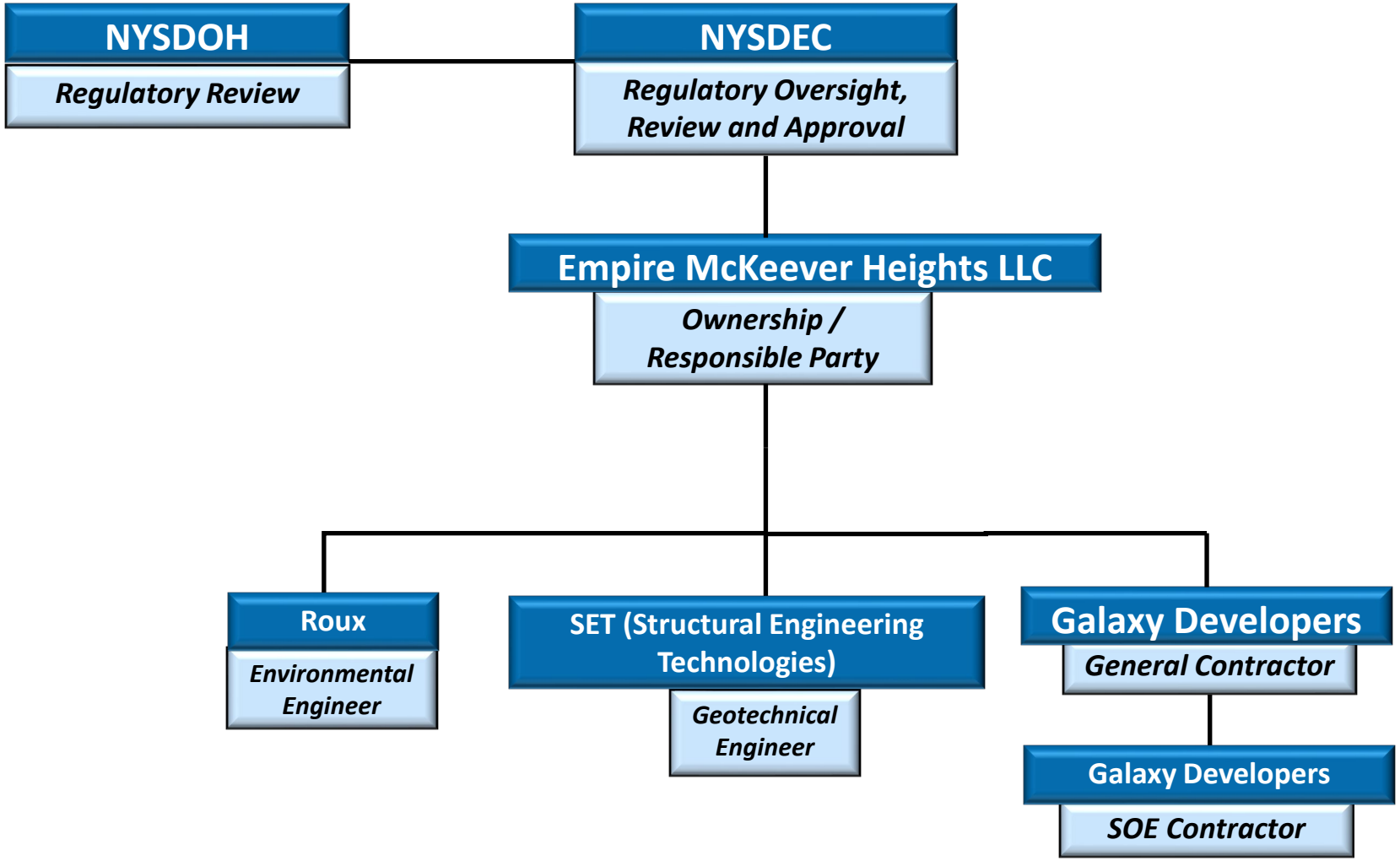
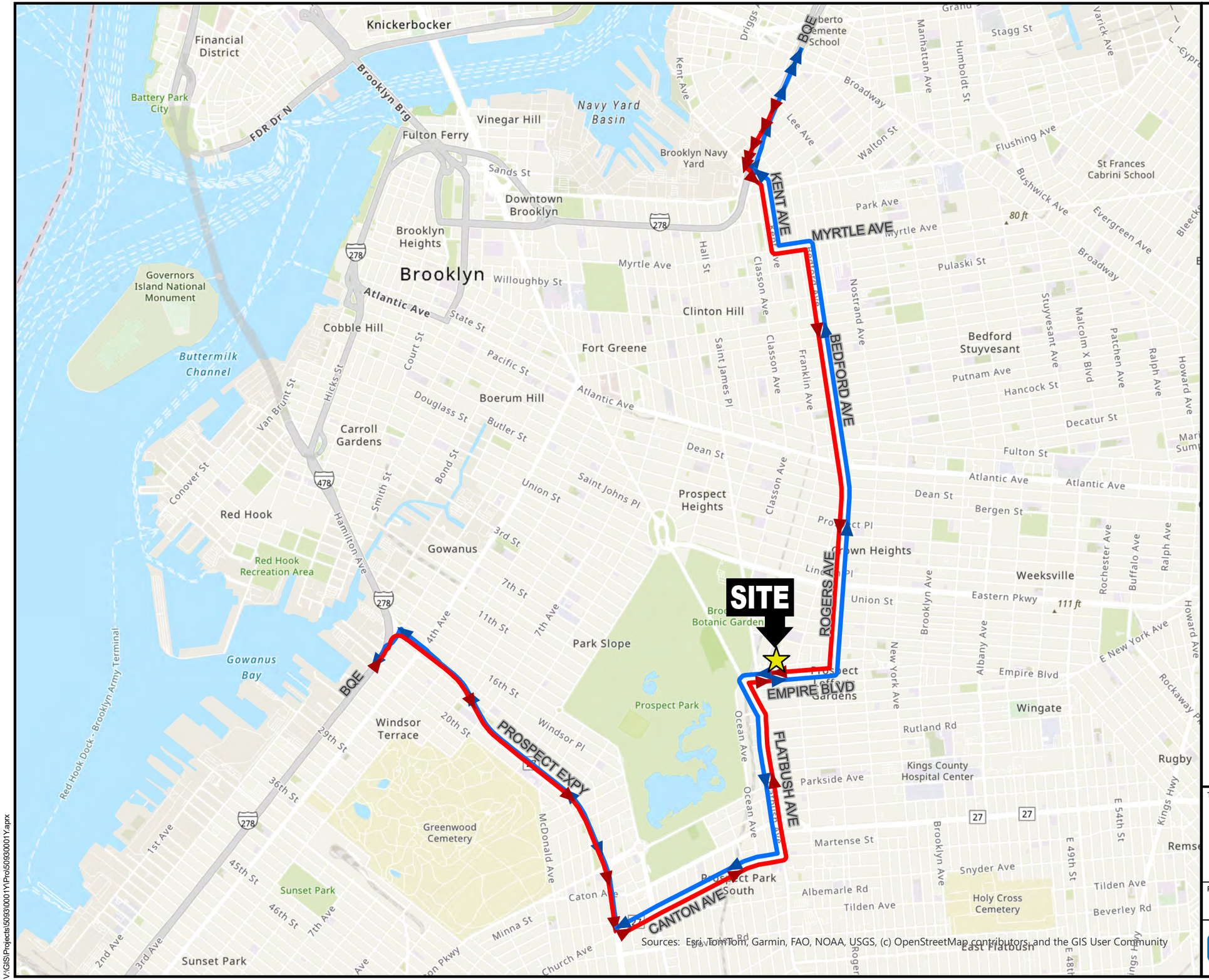


FIGURE 13



LEGEND

FROM SITE

TO SITE

2,500 0 2,500'

Title:

TRUCK ROUTE

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

CARTERET

ROUX

Compiled by: P.P	Date: 01/05/2026
Prepared by: M.S.R.	Scale: AS SHOWN
Project Mgr: W.S.	Project: 5093.0001Y000
File: 5093.00001Y143.14.APRX	

FIGURE 14

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APPENDICES

Appendix A - Metes and Bounds and Survey Map
Appendix B - Redevelopment Plans
Appendix C - Sanborn Maps
Appendix D - Soil Boring and Monitoring Well Logs
Appendix E - Purge Logs
Appendix F - Laboratory Reports
Appendix G - NYSDEC Fact Sheet
Appendix H - Citizens Participation Plan
Appendix I - Health and Safety Plan
Appendix J - Community Air Monitoring Plan
Appendix K - Quality Assurance Project Plan/ Field Sampling Plan
Appendix L - Professional Profiles
Appendix M - Request to Import/Reuse Fill Material Form
Appendix N - GSR Worksheets
Appendix O - SWPPP

APPENDIX A

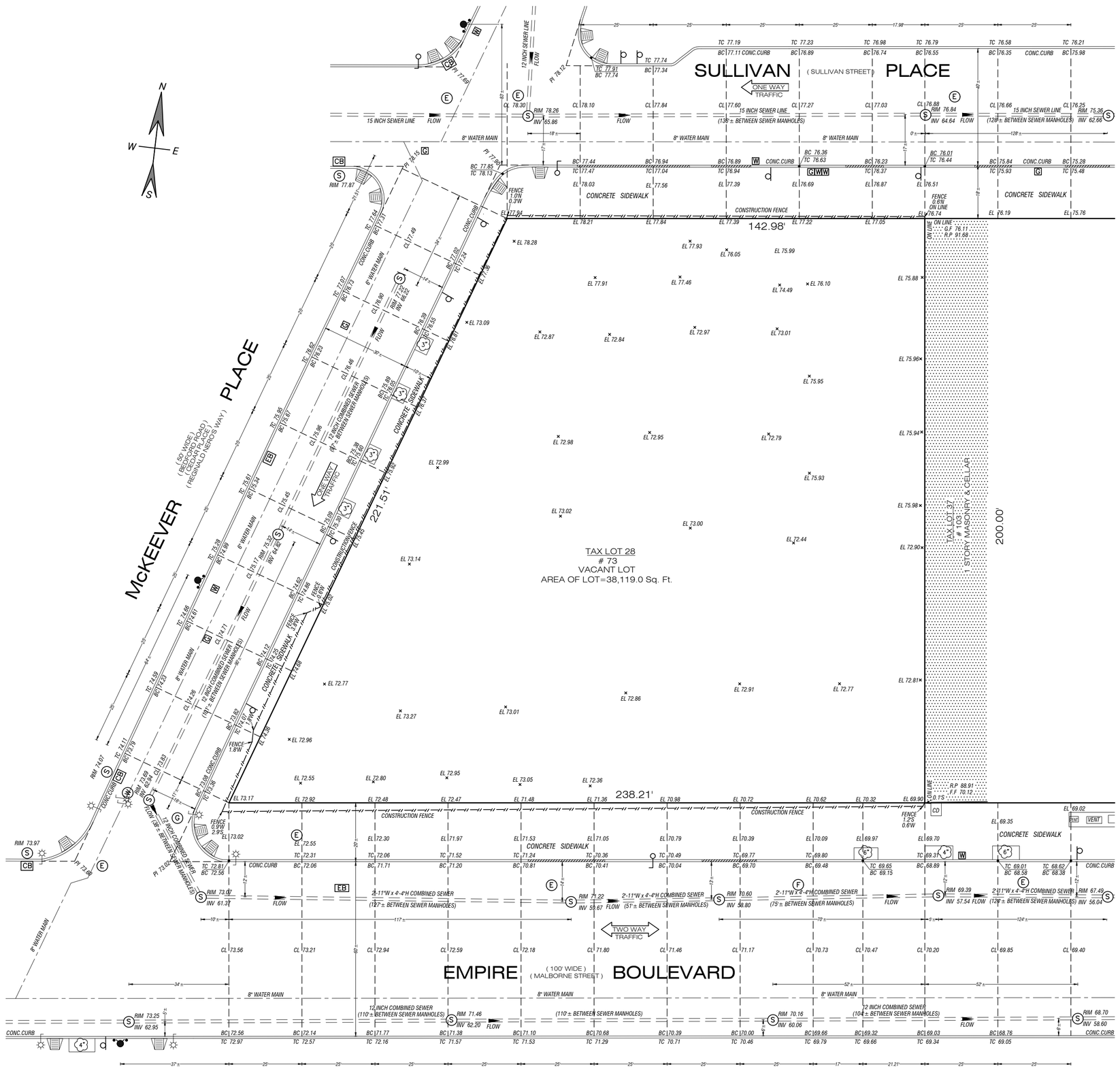
Metes and Bounds and Survey Map

JOB # CM 5022 | ADDRESS: 73 EMPIRE BOULEVARD

GENERAL NOTES:

1. *This survey was prepared only for the party (parties) and purpose indicated hereon.*
2. *Property corner monuments or markers were (not) placed as part of this survey.*
3. *Certifications on this survey map signify that the map was prepared in accordance with the current existing Code of Practice for Land Surveys adopted by the New York State Association of Professional Land Surveyors, Inc. Said certifications are limited to the party (parties) for whom the survey is prepared and are not transferable.*
4. *The location and nature of underground structures, internal walls and improvements or encroachments not visible to the surveyor are not covered under this certification.*
5. *Easements of record are only guaranteed if an Abstract of Title is furnished to the surveyor.*
6. *This is to certify that there are no streams nor natural water courses on the property except as shown on this survey.*
7. *Elevations refer to NAVD 1988 datum.*

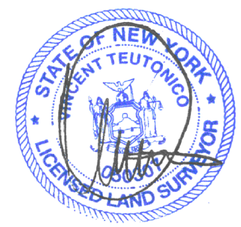
CAPTION	ARCHITECTURAL SURVEY				
DATE	REVISIONS				
10-20-2025	ARCHITECTURAL SURVEY UPDATE				
07-02-2025	ARCHITECTURAL SURVEY				
	DATE	BY		DATE	BY
SURVEYED	07-02-2025	V.B,V.J,P.J	DRAWN	07-05-2025	V.B



SCALE: 1 INCH = 25 FEET

LEGEND

- F.F . . . . . FIRST FLOOR ELEVATION
- R.P . . . . . ROOF PARAPET ELEVATION
- G.F . . . . . GARAGE FLOOR ELEVATION
- TC . . . . . TOP OF CURB
- BC . . . . . BOTTOM OF CURB
- CL . . . . . CENTERLINE
- EL . . . . . SPOT ELEVATION
- INV . . . . . INVERT ELEVATION
- CD . . . . . CELLAR DOOR
- CONC. . . . . CONCRETE
- (G) . . . . . GAS MANHOLE
- (W) . . . . . WATER MANHOLE
- (E) . . . . . ELECTRIC MANHOLE
- (S) . . . . . SEWER MANHOLE
- (F) . . . . . FIRE DEPARTMENT MANHOLE
- W . . . . . WATER VALVE
- G . . . . . GAS VALVE
- CB . . . . . CATCH BASIN
- EB . . . . . ELECTRIC BOX
- TRAFFIC LIGHT
- LIGHT POLE
- STREET SIGN
- HYDRANT
- CHAIN LINK FENCE
- CONSTRUCTION FENCE
- DROP CURB
- PEDESTRIAN RAMP
- 30" . . . . . TREE & SIZE



VINCENT TEUTONICO, L.S.
NEW YORK LICENSE 050307

MAP OF SURVEY OF PROPERTY

BOROUGH AND COUNTY OF BROOKLYN
CITY AND STATE OF NEW YORK
TAX MAP: BLOCK 1306, LOT 28

STATEWIDE LAND SURVEYING P.C.

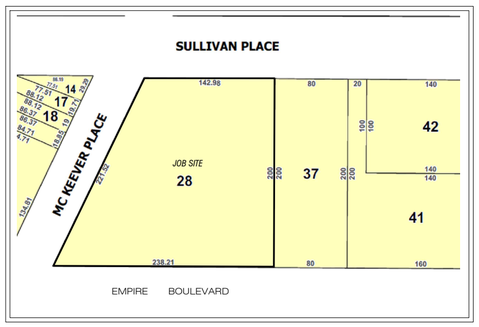
16 FLAGG PLACE
STATEN ISLAND
NY 10304
TEL: 718-751-6871
email: citymapping@yahoo.com

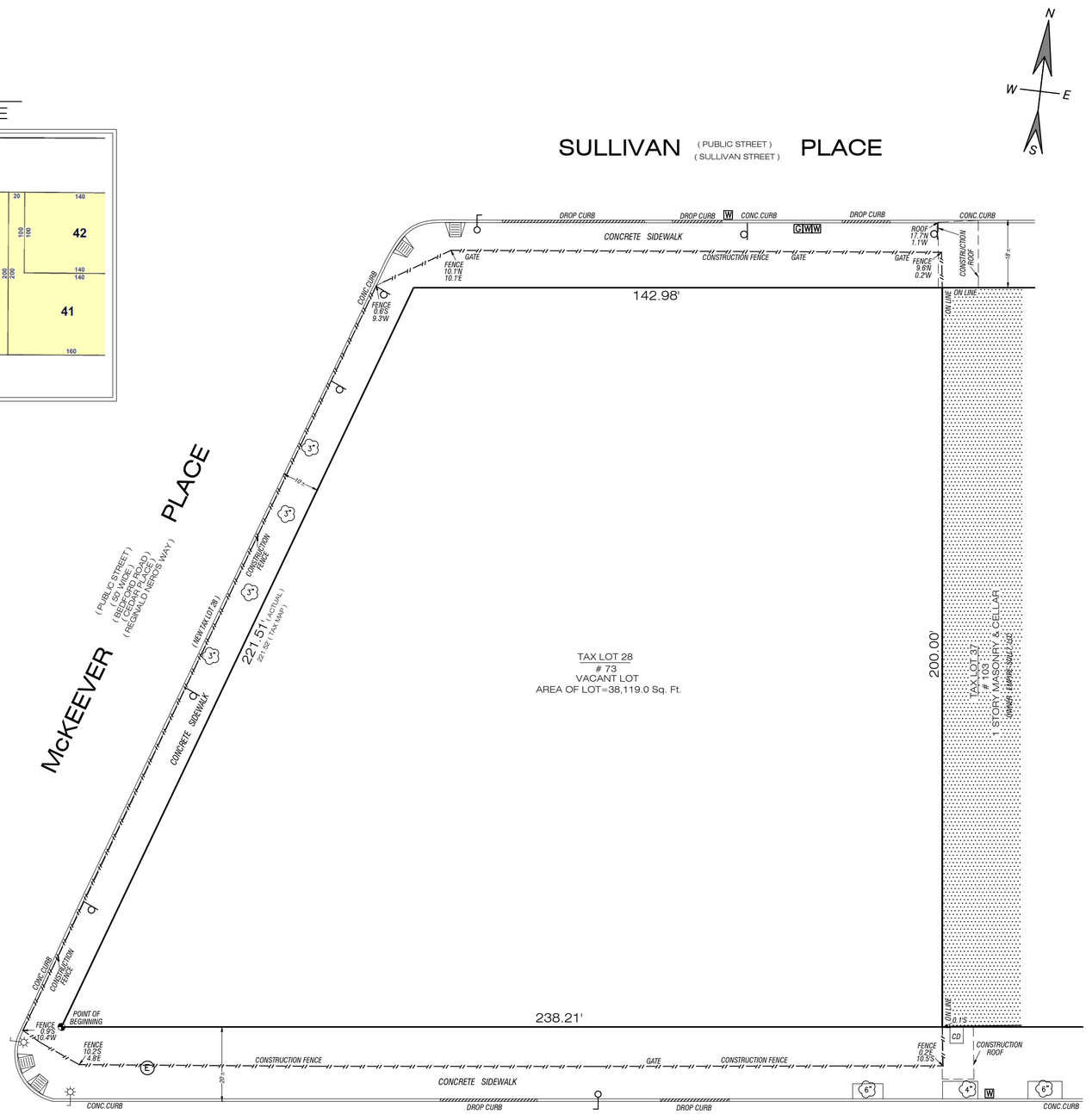
JOB # CM 5022 | ADDRESS: 73 EMPIRE BOULEVARD

SCALE: 1 INCH = 25 FEET

VICINITY MAP

NOT TO SCALE





LEGEND

CD	CELLAR DOOR
CONC.	CONCRETE
E	ELECTRIC MANHOLE
W	WATER VALVE
G	GAS VALVE
CB	CATCH BASIN
EB	ELECTRIC BOX
	TRAFFIC LIGHT
	LIGHT POLE
	STREET SIGN
	HYDRANT
	CHAIN LINK FENCE
	CONSTRUCTION FENCE
	DROP CURB
	PEDESTRIAN RAMP
30"	TREE & SIZE

GENERAL NOTES:

1. This survey was prepared only for the party (parties) and purpose indicated hereon.
2. Property corner monuments or markers were (not) placed as part of this survey.
3. Certifications on this survey map signify that the map was prepared in accordance with the current existing Code of Practice for Land Surveys adopted by the New York State Association of Professional Land Surveyors, Inc. Said certifications are limited to the party (parties) for whom the survey is prepared and are not transferable.
4. The location and nature of underground structures, internal walls and improvements or encroachments not visible to the surveyor are not covered under this certification.
5. Easements of record are only guaranteed if an Abstract of Title is furnished to the surveyor.
6. This is to certify that there are no streams nor natural water courses on the property except as shown on this survey.

CAPTION	ALTA/NSPS LAND TITLE SURVEY				
DATE	REVISIONS		TITLE No. II15983		
08-14-2025	ALTA/NSPS LAND TITLE SURVEY				
	DATE	BY		DATE	BY
SURVEYED	08-14-2025	V.B,V.J,P.J	DRAWN	08-14-2025	V.B

SURVEYOR'S CERTIFICATION

TO EMPIRE MCKEEVER HEIGHTS LLC, S3 RE 73 EMPIRE FUNDING LLC, A DELAWARE LIMITED LIABILITY COMPANY, ITS SUCCESSORS AND ASSIGNS, ATIMA, STEWART TITLE GUARANTY COMPANY, INFINITY LAND SERVICES LLC, THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1,2,3,4,6(A),6(B),7(A),7(B)(1),7(C) 8, 9,10,11,13,14,16,17,18 AND 19 ON TABLE A THEREOF.

THE FIELD WORK WAS COMPLETED ON JULY 23, 2025.

1. SAID DESCRIBED PROPERTY IS LOCATED WITHIN AN AREA HAVING X ZONE DESIGNATION BY THE SECRETARY OF HOUSING AND URBAN DEVELOPMENT, ON FLOOD INSURANCE RATE MAP NO. 3604970212F WITH A DATE OF IDENTIFICATION OF 09/05/2007,COMMUNITY NUMBER 360497, PANEL 0083 IN BROOKLYN, STATE OF NEW YORK, WHICH IS THE CURRENT RATE MAP FOR COMMUNITY IN WHICH SAID PROPERTY SITUATED.
2. AS DESCRIBED IN THE LEGAL DESCRIPTION, THE TOTAL LOTS LAND AREA OF THE SUBJECT PROPERTY IS 38,119.0 sq.ft. (0.87509 Acres).
3. THERE ARE NO PARKING SPACES.
4. EXCEPT AS SHOWN ON THE SURVEY, THERE ARE NO PARTY WALLS OR VISIBLE ENCROACHMENTS ON SAID DESCRIBED PROPERTY BY STREETS, ALLEYS OR BUILDINGS, STRUCTURES OR OTHER IMPROVEMENTS SITUATED ON ADJOINING PROPERTY
5. THE LOCATION OF ALL UTILITIES EXISTING ON THIS PROPERTY HAVE BEEN PLOTTED PER OBSERVED EVIDENCE.
6. THERE IS BUILDING UNDER CONSTRUCTION AT THE PROPERTY.
7. THERE ARE NO PROPOSED CHANGES IN STREET RIGHT OF WAY LINES AND NO EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS OBSERVED IN THE PROCESS OF CONDUCTING THE FIELD WORK .
8. THE SUBJECT PROPERTY IS NOT SUBJECT TO A WETLAND RESTRICTION AS DELINEATED BY APPROPRIATE AUTHORITIES.
9. THERE IS NO OBSERVED EVIDENCE OF USE OF THE PROPERTY AS A SOLID WASTE DUMP, SUMP OR SANITARY LANDFILL.
10. THE PROPERTY HAS DIRECT PHYSICAL ACCESS TO SULLIVAN PLACE, MC KEEVER PLACE, EMPIRE BOULEVARD
11. THE LEGAL DESCRIPTION DESCRIBES THE SAME PROPERTY AS INSURED IN THE TITLE COMMITMENT.

LEGAL DESCRIPTION

BLOCK 1306 LOT 28

ALL that certain plot, piece or parcel of land, situate, lying and being in the Borough of Brooklyn, County of Kings, City and State of New York, bounded and described as follows:

BEGINNING at the corner formed by the intersection of the northerly side of Empire Boulevard and the easterly side of McKeever Place;

RUNNING THENCE northerly along the easterly side of McKeever Place, 221.51 feet (Actual) 221.52 feet (tax map) to the southerly side of Sullivan Place;

THENCE easterly along the southerly side of Sullivan Place, 142.98 feet;

THENCE southerly at right angles with the southerly side of Sullivan Place, 200 feet, to the northerly side of Empire Boulevard;

THENCE westerly along the northerly side of Empire Boulevard, 238.21 feet to the point or place of BEGINNING.

VINCENT TEUTONICO, L.S.
NEW YORK LICENSE 050307

MAP OF SURVEY OF PROPERTY
BOROUGH AND COUNTY OF BROOKLYN
CITY AND STATE OF NEW YORK
TAX MAP: BLOCK 1306, LOT 28

STATEWIDE LAND SURVEYING P.C.
16 FLAGG PLACE
STATEN ISLAND
NY 10304
TEL: 718-751-6871
email: citymapping@yahoo.com

APPENDIX B

Redevelopment Plans

PROJECT DESCRIPTION:

PROPOSED 16 STORY MIXED-USE BUILDING.

SCOPE OF WORK:

SOLDIER PILES, BRACING, AND STABLE SLOPES, FOR THE PROPOSED EXCAVATION AND FOUNDATION WORK.

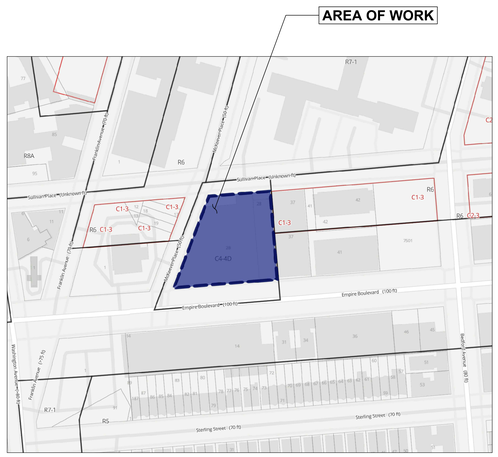
NOTE:

1. THERE ARE NO MTA-STRUCTURES WITHIN 200-FEET OF PROPOSED EXCAVATION.
2. THERE ARE NO HISTORIC STRUCTURES THAT ARE CONTIGUOUS TO OR WITHIN 90-FEET FROM THE EDGE OF THE LOT WHERE EXCAVATION IS OCCURRING.

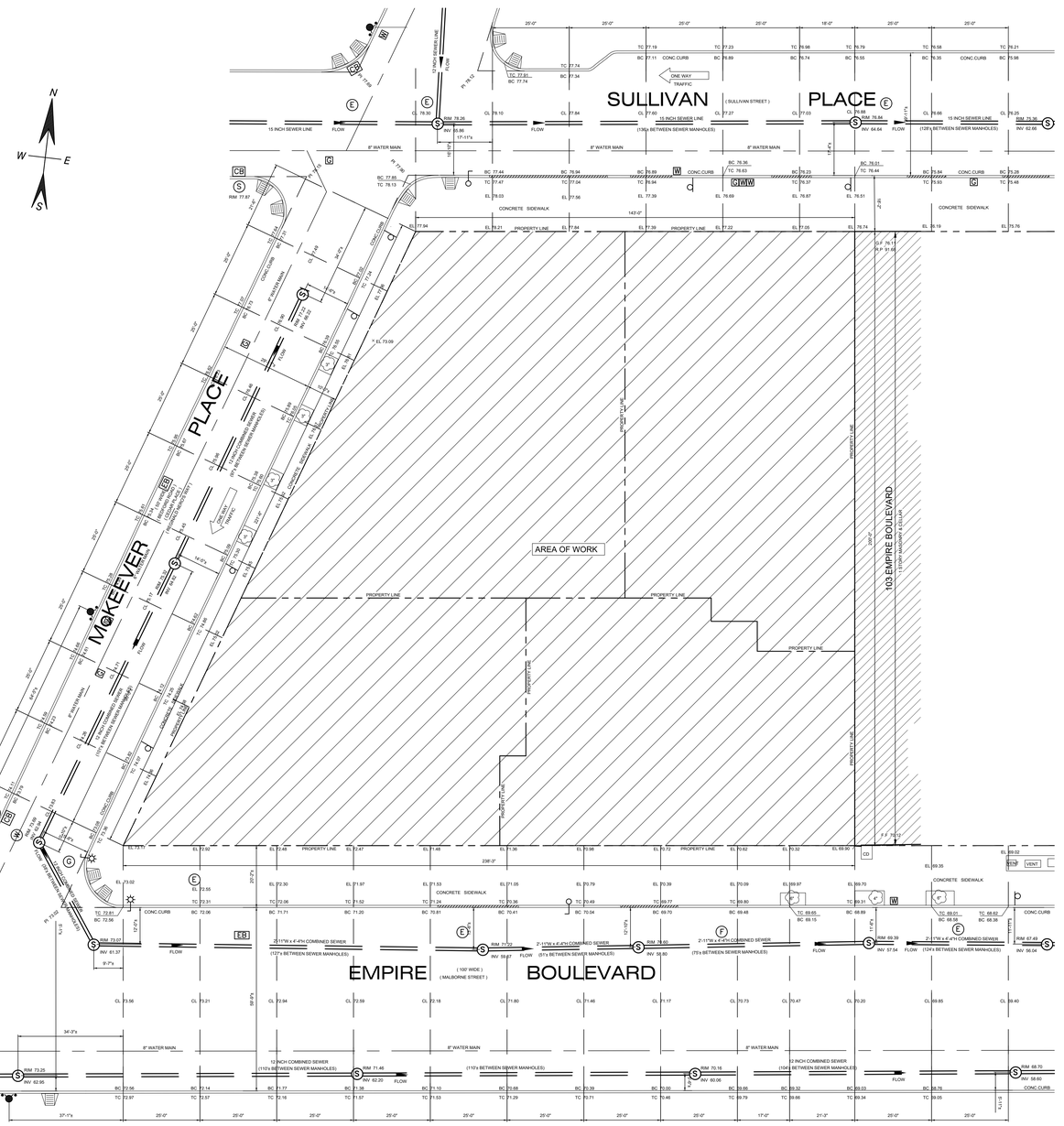
LIST OF RELATED JOB NOS.	
JOB TYPE	JOB NUMBER
ARCHITECTURAL	
MECHANICAL	
PLUMBING	
SPRINKLER	
STRUCTURAL	
FOUNDATION	
SUPPORT OF EXCAVATION	

INDEX DRAWING

SHEET NUMBER	DRAWING NUMBER	DRAWING TITLE
01	T-001.00	TITLE SHEET AND PLOT PLAN
02	SOE-001.00	GENERAL NOTES
03	SOE-101.00	SUPPORT OF EXCAVATION PLAN
04	SOE-102.00	MONITORING PLAN
05	SOE-201.00	SUPPORT OF EXCAVATION SECTIONS
06	SOE-202.00	SUPPORT OF EXCAVATION SECTIONS
07	SOE-203.00	SUPPORT OF EXCAVATION SECTIONS
08	SOE-204.00	SUPPORT OF EXCAVATION SECTIONS
09	SOE-301.00	SUPPORT OF EXCAVATION DETAILS
10	SOE-305.00	BORINGS AND TEST PITS LOGS



KEY PLAN:



PLOT PLAN:
SCALE: 3/32" = 1'-0"
BLOCK: 1306
LOT: 28

KAO-HWA LEE
ARCHITECTS P.C.
227 CATHERINE STREET
SOUTH AMBOY, NJ 08879
(609) 216 2975

CLIENT:
The Rabsky Group LLC
505 Flushing Ave
Brooklyn, NY 11205

Architect:
KHO -HWA LEE Architects P.C.
227 Catherine Street
South Amboy, NJ 08879

Structure Engineer:
STRUCTURAL ENGINEERING TECHONOLOGIES P.C
40-12 28th Street
Long Island City, NY 11101

Interior Designer:
Durukan Design
55 Washington Street, Suite 508
Brooklyn, NY 11201

SOE Engineer:
STRUCTURAL ENGINEERING TECHONOLOGIES P.C
40-12 28th Street
Long Island City, NY 11101

No.	Description	Date

KEY PLAN

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BOULEVARD,
BROOKLYN
NY-11225

SHEET TITLE
TITLE SHEET AND PLOT PLAN

T-001.00

01 OF 10

Scale:	AS NOTED
Date:	11-19-2025
Drawn by:	A.M.C.
Checked by:	D.P.
DOB JOB NUMBER:	

SPECIAL INSPECTIONS:

1. PRIOR TO BEGINNING ANY WORK, THE OWNER SHALL RETAIN THE SERVICES OF AN NYCDOB LICENSED SPECIAL INSPECTIONS AGENCY (SIA) WHO SHALL HAVE PROVEN EXPERIENCE ACCEPTABLE TO THE OWNER AND ENGINEER OF RECORD. MINIMUM REQUIRED QUALIFICATIONS SHALL INCLUDE A PROFESSIONAL LIABILITY INSURANCE COVERAGE OF 1 MILLION DOLLARS AND A MINIMUM PROVEN EXPERIENCE OF 5 YEARS WITH SIMILAR WORK.

2. SPECIAL AND PROGRESS INSPECTIONS REQUIRED BY THE NYC BUILDING CODE SHALL BE PERFORMED BY A SIA AND / OR PROFESSIONAL ENGINEER RETAINED BY THE OWNER AT NO COST TO THE CONTRACTOR FOR THE FOLLOWING CHECKED ITEMS:

		SPECIAL INSPECTION CATEGORIES	
		ALTERNATIVE MATERIALS - OTCR BUILDING BULLETIN# ___________	BC 1705.1.1
		STRUCTURAL STEEL -- WELDING	BC 1705.2.1
		STRUCTURAL STEEL -- DETAILS	BC 1705.2.2
		STRUCTURAL STEEL -- HIGH STRENGTH BOLTING	BC 1705.2.3
		STRUCTURAL STEEL -- SPECIAL INSPECTION FOR SEISMIC RESISTANCE	BC 1705.2.4
		STRUCTURAL STEEL -- TESTING FOR SEISMIC RESISTANCE	BC 1705.2.5
		STRUCTURAL COLD-FORMED STEEL	BC 1705.2.6
		OPEN-WEB STEEL JOISTS AND JOIST GIRDERS	BC 1705.2.7
		CONCRETE -- CAST-IN-PLACE, PRE-STRESSED, PRECAST	BC 1705.3
		MASONRY	BC 1705.4
		WOOD CONSTRUCTION - PREFABRICATED WOOD I- JOISTS, METAL-PLATE-CONNECTED WOOD TRUSSES, AND HIGH-LOAD DIAPHRAGMS	BC 1705.5
		WOOD - HIGH LOAD DIAPHRAGMS	BC 1705.5.1
		WOOD - METAL-PLATE-CONNECTED WOOD TRUSSES	BC 1705.5.2
		WOOD - PREFABRICATED I- JOISTS	BC 1705.5.3
		WOOD - SEISMIC RESISTANCE	BC 1705.5.5
		CONSTRUCTION UTILIZING CLT OR SCL, TYPE IV	BC 1705.5.6
		SUBSURFACE INVESTIGATION -- BORINGS AND TEST PITS	BC 1705.6, ITEM 1
		SUBSURFACE CONDITIONS -- FILL PLACEMENT	BC 1705.6, ITEM 2
		SUBSURFACE CONDITIONS -- IN-PLACE DENSITY	BC 1705.6, ITEM 3
		SUBGRADE INSPECTION	BC 1705.6, ITEM 4
		DEEP FOUNDATION ELEMENTS	BC 1705.7
		PRE-STRESSED ROCK AND SOIL ANCHOR	BC 1705.8
		HELICAL PILES (BB # 2014-020)	BC 1705.9
		DESIGNATED SEISMIC SYSTEMS	BC 1705.12.1
		ACCESS FLOORS	BC 1705.12.2
		SEISMIC ISOLATION SYSTEMS	BC 1705.12.5
		VERTICAL MASONRY FOUNDATION ELEMENTS	BC 1705.19
		ALTERATIONS OF EXISTING BUILDINGS	BC 1705.25.1
		CONSTRUCTION OPERATIONS INFLUENCING ADJACENT STRUCTURES	BC 1705.25.2
		EXCAVATIONS	BC 1705.25.3, BC3304.4.1, BC 3304.5.2, BC 3304.12
		UNDERPINNING AND ALTERNATE METHODS OF SUPPORT OF BUILDINGS AND ADJACENT PROPERTY	BC 1705.25.4, BC 1817.10
		MECHANICAL DEMOLITION	BC 1705.25.5
		RAISING AND MOVING OF A BUILDING	BC 1705.25.6
		TENANT PROTECTION PLAN COMPLIANCE	BC 1705.26
		SOIL PERCOLATION TESTS- PRIVATE ON-SITE WATER DRAINAGE DISPOSAL SYSTEMS AND DETENTION FACILITIES	BC 1705.27.1.2
		ON-SITE PRIVATE SEWAGE DISPOSAL SYSTEMS	BC 1705.28
		CHIMNEYS AND VENTS	BC 1705.32
		ALUMINUM CONSTRUCTION	BC 1705.33
		LUMINOUS EXIT PATH MARKINGS	BC 1705.35
		POST-INSTALLED ANCHORS (BB #2014-018, 2014-019)	BC 1705.37
		CONCRETE DESIGN MIX (TR-3)	BC 1905.3, BC 1913.5
		CONCRETE SAMPLING AND TESTING (TR-2)	BC 1905.6, BC 1913.10
		PROGRESS INSPECTION CATEGORIES	
		FOOTING AND FOUNDATION	BC 110.3.1
		STRUCTURAL WOOD FRAME	BC 110.3.3
		FINAL	28-116.2.4.2,
		BC 110.5, DIRECTIVE 14 OF 1975, AND 1 RCNY § 101-10	

THE TESTING AGENCY FOR SPECIAL INSPECTIONS SHALL FILE ALL APPROPRIATE FORMS WITH THE NEW YORK CITY BUILDINGS DEPARTMENT.

3. THE CONTRACTORS ENGINEER SHALL PREPARE PLANS, CALCULATIONS, AND NOTES IN THE FORM OF SHOP DRAWINGS, FOR ALL ITEMS OF WORK WHICH DIFFER FROM WHAT IS SHOWN ON THE SOE DRAWINGS DUE TO FIELD CONDITIONS.

4. COPIES OF SUCH DRAWINGS WHICH INCLUDE THE ARCHITECT'S AND ENGINEER'S COMMENTS SHALL BE FILED WITH THE DEPARMENT OF BUILDINGS (ON AMENDMENT FORMS). ADDITIONALLY, AT COMPLETION OF WORK, FORMS INCLUDING ALL INSPECTION REPORTS PREPARED BY THE CONTRACTOR'S ENGINEER SHALL BE FILED WITH THE DEPARTMENT OF BUILDINGS.

6. THE SPECIAL INSPECTIONS ENGINEER SHALL BE ON SITE CONTINUOUSLY DURING UNDERPINNING WORK AND AT LEAST ONCE PER WEEK DURING SOE AND EXCAVATION. SPECIAL INSPECTOR SHALL BE ON SITE FOR ALL SUBGRADE INSPECTIONS (INCLUDING FOR HEELBLOCKS AND FILL PLACEMENT) AND ALL CONCRETE PLACEMENTS. THE SPECIAL INSPECTIONS ENGINEER SHALL DETERMINE THE FREQUENCY OF ADDITIONAL INSPECTIONS NEEDED AND WHETHER HE OR SHE SHOULD INSPECT THE SITE PERSONALLY OR SEND A PERSON UNDER HIS OR HER DIRECT SUPERVISION.

7. THE SPECIAL INSPECTIONS ENGINEER, SHALL MAINTAIN A LOG IN HIS OR HER OFFICE WHICH INCLUDES THE FOLLOWING INFORMATION:

(i) ADDRESS OF THE PREMISES, JOB NUMBER, CONTRACTOR NAME AND ADDRESS
(ii) DATE AND TIME OF EACH INSPECTION INCLUDING
  (A) NAMES OF PERSONNEL WHO INSPECTED THE SITE
  (B) ANY SIGNIFICANT OBSERVATIONS OR INSTRUCTIONS GIVEN RELATING TO ANY OF THE FOLLOWING:
    (1) DEVIATIONS FROM THE CONTRACT DOCUMENTS.
    (2) ANTICIPATED FIELD CONDITIONS;
    (3) PROPER EXECUTION OF THE STRUCTURAL WORK;
    (4) GOOD ENGINEERING PRACTICE;
    (5) PRECAUTIONS TAKEN TO MAINTAIN SAFE CONDITIONS, IF WORK IS STOPPED FOR ANY REASON.

(iii) THE DATE OF AND PARTICIPANTS IN ANY CONVERSATIONS WITH THE SPECIAL INSPECTIONS ENGINEER OCCURRING OFF-SITE AND RELATING TO ANY SIGNIFICANT OBSERVATIONS OR INSTRUCTIONS.

8. THE SPECIAL INSPECTIONS ENGINEER SHALL RETAIN A COPY OF THE DOCUMENTS DESCRIBED ABOVE IN HIS OR HER OFFICE AND SHALL PROVIDE A COPY TO THE CONTRACTOR AND / OR OWNER TO BE KEPT AT THE CONSTRUCTION SITE.

9. THE SPECIAL INSPECTIONS ENGINEER RESPONSIBLE FOR SPECIAL INSPECTION SHALL REPORT UNSAFE CONDITIONS, WHEN AND IF OBSERVED DURING HIS / HER SITE VISITS, TO THE DEPARTMENT OF BUILDINGS AND / OR ANY OTHER AFFECTED PARTIES OR AGENCIES. IT IS TO BE NOTED THAT THE SPECIAL INSPECTIONS ENGINEER AND ENGINEER OF RECORD ARE NOT RESPONSIBLE IN ANY WAY FOR SITE SAFETY. SITE SAFETY SHALL REMAIN THE RESPONSIBILITY OF THE CONTRACTOR.

10. UPON REQUEST OF THE BUILDINGS DEPARTMENT, THE SPECIAL INSPECTIONS ENGINEER SHALL MAKE AVAILABLE FOR REVIEW BY THE BUILDINGS DEPARTMENT DOCUMENTS AND THE LOG DESCRIBED ABOVE.

MATERIALS AND TESTING NOTES:

1. THE CONTRACTOR SHALL RETAIN THE SERVICES OF AN INDEPENDENT TESTING COMPANY.
2. STRUCTURAL CONCRETE FOR UNDERPINNING PIERS SHALL HAVE A MINIMUM DESIGN COMPRESSIVE STRENGTH OF 4000-PSI AT 28 DAYS.
3. CONCRETE PLACEMENT TIME SHALL NOT EXCEED 2 HOURS OR AS RECOMMENDED BY THE TESTING COMPANY.
4. PERFORM ONE SLUMP TEST FOR EACH BATCH OF CONCRETE. SLUMP SHALL BE BETWEEN 4- AND 6-IN FOR UNDERPINNING.
5. MAKE A SET OF MINIMUM 5 CYLINDERS EACH DAY CONCRETE IS CAST FOR UNDERPINNING OR GROUT IS BEING PLACED FOR SOLDIER PILES OR TIE-BACKS.
6. PERFORM COMPRESSION TEST ON 1 CYLINDER AT 7 DAYS AND 1 AT 14 DAYS. IF THE DESIGN STRENGTH IS ACHIEVED AT 14 DAYS, NO FURTHER TESTING IS REQUIRED, OTHERWISE TEST 1 OR 2 CYLINDERS AT 28 DAYS. 1 OR 2 SAMPLES SHALL BE SAVED FOR 56 DAYS TESTING IF THE PREVIOUS CYLINDERS FAIL TO MEET DESIGN STRENGTH REQUIREMENTS.
7. PROVIDE TESTING RESULTS TO THE CONTRACTOR.
8. IF THE DESIGN STRENGTH REQUIREMENTS ARE NOT MET, APPROVED REMEDIATION SHALL BE PERFORMED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
9. ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH AWS D1.1 USING E-70 ELECTRODES.
10. ALL STRUCTURAL STEEL SHALL BE GRADE 50, ASTM A-572.
11. 1-BAG MIX SHALL CONSIST OF 1 94-LB BAG OF CEMENT TO 1 CUBIC YARD OF SAND. QUANTITY OF WATER SHALL BE ADEQUATE TO ALLOW THE MIX TO FLOW.
12. DRYPACK FOR UNDERPINNING SHALL CONSIST OF 1 PART CEMENT TO 2 PART SAND. QUANTITY OF WATER SHALL BE ADEQUATE TO ALLOW THE MIX TO STICK.
13. TIMBER LAGGING SHALL BE ROUGH CUT, FULL SIZE CONSTRUCTION GRADE, WITH A MINIMUM ALLOWABLE BENDING STRESS OF 1,600-PSI.
14. MISCELLANEOUS STEEL (PLATES AND WEDGES) SHALL BE ASTM A-36.
15. SOLDIER PILE CASING STEEL SHALL BE GRADE B (42-KSI), ASTM A500, U.O.N.
16. POST-INSTALLED ANCHORS SHALL BE GRADE 36, ASTM F1554.
17. FLOWABLE FILL SHALL BE A MIXTURE OF SAND, CEMENT, FLYASH WATER AND ADMIXTURE. MIX SHALL BE DESIGNED BY THE CONTRACTOR TO BE SELF COMPACTING DURING PLACEMENT, SET UP WITHIN SEVERAL HOURS, AND SHALL HAVE COMPRESSIVE STRENGTH AS DESCRIBED BELOW. CONTRACTOR SHALL SUBMIT FOR APPROVAL EACH MIX DESIGN AND 1, 3, 7, 14, 28 AND 56 DAY COMPRESSIVE STRENGTH.
  17.1. FLOWABLE FILL FOR SOLDIER PILES SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 50 PSI AT 28 DAYS, TO PREVENT THE DRILLED HOLE FROM COLLAPSING BUT BE HAND EXCAVATABLE IN THE FUTURE TO ALLOW THE INSTALLATION OF TIMBER LAGGING.
18. DRY PACK SHALL CONSIST OF ONE PART CEMENT TO TWO PARTS SAND BY VOLUME. THE AMOUNT OF WATER SHALL BE JUST SUFFICIENT TO PRODUCE A MIXTURE WHICH WILL HOLD ITS SHAPE WHEN FORMED INTO A BALL BY HAND.

STRUCTURAL STABILITY NOTES:

1. SPECIAL INSPECTION OF THE STABILITY AND INTEGRITY OF EXISTING STRUCTURES DURING CONSTRUCTION OPERATIONS IS REQUIRED BY THE NEW YORK CITY BUILDING CODE CHAPTER 17.

2. CONTRACTOR SHALL PREPARE A STRUCTURAL STABILITY PLAN, TO BE SUBMITTED TO THE STRUCTURAL ENGINEER (SIGNED AND SEALED BY THE PROFESSIONAL ENGINEERS RESPONSIBLE FOR ITS DESIGN) FOR REVIEW, AND APPROVAL PRIOR TO ANY DEMOLITION WORK OR MODIFICATIONS TO THE EXISTING STRUCTURE. THIS STRUCTURAL STABILITY PLAN SHALL INCLUDE:

  A. LAYOUT AND DETAILS OF SHORING, BRACING, UNDERPINNING AND OTHER WORK REQUIRED TO MAINTAIN THE STABILITY AND INTEGRITY OF THE STRUCTURE DURING CONSTRUCTION OPERATIONS.

  B. PHASING, STAGING, AND SEQUENCING OF SUCH OPERATIONS.

INSPECTION PROGRAM:

PRIOR TO COMMENCEMENT OF WORK, THE SPECIAL INSPECTION SHALL REVIEW THE CONTRACTOR'S PROPOSED SEQUENCE OF OPERATIONS AND DETEMINE THE AREAS OF WORK THAT REQUIRE DESIGN. A WRITTEN STATEMNET SHALL BE PREPARED, MUTUALLY ACCEPTABLE TO THE CONTRACTOR AND THE SPECIAL INSPECTION, INDICATING:

1. THE PORTIONS OF WORK REQUIRING DESIGN DOCUMENTS IN ACCORDANCE WITH SECTION 1705.25.8.
2. THE NAMES AND ADDRESSES ON THE LICENSED PROFESSIONALS THAT HAVE BEEN ENGAGED TO SUPPLY DESIGN DOCUMENTS FOR APPLICABLE WORK.
3. THE APPROXIMATE DATES FOR DELIVERY OF DESIGN DOCUMENTS.
4. A SCHEDULE OF PERIODIC SPECIAL INSPECTIONS, AT AGREED INTERVALS, INCLUDING ADEQUATE FREQUENCY TO ASSURE THE CONTRACTOR'S CONTINUED COMPLIANCE WITH THE PROPOSED DESIGNS AND SEQUENCE OF CONSTRUCTION OPERATIONS. AT A MINIMUM, THE SITE MUST BE INSPECTED TWICE, ONE AT A PRE-CONSTRUCTION MEETING WITH THE CONTRACTOR AND ONCE DURING CONSTRUCTION OPERATIONS.

GENERAL

1. THE DESIGNS ON THESE DRAWINGS ARE INTENDED FOR TEMPORARY SUPPORT OF EXCAVATION ONLY.
2. THESE DRAWINGS ARE INTENDED TO BE USED BY ONLY AN EXPERIENCED CONTRACTOR AFTER CONSULTATION WITH THIS OFFICE. THIS OFFICE WILL NOT BE RESPONSIBLE FOR JOB SITE PROBLEMS DUE TO FAILURE TO INTERPRET THE DOCUMENTS CORRECTLY. REPRESENTATIVES OF S.E.T., P.C. ARE AVAILABLE TO ANSWER QUESTIONS AND TO ASSIST THE CONTRACTOR BY EXPLAINING THE DESIGN INTENT. FAILURE BY THE CONTRACTOR TO UNDERSTAND THE COMPLEXITIES OF THE PROJECT AND THE SEQUENCE OF CONSTRUCTION CAN RESULT IN INJURY OR DEATH TO WORKERS. PROCEEDING WITH CONSTRUCTION WITHOUT FULL UNDERSTANDING OF THE PROJECT AND WITHOUT A COMPLETE SET OF DESIGN DOCUMENTS WILL PUT BOTH THE PROJECT AND INDIVIDUALS IN PERIL. THE CONTRACTOR ASSUMES TOTAL RESPONSIBILITY FOR ANY CONSEQUENCE OF THAT ACTION.
3. ALL CONTRACTORS AND SUBCONTRACTORS ARE RESPONSIBLE FOR ADHERING TO THE REQUIREMENTS AS SPELLED OUT IN THESE NOTES. ALL PARTIES MUST CAREFULLY STUDY ALL NOTES FOR ITEMS WHICH MAY PERTAIN TO THEIR TRADES. FAILURE TO READ THESE NOTES DOES NOT PERMIT THE CONTRACTOR TO DEVIATE FROM THEIR REQUIREMENTS.
4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CURRENT BUILDING CODE OF ALL GOVERNING AUTHORITIES.
5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS, AND DRAWINGS.
6. THE DESIGN PLANS AND NOTES, TO THE BEST OF ENGINEER'S KNOWLEDGE, COMPLY WITH THE APPLICABLE REQUIREMENTS OF THE NEW YORK CITY BUILDING CODE.
7. WORK NOT INDICATED ON A PART OF THE DRAWINGS BUT REASONABLY IMPLIED TO BE SIMILAR TO THAT SHOWN AT CORRESPONDING PLACES SHALL BE REPEATED.
8. GENERAL CONTRACTOR SHALL VERIFY ALL CONDITIONS AND CHECK ALL MEASUREMENTS ON JOB AND SHALL BE RESPONSIBLE FOR SAME.
9. ALL DIMENSIONS INDICATED ON THE DRAWINGS ARE APPROXIMATE AND SHOULD NOT BE USED FOR ORDERING AND/OR FABRICATING MATERIAL. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS PRIOR TO ORDERING AND/OR FABRICATING MATERIALS.
10. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS BY MEASUREMENTS AT THE JOB SITE AND SHALL TAKE ANY AND ALL OTHER MEASUREMENTS NECESSARY TO VERIFY THE DRAWINGS AND TO PERFORM WORK PROPERLY.
11. DIFFERENT FIELD CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF S.E.T., P.C. IMMEDIATELY FOR EVALUATION. IF THE CONDITIONS OBSERVED AS THE EXCAVATION ADVANCES ARE DIFFERENT THAN THE CONDITIONS SHOWN ON THE DESIGN DRAWINGS, THE CONTRACTOR SHALL STOP WORK AND NOTIFY THE CONSTRUCTION MANAGER AND ENGINEER. MODIFICATIONS TO THESE DRAWINGS MAY BE NECESSARY.
12. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITIES AND BELOW GROUND STRUCTURES IN THE AREA OF WORK PRIOR TO COMMENCEMENT OF WORK.
13. NOTIFY DOB 24 TO 48 HOURS PRIOR TO START OF EXCAVATION (RULE 52).
14. SIDEWALK CLOSING FROM NYDOT IS REQUIRED TO OVERCUT THE SIDEWALK OR TO PLACE SUPPORT OF EXCAVATION ELEMENTS IN THE SIDEWALK OR STREET.
15. ALL CONTRACTORS AND SUBCONTRACTORS ON THIS PROJECT SHALL BE RESPONSIBLE FOR THE PROPER PERFORMANCE OF THEIR WORK, COORDINATION WITH OTHER TRADES, METHODS, SAFETY AND SECURITY ON THE JOB SITE. S.E.T., P.C. AND ITS AGENTS AND EMPLOYEES ARE NOT RESPONSIBLE OR LIABLE FOR THE ABOVE AND SHALL BE HELD HARMLESS AND INDEMNIFIED BY ALL CONTRACTORS AND SUBCONTRACTORS FROM ANY AND ALL CLAIMS, LOSSES, SUITS AND LEGAL ACTION WHATSOEVER ARISING FROM THE PERFORMANCE OF WORK ON THIS PROJECT.
16. ALL WORK PERFORMED WHICH AFFECTS THE ADJACENT BUILDING OPERATIONS SHALL CAUSE MINIMUM DISTURBANCE TO THE NORMAL OPERATION OF AFFECTED PARTS OF THE BUILDING.
17. PINS, WIRE MESH, AND PARGING MAY BE REQUIRED TO STABILIZE ANY EXISTING FOUNDATION WALL AND/OR FOOTINGS. LOOSE AREAS OF FOUNDATION WALL OR FOOTINGS THAT ARE DAMAGED OR LOOSE SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR EVALUATION AND REMEDIAL MEASURES.
18. CONSENT FROM OWNERS OF ADJACENT PROPERTIES SHALL BE OBTAINED IF REQUIRED WORK EXTENDS BEYOND PROPERTY LINE.
19. ALL CONTRACTORS MUST VISIT SITE AND NOTE ALL EXISTING CONDITIONS AS WELL AS ALL CONDITIONS TO BE MET BEFORE SUBMITTING BID. LACK OF THOROUGH UNDERSTANDING OF THE PROJECT REQUIREMENTS SHALL NOT CONSTITUTE AN EXCUSE FOR ERRORS OR OMISSIONS, NOR JUSTIFY A REQUEST FOR EXTRA COMPENSATION.
20. CONTRACTOR SHALL MAKE NO DEVIATION FROM THESE DRAWINGS WITHOUT WRITTEN APPROVAL OF THE ENGINEER OF RECORD.
21. ACCEPTANCE OF DEVIATIONS FROM ANY OF THE REQUIREMENTS OF THESE NOTES SHALL BE AT THE SOLE DISCRETION OF THE ENGINEER. ACCEPTANCE OF A DEVIATION FROM ANY REQUIREMENT SHALL NOT BE CONSTRUED AS PERMITTING ANY OTHER DEVIATION.
22. A PERMIT SHALL BE OBTAINED FROM DOT FOR SIDEWALK CLOSURE TO INSTALL SOLDIER PILES OR ANY INTRUSION PAST PROPERTY LINE.
23. CONSTRUCTION OF NEW CONCRETE WALLS AGAINST EXISTING STRUCTURES SHALL COMPLY WITH ALL NYCDOB BUILDINGS BULLETINS AND UPDATES.

SAFETY DURING EXECUTION OF WORK:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONDITIONS OF PUBLIC AND WORKER SAFETY DURING EXECUTION OF THE WORK. THIS SHALL INCLUDE COMPLIANCE WITH CHAPTER 33 OF THE NEW YORK CITY BUILDING CODE: SAFEGUARDS DURING CONSTRUCTION.
2. THE CONTRACTOR SHALL PROVIDE SIDEWALK PROTECTION AND PROTECTION OF ADJOINING PROPERTIES, AS REQUIRED BY THE NYC BLDG. CODE.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING AND FILING A SITE SAFETY PLAN AND/OR PROVIDING OTHER WRITTEN ASSURANCES OF SAFE OPERATIONS AS MAY BE REQUIRED BY THE AUTHORITIES HAVING JURISDICTION.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A SAFE WORKING ENVIRONMENT FOR ALL WORKERS. THIS SHALL INCLUDE COMPLIANCE WITH ALL OSHA, STATE AND LOCAL LABOR LAWS WHICH MAY GOVERN THIS TYPE OF WORK.
5. THE CONTRACTOR SHALL PROVIDE REGULAR PERIODIC INSPECTION OF CONSTRUCTION OPERATIONS AS REQUIRED TO ENSURE ONGOING MAINTENANCE OF ALL SAFETY OPERATIONS AND EQUIPMENT. SUCH INSPECTIONS SHALL BE UNDERTAKEN BY AN AGENT OF THE CONTRACTOR WHO IS QUALIFIED TO EVALUATE SUCH OPERATIONS AND EQUIPMENT. THIS INSPECTOR SHALL PREPARE WRITTEN SAFETY REPORTS WHICH SHALL BE MAINTAINED AT THE JOB SITE FOR REVIEW BY THE AUTHORITIES HAVING JURISDICTION.

REFERENCES:

1. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
2. SOE PLANS AND SECTIONS ARE BASED ON:
  2.1. ARCHITECTURAL SURVEY BY STATEWIDE LAND SURVEYING, P.C., DATED 07/02/2025.
  2.2. ARCHITECTURAL DRAWINGS BY KAO-HWA LEE, ARCHITECTS P.C., RECEIVED 2025.
  2.3. STRUCTURAL DRAWINGS BY STRUCTURAL ENGINEERING TECHNOLOGIES, P.C., DATED 2025.
3. SUB-SURFACE INFORMATION OBTAINED FROM:
  3.1 BORING LOGS BY STRUCTURAL ENGINEERING TECHNOLOGIES, P.C., DATED 08/12/2025.
  3.2 TEST PIT LOGS BY STRUCTURAL ENGINEERING TECHNOLOGIES, P.C., DATED 08/12/2025.
  3.3 GEOTECHNICAL REPORT BY STRUCTURAL ENGINEERING TECHNOLOGIES, P.C., DATED 09/02/2025.
4. LOCATIONS AND ELEVATIONS OF ALL PROPOSED STRUCTURAL BUILDING ELEMENTS SHOWN ON THESE DRAWINGS ARE APPROXIMATE AND SHALL BE SUPERSEDED BY FINAL STRUCTURAL AND ARCHITECTURAL DRAWINGS.

DEWATERING NOTES:

1. ANY WATER INFLOW INTO THE EXCAVATION AREA SHALL BE CONTROLLED BY SUMPING OR OTHER SUITABLE METHODS. DISPOSAL OF WATER SHALL BE MADE OUT OF THE EXCAVATED AREA IN ACCORDANCE WITH LOCAL REGULATIONS. THE ELEVATION OF THE WATER LEVELS BEYOND THE LIMITS OF THE PROJECT SITE SHALL NOT BE LOWERED SO AS TO CAUSE DISTRESS AND/OR SETTLEMENT TO ADJOINING STRUCTURES. CONTRACTOR SHALL PROVIDE MEANS AND METHODS TO PREVENT LOSS OF FINES DURING DEWATERING.
2. NO DEWATERING IS ANTICIPATED FOR THE PROJECT. HOWEVER, SHOULD THE GROUNDWATER TABLE FLUCTUATE DUE TO SEASONAL, TIDAL, OR MAN-MADE CONDITIONS, THE SITE SHALL BE DEWATERED AS REQUIRED. THE CONTRACTOR IS RESPONSIBLE FOR ANY DEWATERING THAT MAY BE REQUIRED FOR THIS PROJECT.
3. IF DEWATERING SYSTEM IS REQUIRED, THE CONTRACTOR SHALL CONSULT A DEWATERING ENGINEER.

DRAINAGE NOTES:

NO CONDITION SHALL BE CREATED AS A RESULT OF CONSTRUCTION OR DEMOLITION OPERATIONS THAT WILL INTERFERE WITH NATURAL SURFACE DRAINAGE, WATER COURSES, DRAINAGE DITCHES, ITC., SHALL NOT BE OBSTRUCTED BY REFUSE, WASTE BUILDING MATERIALS, EARTH, STONES, TREE STUMPS, BRANCHES, OR OTHER DEBRIS THAT MAY INTERFERE WITH SURFACE DRAINAGE OR CAUSE THE IMPOUNDMENT OF SURFACE WATERS.

1. PROTECTION OF FOUNDATIONS:
PROVISION SHALL BE MADE TO PREVENT THE ACCUMULATION OF WATER OR WATER DAMAGE TO ANY FOUNDATIONS ON THE PREMISES OR TO ADJOINING PROPERTY.

2. DRAINAGE OF EXCAVATIONS:
ALL EXCAVATIONS SHALL BE DRAINED, AND THE DRAINAGE SHALL BE MAINTAINED AS LONG AS THE EXCAVATION CONTINUES OR REMAINS. WHERE NECESSARY, PUMPING SHALL BE USED, PROVIDED PROPER PERMITS ARE OBTAINED FROM THE NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION.

3. CLOGGING:
PRECAUTIONS SHALL BE TAKEN TO PREVENT CONCRETE OR MORTAR WASHINGS, SAND, GRIT, OR ANY OTHER MATERIAL THAT WOULD CAUSE CLOGGING FROM ENTERING A SEWER OR DRAIN. CONCRETE WASHOUT WATER SHALL ALSO MEET THE REQUIREMENTS OF NYC BC SECTION 3303.15.

EXCAVATION NOTES:

1. CONTRACTOR SHALL CALL 811 BEFORE ANY EXCAVATION BEGINS, FOR UTILITY COMPANIES TO MARK OUT ALL EXISTING UTILITY LINES.
2. NOTICE SHALL BE PROVIDED BY THE PROJECT'S OWNER TO ADJOINING PROPERTY OWNERS IN ACCORDANCE WITH THE NYCBC.
3. ALL WORK PERFORMED IN CONNECTION WITH SHEETING, BRACING, EXCAVATION, AND UNDERPINNING SHALL ADHERE TO THE APPLICABLE PROVISIONS OF THE NYCBC, THE NEW YORK STATE CODE, AND REGULATIONS OF THE NEW YORK STATE DEPARTMENT OF LABOR AND OSHA.
4. PRIOR TO COMMENCEMENT OF MASS EXCAVATION, THE ADJOINING PROPERTIES AND STREETS SHALL BE VISUALLY SURVEYED BY THE CONTRACTOR, SUITABLY MARKED WITH PERMANENT MONITORING POINTS TO BE MEASURED DURING CONSTRUCTION FOR THE PURPOSES OF DETERMINING CONSTRUCTION-RELATED EFFECTS. REPORT WITH PHOTOGRAPHS SHALL BE PROVIDED TO ARCHITECT AND ENGINEER. A PRE-CONSTRUCTION STRUCTURAL STABILITY REPORT OF THE ADJOINING PROPERTIES SHALL BE MADE IN WRITTEN AND PICTORIAL FORM, AND SHALL BE FURNISHED TO THE OWNER'S REPRESENTATIVE.
5. WHEN AN EXCAVATION TO A DEPTH OF 5- TO 10-FT IS TO BE MADE WITHIN 10-FT OF AN ADJACENT FOOTING OR FOUNDATION, OR WHEN ANY EXCAVATION OVER 10-FT IS TO BE MADE ANYWHERE ON A SITE, THE CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE OWNERS OF THE ADJOINING PROPERTY NO LESS THAN 10 DAYS PRIOR TO THE SCHEDULED STARTING DATE OF THE EXCAVATION. THE WRITTEN NOTICE SHALL PROVIDE A DESCRIPTION OF THE WORK TO BE PERFORMED, THE TIMEFRAME AND SCHEDULE, AND THE CONTACT INFORMATION OF THE CONTRACTOR AND OF THE DEPARTMENT.
6. A COMPETENT REPRESENTATIVE OF THE CONTRACTOR SHALL INSPECT THE SUBGRADE OF THE EXCAVATION, ANY AND ALL BRACING AND BLOCKING, AT THE COMMENCEMENT OF EACH SHIFT, TO ASSURE INTEGRITY, PRIOR TO PERMITTING WORKMEN TO WORK WITHIN ANY EXCAVATED AREA. ALL SIDES OR SLOPES OF EXCAVATIONS SHALL BE INSPECTED FOR STABILITY AFTER RAINSTORMS.
7. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE SUBGRADE CONDITIONS PRIOR TO START OF WORK. THESE DRAWINGS DISCOUNT UNDERGROUND WATER CONDITIONS.
8. THE CONTRACTOR SHALL PROVIDE ANY TEMPORARY EXCAVATION RESTRAINT REQUIRED FOR THE CONSTRUCTION OF THE PROJECT. IF A SHEETING OR BRACING SYSTEM IS TO BE UTILIZED, THE DETAILS ARE TO BE SHOWN ON SHOP DRAWINGS TO BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ARCHITECT AND ENGINEER OF RECORD BEFORE COMMENCEMENT OF WORK.
9. ALL EXCAVATION GREATER THAN 5-FT IN DEPTH SHALL BE SHEETED, OR LAGGED AND BRACED.
10. IF BRACING IS USED TO SUPPORT THE EXCAVATION, PROVIDE THE REACTION TO THE BRACING BY PRE-LOADING OR BY THE USE OF SUITABLE WEDGES PROPERLY DRIVEN INTO THE JOINTS UNTIL THE NECESSARY REACTION IS PRODUCED AGAINST THE EXCAVATION BANKS.
11. IF MATERIAL BEHIND LAGGING IS LOST OR DISTURBED, LEAVE A 1- TO 1.5-IN SPACE BETWEEN LAGGING BOARDS AND IMMEDIATELY BACKFILL OR GROUT.
12. NO MATERIAL STORAGE AND/OR HEAVY CONSTRUCTION EQUIPMENT SHALL BE PLACED WITHIN 10-FT OF UPPER EXCAVATION PERIMETER.
13. BOTTOM OF EXCAVATION ELEVATION AS SHOWN ON THESE DRAWINGS SHALL BE VERIFIED AND COORDINATED IN FIELD WITH CONTRACT DOCUMENTS.
14. EXCAVATION ELEVATIONS SHOWN ON THESE DRAWINGS ARE BASED ON ELEVATIONS SHOWN ON DESIGN STRUCTURAL / ARCHITECTURAL DRAWINGS. ADDITIONAL EXCAVATION MAY BE REQUIRED AS PER STRUCTURAL DESIGN AND CONSTRUCTION REQUIREMENTS.
15. USE HAND TOOLS TO EXCAVATE WITHIN 5-FT OF ANY UNDERGROUND UTILITIES.
16. PROVIDE BLOCK OUTS USING HIGH DENSITY FOAM IN CONCRETE STRUCTURE WHERE SHORING STRUCTURE ELEMENTS PENETRATE NEW FOUNDATION WALL.
17. THOUGH USUALLY SMALL, SETTLEMENT NEARLY ALWAYS ACCOMPANIES EXCAVATION / UNDERPINNING / SHEETING WORK. THE AMOUNT OF SETTLEMENT, IF ANY, WILL VARY BASED ON THE TYPE OF BUILDING, THE CLASS OF SOILS UPON WHICH IT RESTS, THE PRESENCE OR ABSENCE OF GROUNDWATER, THE RESERVE FOUNDATION LOAD CAPACITY OF THE ORIGINAL FOUNDATION AND THE EXCELLENCE AND CARE OF THE WORKMANSHIP OF THE CONTRACTOR INSTALLING THE EXCAVATION / UNDERPINNING / SHEETING. BY USING THESE DRAWINGS TO COMPLETE THE EXCAVATION / UNDERPINNING / SHEETING WORK, THE CONTRACTOR AND THE OWNER UNDERSTAND THE INHERENT RISK AND ASSUME ALL RESPONSIBILITY FOR THE EFFECTS OF ANY SETTLEMENT THAT MIGHT OCCUR. ALL EXCAVATION / UNDERPINNING / SHEETING WORK SHALL BE STOPPED IMMEDIATELY AND THE ENGINEER OF RECORD SHALL BE NOTIFIED IF SETTLEMENTS SHOULD EXCEED PRE-DETERMINED LEVELS SPECIFIED IN MONITORING PROTOCOL.
18. HAY OR FILTER FABRIC SHALL BE USED TO MINIMIZE MIGRATION OF FINES INTO THE EXCAVATION AREA.
19. BACKFILL EXCAVATION WITH APPROVED MATERIAL IN LAYERS NOT MORE THAN 12 INCHES IN LOOSE DEPTH AND COMPACT WITH HAND OPERATED EQUIPMENT.
20. COMPACT EACH LIFT OF BACKFILL TO 93% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 PRIOR TO PLACING SUCCESSIVE LIFTS OF MATERIAL.
21. WHERE SUBGRADE OR LAYERS OF SOIL IS TOO DRY TO BE SATISFACTORILY COMPACTED, EITHER SUFFICIENT WATER SHALL BE MIXED WITH THE FILL TO PERMIT PROPER COMPACTION OR THE DRY MATERIAL SHALL BE REPLACED WITH SATISFACTORY FILL MATERIALS.
22. ALL UNUSED EXCAVATED MATERIALS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LEGAL MANNER.

BIDDERS WARRANTY:

BY THE ACT OF SUBMITTING A BID FOR THE PROPOSED CONTRACT, THE BIDDER WARRANTS THAT:

1. THE BIDDER AND ALL SUBCONTRACTORS HE INTENDS TO USE HAVE CAREFULLY AND THOROUGHLY REVIEWED THE DRAWINGS, SPECIFICATIONS AND OTHER CONSTRUCTION CONTRACT DOCUMENTS AND HAVE FOUND THEM COMPLETE AND FREE FROM AMBIGUITIES AND SUFFICIENT FOR THE CONTRACTOR TO BID, FABRICATE, AND INSTALL THE WORK ON TIME.
2. THE BIDDER AND ALL WORKMEN, EMPLOYEES AND SUBCONTRACTORS HE INTENDS TO USE ARE SKILLED AND EXPERIENCED IN THE TYPE OF CONSTRUCTION REPRESENTED BY THE CONSTRUCTION CONTRACT DOCUMENTS BID UPON.
3. NEITHER THE BIDDER NOR ANY OF HIS EMPLOYEES, AGENTS INTENDED SUPPLIERS OR SUBCONTRACTORS HAVE RELIED UPON ANY VERBAL REPRESENTATIONS, ALLEGEDLY AUTHORIZED OR UNAUTHORIZED FROM THE OWNER, HIS EMPLOYEES OR AGENTS INCLUDING ARCHITECTS, ENGINEERS OR CONSULTANTS, IN ASSEMBLING THE BID FIGURE; AND FURTHER THAT,THE BID FIGURE IS BASED SOLELY UPON THE CONSTRUCTION CONTRACT DOCUMENTS AND PROPERLY ISSUED WRITTEN ADDENDA AND NOT UPON ANY OTHER WRITTEN REPRESENTATION.
4. THE BIDDER ALSO WARRANTS THAT HE HAS CAREFULLY EXAMINED THE SITE OF THE WORK AND THAT FROM HIS OWN INVESTIGATIONS HE HAS SATISFIED HIMSELF AS TO THE NATURE AND LOCATION OF THE WORK AND THE CHARACTER, QUALITY, QUANTITIES OF MATERIALS AND DIFFICULTIES TO BE ENCOUNTERED, THE KIND AND EXTENT OF EQUIPMENT AND OTHER FACILITIES NEEDED FOR THE PERFORMANCE OF THE WORK, THE GENERAL AND LOCAL CONDITIONS, AND OTHER ITEMS WHICH MAY, IN ANY WAY, AFFECT THE WORK OR ITS PERFORMANCE.

DISCLAIMER:
THE DRAWINGS HEREIN ARE RELATED TO A NEW BUILDING STRUCTURE. THE STRUCTURAL DESIGN WAS BASED UPON AS MUCH OBSERVATION, MEASUREMENT, TESTING, ETC. AS CIRCUMSTANCES PERMITTED, HOWEVER, THERE WERE ASSUMPTIONS MADE ABOUT UNKNOWN CONDITIONS. SHOULD THE OWNER DECIDE NOT TO UTILIZE S.E.T. , P.C. TO VERIFY AND INSPECT THESE CONDITIONS IN THE FIELD, S.E.T. , P.C. WILL NOT BE RESPONSIBLE FOR ANY FAILURE, DAMAGE, INJURY, DELAY, LOSS OF INCOME, EXTRA COST, OR ANY OTHER LOSS DUE TO EXISTING CONDITIONS.

SHOP DRAWING REVIEW:
THE ENGINEER WILL REVIEW CONTRACTOR'S SHOP DRAWINGS AND RELATED SUBMITTALS WITH RESPECT TO CONFORMANCE WITH THE STRUCTURAL DRAWINGS AND THE SPECIFICATIONS. SHOP DRAWINGS SHALL BE SUBMITTED IN DUPLICATE. EXCESS DRAWINGS WILL BE DISCARDED. IF REQUIRED BY SPECIFICATIONS, SHOP DRAWINGS SHALL BEAR THE SEAL AND SIGNATURE OF A LICENSED ENGINEER WHO IS LICENSED IN THE STATE WHERE THE PROJECT IS TO BE CONSTRUCTED. BEFORE SUBMITTING A SHOP DRAWING OR ANY RELATED MATERIAL TO THE ENGINEER, CONTRACTOR SHALL: REVIEW EACH SUCH SUBMISSION FOR CONFORMANCE WITH THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND OPERATIONS OF CONSTRUCTION, AND SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL THERETO, INCLUDING REFLECTION OF EXISTING FIELD CONDITIONS, ALL OF WHICH ARE THE SOLE RESPONSIBILITY OF CONTRACTOR; APPROVE EACH SUCH SUBMISSION BEFORE SUBMITTING IT; AND SO STAMP EACH SUCH SUBMISSION BEFORE SUBMITTING IT. THE ENGINEER WILL ASSUME THAT NO SHOP DRAWING OR RELATED SUBMITTAL COMPRISES A VARIATION FROM THE CONTRACT UNLESS CONTRACTOR ADVISES THE ENGINEER OTHERWISE VIA A WRITTEN INSTRUMENT WHICH IS ACKNOWLEDGED BY THE ENGINEER IN WRITING. IN THE EVENT THAT THE ENGINEER WILL REQUIRE MORE THAN TEN (10) WORKING DAYS TO PERFORM REVIEW, THE ENGINEER WILL SO NOTIFY THE CONTRACTOR. THE ENGINEER WILL RETURN WITHOUT REVIEW MATERIAL WHICH HAS NOT BEEN APPROVED BY GENERAL CONTRACTOR OR CONSTRUCTION MANAGER

FIDUCIARY LIABILITY DECLINED:
S.E.T., P.C. MAKES NO WARRANTY, EITHER EXPRESSED OR IMPLIED AS TO S.E.T.. P.C. FINDINGS, RECOMMENDATIONS, PLANS, SPECIFICATIONS, OR PROFESSIONAL ADVICE. S.E.T., P.C. HAS ENDEAVORED AND WILL ENDEAVOR TO PERFORM ITS SERVICES IN ACCORDANCE WITH GENERALLY ACCEPTED STANDARDS OR PRACTICE IN EFFECT AT THE TIME OF PERFORMANCE. BY UTILIZING THESE DOCUMENTS (OR HAVING OTHERS UTILIZE THEM) FOR ANY PURPOSE WHATSOEVER THE OWNER OR DEVELOPER RECOGNIZES THAT NEITHER S.E.T., P.C. OR ANY OF S.E.T., P.C. SUBCONSULTANTS OR SUBCONTRACTORS OWES ANY FIDUCIARY RESPONSIBILITY TO THE OWNER OR DEVELOPER.

DRILLED IN SOLDIER PILE AND LAGGING NOTES:

1. ALL SOLDIER PILES SHALL BE INSTALLED IN THE LOCATION SHOWN ON THESE DRAWINGS.
2. THE CONTRACTOR SHALL PERFORM UTILITY IDENTIFICATION AND EXPLORATION AS NECESSARY PRIOR TO THE DRILLING OPERATIONS.
3. SOLDIER PILE CASING SHALL BE INSTALLED USING INTERNAL FLUSH DUPLEX DRILLING METHOD.
4. NO LOSS OF MATERIAL FROM THE OUTSIDE OF THE SOLDIER PILE IS PERMITTED. THE CONTRACTOR SHALL ADOPT THE NECESSARY DRILLING PROCEDURES TO PREVENT LOSS OF MATERIAL BETWEEN THE ANNULUS AND THE SOLDIER PILE.
5. THE CONTRACTOR SHALL ADJUST DRILLING PROCEDURES AS REQUIRED TO PREVENT SETTLEMENT AND LATERAL MOVEMENT OF BUILDINGS, UTILITIES, AND OTHER STRUCTURES.
6. STEEL CASING SHALL HAVE A MINIMUM WALL THICKNESS OF 0.5-IN. SPLICES IN CASINGS SHALL BE THREADED AND FULLY TIGHTENED.
7. THE BOTTOM CASING OF EACH SOLDIER PILE SHALL BE PROTECTED BY A HIGH-STRENGTH CUTTING SHOE WITH HARDENED CUTTING EDGE.
8. NO CONCRETE OR GROUT SHALL BE PLACED AT ANY SOLDIER PILE LOCATION UNTIL TIP ELEVATION HAS BEEN CONFIRMED, CLEANED OF MUD AND ANY EXTRANEOUS MATERIAL, AND INSPECTED AND APPROVED BY THE SPECIAL INSPECTOR.
9. CONCRETE OR GROUT SHALL BE PLACED CONTINUOUSLY FOR THE FULL DEPTH OF THE SOLDIER PILE STARTING AT THE BOTTOM OF THE SOCKET AND UP TO THE DESIGNED CUTOFF ELEVATION. NO COLD JOINT IS ALLOWED.
10. THE ENGINEER MAY DIRECT AN INCREASE IN SOLDIER PILE LENGTH FROM THAT SPECIFIED ON THESE DRAWINGS IF INFERIOR SOIL OR ROCK IS ENCOUNTERED ABOVE THE ORIGINAL MINIMUM TIP ELEVATION.
11. NO SOLDIER PILE SHALL BE OUT OF PLUMB MORE THAN ONE PERCENT (1%) OF ITS EMBEDDED LENGTH.
12. IF ANY OF THE ABOVE TOLERANCES ARE EXCEEDED, AND IN THE OPINION OF THE ENGINEER REQUIRES CORRECTIVE MEASURES, SUCH CORRECTIVE MEASURES, INCLUDING COSTS OF ENGINEERING AND REDESIGN, SHALL BE PAID FOR BY THE CONTRACTOR.
13. BEFORE LATERAL BRACING (ANCHORS AND/OR RAKERS) IS INSTALLED, MAXIMUM EXCAVATION BELOW BRACING LEVEL IS 1.5-FT UNLESS NOTED ON THESE DRAWINGS.
14. LATERAL BRACING AND SHEETING/SHORING SHALL NOT BE REMOVED UNTIL THE NEW GROUND FLOOR SLAB IS INSTALLED AND THE NEW CONCRETE HAS REACHED THE DESIGN COMPRESSIVE STRENGTH.
15. AT COMPLETION OF THE NEW STRUCTURE, BURN OFF SOLDIER PILES 1-FT BELOW PROPOSED FINISH GRADE.
16. INSTALL CONTROLLED BACKFILL IN ACCORDANCE WITH DESIGN DOCUMENTS, AS REQUIRED.

NEW YORK CITY BUILDING CODE COMPLIANCE NOTES:

1. DEWATERING NOTES:
AS PER BC3303.14.5, THE PERSON CAUSING THE SOIL OR FOUNDATION WORK TO BE PERFORMED SHALL DEWATER THE SITE, AS NEEDED, FOR THE PROGRESS OF THE WORK. MEASURES SHALL BE TAKEN TO PREVENT SETTLEMENT, SLOPE FAILURE, AND DAMAGE TO ADJACENT BUILDINGS, STRUCTURES, AND PROPERTY AFFECTED BY DEWATER OPERATIONS.

2. **DRAINAGE NOTES:**
AS PER BC 3304.14.1, NO CONDITION SHALL BE CREATED AS A RESULT OF CONSTRUCTION OR DEMOLITION OPERATIONS THAT WILL INTERFERE WITH NATURAL SURFACE DRAINAGE. WATER COURSES, DRAINAGE DITCHES, ETC., SHALL NOT BE OBSTRUCTED BY REFUSE, WASTE BUILDING MATERIALS, EARTH, STONES, TREE STUMPS, BRANCHES, OR OTHER DEBRIS THAT MAY INTERFERE WITH SURFACE DRAINAGE OR CAUSE THE IMPOUNDMENT OF SURFACE WATERS.

2.1 **PROTECTION OF FOUNDATIONS**
AS PER BC 3304.14.2, PROVISION SHALL BE MADE TO PREVENT THE ACCUMULATION OF WATER OR WATER DAMAGE TO ANY FOUNDATIONS ON THE PREMISES OR TO ADJOINING PROPERTY.

2.2 **DRAINAGE OF EXCAVATIONS**
AS PER 3304.14.3, ALL EXCAVATIONS SHALL BE DRAINED, AND THE DRAINAGE SHALL BE MAINTAINED AS LONG AS THE EXCAVATION CONTINUES OR REMAINS. WHERE NECESSARY, PUMPING SHALL BE USED, PROVIDED PROPER PERMITS ARE OBTAINED FROM THE NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION.

2.3 **CLOGGING**
AS PER 3303.14.4, PRECAUTIONS SHALL BE TAKEN TO PREVENT CONCRETE OR MORTAR WASHINGS, SAND, GRIT, OR ANY OTHER MATERIAL THAT WOULD CAUSE CLOGGING FROM ENTERING A SEWER OR DRAIN. CONCRETE WASHOUT WATER SHALL ALSO MEET THE REQUIREMENTS OF NYC BC SECTION 3303.15.

3. FLOOD-RESISTANT CONSTRUCTION NOTES:
AS PER BC APPENDIX G, CONDITIONS SHALL PROMOTE THE PUBLIC HEALTH, SAFETY AND GENERAL WELFARE AND TO MINIMIZE PUBLIC AND PRIVATE LOSSES DUE TO FLOOD CONDITIONS IN SPECIFIC FLOOD HAZARD AREAS THROUGH THE ESTABLISHMENT OF COMPREHENSIVE REGULATIONS FOR MANAGEMENT OF FLOOD HAZARD DESIGNED TO:

3.1 **PURPOSE**
3.1.1 PREVENT UNNECESSARY DISRUPTION OF COMMERCE, ACCESS AND PUBLIC SERVICE DURING TIMES OF FLOODING;

3.1.2 MANAGE THE ALTERATION OF NATURAL FLOOD PLAINS, STREAM CHANNELS AND SHORELINES;

3.1.3 MANAGE FILLING, GRADING, DREDGING AND OTHER DEVELOPMENT WHICH MAY INCREASE FLOOD DAMAGE OR EROSION POTENTIAL;

3.1.4 PREVENT OR REGULATE THE CONSTRUCTION OF FLOOD BARRIERS WHICH WILL DIVERT FLOODWATERS OR WHICH CAN INCREASE FLOOD HAZARDS;

3.1.5 CONTRIBUTE TO IMPROVED CONSTRUCTION TECHNIQUES IN THE FLOOD PLAIN; AND

3.1.6 COMPLY WITH AND EXCEED THE MINIMUM STANDARDS OF THE NATIONAL FLOOD INSURANCE PROGRAM AS ADMINISTERED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA).

3.2 **SITE IMPROVEMENT - RETAINING WALLS, DRIVEWAYS, GRADING & FILL**

3.2.1 RETAINING WALL'S GRADING AND FILL COMPLIES WITH REQUIREMENTS IN BC G303.6 & G303.7.

4. SOILS & FOUNDATIONS DESIGN LOAD NOTES:
AS PER BC CHAPTER 18 & BC 107.7.1, FOUNDATION PLANS SHALL DEMONSTRATE CODE COMPLIANCE REGARDING DESIGN LOADS, DESIGN ELEVATIONS, AND DETAILS AS TO SIZES, CURE STRENGTHS AND REINFORCEMENTS.

4.1 **ALLOWABLE BEARING PRESSURES, ALLOWABLE STRESSES AND DESIGN FORMULAS**
AS PER BC CHAPTER 18, DESIGN FORMULAS SHALL BE USED WITH THE ALLOWABLE STRESS DESIGN LOAD COMBINATIONS SPECIFIED IN SECTION 1605.3. THE QUALITY AND DESIGN OF MATERIALS USED STRUCTURALLY IN EXCAVATIONS AND FOUNDATIONS SHALL CONFORM TO THE REQUIREMENTS SPECIFIED IN CHAPTERS 16, 19, 21, 22 AND 23. OTHERWISE, AS PER PROJECT SPECIFIED.

5. CONSTRUCTION OPERATIONS NOTES:
AS REQUIRED IN BC 3303.14 & BC 3304.10, CONSTRUCTION OPERATIONS HAVE ACCOUNTED FOR THE PREVENTION OF ACCUMULATION OF WATER, WHICH COULD CAUSE DAMAGE TO NEARBY BUILDING FOUNDATIONS ON THE SUBJECT PROPERTY OR ON ADJACENT PROPERTIES.

6. RODENT-PROOFING NOTES:
AS PER BC F102.1, FOR WALLS OR PORTIONS THEREOF WITHIN 2 FEET OF THE OUTSIDE GROUND LEVEL, AND FOR WALLS BELOW THE OUTSIDE GROUND LEVEL, ALL OPENINGS, INCLUDING BUT NOT LIMITED TO, ANNULAR SPACES AROUND PIPES, ELECTRIC CABLES, AND CONDUITS, SHALL BE PROTECTED BY CLOSING SUCH OPENINGS WITH CEMENT MORTAR, CONCRETE MASONRY, METAL PLATES OR SCREENING DESIGNED TO PREVENT THE PASSAGE OF RODENTS.

7. SEISMIC LOAD NOTES:
AS PER BC 1613, EVERY STRUCTURE, AND PORTION THEREOF, INCLUDING NONSTRUCTURAL COMPONENTS THAT ARE PERMANENTLY ATTACHED TO STRUCTURES AND THEIR SUPPORTS AND ATTACHMENTS, SHALL BE DESIGNED AND CONSTRUCTED TO RESIST THE EFFECTS OF EARTHQUAKE MOTIONS IN ACCORDANCE WITH ASCE 7-16, EXCLUDING CHAPTER 14 AND APPENDIX 11A. THE SEISMIC DESIGN CATEGORY FOR A STRUCTURE SHALL BE DETERMINED IN ACCORDANCE WITH EITHER SECTION 1613 OR ASCE 7-16.

7.1 SEISMIC LOAD IS COMPLIANCE WITH NEW YORK CITY SEISMIC CODE: LOCAL LAW 17/95 & ASCE 7-16.

8. SHORING & BRACING NOTES:
AS PER BC 3305.3.2.6, WHEN PATENTED OR COMMERCIAL DEVICES THAT ARE NOT SUSCEPTIBLE TO DESIGN ARE USED FOR SHORING, BRACING, OR SPLICING, THEY SHALL BE APPROVED BY THE NYC DOB COMMISSIONER. SPLICES SHALL DEVELOP THE FULL STRENGTH OF THE SPLICED MEMBERS. WHERE SHORE HEIGHT EXCEEDS 10 FEET OR WHEN NECESSARY TO PROVIDE STRUCTURAL STABILITY, DIAGONAL BRACING SHALL BE PROVIDED. STRUTS, ANCHORED INTO MASONRY OR TO PANEL JOINTS OF ADJACENT BRACED BAYS MAY BE USED TO PREVENT BUCKLING OF INDIVIDUAL MEMBERS NOT SUPPORTED BY THE DIAGONAL BRACING, BUT BRACING AN ENTIRE TIER OF SHORES WITH STRUTS WITHOUT DIAGONAL BRACING SHALL BE PROHIBITED UNLESS THE SYSTEM CAN BE DEMONSTRATED TO BE BRACED BY OTHER RIGID CONSTRUCTION. THE UNBRACED LENGTH OF SHORES SHALL NOT EXCEED THE MAXIMUM LENGTH DETERMINED IN ACCORDANCE WITH THE REQUIREMENTS OF NYC BC 3305.3.2.6 FOR THE STRUCTURAL MATERIAL USED.

9. **SOIL & ROCK SAMPLING NOTES:**
AS PER BC 1802.5, THE SOIL ROCK CLASSIFICATIONS, NEEDED TO DETERMINE THE PROPER FOUNDATION DESIGN, ARE BASED ON MATERIALS OBTAINED FROM BORINGS, TEST PITS OR OTHER SUBSURFACE EXPLORATION METHODS AS ALLOWED.

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No.	Description	Date

KEY PLAN:

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BOULEVARD,
BROOKLYN
NY-11225

SHEET TITLE
GENERAL NOTES

SOE-001.00

02 OF 10

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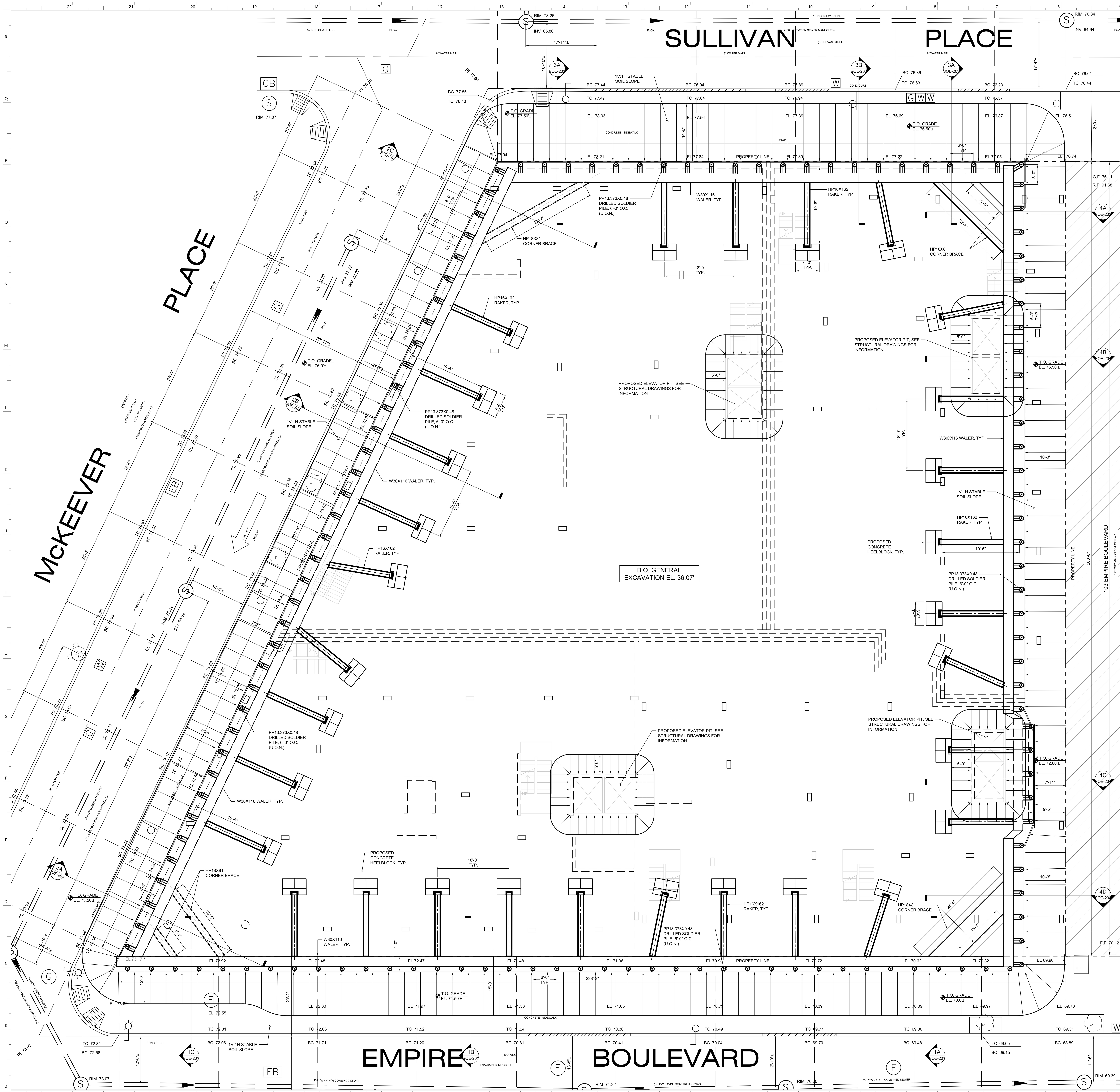

SUPPORT OF EXCAVATION PLAN

SCALE: 1/8" = 1' - 0"

LEGEND:

Symbol	Description
(arrows)	SOIL SLOPE DIRECTION OF STABLE SOIL SLOPE
(hatch)	PERIMETER OF ADJACENT BUILDING
36.07'	SPOT ELEVATION
B-X	APPROXIMATE BORING LOCATION
TP-X	APPROXIMATE TEST PIT LOCATION

NOTE:

1. BOTTOM OF EXCAVATION ELEVATION EL. 36.07' (U.O.N.), ELEVATIONS ARE BASED ON NAVD88 (NORTH AMERICAN VERTICAL DATUM OF 1988).
2. DENOTES TOP OF EXISTING GRADE/SIDEWALK ELEVATION.
3. PRIOR TO CONSTRUCTION, IT IS REQUIRED THAT OWNER CONDUCT A PRE-CONDITION SURVEY AND ADJACENT BUILDINGS EVALUATION (ABE) REPORT OF ALL ADJACENT PROPERTIES INCLUDING DATED PHOTOGRAPHS, IN ORDER TO DOCUMENT PRE-EXISTING CONDITIONS SUCH AS CRACKS, WALL BULGING, DETERIORATIONS, ETC.
   IF ADJACENT BUILDINGS EVALUATION (ABE) REPORT RECOMMENDS ANY TEMPORARY BRACING, SHORING, REPAIRS, ETC. OF ADJACENT BUILDINGS OR PROPERTIES, THEN OWNER, CONTRACTOR, AND ENGINEER TO COORDINATE AND IMPLEMENT SAID TEMPORARY WORK PRIOR TO START OF ANY SUPPORT OF EXCAVATION WORK.
   IF ANY CRACKS EXIST ON THE ADJACENT PROPERTIES, IT IS REQUIRED THAT CRACK MONITORS BE INSTALLED AT LOCATIONS DICTATED BY ENGINEER OR CRACK MONITORING COMPANY, AND BE MONITORED AT LEAST ONCE A WEEK DURING CONSTRUCTION (BY ENGINEER OR CRACK MONITORING COMPANY). SEE ALSO MONITORING PLAN FOR ADDITIONAL REQUIREMENTS.
4. PRIOR TO CONSTRUCTION, NEW YORK STATE LICENSED LAND SURVEYOR TO ESTABLISH VERTICAL WALL PLANES ALONG PROPERTY LINES, IN ORDER TO LOCATE ANY LINE INCURSIONS BY ADJACENT BUILDINGS ON TO THIS SITE. IF SUCH INCURSIONS OCCUR (I.E. TOP OF ADJACENT BUILDING "LEANS" INTO THIS SITE, ETC.) CONTRACTOR MUST ADJUST NEW BUILDING WALL LINE ACCORDINGLY.
5. OWNER/CONTRACTOR TO OBTAIN WRITTEN PERMISSION/CONSENT FROM ADJACENT PROPERTY OWNER TO PLACE SOLDIER PILES, LAGGINGS, AND UNDERPINNING WITHIN THEIR PROPERTY, AND WRITTEN PERMISSION TO RESTORE SAME PROPERTY TO ORIGINAL CONDITIONS.
6. PRIOR TO CONSTRUCTION, IT IS REQUIRED THAT A MONITORING PLAN BE ESTABLISHED BY OWNER, ENGINEER AND CONTRACTOR FOR MONITORING VIBRATION, VERTICAL AND HORIZONTAL MOVEMENT, ETC. DURING EXCAVATION, UNDERPINNING, SHEETING, AND LAGGING OPERATIONS, AND FOR DRILLING/DRIVING OF PILES (IF PROJECT REQUIRES PILES).
7. ELEVATIONS SHOWN ON PLANS AND SECTIONS ARE BASED ON SITE SURVEY PREPARED BY STATEWIDE LAND SURVEYING, P.C., DATED 07/02/2025.
8. SOIL INFORMATION IS BASED ON SOIL BORING LOGS PREPARED BY STRUCTURAL ENGINEERING TECHNOLOGIES, P.C., DATED 08/12/2025.
9. NOTIFY NEIGHBOR'S PROPERTY MANAGEMENT TO ALLOW FOR VISUAL INSPECTION OF ADJACENT PROPERTY FOUNDATION DURING EXCAVATION WHEN THE ADJACENT PROPERTY FOUNDATION IS EXPOSED OR IS ABOUT TO BE EXPOSED.
10. COPIES OF SPECIAL INSPECTION REPORTS WITH PHOTOGRAPHS OF UNDERPINNING AND EXCAVATION STATUS SHALL BE PROVIDED TO PROJECT MANAGEMENT AND ADJACENT PROPERTY OWNER'S PROPERTY MANAGER UPON REQUEST.

NOTE:

CONTRACTOR SHALL COORDINATE PLACEMENT OF SOLDIER PILES WITH THE STRUCTURAL AND FOUNDATION DRAWINGS AND WILL ENSURE THAT NO SOLDIER PILES WILL BE PLACED AT LOCATIONS OF SHEAR WALL END ZONES AND COLUMNS.

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SHEET TITLE
SUPPORT OF EXCAVATION PLAN

SOE-101.00

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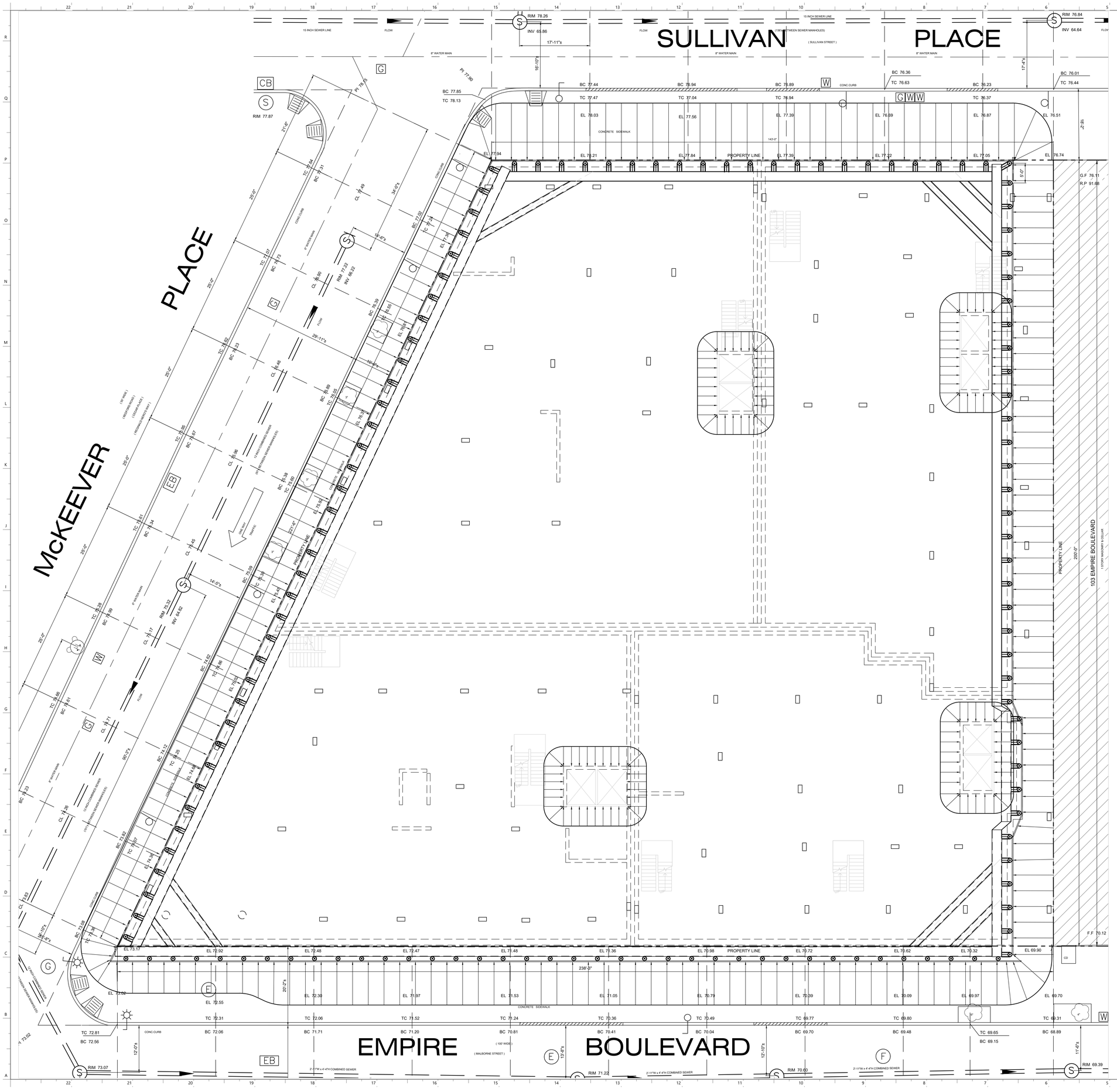


MONITORING PLAN

SCALE: 1/8" = 1' - 0"

LEGEND:

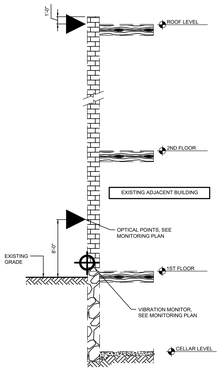
- PERIMETER OF ADJACENT BUILDING.
- OPTICAL MONITORING POINT AT ROOF LEVEL AND 8-FT ABOVE GRADE.
- OPTICAL MONITORING AT TOP OF SOE.
- VIBRATION MONITORING POINT.

SURVEY AND MONITORING NOTES:

1. A BUILDING PROTECTION PLAN IN ACCORDANCE WITH THE REQUIREMENTS OF THE NYCDOB TECHNICAL POLICY AND PROCEDURE NOTICE #10/88 (TPPN #0/88) SHOULD BE PREPARED FOR LANDMARKED BUILDINGS.
2. A PRE-CONSTRUCTION (PRE-CONDITION) SURVEY OF THE ADJACENT STRUCTURES SHALL BE PERFORMED PRIOR TO CONSTRUCTION IN ACCORDANCE WITH THE BUILDING PROTECTION PLAN. THE CONTRACTOR SHALL REVIEW AND FAMILIARIZE HIMSELF WITH THE RESULTS OF THE SURVEY. THE CONTRACTOR SHALL MAKE A VISUAL INSPECTION OF THE ADJACENT STRUCTURES (INSIDE AND OUT) PRIOR TO STARTING THE WORK.
3. MONITOR ADJACENT STRUCTURES BY OPTICAL SURVEY AT ABOUT 25-FT INTERVALS FOR VERTICAL AND LATERAL MOVEMENT. NOTE THAT BUILDING MONITORING LOCATIONS ARE NOT SHOWN ON THE SUPPORT OF EXCAVATION PLAN FOR CLARITY.
4. CRACK GAUGES SHALL BE INSTALLED ON EXISTING NEIGHBORING BUILDING CRACKS AND MONITORED DURING EXCAVATION AND FOUNDATION CONSTRUCTION.
5. CRACK MONITORING THRESHOLD SHALL BE 3-MM, IF REACHED THE CONTRACTOR AND THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR COURSE OF ACTION.
6. OBTAIN BASELINE READINGS OF THE MONITORING POINTS PRIOR TO EXCAVATION AND NEW CONSTRUCTION. HORIZONTAL AND VERTICAL SURVEY DATA TO BE OBTAINED BY ONE OF THE FOLLOWING:
   6.1 A NEW YORK STATE LICENSED SURVEYOR;
   6.2 A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER WITH MINIMUM FIVE YEARS EXPERIENCE IN HORIZONTAL AND VERTICAL SURVEY MONITORING.
7. OBTAIN AMBIENT TEMPERATURE DURING EACH OPTICAL MONITORING MEASUREMENT.
8. PERFORM OPTICAL SURVEYS AT LEAST TWICE PER WEEK DURING UNDERPINNING, AND ONCE PER WEEK DURING EXCAVATION AND FOUNDATION CONSTRUCTION, UNTIL FOUNDATION WALL IS BRACED AND BACKFILL IS COMPLETE. IF MOVEMENT OCCURS, INCREASE THE FREQUENCY OF THE READINGS AS RECOMMENDED BY THE CONTRACTOR OR ENGINEER.
9. VIBRATION MONITORS (SEISMOGRAPHS) SHALL BE PLACED ADJACENT TO AREAS WHERE WORK IS BEING PERFORMED AS NEGOTIATED WITH THE NEIGHBORING BUILDINGS. BASELINE READINGS SHALL BE OBTAINED AT LEAST ONE WEEK PRIOR TO START OF EXCAVATION.
10. NON-LANDMARK BUILDING MOVEMENT AND VIBRATION CRITERIA:
    10.1. IF THE VERTICAL OR LATERAL BUILDING MOVEMENT REACHED 1/4-IN, IMMEDIATELY NOTIFY THE CONSTRUCTION MANAGER, OWNER, AND ENGINEER.
    10.2. IF THE VERTICAL OR LATERAL BUILDING MOVEMENT REACHED 1/2-IN, IMMEDIATELY NOTIFY THE CONSTRUCTION MANAGER, OWNER, AND ENGINEER, AND STOP WORK. INFORM NYCDOB CONSTRUCTION SAFETY UNIT. THE WORK SHALL RESUME UPON APPROVAL BY THE CONSTRUCTION MANAGER AND APPROVED REMEDIAL MEASURES AND/OR MODIFIED CONSTRUCTION PROCEDURES BY THE ENGINEER.
    10.3. IF THE VIBRATIONS EXCEEDED 1.0-IPS, IMMEDIATELY NOTIFY THE CONSTRUCTION MANAGER, OWNER, AND ENGINEER.
    10.4. IF THE VIBRATIONS EXCEEDED 2.0-IPS, AND/OR ANY INDIVIDUAL CRACK GAUGE READING EXCEEDS 6-MM, IMMEDIATELY INFORM THE CONSTRUCTION MANAGER, OWNER, AND ENGINEER, AND STOP WORK. INFORM NYCDOB CONSTRUCTION SAFETY UNIT, OBSERVE NEIGHBORING STRUCTURE CONDITIONS, AND REVIEW AND MODIFY MEANS AND METHODS FOR EXCAVATION AND SUPPORT OF EXCAVATION AS NECESSARY. WORK SHALL NOT RESUME UNTIL AGREED UPON CORRECTIVE ACTION IS SUPPLEMENTED BY THE CONTRACTOR AND UPON APPROVAL BY THE CONSTRUCTION MANAGER AND THE ENGINEER.
11. NEW YORK CITY TRANSIT STRUCTURE MOVEMENT AND VIBRATION CRITERIA:
    11.1. IF THE VERTICAL OR LATERAL MOVEMENT OF THE NYCT STRUCTURE REACHED 1/4-IN, NOTIFY THE NYCT AND ADJUST MEANS AND METHODS.
    11.2. IF THE VERTICAL OR LATERAL MOVEMENT OF THE NYCT STRUCTURE REACHED 1/2-IN, DISCUSS REMEDIAL ACTION WITH THE NYCT.
    11.3. VIBRATION MONITORING DATA SHALL BE AVAILABLE AT THE JOB SITE.
    11.4. IF THE VIBRATIONS EXCEEDED 0.5-IPS, NOTIFY THE NYCT.
12. VIBRATION MONITORS SHALL TAKE REAL-TIME READING.
13. ALL MONITORING DATA SHALL BE PRESENTED TO THE CONSTRUCTION MANAGER, OWNER, ENGINEER, AND SPECIAL INSPECTOR AT THE END OF EACH DAY, OR AT AGREED-UPON INTERVALS.
14. CONTRACTOR IS REQUIRED TO OBTAIN CONSENT LETTER FROM ADJACENT PROPERTY OWNER TO UNDERPIN THEIR WALL, INSTALL SOIL NAILS OR TIE-BACK, ETC.

MONITORING PROTOCOL

MONITORING TYPE	MONITORING FREQUENCY	ALERT LEVEL	ACTION LEVEL
OPTICAL	(1) TIME PER WEEK DURING SUPPORT OF EXCAVATION, EXCAVATION, AND FOUNDATION WORK. (2) TIMES PER WEEK DURING UNDERPINNING WORK.	VERTICAL MOVEMENT = 0.25-IN HORIZONTAL MOVEMENT = 0.25-IN	VERTICAL MOVEMENT = 0.50-IN HORIZONTAL MOVEMENT = 0.50-IN
VIBRATION	CONTINUOUS REAL TIME VIBRATION MONITORING DURING SUPPORT OF EXCAVATION, UNDERPINNING, EXCAVATION, FOUNDATION, AND PLACING COMPACTED BACKFILL WITHIN 50 FEET OF A MONITOR POINT.	0.25-IPS AT UP TO 20-HZ 0.5-IPS AT BETWEEN 20- AND 40-HZ 1.0-IPS AT HIGHER THAN 40-HZ	0.50-IPS AT UP TO 20-HZ 1.0-IPS AT BETWEEN 20- AND 40-HZ 2.0-IPS AT HIGHER THAN 40-HZ
CRACK	SAME FREQUENCY AS OPTICAL MONITORING	3-MM	6-MM



TYPICAL MONITORING SECTION

N.T.S."

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DOB SCAN STICKER:

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BROOKLYN
NY-11225

SHEET TITLE

MONITORING PLAN

SOE-102.00

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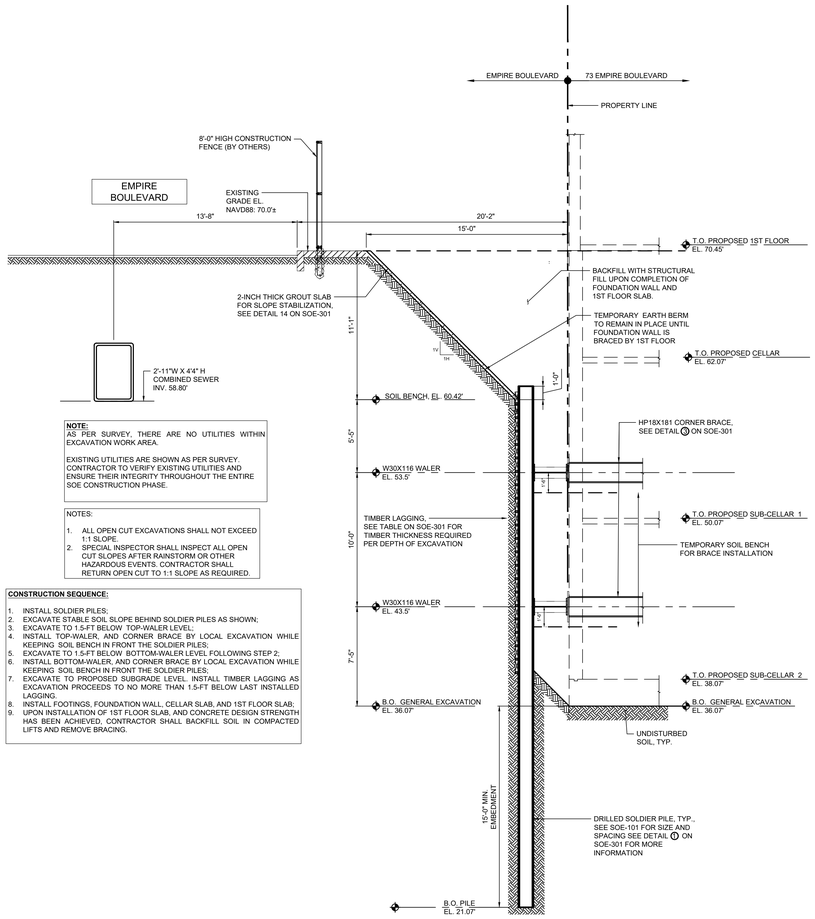


NOTE:
AS PER SURVEY, THERE ARE NO UTILITIES WITHIN EXCAVATION WORK AREA.

EXISTING UTILITIES ARE SHOWN AS PER SURVEY. CONTRACTOR TO VERIFY EXISTING UTILITIES AND ENSURE THEIR INTEGRITY THROUGHOUT THE ENTIRE SOE CONSTRUCTION PHASE.

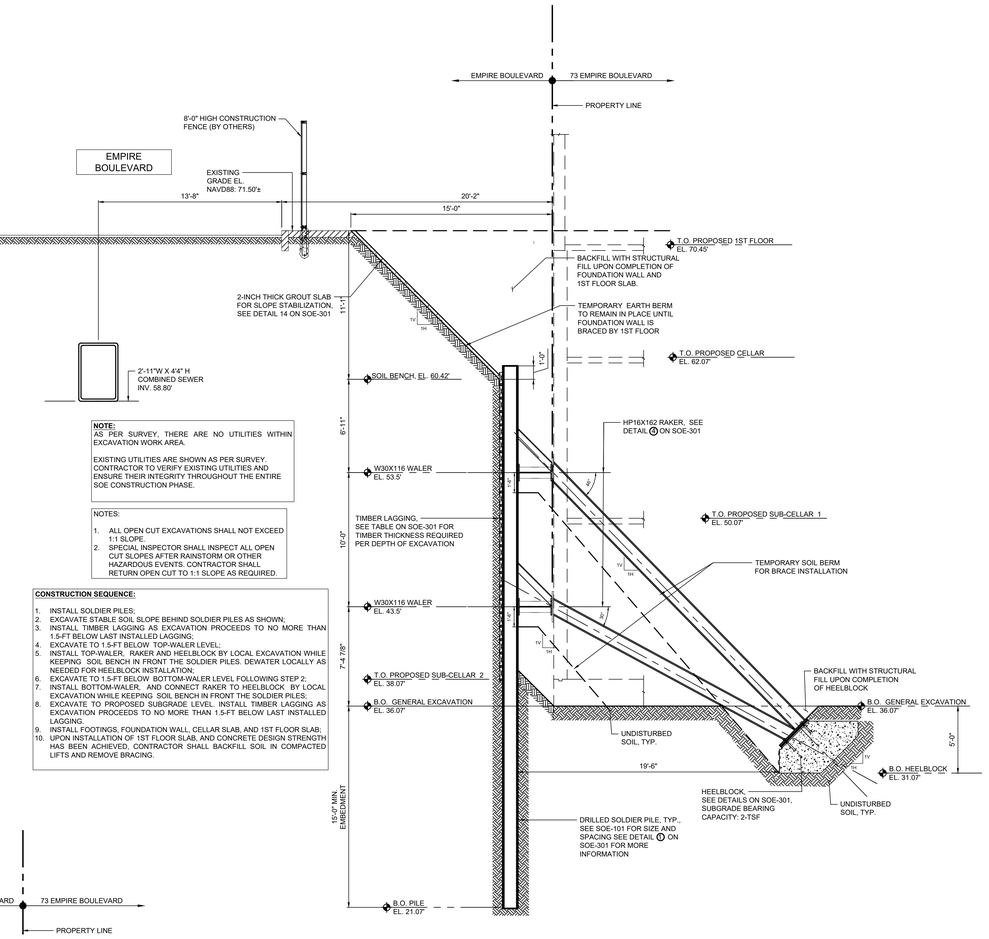
NOTES:

1. ALL OPEN CUT EXCAVATIONS SHALL NOT EXCEED 1:1 SLOPE.
2. SPECIAL INSPECTOR SHALL INSPECT ALL OPEN CUT SLOPES AFTER RAINSTORM OR OTHER HAZARDOUS EVENTS. CONTRACTOR SHALL RETURN OPEN CUT TO 1:1 SLOPE AS REQUIRED.

CONSTRUCTION SEQUENCE:

1. INSTALL SOLDIER PILES;
2. EXCAVATE STABLE SOIL SLOPE BEHIND SOLDIER PILES AS SHOWN;
3. EXCAVATE TO 1.5-FT BELOW TOP-WALER LEVEL;
4. INSTALL TOP-WALER, AND CORNER BRACE BY LOCAL EXCAVATION WHILE KEEPING SOIL BENCH IN FRONT THE SOLDIER PILES;
5. EXCAVATE TO 1.5-FT BELOW BOTTOM-WALER LEVEL FOLLOWING STEP 2;
6. INSTALL BOTTOM-WALER, AND CORNER BRACE BY LOCAL EXCAVATION WHILE KEEPING SOIL BENCH IN FRONT THE SOLDIER PILES;
7. EXCAVATE TO PROPOSED SUBGRADE LEVEL. INSTALL TIMBER LAGGING AS EXCAVATION PROCEEDS TO NO MORE THAN 1.5-FT BELOW LAST INSTALLED LAGGING.
8. INSTALL FOOTINGS, FOUNDATION WALL, CELLAR SLAB, AND 1ST FLOOR SLAB.
9. UPON INSTALLATION OF 1ST FLOOR SLAB, AND CONCRETE DESIGN STRENGTH HAS BEEN ACHIEVED, CONTRACTOR SHALL BACKFILL SOIL IN COMPACTED LIFTS AND REMOVE BRACING.

1A SECTION
SCALE: 1/4" = 1' - 0"



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3. INSTALL TIMBER LAGGING AS EXCAVATION PROCEEDS TO NO MORE THAN 1.5-FT BELOW LAST INSTALLED LAGGING;
4. EXCAVATE TO 1.5-FT BELOW TOP-WALER LEVEL;
5. INSTALL TOP-WALER, RAKER AND HEELBLOCK BY LOCAL EXCAVATION WHILE KEEPING SOIL BENCH IN FRONT THE SOLDIER PILES. DEWATER LOCALLY AS NEEDED FOR HEELBLOCK INSTALLATION;
6. EXCAVATE TO 1.5-FT BELOW BOTTOM-WALER LEVEL FOLLOWING STEP 2;
7. INSTALL BOTTOM-WALER, AND CONNECT RAKER TO HEELBLOCK BY LOCAL EXCAVATION WHILE KEEPING SOIL BENCH IN FRONT THE SOLDIER PILES;
8. EXCAVATE TO PROPOSED SUBGRADE LEVEL. INSTALL TIMBER LAGGING AS EXCAVATION PROCEEDS TO NO MORE THAN 1.5-FT BELOW LAST INSTALLED LAGGING.
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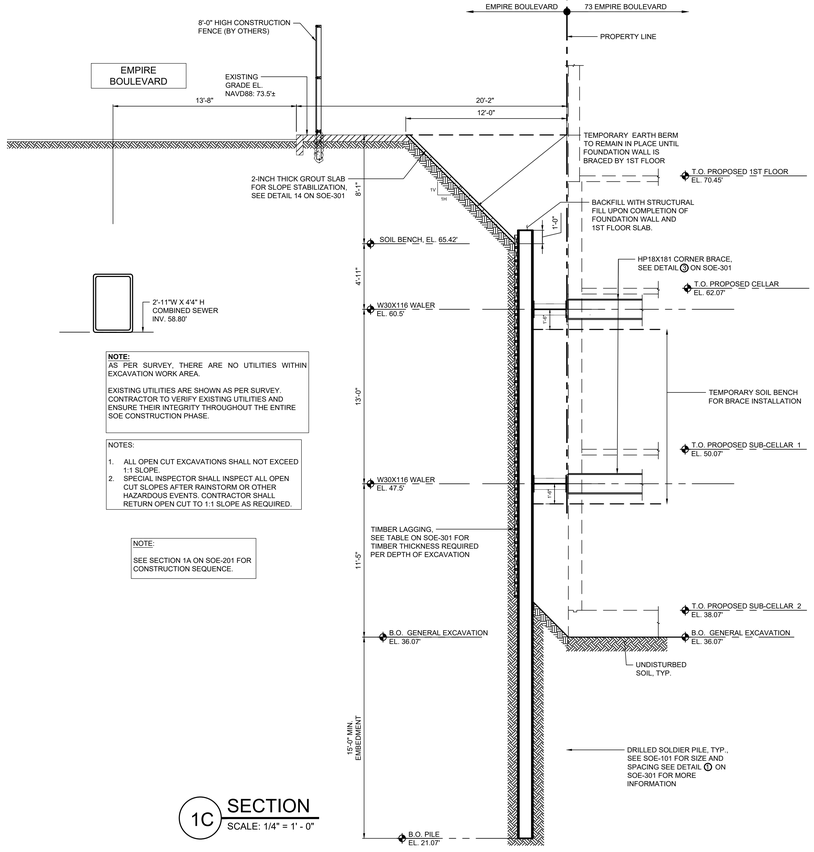

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NOTE:
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1C SECTION
SCALE: 1/4" = 1' - 0"

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SIGNATURE & SEAL

DOB SCAN STICKER:

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73 EMPIRE BOULEVARD,
BROOKLYN
NY-11225

SHEET TITLE
SUPPORT OF EXCAVATION SECTIONS

SOE-201.00

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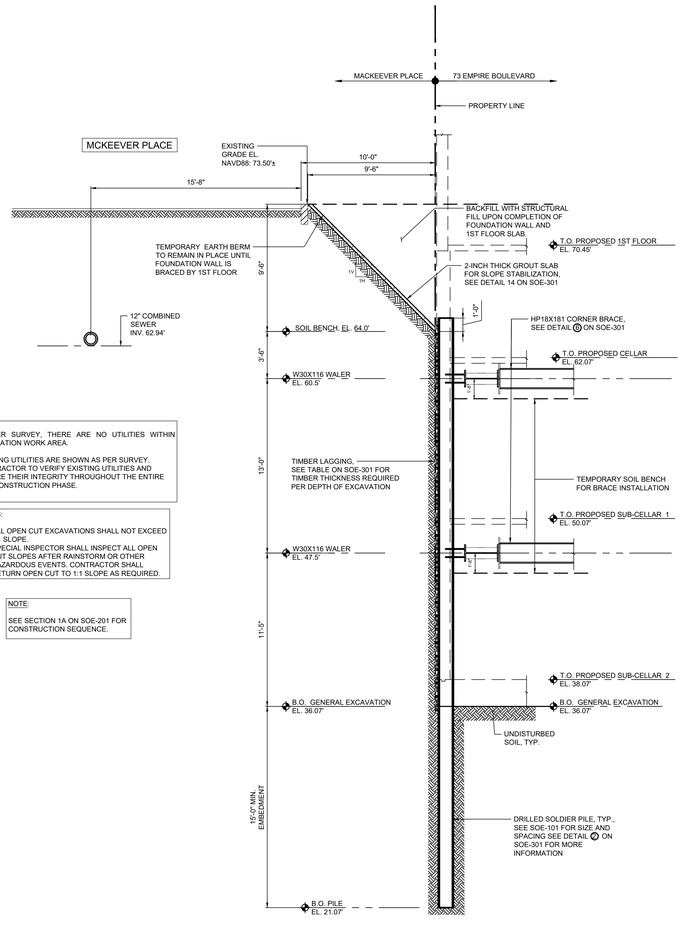

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2A SECTION
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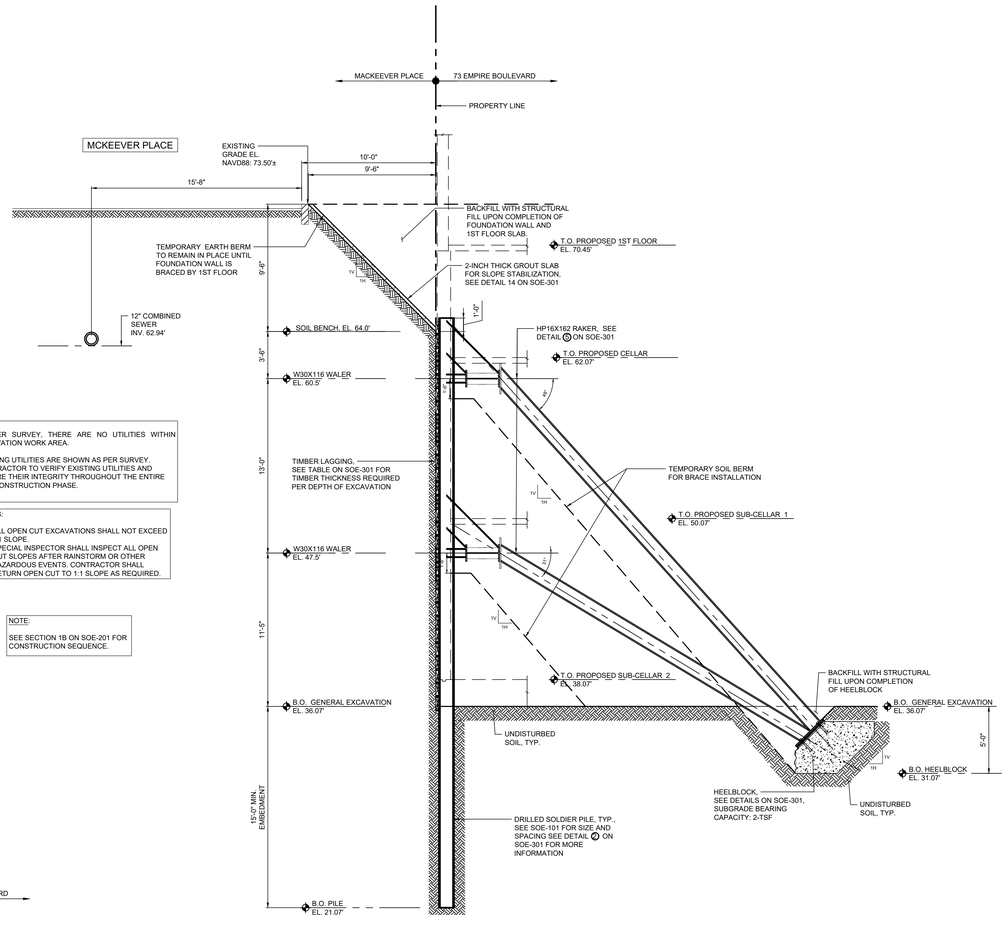

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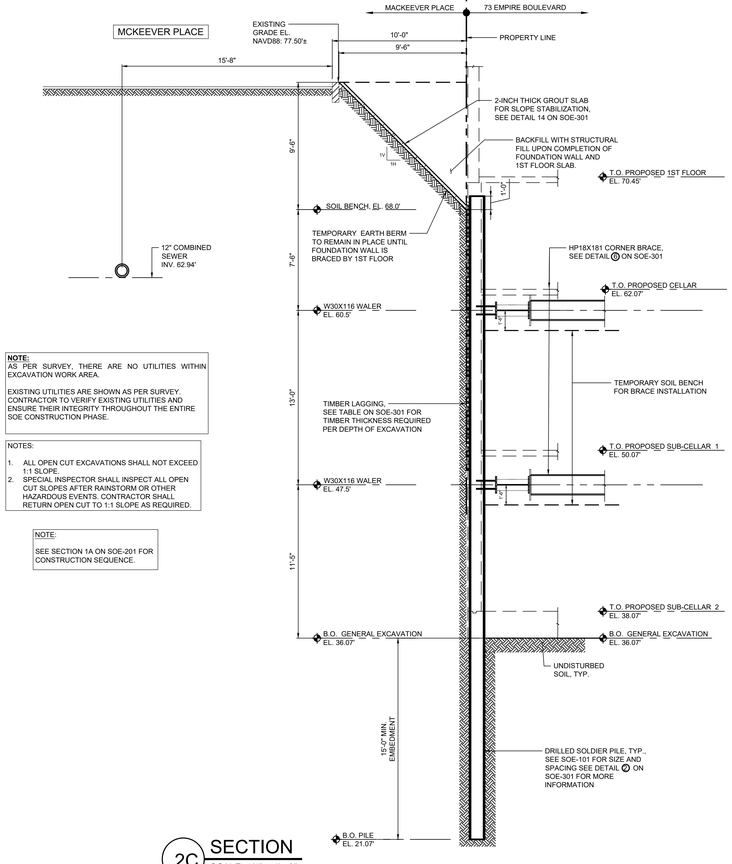

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South Amboy, NJ 08879

Structure Engineer:
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40-12 28th Street
Long Island City, NY 11101

Interior Designer:
Durukan Design
55 Washington Street, Suite 508
Brooklyn, NY 11201

SOE Engineer:
STRUCTURAL ENGINEERING TECHONOLOGIES P.C
40-12 28th Street
Long Island City, NY 11101

No.	Description	Date

KEY PLAN

SIGNATURE & SEAL

DOB SCAN STICKER:

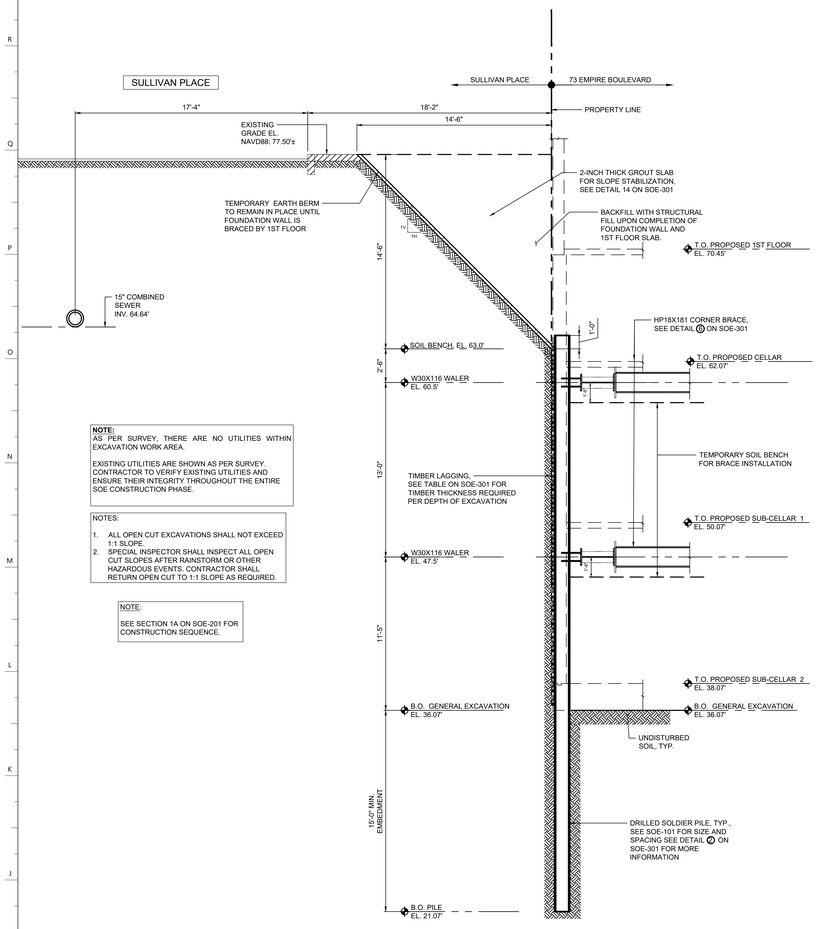
LOCATION
73 EMPIRE BOULEVARD, BROOKLYN
NY-11225

SHEET TITLE
SUPPORT OF EXCAVATION SECTIONS

SOE-202.00

06 OF 10

Scale:	AS NOTED
Date:	11-19-2025
Drawn by:	A.M.C.
Checked by:	D.P.
DOB JOB NUMBER:	



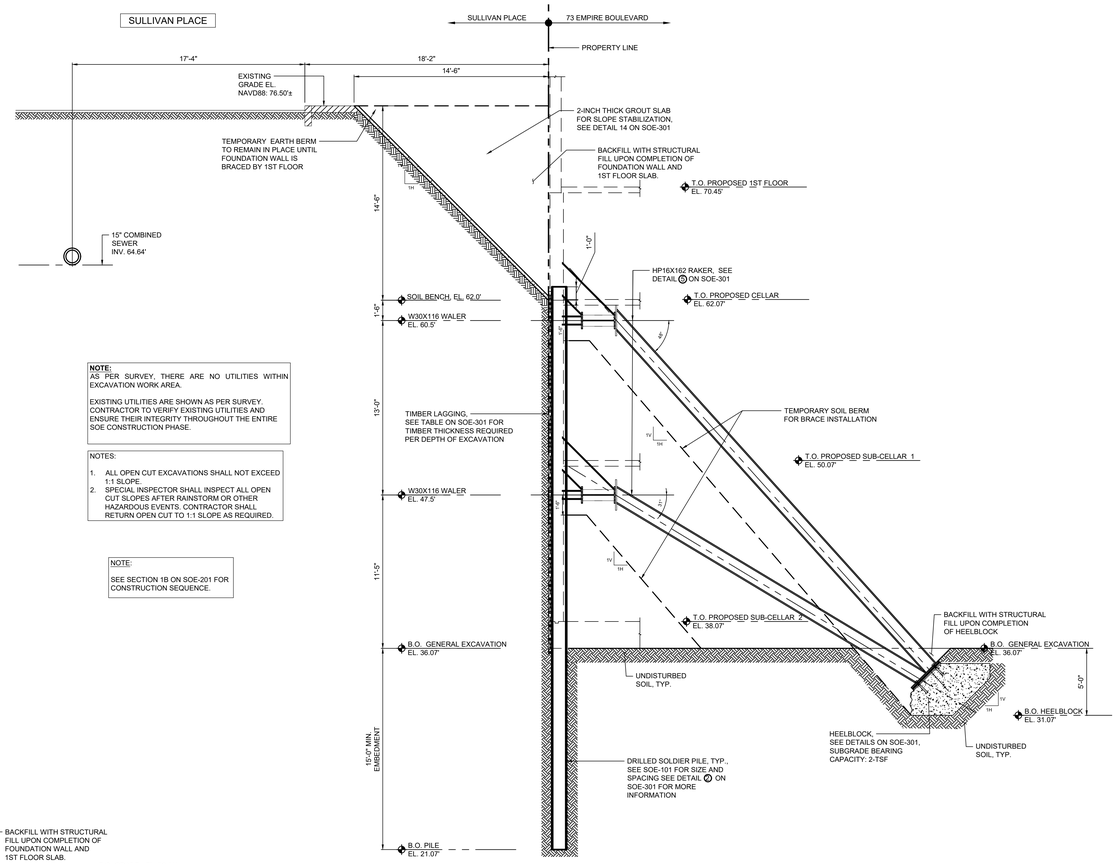
NOTE:
AS PER SURVEY, THERE ARE NO UTILITIES WITHIN EXCAVATION WORK AREA.

EXISTING UTILITIES ARE SHOWN AS PER SURVEY. CONTRACTOR TO VERIFY EXISTING UTILITIES AND ENSURE THEIR INTEGRITY THROUGHOUT THE ENTIRE SOE CONSTRUCTION PHASE.

NOTES:
1. ALL OPEN CUT EXCAVATIONS SHALL NOT EXCEED 1:1 SLOPE.
2. SPECIAL INSPECTOR SHALL INSPECT ALL OPEN CUT SLOPES AFTER RAINSTORM OR OTHER HAZARDOUS EVENTS. CONTRACTOR SHALL RETURN OPEN CUT TO 1:1 SLOPE AS REQUIRED.

NOTE:
SEE SECTION 1A ON SOE-201 FOR CONSTRUCTION SEQUENCE.

3A SECTION
SCALE: 1/4" = 1' - 0"



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NOTE:
SEE SECTION 1B ON SOE-201 FOR CONSTRUCTION SEQUENCE.

3B SECTION
SCALE: 1/4" = 1' - 0"

NOTES:
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NOTE:
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4A SECTION
SCALE: 1/4" = 1' - 0"

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ARCHITECTS P.C.
227 CATHERINE STREET
SOUTH AMBOY, NJ 08879
(609) 216 2975

CLIENT:
The Rabsky Group LLC
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SOE-203.00

07 OF 10

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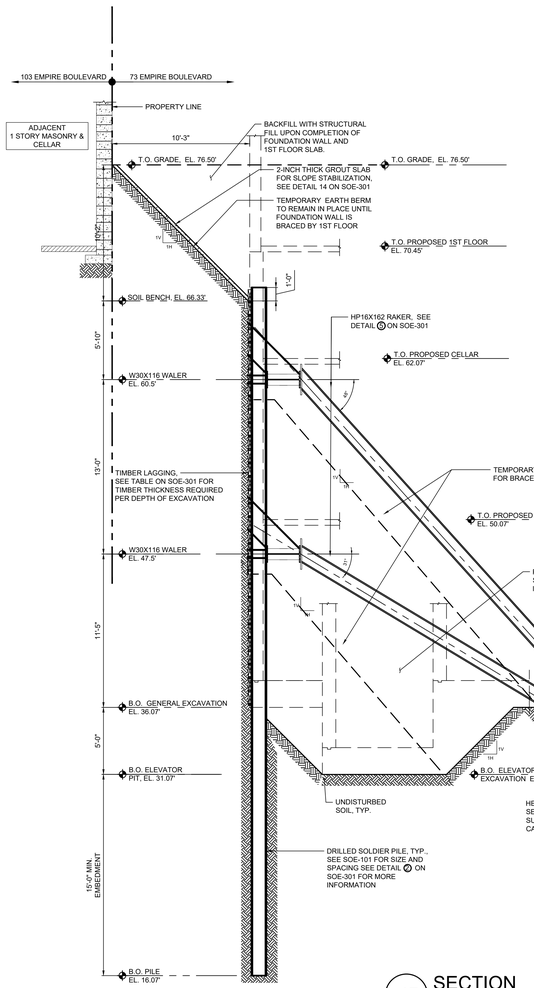

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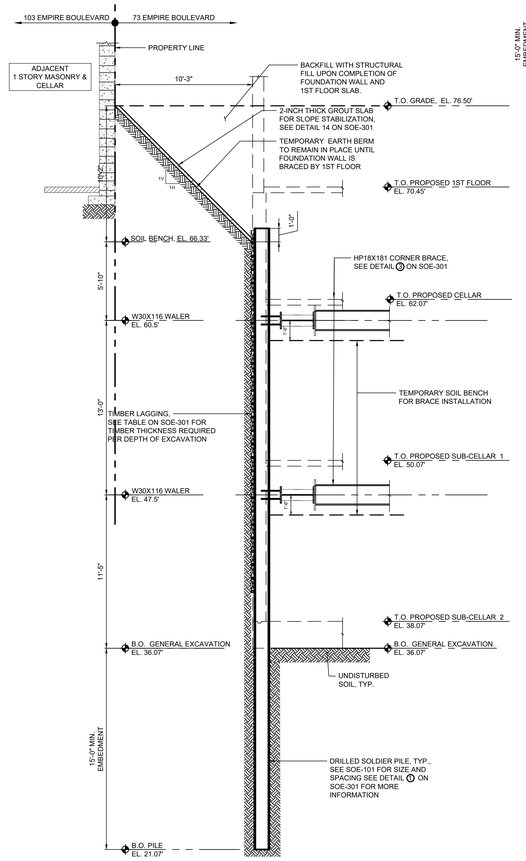
SCALE: 1/4" = 1' - 0"



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NOTE:

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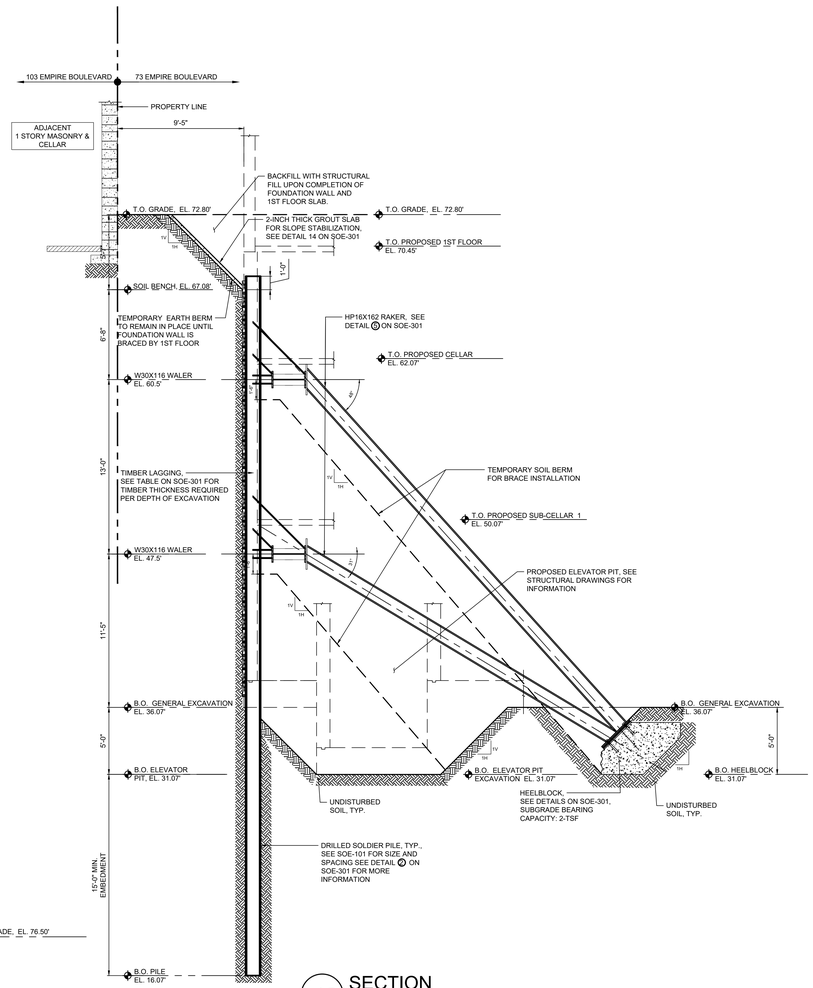
4D SECTION
SCALE: 1/4" = 1' - 0"



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NOTE:

SEE SECTION 1A ON SOE-201 FOR CONSTRUCTION SEQUENCE.

4C SECTION
SCALE: 1/4" = 1' - 0"

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BROOKLYN
NY-11225

SHEET TITLE
SUPPORT OF EXCAVATION SECTIONS

SOE-204.00

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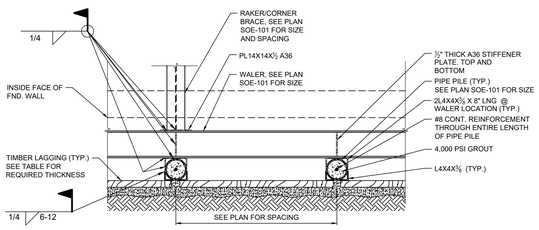
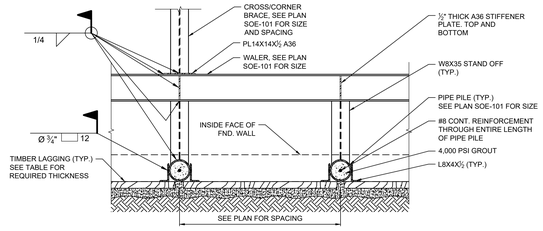


1 BRACED SOLDIER PILE PLAN
1/2"=1-0"

NOTES:
1. ROLL CHOCK AT RAKER-PIPE PILE LOCATION NOT SHOWN FOR CLARITY. SEE SECTION 5 FOR MORE INFORMATION.
2. PROPOSED ANGLE CAN BE SUBSTITUTED PER DETAIL SHOWN IN 2/SOE-301.



2 BRACED SOLDIER PILE PLAN
1/2"=1-0"

NOTES:
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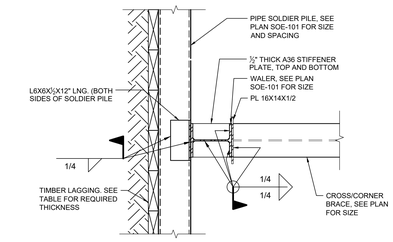
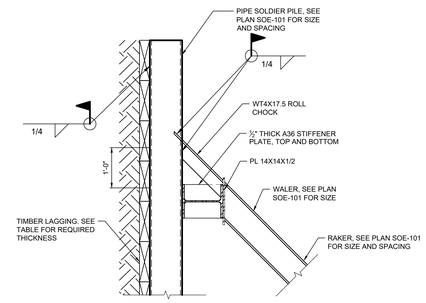


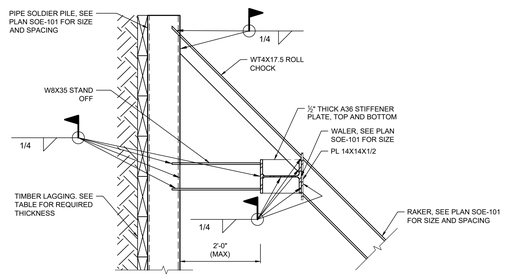
3 SOLDIER PILE/ANGLE - WALER CONNECTION DETAIL
3/4"=1-0"

NOTES:
1. WORK THIS DETAIL WHEN SOLDIER PILES ABUT WALER.



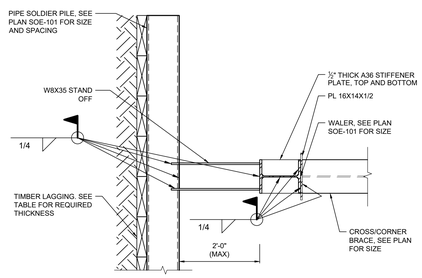
4 SOLDIER PILE - WALER SECTION
3/4"=1-0"

NOTES:
1. WELDING CONNECTIONS AT WALER CONNECTION NOT SHOWN FOR CLARITY. SEE SOLDIER PILE-WALER SECTION I FOR CONNECTION DETAILS.
2. ANGLE AT SOLDIER PILE-WALER CONNECTION NOT SHOWN FOR CLARITY. SEE DETAIL 9/SOE-301.



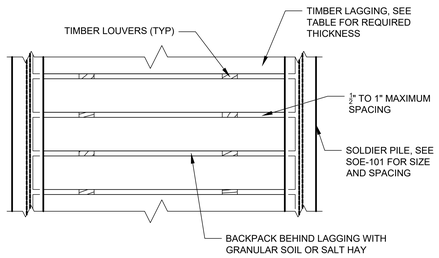
5 SOLDIER PILE - WALER SECTION
3/4"=1-0"

NOTES:
1. ANGLE-WOOD LAGGING CONNECTION NOT SHOWN FOR CLARITY.

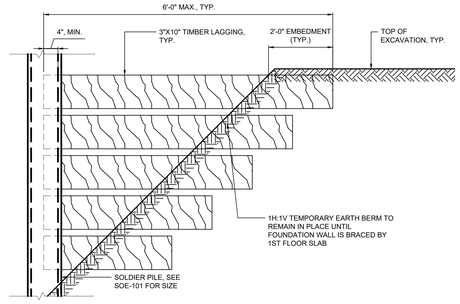


6 WALER- CORNER BRACE SECTION I
3/4"=1-0"

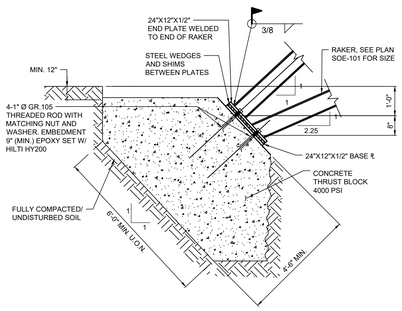
NOTES:
1. ANGLE-WOOD LAGGING CONNECTION NOT SHOWN FOR CLARITY.



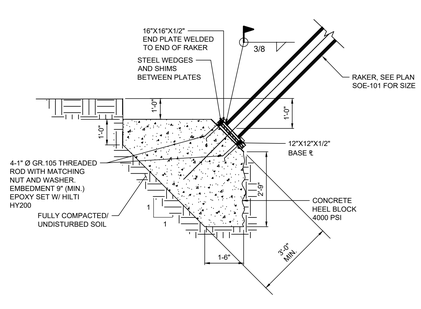
7 LAGGING INSTALLATION DETAIL
N.T.S.



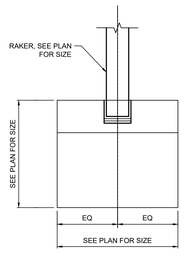
8 TIMBER LAGGING TO SOIL SLOPE CONNECTION
3/4"=1-0"



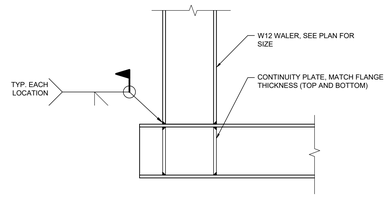
9 HEELBLOCK SECTION VIEW DETAIL
1/2"=1-0"



10 HEELBLOCK SECTION VIEW DETAIL
1/2"=1-0"

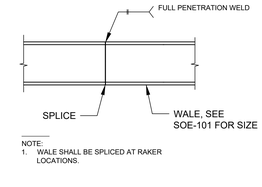


11 TYP. HEELBLOCK PLAN VIEW
1/2"=1-0"



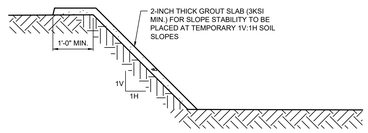
12 WALER CORNER CONNECTION DETAIL
1"=1-0"

NOTES:
1. PROVIDE THIS DETAIL AT ALL CORNERS AND INTERSECTIONS.
2. SOE PILES NOT SHOWN FOR CLARITY.



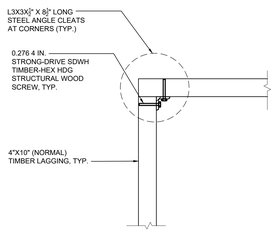
NOTE:
1. WALE SHALL BE SPLICED AT RAKER LOCATIONS.

13 WALER SPLICE DETAIL
1"=1-0"



NOTES:
1. GROUT SLAB SHALL BE PLACED AT ALL TEMPORARY SLOPES THAT EXCEED 1.5H:1V (MAX 1H:1V AS SHOWN HEREIN);
2. GROUT SLAB SHALL BE PLACED WITHIN 8 HOURS OF EXCAVATING TEMPORARY SLOPE;
3. TEMPORARY SLOPES EXCEEDING 1.5H:1V SHALL NOT BE IN PLACED IN LENGTHS GREATER THAN 10 FEET WITHOUT PLACEMENT OF GROUT SLAB;
4. 3. TEMPORARY SLOPES EXCEEDING 1.5H:1V SHALL NOT BE IN PLACE MORE THAN 24 HOURS WITHOUT INSPECTION AND APPROVAL BY THE PROJECT SIA. INSPECTIONS SHALL CONTINUE EVERY 24 HOURS UNTIL THE SLOPE IS BACKFILLED OR FOUNDATION CONCRETE IS PLACED AGAINST SLOPE.

14 GROUT SLAB FOR TEMPORARY SLOPE STABILITY DETAIL
3/4"=1-0"



15 LAGGING TYPICAL DETAIL
1"=1-0"

Required Minimum Thickness of Timber Sheeting (inches) [T]								
		Span (ft) [S]						
		4	5	6	7	8	9	10
Depth (ft) [D]	4	3	3	3	3	3	3	3
	5	3	3	3	3	3	3	4
	6	3	3	3	3	3	4	4
	7	3	3	3	3	3	4	4
	8	3	3	3	3	4	4	4
	9	3	3	3	3	4	4	4
	10	3	3	3	3	4	4	5
	11	3	3	3	4	4	4	5
	12	3	3	3	4	4	5	6
	13	3	3	3	4	4	5	6
	14	3	3	3	4	4	5	6
	15	3	3	4	4	4	5	6
	16	3	3	4	4	5	6	8
	17	3	3	4	4	5	6	8
	18	3	3	4	4	5	6	8
	19	3	3	4	4	5	6	8
	20	3	3	4	4	5	6	8
	25	3	4	4	5	6	8	8
	30	3	4	5	6	8	8	8

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BROOKLYN
NY-11225

SHEET TITLE
SUPPORT OF EXCAVATION DETAILS

SOE-301.00

09 OF 10

Scale:	AS NOTED
Date:	11-19-2025
Drawn by:	A.M.C.
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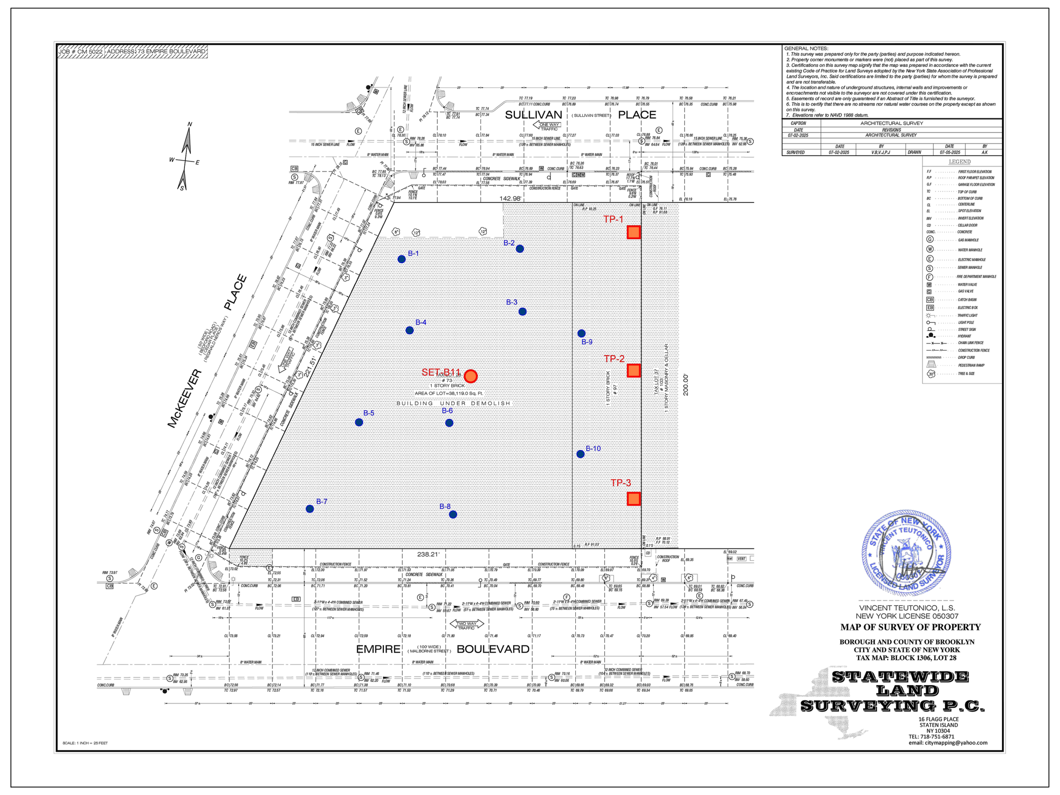

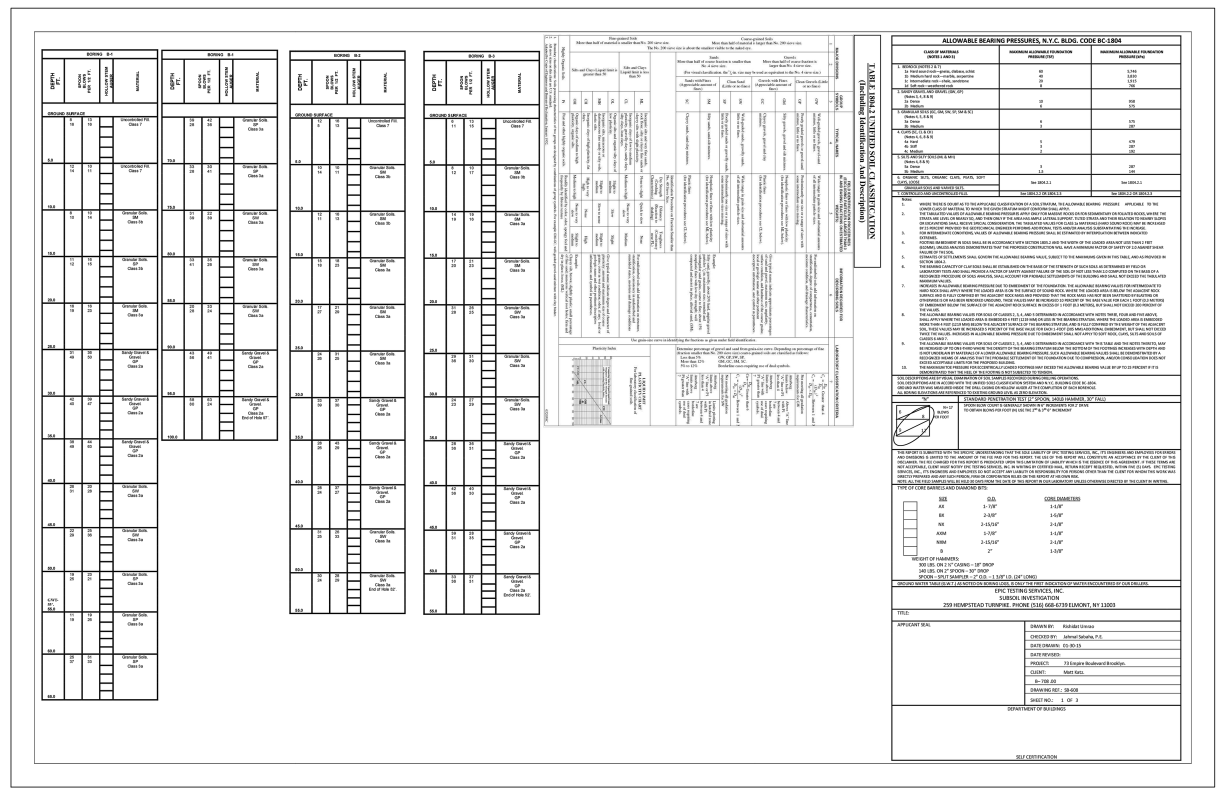

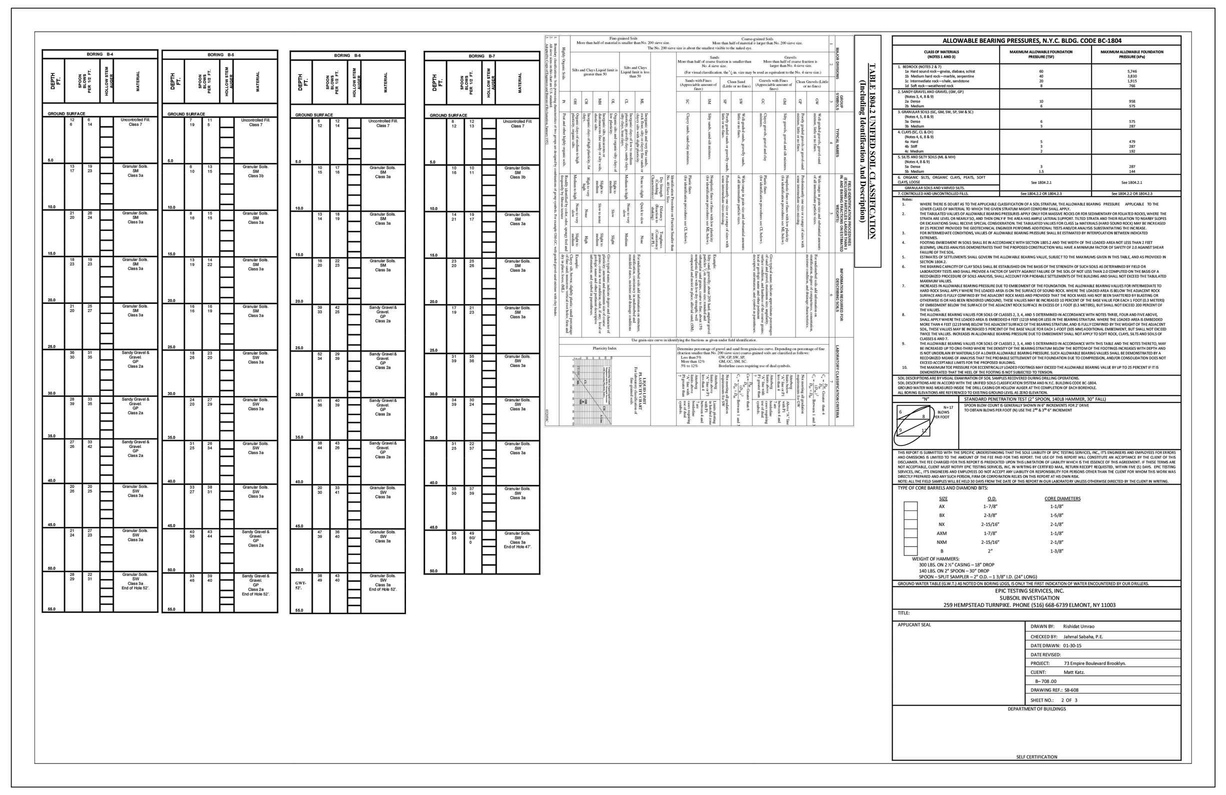

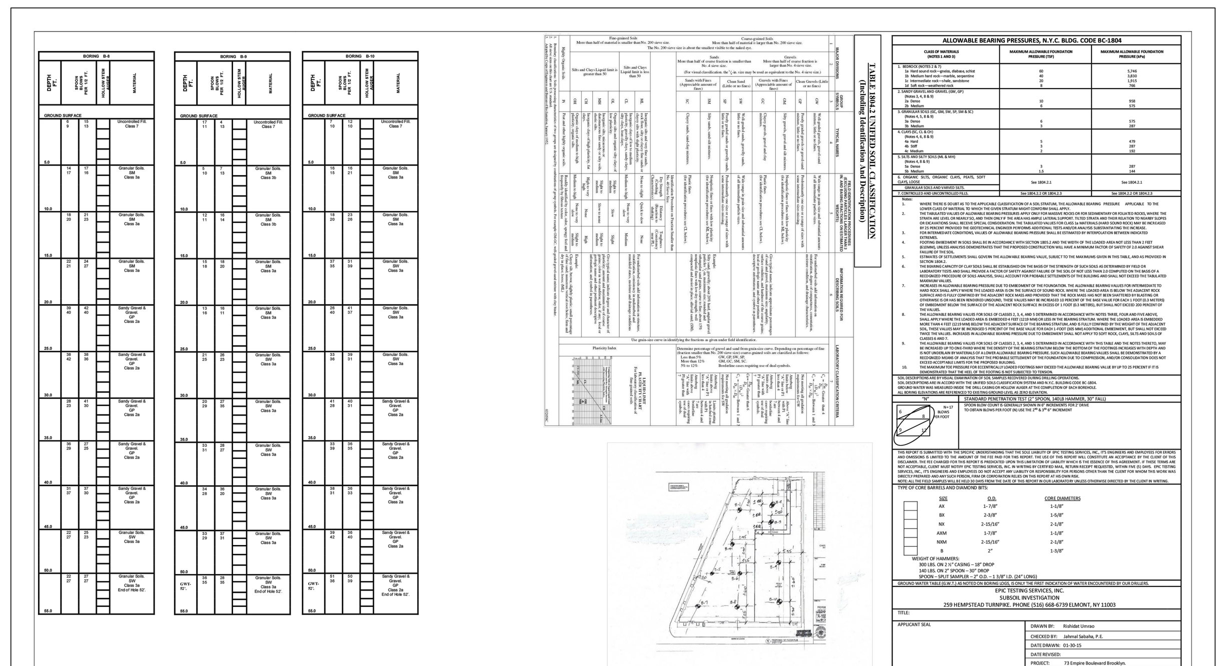

SB-608

B-1 PERCOLATION TEST RESULTS

TIME (MINUTES)	DROP IN WATER LEVEL (INCHES)
1	7.0
5	19.0
10	35.0
15	60.0
30	77.0
45	93.0
60	115.0

SB-608

B-6 PERCOLATION TEST RESULTS

TIME (MINUTES)	DROP IN WATER LEVEL (INCHES)
1	10.0
5	25.0
10	38.0
15	55.0
30	76.0
45	90.0
60	104.0

SB-608

B-10 PERCOLATION TEST RESULTS

TIME (MINUTES)	DROP IN WATER LEVEL (INCHES)
1	13.0
5	42.0
10	63.0
15	81.0
30	94.0
45	115.0
60	121.0

STRUCTURAL ENGINEERING TECHNOLOGIES, P.C.
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Tel: 718.706.7196 E-mail: info@set-ny.com
www.set-ny.com

GEOTECHNICAL BORING LOG

Boring #: B-11

Client: MR. ZELIG WEISS Date Start: 08-12-2025 Date Finish: 08-12-2025
Project: 73 EMPIRE BOULEVARDE, BROOKLYN NY Block: 1306 Lot(s): 28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC. Driller: Reuben Helper: Lucas
Elevation & Datum: About Sidewalk grade Groundwater Depth: N/A Rock Depth: N/A

DEPTH	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
0.0'	S-1 (0.0'-2.0')	Dark brown fm SAND, some mc gravel, SM (dry)	9"	8 / 10	5 / 10	FILL (7)
	S-2 (2.0'-4.0')	Dark brown fm SAND, some mc gravel, SM (dry)	7"	10 / 4	7 / 3	FILL (7)
5.0'	S-3 (4.0'-6.0')	Brown fm SAND, some silt, bricks, SM (moist)	12"	7 / 10	9 / 6	FILL (7)
	S-4 (6.0'-8.0')	Brown mc SAND, some mc gravel, bricks, SM (dry)	4"	9 / 5	6 / 6	FILL (7)
	S-5 (8.0'-10.0')	Brown f silty SAND, SM-ML (dry)	9"	4 / 1	2 / 2	SAND (6)
10.0'	S-6 (10.0'-12.0')	Brown f silty SAND, SM-ML (dry)	10"	2 / 3	4 / 5	SAND (6)
	S-7 (12.0'-14.0')	Brown f silty SAND, some mc gravel, SM-GP (dry)	10"	5 / 11	7 / 16	SAND (3b)
15.0'	S-8 (15.0'-17.0')	Brown f SAND, some f gravel, trace silt, SM (dry)	12"	9 / 11	11 / 12	SAND (3b)
20.0'	S-9 (20.0'-22.0')	Gray to brown fm GRAVEL and c sand, GP-SM (dry)	14"	20 / 26	17 / 35	GRAVEL (2a)

Drilling Equipment: Year: 2024 Make: GEOPROBE Model: 7822DT Mounting: TRACK
Spoon Hammer Type: Automatic Trip Hammer Spoon Hammer Drop: 30 INCH. Spoon Hammer Weight: 140 LBS. Spoon Size: 24 INCH Rock Core Barrel Size: N/A

PAGE 1 OF 5

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Elevation & Datum: About Sidewalk grade Groundwater Depth: N/A Rock Depth: N/A

DEPTH	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
25.0'	S-10 (25.0'-27.0')	Brown to gray f GRAVEL, some c sand, GP-SM (dry)	12"	24 / 29	27 / 38	GRAVEL (2a)
30.0'	S-11 (30.0'-32.0')	Brown to gray m GRAVEL, some c sand, GP-SM (dry)	10"	21 / 17	18 / 31	GRAVEL (2a)
35.0'	S-12 (35.0'-37.0')	Brown to gray f GRAVEL, some c sand, GP-SP (wet)	16"	17 / 18	15 / 16	GRAVEL (2a)
40.0'	S-13 (40.0'-42.0')	Brown mc SAND, some f gravel, SM (moist)	14"	14 / 16	15 / 14	SAND (3a)

Drilling Equipment: Year: 2024 Make: GEOPROBE Model: 7822DT Mounting: TRACK
Spoon Hammer Type: Automatic Trip Hammer Spoon Hammer Drop: 30 INCH. Spoon Hammer Weight: 140 LBS. Spoon Size: 24 INCH Rock Core Barrel Size: N/A

PAGE 2 OF 5

STRUCTURAL ENGINEERING TECHNOLOGIES, P.C.
40-12 28th Street, Long Island City, NY 11101
Tel: 718.706.7196 E-mail: info@set-ny.com
www.set-ny.com

GEOTECHNICAL BORING LOG

Boring #: B-11

Client: MR. ZELIG WEISS Date Start: 08-12-2025 Date Finish: 08-12-2025
Project: 73 EMPIRE BOULEVARDE, BROOKLYN NY Block: 1306 Lot(s): 28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC. Driller: Reuben Helper: Lucas
Elevation & Datum: About Sidewalk grade Groundwater Depth: N/A Rock Depth: N/A

DEPTH	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
45.0'	S-14 (45.0'-47.0')	Brown m SAND, trace f gravel, SP (wet)	12"	13 / 18	16 / 20	SAND (3a)
50.0'	S-15 (50.0'-52.0')	Brown fm SAND, some f gravel, SP (dry)	15"	15 / 19	14 / 22	SAND (3a)
55.0'	S-16 (55.0'-57.0')	Brown fm SAND, SM (moist)	11"	16 / 15	19 / 18	SAND (3a)
60.0'	S-17 (60.0'-62.0')	Brown fm SAND, SM (dry)	10"	20 / 16	19 / 21	SAND (3a)
65.0'						

Drilling Equipment: Year: 2024 Make: GEOPROBE Model: 7822DT Mounting: TRACK
Spoon Hammer Type: Automatic Trip Hammer Spoon Hammer Drop: 30 INCH. Spoon Hammer Weight: 140 LBS. Spoon Size: 24 INCH Rock Core Barrel Size: N/A

PAGE 3 OF 5

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Boring #: B-11

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Project: 73 EMPIRE BOULEVARDE, BROOKLYN NY Block: 1306 Lot(s): 28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC. Driller: Reuben Helper: Lucas
Elevation & Datum: About Sidewalk grade Groundwater Depth: N/A Rock Depth: N/A

DEPTH 65.0'	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
	S-18 (65.0'-67.0')	Brown fm SAND, SM (moist)	19"	15 / 20	17 / 24	SAND (3a)
70.0'	S-19 (70.0'-72.0')	Brown fm SAND, some silt, SM (moist)	16"	17 / 27	22 / 26	SAND (3a)
75.0'	S-20 (75.0'-77.0')	Brown fm SAND, SM (moist)	16"	12 / 20	14 / 19	SAND (3a)
80.0'	S-21 (80.0'-82.0')	Brown fm SAND, trace silt, SM (moist)	15"	11 / 22	12 / 24	SAND (3a)
85.0'	S-22 (85.0'-87.0')	Brown f SAND, SM (dry)	17"	25 / 37	41 / 45	SAND (3a)

Drilling Equipment: Year: 2020 Make: GEOPROBE Model: 7822DT Mounting: TRACK
Spoon Hammer Type: Automatic Trip Hammer Spoon Hammer Drop: 30 INCH. Spoon Hammer Weight: 140 LBS. Spoon Size: 24 INCH Rock Core Barrel Size: N/A

PAGE 4 OF 5

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GEOTECHNICAL BORING LOG

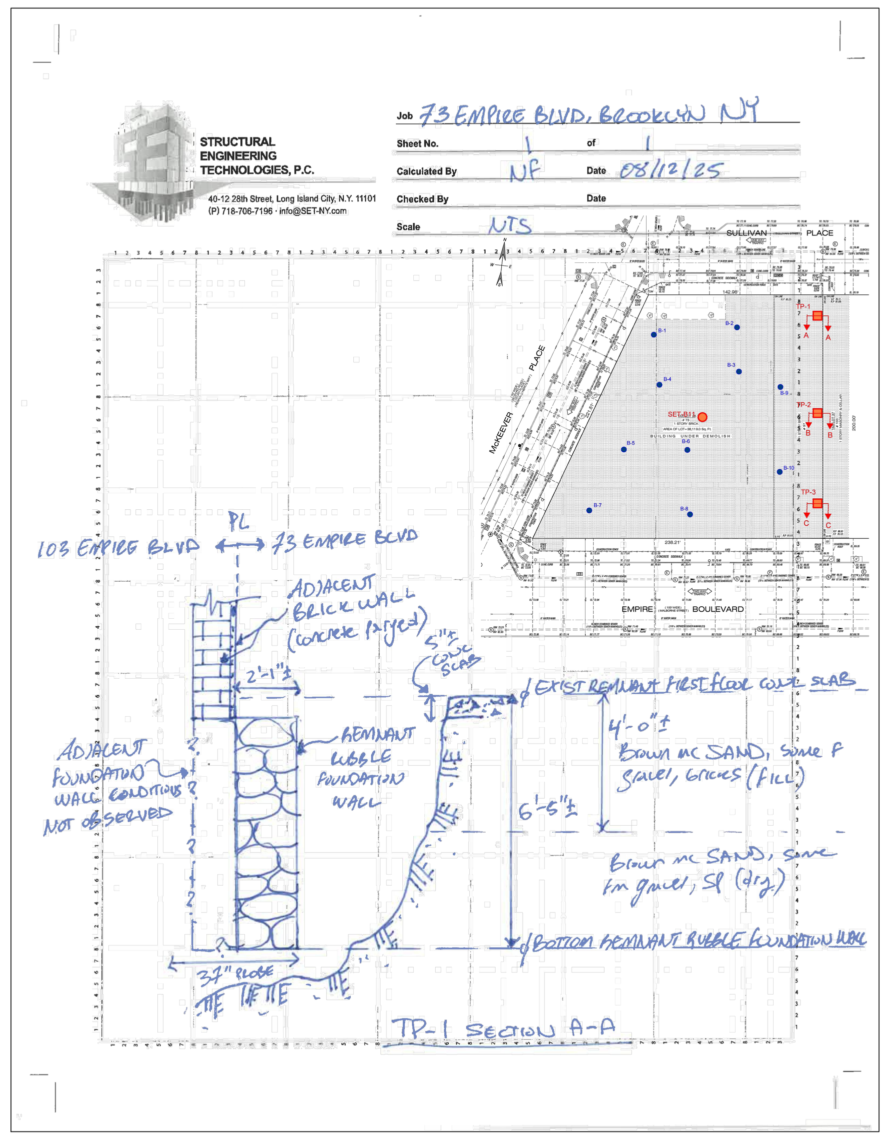
Boring #: B-11

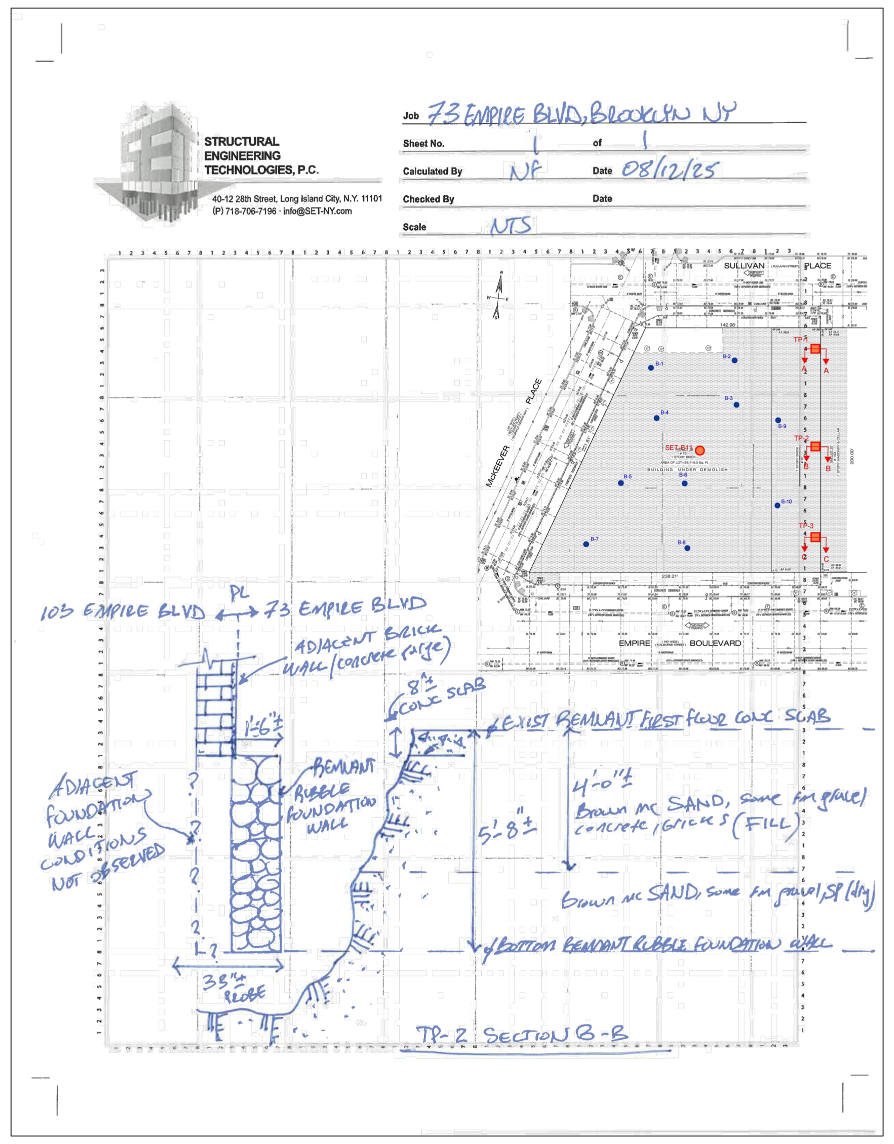
Client: MR. ZELIG WEISS Date Start: 08-12-2025 Date Finish: 08-12-2025
Project: 73 EMPIRE BOULEVARDE, BROOKLYN NY Block: 1306 Lot(s): 28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC. Driller: Reuben Helper: Lucas
Elevation & Datum: About Sidewalk grade Groundwater Depth: N/A Rock Depth: N/A

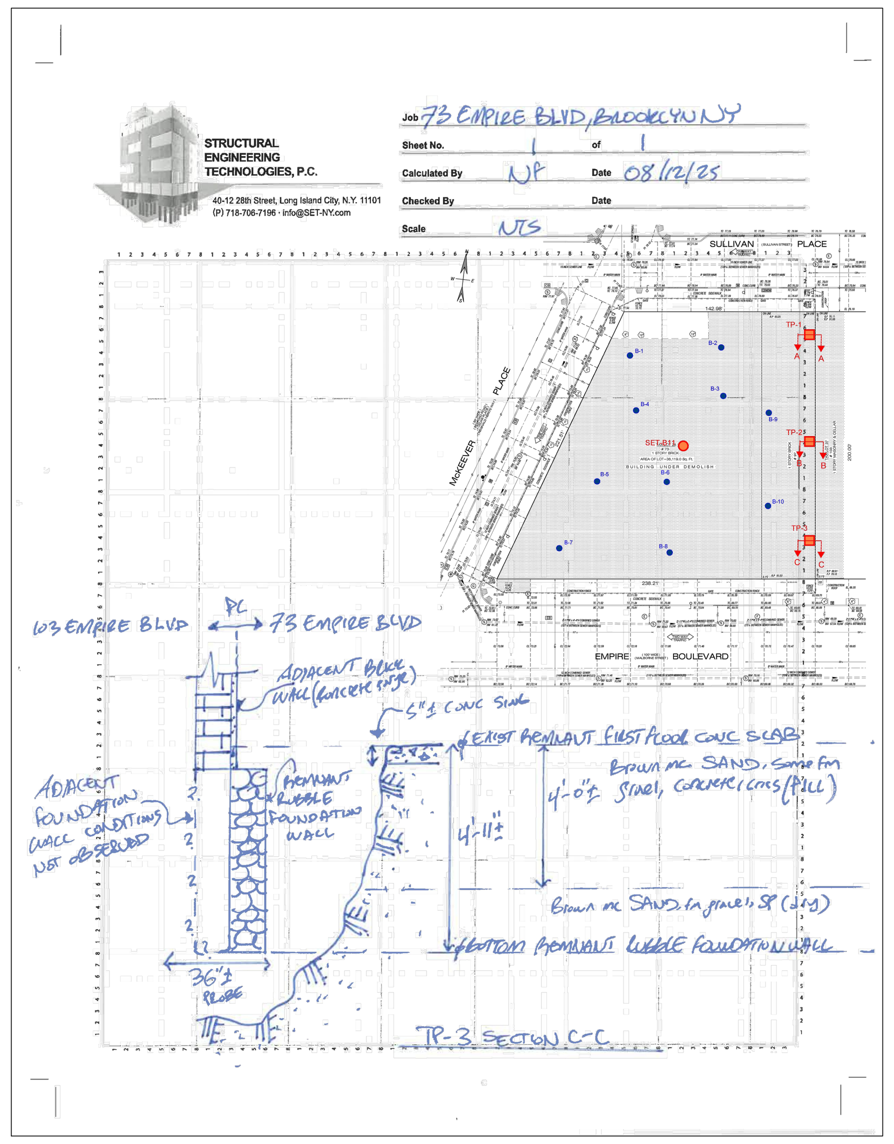
DEPTH	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
90.0'	S-23 (90.0'-92.0')	Brown silty SAND, SM (moist)	14"	27 / 60	50 / 55	SAND (3a)
95.0'	S-24 (95.0'-97.0')	Brown fm SAND, trace silt, SM (moist)	14"	12 / 14	11 / 16	SAND (3b)
100.0'	S-25 (100.0'-102.0')	Brown fm SAND, trace silt, SM (moist)	12"	14 / 15	13 / 18	SAND (3b)
						End of boring @ 102-feet Below Grade
105.0'						

Drilling Equipment: Year: 2020 Make: GEOPROBE Model: 7822DT Mounting: TRACK
Spoon Hammer Type: Automatic Trip Hammer Spoon Hammer Drop: 30 INCH. Spoon Hammer Weight: 140 LBS. Spoon Size: 24 INCH Rock Core Barrel Size: N/A

PAGE 5 OF 5







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Long Island City, NY 11101

Interior Designer:
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Brooklyn, NY 11201

SOE Engineer:
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40-12 28th Street
Long Island City, NY 11101

No.	Description	Date

KEY PLAN:

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BOULEVARD, BROOKLYN NY-11225

SHEET TITLE
BORINGS AND TEST PITS LOGS

SOE-305.00

10 OF 10

Scale:	AS NOTED
Date:	11-19-2025
Drawn by:	A.M.C.
Checked by:	D.P.
DOB JOB NUMBER:	

62 SULLIVAN PLACE

BROOKLYN, NEW YORK 11225

PROPOSED 14 STORY MIX-USE DEVELOPMENT (RESIDENTIAL & COMMERCIAL)

BLDG A - DRAWING INDEX DOB			
DRAWING NO.	SHEET NO.	REVISION NO.	SHEET TITLE
1	T-001A	00	*TITLE SHEET*
2	Z-001A	00	*ZONING ANALYSIS*
3	Z-002A	00	*ZONING ANALYSIS*
4	A-103A	00	*PROPOSED 1ST FLOOR PLAN*
5	Z-003A	00	*ZONING MAPS*
6	Z-004A	00	*ZONING DIAGRAMS*
7	Z-005A	00	*ZONING DIAGRAMS*
8	Z-010A	00	*GROSS FLOOR AREA DIAGRAMS*
9	Z-011A	00	*GROSS FLOOR AREA DIAGRAMS*
10	Z-020A	00	*FLOOR AREA DEDUCTIONS*
11	Z-021A	00	*FLOOR AREA DEDUCTIONS*
12	G-001A	00	*PROJECT SUMMARY & BUILDING CODE COMPLIANCE*
13	G-002A	00	*GENERAL NOTES*
14	G-004A	00	*MEANS OF EGRESS NOTES*
15	G-005A	00	*ACCESSIBILITY NOTES*
16	V-001A	00	*ARCHITECTURAL SURVEY*
17	A-001A	00	*SUBCELLAR 1 & 2 LIFE SAFETY PLANS*
18	A-002A	00	*CELLAR - 1ST FLOOR LIFE SAFETY PLANS*
19	A-003A	00	*2ND - 10TH FLOOR LIFE SAFETY PLANS*
20	A-004A	00	*11TH - 14TH FLOOR LIFE SAFETY PLANS*
21	A-005A	00	*ROOF LIFE SAFETY PLANS*

BLDG A - DRAWING INDEX DOB			
DRAWING NO.	SHEET NO.	REVISION NO.	SHEET TITLE
22	A-006A	00	*SITE PLAN*
23	A-100A	00	*PROPOSED SUB-CELLAR 02 PLAN*
24	A-101A	00	*PROPOSED SUB-CELLAR 01 PLAN*
25	A-102A	00	*PROPOSED CELLAR PLAN*
26	A-104A	00	*PROPOSED 2ND - 3RD FLOOR PLAN*
27	A-200A	00	*EAST ELEVATION*
28	A-105A	00	*PROPOSED 4TH - 11TH FLOOR PLAN*
29	A-106A	00	*PROPOSED 12TH - ROOF PLAN*
30	A-510A	00	*SECTION DETAILS*
31	A-201A	00	*WEST ELEVATION*
32	A-202A	00	*NORTH & SOUTH ELEVATION*
33	A-300A	00	*BUILDING SECTIONS*
34	A-404A	00	*STAIRS DETAILS*
35	A-500A	00	*WALL TYPES & DETAILS*
36	A-700A	00	*DOOR LEGEND & SCHEDULE*
37	A-701A	00	*FLOOR AND TRANSITION DETAILS*
38	A-710A	00	*WINDOW LEGEND & SCHEDULE*
39	A-711A	00	*CURTAIN WALL LEGEND & SCHEDULE*
40	A-910A	00	*ENLARGED KITCHEN PLANS & ELEVATIONS*
41	A-911A	00	*ENLARGED BATHROOM PLANS & ELEVATIONS*

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MEP Engineer:
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Interior Designer:
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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
TITLE SHEET

T-001A.00

Scale:
Date: 12/1/2025 7:14:18 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

ZONING ANALYSIS			
ADDRESS:	67 SOUTH 6TH ST, BROOKLYN, NY 11249		
BLOCK:	2455		
TAX LOT:	27		
ZONING DISTRICT:	C4-4D / R-8A EQUIVALENT		
ZONING MAP:	16d		
COMMUNITY DISTRICT :	BROOKLYN COMMUNITY DISTRICT 9		
INCLUSIONARY HOUSING	MANDATORY AS PER ZR APPENDIX F		
LOT AREA:	38,119.0 SF		
TRANSIT APPROVALS REQUIREMENT	NO TRANSIT APPROVAL IS REQUIRED. THE SITE IS NOT LOCATED WITHIN 200' OF A TRANSIT AUTHORITY		
APPLICABLE ZR SECTION	ITEM	PERMITTED/REQUIRED	PROPOSED
ZR 12-10	DEFINITIONS		
ZR 12-10 FLOOR AREA (c)(1))	FLOOR AREA	FLOOR SPACE WITHIN A FULLY ELECTRIFIED BUILDING OR AN ULTRA LOW ENERGY BUILDING, OF AN AMOUNT EQUIVALENT TO FIVE PERCENT OF THE FLOOR AREA LOCATED WITHIN SUCH BUILDING, AND EXCLUSIVE OF ANY FLOOR SPACE OTHERWISE EXCLUDED FROM FLOOR AREA;	PROPOSED BUILDING IS COMPYING WITH THIS PROVISION. 5% OF FLOOR AREA DEDUCTED, SEE ZONING TABLE ON Z-001
ZR 32-00	APPLICABILITY AND DEFINITIONS		
ZR 32-10	USE ALLOWANCES	IN C4 DISTRICTS, USE GROUP II, IIIB, & VI IS PERMITTED	PROPOSED USES: II(RESIDENTIAL), VI (RETAIL)
ZR 32-30	GROUND FLOOR LEVEL USE AND TRANSPARENCY REQUIREMENTS	GROUND FLOOR LEVEL USES FOR TIER B FRONTAGES ON THE PORTION OF A GROUND FLOOR LEVEL FACING A TIER B STREET FRONTAGE, WITHIN THE MINIMUM QUALIFYING DEPTH, THE UNDERLYING USE REGULATIONS ARE MODIFIED AS FOLLOWS: DWELLING UNITS SHALL NOT BE PERMITTED; USES IN GROUP III SHALL NOT BE PERMITTED; NOT BE PERMITTED; USES LISTED UNDER USE GROUP IV SHALL BE LIMITED TO THOSE LISTED UNDER PUBLIC SERVICE BUILDINGS, AND RENEWABLE ENERGY AND GREEN INFRASTRUCTURE; GUEST ROOMS OR SUITES ASSOCIATED WITH TRANSIENT ACCOMMODATIONS LISTED UNDER USE GROUP V SHALL NOT BE PERMITTED; USES LISTED UNDER USE GROUP VII SHALL BE LIMITED IN SIZE TO 5,000 SQUARE FEET PER ESTABLISHMENT; THE MAXIMUM STREET WALL WIDTH OF ANCILLARY RESIDENTIAL USES OR LOBBIES ACCESSING USES NOT PERMITTED ON THE GROUND FLOOR LEVEL SHALL BE LIMITED TO 50 PERCENT OF THE GROUND FLOOR LEVEL STREET FRONTAGES, OR 50 FEET, WHICHEVER IS GREATER; OFF-STREET PARKING SPACES OR LOADING BERTHS, SHALL NOT BE PERMITTED, EXCEPT THAT: ENTRANCES AND EXITS TO PARKING AND LOADING FACILITIES LOCATED BEYOND THE MINIMUM QUALIFYING DEPTH SHALL BE PERMITTED, SUBJECT TO ANY APPLICABLE CURB CUT REGULATIONS OF THIS SECTION, INCLUSIVE, OR THIS RESOLUTION; FOR BUILDINGS ALONG A TIER B STREET FRONTAGE, AND NO FRONTAGE ALONG ANOTHER STREET WHERE A LOADING BERTH IS PERMITTED, LOADING BERTHS WITH A MAXIMUM STREET WALL WIDTH OF 50 FEET SHALL BE PERMITTED; AND FOR BUILDINGS WITH A STREET WALL WIDTH IN EXCESS OF 100 FEET AND WITH NO FRONTAGE ALONG ANOTHER STREET WHERE PARKING SPACES ARE PERMITTED WITHIN A MINIMUM QUALIFYING DEPTH, PARKING SPACES SHALL BE PERMITTED IN THE STREET WALL PORTION IN EXCESS OF 100 FEET, PROVIDED THAT: THE MAXIMUM STREET WALL WIDTH OF SUCH PARKING SPACES DOES NOT EXCEED 50 FEET; THE FRONTAGE ALLOCATED TO SUCH PARKING SPACES SHALL BE INCLUDED IN THE MAXIMUM PERCENTAGE PERMITTED FOR ANCILLARY RESIDENTIAL USES OR LOBBIES; AND SUCH PARKING SPACES SHALL BE SCREENED IN ACCORDANCE WITH THE PROVISIONS FOR TIER A STREET FRONTAGES SET FORTH IN PARAGRAPH (A) OF SECTION 32-312. PARKING SPACES ACCESSORY TO ACCESS TRANSIT STATIONS, AS DEFINED IN SECTION 66-11, SHALL BE PERMITTED WITHOUT RESTRICTION. TRANSPARENCY REQUIREMENTS ALONG THE TIER B STREET FRONTAGE OF A GROUND FLOOR LEVEL, STREET WALLS SHALL BE GLAZED WITH TRANSPARENT MATERIALS, WHICH MAY INCLUDE SHOW WINDOWS, TRANSOM WINDOWS, OR GLAZED PORTIONS OF DOORS. SUCH TRANSPARENT MATERIALS SHALL OCCUPY AT LEAST 50 PERCENT OF THE SURFACE AREA OF SUCH GROUND FLOOR LEVEL STREET WALL BETWEEN A HEIGHT OF TWO FEET AND 12 FEET, OR THE HEIGHT OF THE GROUND FLOOR CEILING, WHICHEVER IS HIGHER, AS MEASURED FROM THE ADJOINING SIDEWALK. TRANSPARENT MATERIALS PROVIDED TO SATISFY SUCH 50 PERCENT REQUIREMENT SHALL NOT BEGIN HIGHER THAN 2 FEET, 6 INCHES, ABOVE THE LEVEL OF THE ADJOINING SIDEWALK, WITH THE EXCEPTION OF TRANSOM WINDOWS, OR PORTIONS OF WINDOWS SEPARATED BY MULLIONS OR OTHER STRUCTURAL DIVIDERS, AND SHALL HAVE A MINIMUM WIDTH OF TWO FEET. HOWEVER, SUCH TRANSPARENCY REQUIREMENTS SHALL NOT APPLY TO PORTIONS OF THE GROUND FLOOR LEVEL OCCUPIED BY ENTRANCES OR EXITS TO PARKING OR LOADING FACILITIES, TO DOORS ACCESSING EMERGENCY EGRESS STAIRWELLS AND PASSAGEWAYS, OR TO COMMUNITY FACILITY BUILDINGS.	BUILDING COMPLIES WITH THIS SECTION: NO DWELLINGS PROPOSED WITHIN 30'-0" ON THE GROUND FLOOR. MAX LOBBY WIDTH IS BELOW 50% OF STREET FRONTAGE SEE A-101 GROUND LEVEL PROVIDED WITH GLAZING OVER 50% SEE A-101
ZR 35-00	APPLICABILITY AND DEFINITIONS		
ZR 35-01	APPLICABILITY OF THIS CHAPTER	THE BULK REGULATIONS OF THIS CHAPTER APPLY TO ANY MIXED BUILDING LOCATED ON ANY ZONING LOT OR PORTION OF A ZONING LOT IN ANY COMMERCIAL DISTRICT IN WHICH SUCH BUILDING IS PERMITTED. THE BULK REGULATIONS OF THIS CHAPTER SHALL ALSO APPLY IN ANY COMMERCIAL DISTRICT WHERE THERE ARE MULTIPLE BUILDINGS ON A SINGLE ZONING LOT AND SUCH ZONING LOT CONTAINS A RESIDENTIAL USE AND EITHER A COMMERCIAL USE OR A COMMUNITY FACILITY USE. IN ADDITION, THE BULK REGULATIONS OF THIS CHAPTER, OR OF SPECIFIED SECTIONS THEREOF, ALSO APPLY IN OTHER PROVISIONS OF THIS RESOLUTION WHERE THEY ARE INCORPORATED BY CROSS-REFERENCE.	
ZR 35-10	GENERAL PROVISIONS	EXCEPT AS OTHERWISE PROVIDED IN THIS CHAPTER, THE PORTIONS OF A BUILDING USED FOR RESIDENTIAL USE ARE SUBJECT TO THE BULK REGULATIONS SET FORTH IN ARTICLE II, CHAPTER 3, AND THE PORTIONS OF A BUILDING USED FOR COMMERCIAL OR COMMUNITY FACILITY USE ARE SUBJECT TO THE BULK REGULATIONS SET FORTH IN ARTICLE III, CHAPTER 3. SPECIAL PROVISIONS APPLYING TO MIXED BUILDINGS OR ZONING LOTS WITH MULTIPLE BUILDINGS SUBJECT TO THE PROVISIONS OF THIS CHAPTER ARE SET FORTH IN SECTIONS 35-20 (APPLICABILITY OF RESIDENCE DISTRICT BULK REGULATIONS), INCLUSIVE, 35-30 (APPLICABILITY OF FLOOR AREA AND OPEN SPACE REGULATIONS), INCLUSIVE, 35-40 (APPLICABILITY OF DENSITY REGULATIONS), INCLUSIVE, 35-50 (MODIFICATION OF YARD REGULATIONS) AND 35-60 (MODIFICATION OF HEIGHT AND SETBACK REGULATIONS), INCLUSIVE.	
ZR 35-20	APPLICABILITY OF RESIDENCE DISTRICT BULK REGULATIONS		
ZR 35-21	GENERAL PROVISIONS	IN THE DISTRICTS INDICATED, THE BULK REGULATIONS SET FORTH IN ARTICLE II, CHAPTER 3 SHALL APPLY TO ALL RESIDENTIAL PORTIONS OF BUILDINGS IN ACCORDANCE WITH THE PROVISIONS AND MODIFICATIONS SET FORTH IN THE REMAINING SECTIONS OF THIS CHAPTER. THE PURPOSE OF THESE MODIFICATIONS IS TO MAKE THE REGULATIONS SET FORTH IN ARTICLE II, CHAPTER 3, APPLICABLE TO COMMERCIAL DISTRICTS.	
ZR 35-23 ZR 34-112	GENERAL PROVISIONS	IN C4-4D DISTRICTS , THE APPLICABLE BULK REGULATIONS ARE THE BULK REGULATIONS FOR THE RESIDENTIAL EQUIVALENT IS R8A	
ZR 35-30	APPLICABILITY OF FLOOR AREA AND OPEN SPACE REGULATIONS		
ZR 35-31	MAXIMUM FLOOR AREA RATIO	THE MAXIMUM FLOOR AREA RATIO PERMITTED FOR A COMMERCIAL OR COMMUNITY FACILITY USE SHALL BE AS SET FORTH IN ARTICLE III, CHAPTER 3, AND THE MAXIMUM FLOOR AREA RATIO PERMITTED FOR A RESIDENTIAL USE SHALL BE AS SET FORTH IN ARTICLE II, CHAPTER 3, EXCEPT AS SET FORTH IN SECTION 35-30. INCLUSIVE. THE TOTAL OF ALL SUCH FLOOR AREA RATIOS SHALL NOT EXCEED THE GREATEST FLOOR AREA RATIO PERMITTED FOR ANY SUCH USE ON THE ZONING LOT, EXCEPT WHERE EXPLICITLY STATED OTHERWISE. SPECIAL RULES FOR CERTAIN AREAS ARE SET FORTH IN SECTION 35-36 (SPECIAL FLOOR AREA RATIO AND RELATED BULK PROVISIONS FOR CERTAIN AREAS).	SEE ZR 23-153 AND ZR 33-121 BELOW FOR RESIDENTIAL AND COMMERCIAL FLOOR AREA REGULATIONS
ZR 33-123	FLOOR AREA RATIO	IN C4-4D DISTRICT THE COMMERCIAL & COMMUNITY FACILITY FLOOR AREA RATIO IS: 6.5 LOT AREA: 38,119 SF 6.5 X 38,119 = 247,773.50 SF	PROPOSED COMMERCIAL ZFA: 0 SF PROPOSED COMMUNIT FACILITY ZFA: 0 SF PROPOSED TOTAL COMMERCIAL/COMMUNITY ZFA: 0 SF OK
ZR 23-22	FLOOR AREA RATIO	IN R8A EQUIVALENT THE MAX RESIDENTIAL FLOOR AREA RATIO FOR QUALIFYING AFFORDABLE HOUSING IS: 7.2 LOT AREA: 38,119 SF 7.2 X 38,119 = 274,456.80 SF	PROPOSED RESIDENTIAL ZFA: 0 SF OK
ZR 35-40 ZR 23-52	MAXIMUM NUMBER OF DWELLING UNITS	MAX RESIDENTIAL FLOOR AREA: 274,456.80 / 680 = 403.61 = MAX 403 DWELLING UNITS	PROPOSED DWELLING UITS IN BUILDING A: 99 PROPOSED DWELLING UITS IN BUILDING B: 99 PROPOSED DWELLING UITS IN BUILDING C: 99 PROPOSED DWELLING UITS IN BUILDING D: 99 PROPOSED TOTAL DWELLING UNITS : 396
ZR 35-50	MODIFICATION OF YARD REGULATIONS		
ZR 35-51	MODIFICATION OF FRONT YARD REQUIREMENTS	IN C4 DISTRICT, NO FRONT YARD SHALL BE REQUIRED.	NO FRONT YARD PROVIDED
ZR 35-52	MODIFICATION OF SIDE YARD REQUIREMENTS	IN C4 DISTRICTS, NO SIDE YARD SHALL BE REQUIRED. HOWEVER, IF ANY OPEN AREA EXTENDING ALONG A SIDE LOT LINE IS PROVIDED AT ANY LEVEL, IT SHALL HAVE A MINIMUM WIDTH OF FIVE FEET	NO SIDE YARD PROVIDED
35-53	MODIFICATION OF REAR YARD REQUIREMENTS	IN C4 DISTRICTS, FOR A RESIDENTIAL PORTION OF A MIXED BUILDING, THE REQUIRED RESIDENTIAL REAR YARD SHALL BE PROVIDED AT THE FLOOR LEVEL OF THE LOWEST STORY USED FOR DWELLING UNITS OR ROOMING UNITS, WHERE ANY WINDOW OF SUCH DWELLING UNITS OR ROOMING UNITS FACES ONTO SUCH REAR YARD. IF THE LEVEL OF SUCH YARD IS AT OR HIGHER THAN THE FIRST STORY, DECKS, PARAPET WALLS, ROOF THICKNESS, SOLAR ENERGY SYSTEMS UP TO FOUR FEET HIGH, VEGETATED ROOFS, AND WEIRS, SHALL BE PERMITTED, PURSUANT TO SECTION 23-41 (PERMITTED OBSTRUCTIONS), INCLUSIVE.	SEE 23-343 (a) (3) FOR THE EXCEPTION
23-343 (a) (3)	REAR YARD EQUIVALENT REQUIREMENTS	NO REAR YARD EQUIVALENT REGULATIONS SHALL APPLY TO ANY ZONING LOT THAT INCLUDES A THROUGH LOT PORTION THAT IS CONTIGUOUS ON ONE SIDE TO TWO CORNER LOT PORTIONS AND SUCH ZONING LOT OCCUPIES THE ENTIRE BLOCK FRONTAGE OF A STREET	PROPOSED ZONING LOT HAS A THROUGH LOT PORTION THAT IS CONTIGUOUS ON ONE SIDE TO TWO CORNER LOT PORTIONS AND SUCH ZONING LOT OCCUPIES THE ENTIRE BLOCK FRONTAGE OF A STREET THEREFORE A REAR YARD EQUIVALENT IS NOT REQUIRED
ZR 35-60	MODIFICATION OF HEIGHT AND SETBACK REGULATIONS		
ZR 35-63	HEIGHT AND SETBACK REQUIREMENTS IN COMMERCIAL DISTRICTS WITH R6 THROUGH R12 EQUIVALENCY	C1 C2 C4 C5 C6 IN COMMERCIAL DISTRICTS MAPPED WITHIN, OR WITH A RESIDENTIAL EQUIVALENT OF R6 THROUGH R12 DISTRICTS, THE STREET WALL LOCATION OF A BUILDING SHALL BE AS SET FORTH IN SECTION 35-631, AND THE HEIGHT AND SETBACK PROVISIONS SHALL BE AS SET FORTH IN SECTION 35-632. ADDITIONAL HEIGHT AND SETBACK PROVISIONS ARE SET FORTH IN SECTION 35-633 AND SECTION 35-64. INCLUSIVE. THE HEIGHT OF ALL BUILDINGS OR OTHER STRUCTURES SHALL BE MEASURED FROM THE BASE PLANE. FOR THE PURPOSES OF THIS SECTION, WHERE BASE PLANES OF DIFFERENT ELEVATIONS APPLY TO DIFFERENT PORTIONS OF A BUILDING OR OTHER STRUCTURE, EACH SUCH PORTION OF THE BUILDING MAY BE CONSIDERED TO BE A SEPARATE BUILDING.	
ZR 35-631	STREET WALL LOCATION	C1 C2 C4 C5 C6 IN THE DISTRICTS INDICATED, THE APPLICABLE STREET WALL LOCATION PROVISIONS OF THIS SECTION SHALL APPLY. SUCH PROVISIONS SHALL APPLY TO THE PORTION OF A STREET WALL LOCATED BELOW THE MAXIMUM BASE HEIGHT AND BEFORE THE REQUIRED SETBACK AS SET FORTH IN SECTION 23-432 (HEIGHT AND SETBACK REQUIREMENTS). (B) PERCENTAGE-BASED RULES AT LEAST 70 PERCENT OF THE AGGREGATE WIDTH OF STREET WALLS SHALL BE LOCATED WITHIN EIGHT FEET OF THE STREET LINE AND SHALL EXTEND TO AT LEAST THE MINIMUM BASE HEIGHT SPECIFIED IN SECTION 23-432, OR THE HEIGHT OF THE BUILDING, WHICHEVER IS LESS. UP TO 30 PERCENT OF THE AGGREGATE WIDTH OF STREET WALLS MAY BE RECESSED BEYOND EIGHT FEET OF THE STREET LINE, PROVIDED THAT ANY SUCH RECESSES DEEPER THAN 10 FEET ALONG A WIDE STREET OR 15 FEET ALONG A NARROW STREET ARE LOCATED WITHIN AN OUTER COURT.	100% OF PROPOSED STREET WALL IS LOCATED WITHIN 8' OF THE PROPERTY LINE
ZR 35-632 ZR 23-432	HEIGHT AND SETBACK REQUIREMENTS	IN R8A EQUIVALENT DISTRICT FOR QUALIFYING AFFORDABLE HOUSING MIN. BASE HEIGHT: 60' MAX. BASE HEIGHT: 105' MAX. BUILDING HEIGHT: 145'	PROPOSED BASE HEIGHT: 105' PROPOSED BUILDING HEIGHT: 145'
ZR 36-20	REQUIRED ACCESSORY OFF-STREET PARKING SPACES FOR COMMERCIAL AND COMMUNITY FACILITY USE		
ZR 36-26	WAIVER FOR MIXED-USE DEVELOPMENTS	IN ALL DISTRICTS, AS INDICATED, THE NON-RESIDENTIAL PARKING REQUIREMENTS OF SECTION 36-20 SHALL BE WAIVED FOR USES LOCATED WITHIN BUILDINGS CONTAINING RESIDENCES ON ANY ZONING LOT (a)WITHIN THE SPECIAL MIXED USE PARKING AREA ; (1)SPECIAL MIXED USE PARKING AREAS" SHALL REFER TO SPECIAL GEOGRAPHIES WHERE UNIQUE PARKING REQUIREMENTS APPLY TO MIXED USE #BUILDINGS# .#SPECIAL MIXED USE PARKING AREAS# SHALL INCLUDE AREAS WITHIN THE BOUNDARIES SHOWN IN APPENDIX I OF THIS RESOLUTION.	THE PROPERTY FALLS UNDER APPENDIX I THEREFORE, THE PARKING IS WAIVED FOR THE COMMERCIAL
ZR 25-222	RESIDETIAL PARKING REQUIREMENTS	**IN R8A DISTRICTS, WITHIN THE OUTER TRANSIT ZONE , FOR DWELLING UNITS CREATED AS PART OF A DEVELOPMENT OR ENLARGEMENT AFTER DECEMBER 5, 2024, THE NUMBER OF REQUIRED ACCESSORY OFF-STREET PARKING SPACES SHALL BE DETERMINED BY MULTIPLYING THE NUMBER OF DWELLING UNITS BY THE APPLICABLE PARKING REQUIREMENT SET FORTH FOR THE APPLICABLE DISTRICT IN COLUMNS A OR B OF THE TABLE. HOWEVER, WHERE THE CALCULATION RESULTS IN A NUMBER OF PARKING SPACES LESS THAN OR EQUAL TO THE NUMBER IN COLUMN C, NO PARKING SPACES SHALL BE REQUIRED FOR RESIDENCES ON THE ZONING LOT.** **AS PER COLUMN A: 12% OF THE MARKET RATE UNITS REQUIRE PARKING** **BUILDING A: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **BUILDING B: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **BUILDING C: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **BUILDING D: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **TOTAL PARKING REQUIRED = 36 SPACES REQUIRED** **AS PER COLUMN B: 0% OF THE AFFORDABLE UNITS REQUIRE PARKING**	TOTAL NUMBER OF PARKING PROVIDED = 94
ZR 36-70	BICYCLE PARKING		
ZR 36-711	REQUIRED ENCLOSED BICYCLE PARKING SPACES FOR RESIDENTIAL USE	IN R8A DISTRICTS, 1 PARKING SPACE PER 2 NEW DWELLING UNITS REQUIRED BUILDING A: 99/2 = 50 PARKING SPACES REQUIRED BUILDING B: 99/2 = 50 PARKING SPACES REQUIRED BUILDING C: 99/2 = 50 PARKING SPACES REQUIRED BUILDING D: 99/2 = 50 PARKING SPACES REQUIRED	BUILDING A: 50 PARKING SPACES PROVIDED BUILDING B: 50 PARKING SPACES PROVIDED BUILDING C: 50 PARKING SPACES PROVIDED BUILDING D: 50 PARKING SPACES PROVIDED
ZR 36-711 (d)	REQUIRED ENCLOSED BICYCLE PARKING SPACES FOR #COMMERCIAL USE	FOR GENERAL RETAIL SERVICES, 1 PARKING SPACE PER 10,000 SF REQUIRED. WAIVED IF UNER 5 SPACES REQUIRED BUILDING A: 4999.69 / 10000= .12 ~ 1 BICYCLE PARKING SPACES REQUIRED	PROPOSED COMMERCIAL/COMMUNITY FACILITY BICYCLE PARKING SPACES: 0
ZR 23-00	RESIDENTIAL BULK REGULATIONS		
ZR 23-12	MINIMUM LOT AREA	MIN. LOT AREA: 1700 SF	PROPOSED LOT AREA: 38,119.0 SF
ZR 23-12	MINIMUM LOT WIDTH	MIN. LOT WIDTH: 18'-0"	PROPOSED LOT WIDTH: 200'-0"
ZR-23-362 (a)	LOT COVERAGE	THE MAXIMUM RESIDENTIAL LOT COVERAGE FOR INTERIOR LOTS OR THROUGH LOTS SHALL BE 80 PERCENT AND THE MAXIMUM RESIDENTIAL LOT COVERAGE FOR CORNER LOTS SHALL BE 100 PERCENT.	PROPOSED LOT COVERAGE ON CORNER LOT PORTION IS: 96.84% PROPOSED LOT COVERAGE ON THRUGH LOT PORTION IS: 80%
ZR 23-60	ADDITIONAL DEISGN ELEMENTS		
ZR 23-61 ZR 26-41	STREET TREES AND PLANTING	IN DISTRICTS R1 TO R12, THE FOLLOWING SHALL PROVIDE STREET TREES IN ACCORDANCE WITH SECTION 26-14 (STREET TREE PLANTING: IN ACCORDANCE WITH APPLICABILITY REQUIREMENTS OF UNDERLYING DISTRICT REGULATIONS, ONE STREET TREE, PRE-EXISTING OR NEWLY PLANTED, SHALL BE PROVIDED FOR EVERY 25 FEET OF STREET FRONTAGE OF THE ZONING LOT. FRACTIONS EQUAL TO OR GREATER THAN ONE-HALF RESULTING FROM THIS CALCULATION SHALL BE CONSIDERED TO BE ONE TREE.	TOTAL STREET FRONTAGE : 602.7' 24 TREES REQUIRED EXISTING TREES TO BE PROTECTED ON SITE: 5 PROPOSED TREE TO BE PAID INTO ON-SITE TREE FUNDS = 16 PROPOSED TREE TO BE PAID INTO OFF-SITE TREE FUNDS = 3
23-413	FRONT YARD PLANTING REQUIREMENTS	IN DISTRICTS R1 TO R12, THE AREA OF THE ZONING LOT BETWEEN THE STREET LINE AND ALL STREET WALLS OF THE BUILDING AND THEIR PROLONGATIONS SHALL BE PLANTED AT GROUND LEVEL, OR IN RAISED PLANTING BEDS THAT ARE PERMANENTLY AFFIXED TO THE GROUND, EXCEPT THAT SUCH PLANTINGS SHALL NOT BE REQUIRED AT THE ENTRANCES TO AND EXITS FROM THE BUILDING, WITHIN DRIVEWAYS ACCESSING OFF-STREET PARKING SPACES LOCATED WITHIN, TO THE SIDE, OR REAR OF SUCH BUILDING, IN ANY AREA WHERE THERE IS A PERMITTED OBSTRUCTION	PROPOSED AREA BETWEEN THE STREET LINE AND BUILDING WALL IS PROVIDED WITH PLANTING
ZR 23-62	BALCONIES	IN DISTRICTS R1 TO R12, BALCONIES MAY PROJECT INTO OR OVER ANY OPEN AREAS NOT OCCUPIED BY BUILDINGS AT THAT PARTICULAR LEVEL, PROVIDED THAT: (a) WITHIN ANY YARDS, COURTS, OR OTHER REQUIRED OPEN AREAS, SUCH BALCONY SHALL: (1) NOT PROJECT BY MORE THAN ONE THIRD OF THE DEPTH OF SUCH AREAS SPECIFIED ABOVE, OR A DISTANCE GREATER THAN SEVEN FEET, WHICHEVER IS LESS, AS MEASURED FROM THE PLANE SURFACE OF THE BUILDING WALL FROM WHICH IT PROJECTS; (2) NOT COVER MORE THAN 10 PERCENT OF ANY OPEN AREA REQUIRED PURSUANT TO SECTION 23-30, INCLUSIVE, OR ANY OUTDOOR RECREATION SPACE PROVIDED PURSUANT TO SECTION 23-63; AND (3) HAVE AN AGGREGATE WIDTH, AT THE LEVEL OF ANY STORY, NOT EXCEEDING 50 PERCENT OF THE WIDTH AT THAT LEVEL OF THE PLANE SURFACE OF THE BUILDING WALL FROM WHICH IT PROJECTS; AND (b) WITHIN ANY OPEN AREAS, WHETHER REQUIRED OR NOT, SUCH BALCONY SHALL: (1) BE UNENCLOSED EXCEPT FOR BUILDING WALLS AND PARAPETS, RAILINGS, OR SAFETY GUARDS, WHETHER APPLIED SINGLY, OR IN COMBINATION, PROVIDED THAT: (i) PARAPETS SHALL NOT EXCEED FOUR FEET IN HEIGHT; (ii) RAILINGS SHALL NOT EXCEED 4 FEET, 6 INCHES IN HEIGHT AND SHALL BE AT LEAST 50 PERCENT OPEN FOR THE PORTION THAT EXCEEDS FOUR FEET IN HEIGHT; AND (iii) SAFETY GUARDS SHALL NOT EXCEED 10 FEET IN HEIGHT AND SHALL BE AT LEAST 50 PERCENT TRANSPARENT MATERIALS FOR THE PORTION THAT EXCEEDS FOUR FEET IN HEIGHT. IN ADDITION, WHERE SUCH BALCONY HAS A ROOFED PORTION ABOVE IT, THERE SHALL BE AN OPENING THAT IS NOT LESS THAN 40 PERCENT OF THE HEIGHT BETWEEN THE BOTTOM OF THE ROOF AND THE FINISHED FLOOR LEVEL OF SUCH BALCONY. HOWEVER, SUCH BALCONIES MAY BE RECESSED INTO A BUILDING WALL UP TO A MAXIMUM DEPTH OF SIX FEET PROVIDED THAT AT LEAST 33 PERCENT OF THE PERIMETER OF SUCH BALCONY IS UNENCLOSED EXCEPT FOR A PARAPET, RAILING, OR SAFETY GUARD; AND (2) BE LOCATED AT LEAST 13 FEET ABOVE CURB LEVEL, EXCEPT THAT FOR BUILDINGS CONTAINING RESIDENCES NOT MORE THAN 35 FEET IN HEIGHT, SUCH BALCONY MAY BE LOCATED AT OR HIGHER THAN THE FLOOR LEVEL OF THE SECOND STORY PROVIDED THAT SUCH BALCONY IS LOCATED NOT LOWER THAN SEVEN FEET ABOVE CURB LEVEL OR SEVEN FEET ABOVE NATURAL GRADE, WHICHEVER IS HIGHER.	PROPOSED BALCONIES ARE IN COMPLIANCE OF SECTION 23-62 AND ARE NOT GREATER THAN 50% OF THE TOTAL WALL WIDTH. SEE SHEET A-101

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Interior Designer:
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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING ANALYSIS

Z-001A.00

Scale: 12" = 1'-0"
Date: 12/1/2025 7:14:19 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

ZONING FLOOR AREA

NAME	USE GROUP	GFA	DEDUCTIONS	TOTAL	5% ULTRA LOW EN	ZFA	FAR
BUILDING A							
COMMERCIAL							
00A_CELLAR	VI	7692.14 SF	7692.14 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01A_1ST FL. RETAIL	VI	4999.69 SF	4536.25 SF	463.44 SF	23.17 SF	440.27 SF	0.01
		12691.83 SF	12228.39 SF	463.44 SF	23.17 SF	440.27 SF	0.01
RESIDENTIAL							
00A_SUBCELLAR 2	II	7692.14 SF	7692.14 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00A_SUBCELLAR 1	II	7692.14 SF	7692.14 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01A_ 1ST FL.	II	3259.06 SF	579.85 SF	2679.20 SF	133.96 SF	2545.24 SF	0.07
02A_2ND FL.	II	6543.76 SF	3760.04 SF	2783.72 SF	139.19 SF	2644.53 SF	0.07
03A_3RD FL.	II	6543.76 SF	1102.12 SF	5441.64 SF	272.08 SF	5169.56 SF	0.14
04A_4TH FL.	II	5857.40 SF	1102.12 SF	4755.28 SF	237.76 SF	4517.52 SF	0.12
05A_5TH FL.	II	5857.40 SF	1102.12 SF	4755.28 SF	237.76 SF	4517.52 SF	0.12
06A_6TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
07A_7TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
08A_8TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
09A_9TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
10A_10TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
11A_11TH FL.	II	5489.70 SF	1055.47 SF	4434.23 SF	221.71 SF	4212.52 SF	0.11
12A_12TH FL.	II	5489.70 SF	1055.47 SF	4434.23 SF	221.71 SF	4212.52 SF	0.11
13A_13TH FL.	II	5489.70 SF	1891.02 SF	3598.68 SF	179.93 SF	3418.75 SF	0.09
14A_14TH FL.	II	5489.70 SF	1055.47 SF	4434.23 SF	221.71 SF	4212.52 SF	0.11
15A_ROOF	II	569.87 SF	569.87 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		95246.40 SF	34168.41 SF	61077.99 SF	3053.91 SF	58024.08 SF	1.52
BUILDING B							
COMMERCIAL							
00B_CELLAR	VI	11464.06 SF	11464.06 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01B_1ST FL. RETAIL	VI	10084.56 SF	4536.25 SF	5548.32 SF	277.42 SF	5270.90 SF	0.14
		21548.62 SF	16000.31 SF	5548.32 SF	277.42 SF	5270.90 SF	0.14
RESIDENTIAL							
00B_SUBCELLAR 2	II	11464.06 SF	11464.06 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00B_SUBCELLAR 1	II	11464.06 SF	11464.06 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01B_1ST FL.	II	1268.91 SF	451.78 SF	817.14 SF	40.86 SF	776.28 SF	0.02
02B_2ND FL.	II	6494.93 SF	822.24 SF	5672.69 SF	283.63 SF	5389.06 SF	0.14
03B_3RD FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
04B_4TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
05B_5TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
06B_6TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
07B_7TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
08B_8TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
09B_9TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
10B_10TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
11B_11TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
12B_12TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
13B_13TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
14B_14TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
15B_ROOF	II	692.91 SF	692.91 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		104970.45 SF	34713.13 SF	70257.35 SF	3512.85 SF	66744.50 SF	1.75
BUILDING C							
COMMERCIAL							
00C_CELLAR	VI	8957.70 SF	8957.70 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01C_1ST FL. RETAIL	VI	6555.24 SF	4536.25 SF	2019.00 SF	100.95 SF	1918.05 SF	0.05
		15512.95 SF	13493.95 SF	2019.00 SF	100.95 SF	1918.05 SF	0.05
RESIDENTIAL							
00C_SUBCELLAR 2	II	8957.70 SF	8957.70 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00C_SUBCELLAR 1	II	8957.70 SF	8957.70 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01C_1ST FL.	II	1779.77 SF	551.00 SF	1228.77 SF	61.44 SF	1167.33 SF	0.03
02C_2ND FL.	II	6387.91 SF	673.97 SF	5713.93 SF	285.70 SF	5428.23 SF	0.14
03C_3RD FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
04C_4TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
05C_5TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
06C_6TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
07C_7TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
08C_8TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
09C_9TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
10C_10TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
11C_11TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
12C_12TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
13C_13TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
14C_14TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
15C_ROOF	II	985.53 SF	985.53 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		104397.11 SF	29784.42 SF	74612.74 SF	3730.62 SF	70882.12 SF	1.86
BUILDING D							
COMMERCIAL							
00D_CELLAR	VI	7848.13 SF	7848.13 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01D_1ST FL. RETAIL	VI	6063.41 SF	4536.25 SF	1527.16 SF	76.36 SF	1450.80 SF	0.04
		13911.54 SF	12384.38 SF	1527.16 SF	76.36 SF	1450.80 SF	0.04
RESIDENTIAL							
00D_SUBCELLAR 2	II	7848.13 SF	7848.13 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00D_SUBCELLAR 1	II	7848.13 SF	7848.13 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01D_1ST FL.	II	1652.78 SF	444.95 SF	1207.84 SF	60.39 SF	1147.45 SF	0.03
02D_2ND FL.	II	6487.73 SF	851.42 SF	5636.31 SF	281.82 SF	5354.49 SF	0.14
03D_3RD FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
04D_4TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
05D_5TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
06D_6TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
07D_7TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
08D_8TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
09D_9TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
10D_10TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
11D_11TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
12D_12TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
13D_13TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
14D_14TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
15D_ROOF	II	734.87 SF	734.87 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		100596.51 SF	27916.04 SF	72680.47 SF	3634.01 SF	69046.46 SF	1.81
GRAND TOTAL		468875.42 SF	180689.03 SF	288186.47 SF	14409.29 SF	273777.18 SF	7.18

BUILDING A _ TOTAL DEDUCTION BY CODE CATEGORY	
DEDUCTION	TOTAL SF
	0.00 SF
AMENITY	361.32 SF
BULKHEAD	569.87 SF
CELLAR	23076.43 SF
CORRIDOR DEDUCTION	11104.73 SF
MECHANICAL ROOM	100.82 SF
RECREATION ROOM	3350.88 SF
REFUSE ROOM	296.97 SF
SHAFT	1744.17 SF
STAIRS	419.81 SF
Grand total	41025.00 SF

BUILDING A _ DEDUCTION PER ZR 12-10	
DEDUCTION	TOTAL SF
BULKHEAD	569.87 SF
CELLAR	23076.43 SF
MECHANICAL ROOM	100.82 SF
RECREATION ROOM	3350.88 SF
SHAFT	1744.17 SF
STAIRS	419.81 SF
Grand total	29261.98 SF

BUILDING A _ DEDUCTION PER ZR 23-23	
DEDUCTION	TOTAL SF
AMENITY	361.32 SF
CORRIDOR DEDUCTION	11104.73 SF
REFUSE ROOM	296.97 SF
Grand total	11763.02 SF

BUILDING A _ ZFA AFTER ZR 12-10 DEDUCTIONS	
RESIDENTIAL GFA	102,938.55 SF
ZR 12-10 DEDUCTONS	29,261.98 SF
102,938.55 - 29,261.98	73,676.57 SF

LEVEL	A	B	C	D	E	F	G	H
1								
2	201	202	203					
	1-BR	1-BR	2-BR					
	494 SF	494 SF	748 SF					
3	301	302	303	304	305	306	307	308
	1-BR	1-BR	2-BR	1-BR	STUDIO	2-BR	STUDIO	STUDIO
	494 SF	494 SF	748 SF	527 SF	381 SF	727 SF	321 SF	321 SF
4	401	402	403	404	405	406	407	408
	1-BR	1-BR	2-BR	1-BR	STUDIO	2-BR	STUDIO	STUDIO
	494 SF	494 SF	748 SF	527 SF	381 SF	727 SF	321 SF	321 SF
5	501	502	503	504	505	506	507	508
	1-BR	1-BR	2-BR	1-BR	STUDIO	2-BR	STUDIO	STUDIO
	494 SF	494 SF	748 SF	527 SF	381 SF	727 SF	321 SF	321 SF
6	601	602	603	604	605	606	607	608
	1-BR	1-BR	2-BR	1-BR	STUDIO	2-BR	STUDIO	STUDIO
	494 SF	494 SF	748 SF	527 SF	381 SF	727 SF	321 SF	321 SF
7	701	702	703	704	705	706	707	708
	1-BR	1-BR	2-BR	1-BR	STUDIO	2-BR	STUDIO	STUDIO
	494 SF	494 SF	748 SF	527 SF	381 SF	727 SF	321 SF	321 SF
8	801	802	803	804	805	806	807	808
	1-BR	1-BR	2-BR	1-BR	STUDIO	2-BR	STUDIO	STUDIO
	494 SF	494 SF	748 SF	527 SF	381 SF	727 SF	321 SF	321 SF
9	901	902	903	904	905	906	907	908
	1-BR	1-BR	2-BR	1-BR	STUDIO	2-BR	STUDIO	STUDIO
	494 SF	494 SF	748 SF	527 SF	381 SF	727 SF	321 SF	321 SF
10	1001	1002	1003	1004	1005	1006	1007	1008
	1-BR	1-BR	2-BR	1-BR	STUDIO	2-BR	STUDIO	STUDIO
	494 SF	494 SF	748 SF	527 SF	381 SF	727 SF	321 SF	321 SF
11	1101	1102	1103	1104	1105	1106	1107	1108
	1-BR	1-BR	1-BR	1-BR	STUDIO	2-BR	STUDIO	STUDIO
	488 SF	452 SF	504 SF	483 SF	380 SF	727 SF	321 SF	321 SF
12	1201	1202	1203	1204	1205	1206	1207	1208
	1-BR	1-BR	1-BR	1-BR	STUDIO	2-BR	STUDIO	STUDIO
	488 SF	452 SF	504 SF	483 SF	380 SF	727 SF	321 SF	321 SF
13	1301	1302	1303	1304	1305	1306	1307	1308
	1-BR	1-BR	1-BR	1-BR	STUDIO	2-BR	STUDIO	STUDIO
	488 SF	452 SF	504 SF	483 SF	380 SF	727 SF	321 SF	321 SF
14	1401	1402	1403	1404	1405	1406	1407	1408
	1-BR	1-BR	1-BR	1-BR	STUDIO	2-BR	STUDIO	STUDIO
	488 SF	452 SF	504 SF	483 SF	380 SF	727 SF	321 SF	321 SF

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Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

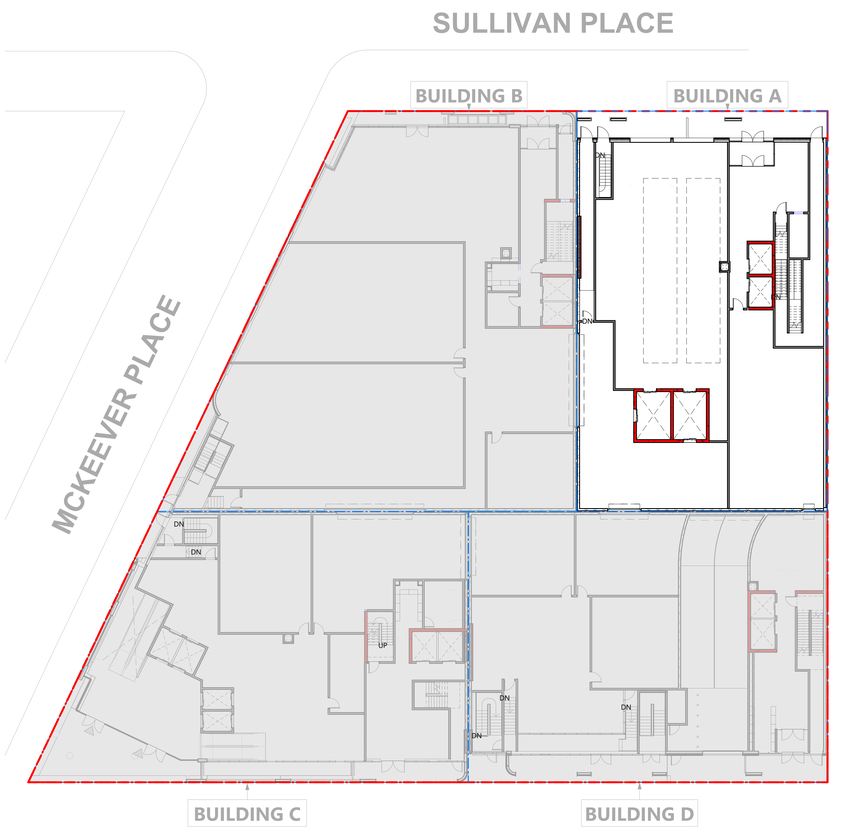
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING ANALYSIS

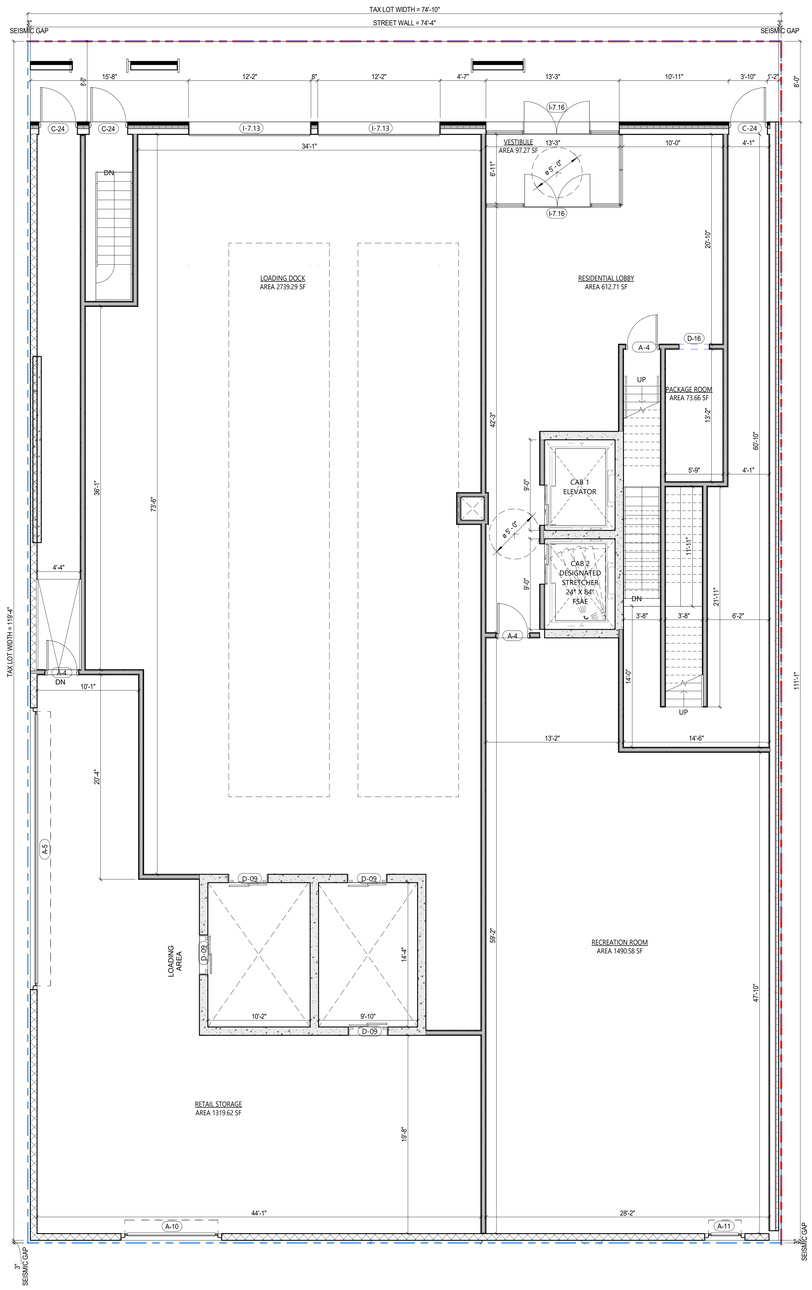
Z-002A.00

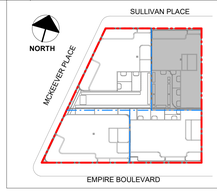
Scale: 12" = 1'-0"
Date: 12/1/2025 7:14:26 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 | 1ST FLOOR OVERALL PLAN
1/16" = 1'-0"



2 | BLDG A - 1ST FLOOR ENLARGED PLAN
3/16" = 1'-0"





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DOB SCAN STICKER:

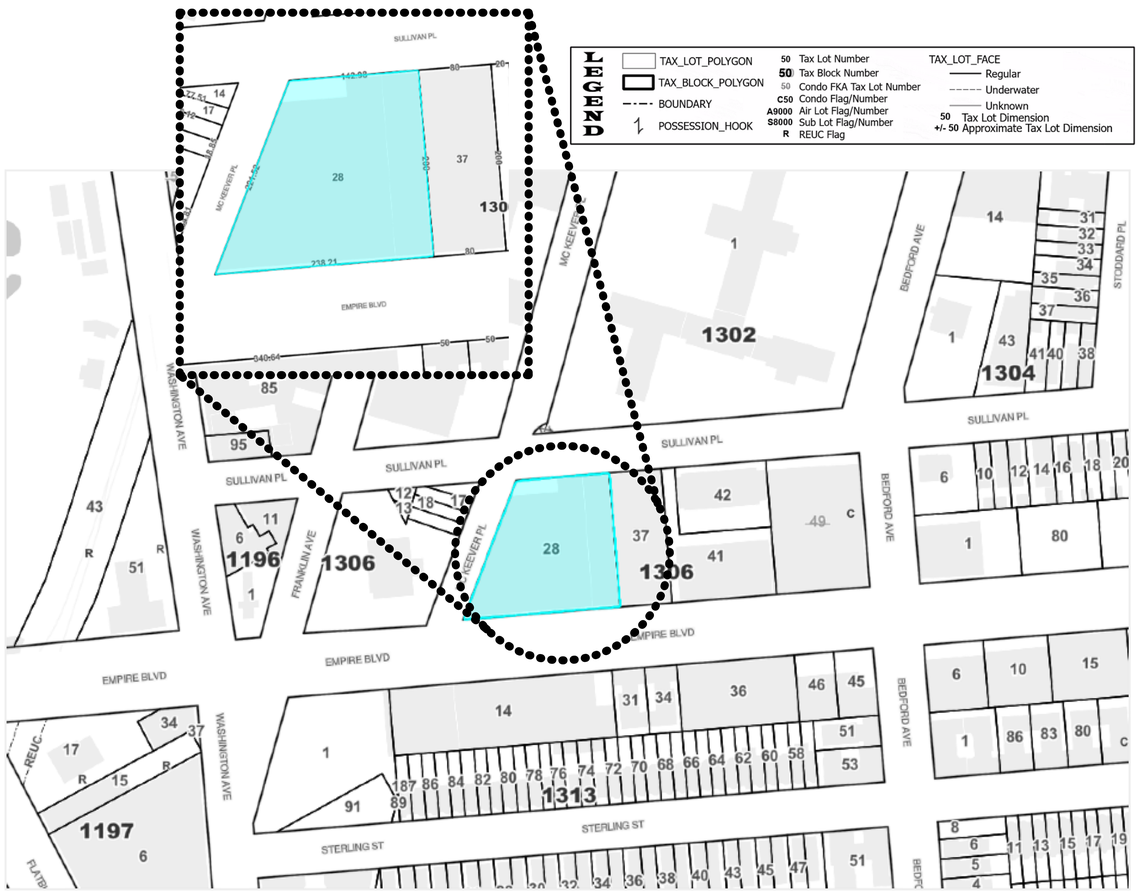
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED 1ST FLOOR PLAN

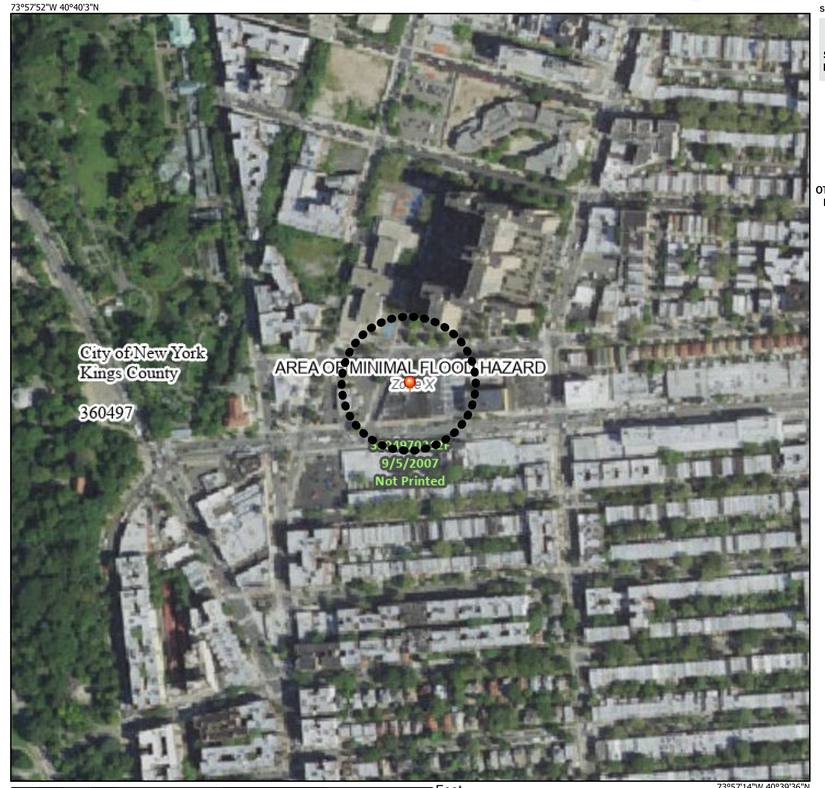
A-103A.00

Scale:	As indicated
Date:	12/1/2025 7:14:29 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 TAX MAP
N.T.S.



2 FLOOD MAP - ZONE 'X' SEPTEMBER 5, 2007
N.T.S.



3 ZONING MAP
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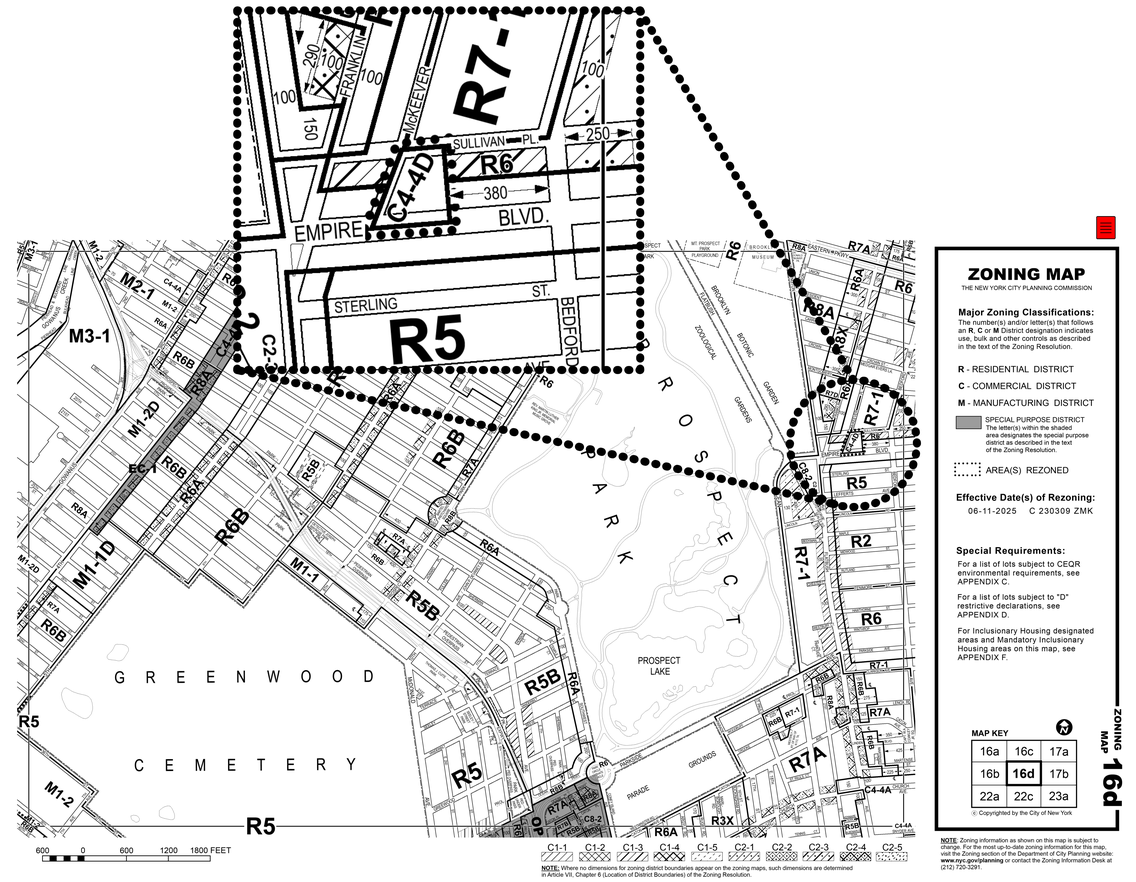
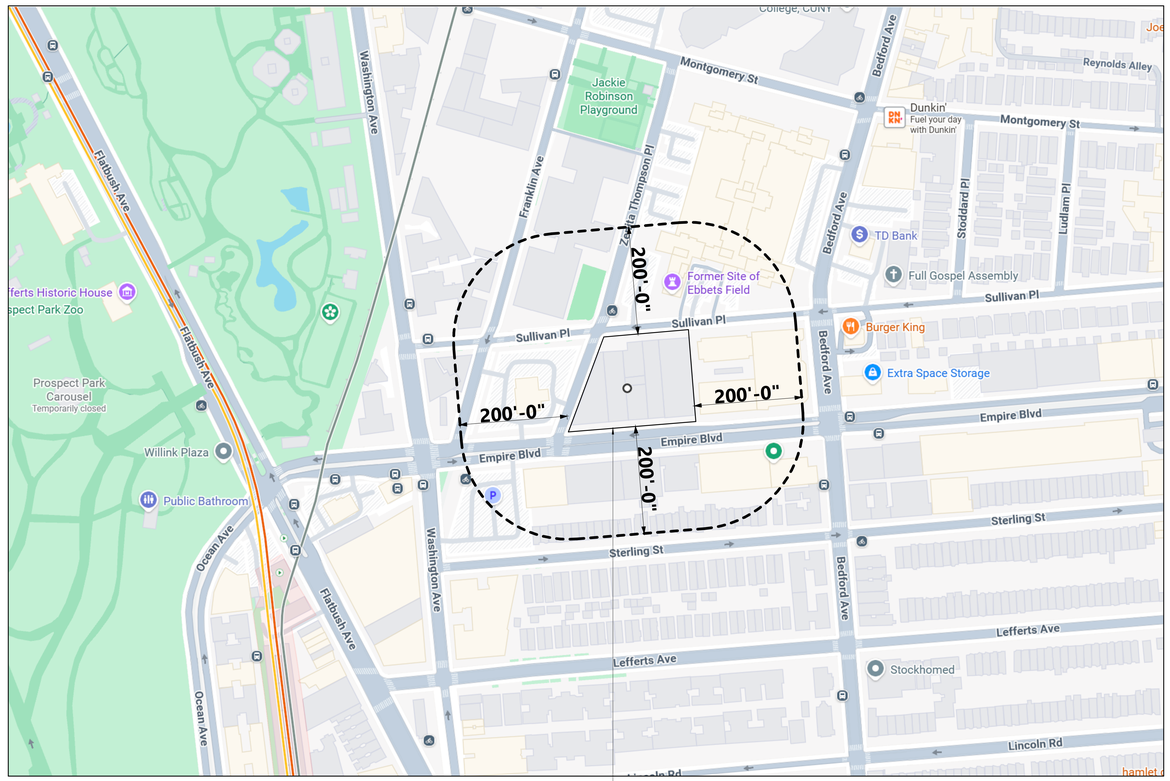


TRANSIT MAP
1" = 100'-0"



SITE IS NOT LOCATED WITHIN 200' OF A TRANSIT AUTHORITY PROPOERTY

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DOB SCAN STICKER:

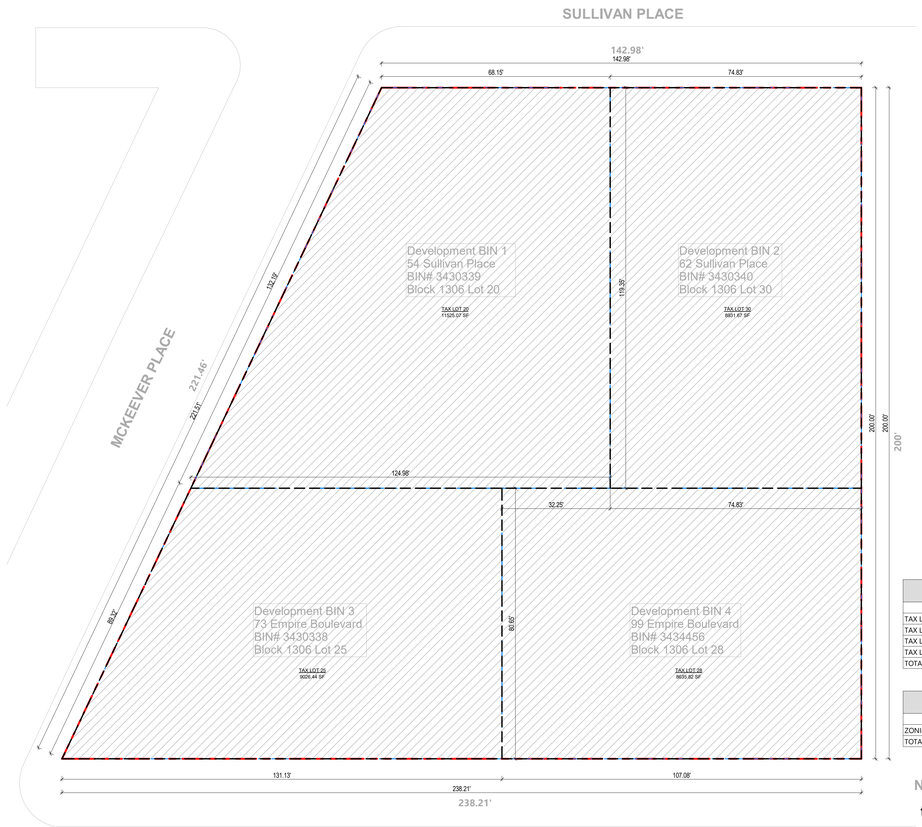
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING MAPS

Z-003A.00

Scale: 1" = 100'-0"
Date: 12/1/2025 7:14:34 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 LOT AREA & BASE PLANE CALCULATION
1/16" = 1'-0"



TAX LOTS	
Name	SF
TAX LOT 20	11525.07 SF
TAX LOT 30	8931.67 SF
TAX LOT 28	8635.82 SF
TAX LOT 25	9026.44 SF
TOTAL	38119.00 SF

COMBINED LOT AREA	
Name	SF
ZONING LOT COMBINED	38119.00 SF
TOTAL	38119.00 SF

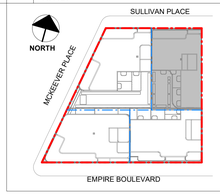
2 LOT COVERAGE CALCULATION
1/16" = 1'-0"

LOT COVERAGE ALLOWED WITHIN 100FT = 100%

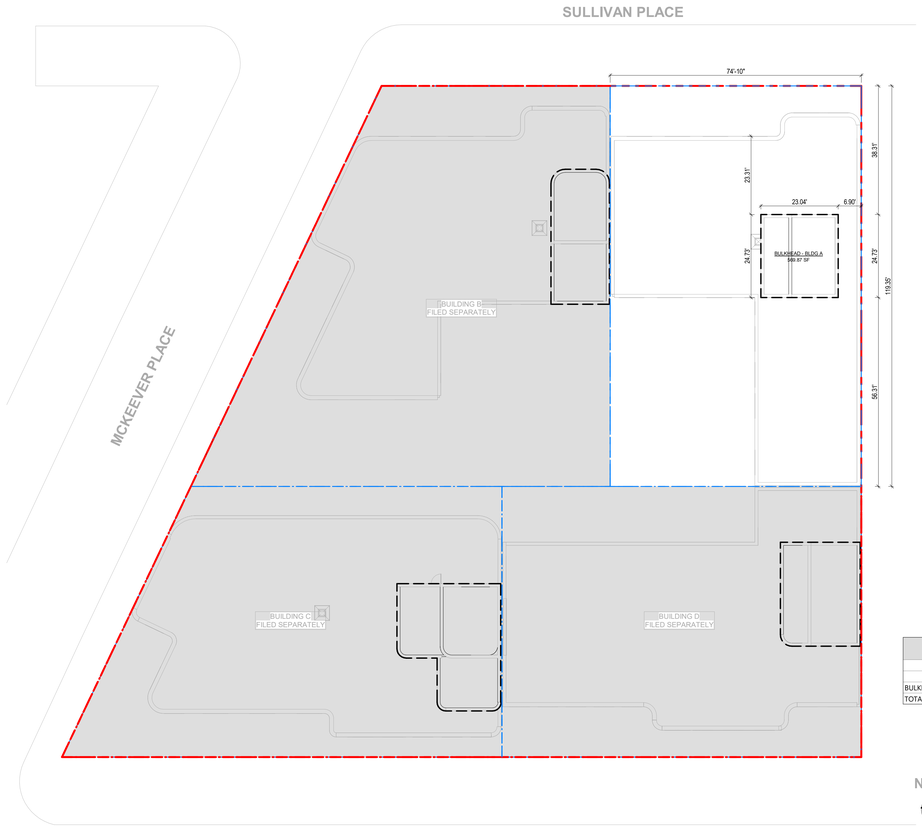
AREA SCHEDULE (LOT COVERAGE)	
Name	Area
PORTION OF BUIDLING A - BEYOND 100FT	5395 SF
PORTION OF BUILDING C - BEYOND 100FT	423 SF
PORTION OF BUILDING D - BEYOND 100FT	6956 SF
TOTAL	12774 SF

MAXIMUM PERMITTED LOT COVERAGE: 80% x 15,967.53 = 12,774.02 SF
PROPOSED LOT COVERAGE: (12774 / 15967.53) x 100 = 79.99%

KEY PLAN
N.T.S.



3 PERMITTED OBSTRUCTION CALCULATION
1/16" = 1'-0"



BULKHEAD AREA CALCULATION - BLDG A			
Name	Length	Width	Area
BULKHEAD - BLDG A	36' - 5 1/2"	24' - 9"	570 SF
TOTAL			570 SF

4 BLDG A - COURTYARD ANALYSIS DIAGRAM
1/16" = 1'-0"

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DOB SCAN STICKER:

LOCATION
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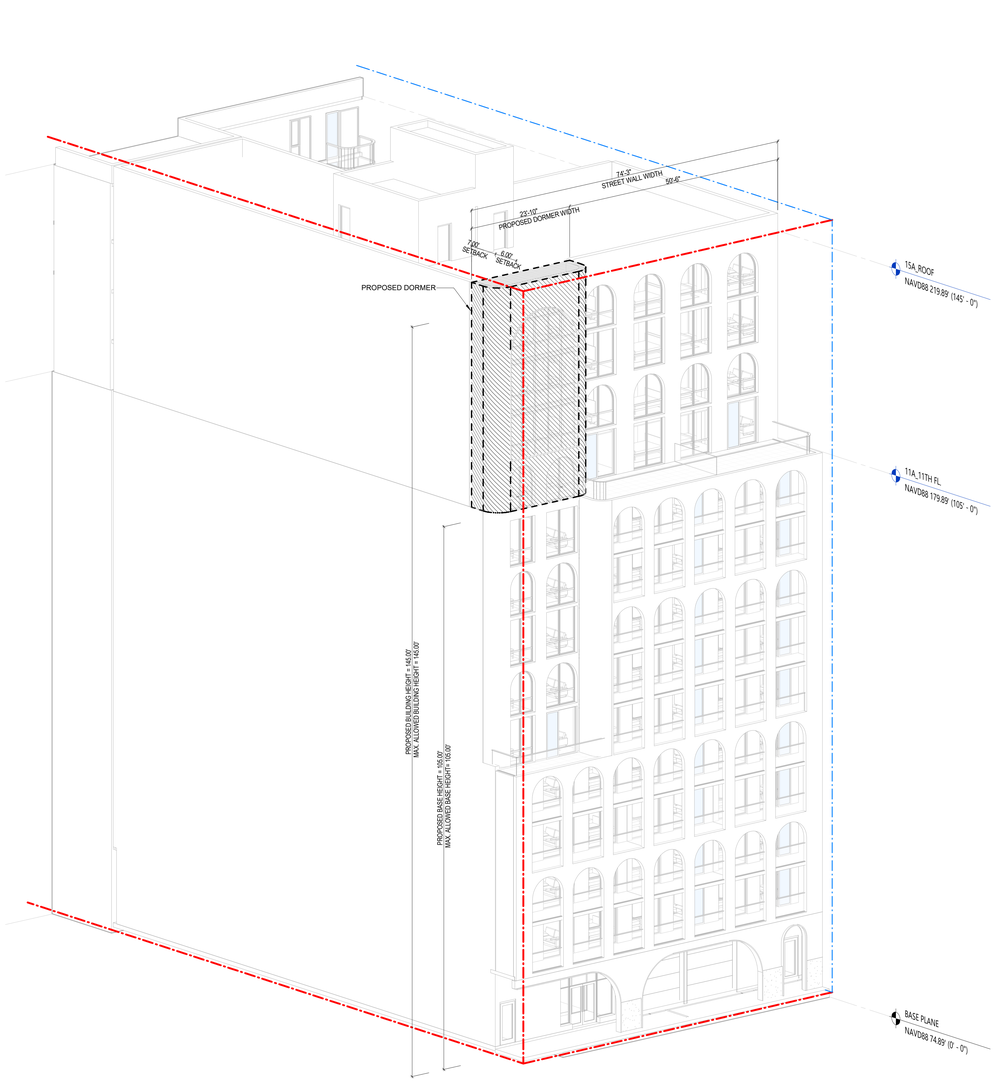
Brooklyn, NY 11225

SHEET TITLE
ZONING DIAGRAMS

Z-004A.00

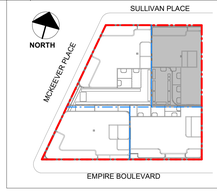
Scale: As indicated
Date: 12/1/2025 7:14:49 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 3D DIAGRAM - BLDG A



2 DORMER CALCULATIONS - SULLIVAN PLACE (NORTH ELEVATION) - BLDG A
1/8" = 1'-0"

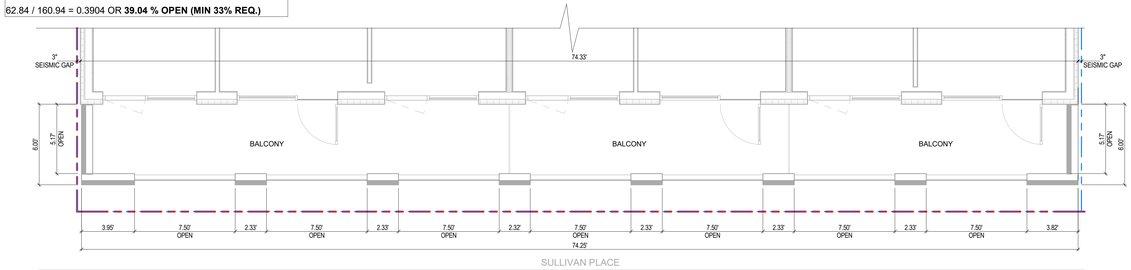
KEY PLAN
N.T.S.



3 BALCONY CALCULATIONS

BLDG A - BALCONY ENCLOSURE:
OPENINGS: (7.50' x 7) + 5.17 + 5.17 = 62.84'
PERIMETER OF THE BALCONY: (74.44 + 74.50 + 6 + 6) = 160.94'

62.84 / 160.94 = 0.3904 OR **39.04 % OPEN (MIN 33% REQ.)**

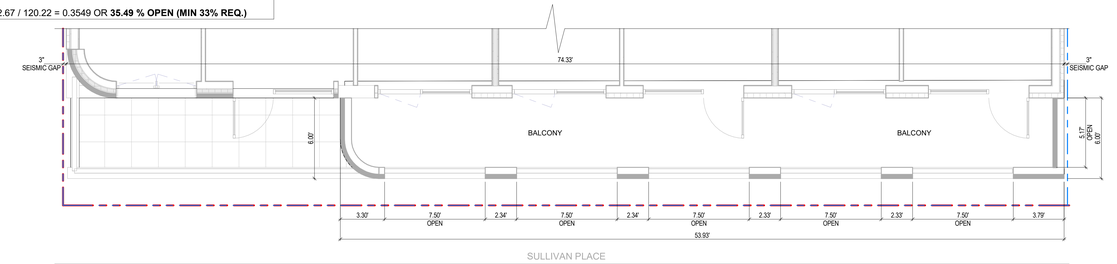


SULLIVAN PLACE

3.1 BLDG A - 3RD TO 5TH PARTIAL FLOOR PLAN
1/4" = 1'-0"

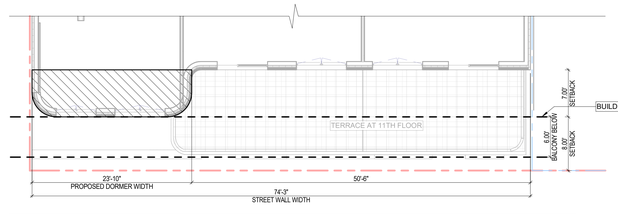
BLDG A - BALCONY ENCLOSURE:
OPENINGS: (7.50' x 5) + 5.17 = 42.67'
PERIMETER OF THE BALCONY: (54.11 + 54.11 + 6 + 6) = 120.22'

42.67 / 120.22 = 0.3549 OR **35.49 % OPEN (MIN 33% REQ.)**



SULLIVAN PLACE

3.2 BLDG A - 6TH TO 10TH PARTIAL FLOOR PLAN
1/4" = 1'-0"



SULLIVAN PLACE

2.1 11TH FL. - PARTIAL PLAN
1/8" = 1'-0"

SULLIVAN PLACE DORMER CALCULATION

STREET WALL WIDTH = 74'-3"
MAX. PERMITTED DORMER = 74'-3" x 40% = 29'-8 3/8"
PROPOSED DORMER = 23'-10" FT

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No.	Description	Date
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SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

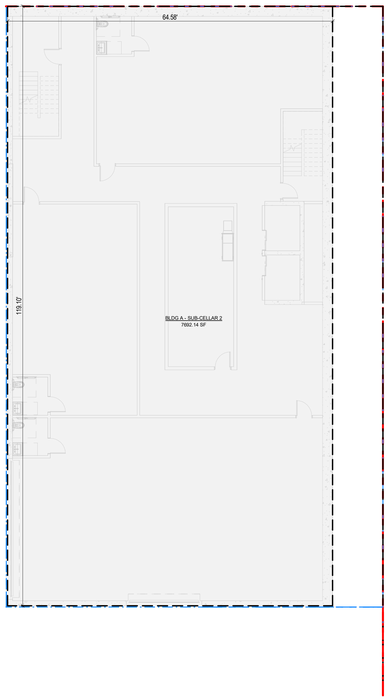
SHEET TITLE
ZONING DIAGRAMS

Z-005A.00

Scale:	As indicated
Date:	12/1/2025 7:14:53 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

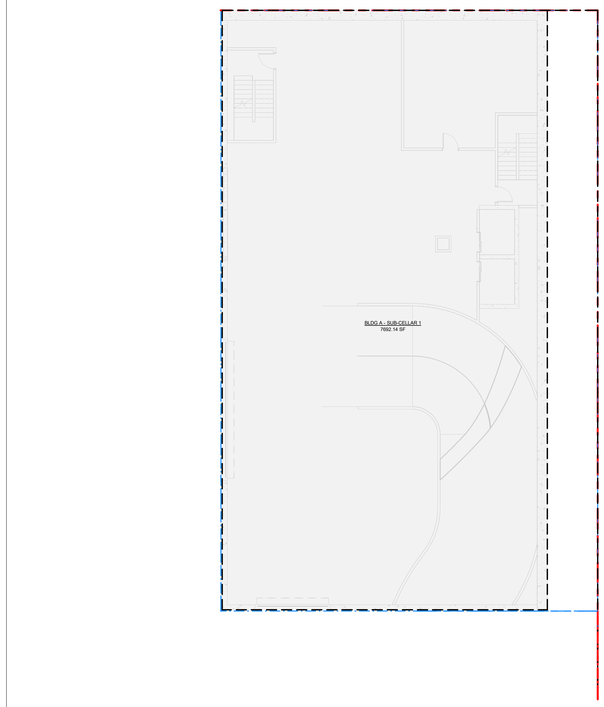
1 BLDG A - SUBCELLAR 2 GROSS AREA
3/32" = 1'-0"

AREA - 00 SUBCELLAR 2 FLOOR - BLDG A	
Name	SF
BLDG A - SUB-CELLAR 2	7692.14 SF
	7692.14 SF



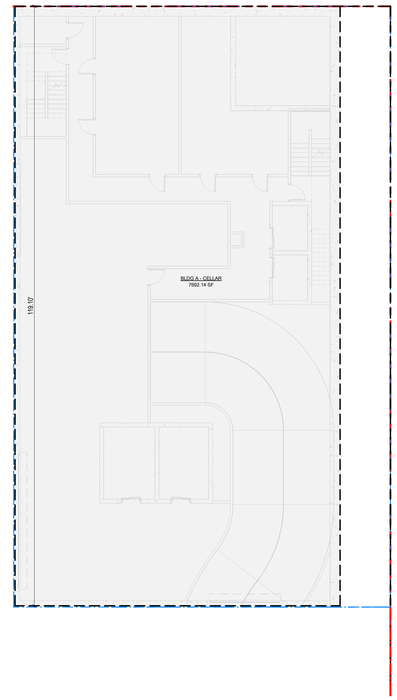
2 BLDG A - SUBCELLAR 1 GROSS AREA
3/32" = 1'-0"

AREA - 00 SUBCELLAR 1 FLOOR - BLDG A	
Name	SF
BLDG A - SUB-CELLAR 1	7692.14 SF
	7692.14 SF

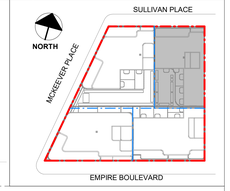


3 BLDG A - CELLAR GROSS AREA
3/32" = 1'-0"

AREA - 00 CELLAR FLOOR - BLDG A	
Name	SF
BLDG A - CELLAR	7692.14 SF
	7692.14 SF



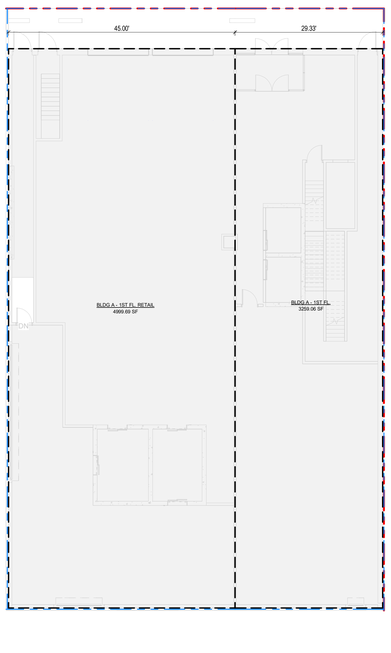
KEY PLAN
N.T.S.



7 01A_ 1ST FL.
3/32" = 1'-0"

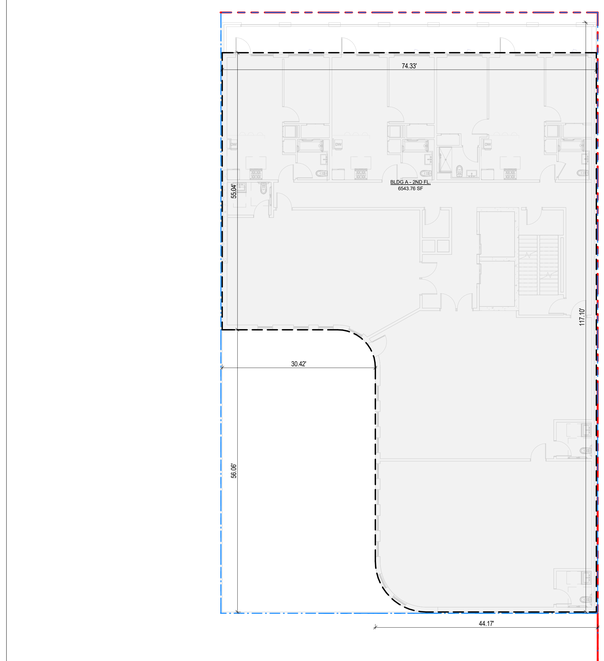
AREA - 1ST FLOOR - BLDG A - RESIDENTIAL	
Name	SF
BLDG A - 1ST FL.	3259.06 SF
	3259.06 SF

AREA - 1ST FLOOR - BLDG A - RETAIL	
Name	SF
BLDG A - 1ST FL. RETAIL	4999.69 SF
	4999.69 SF



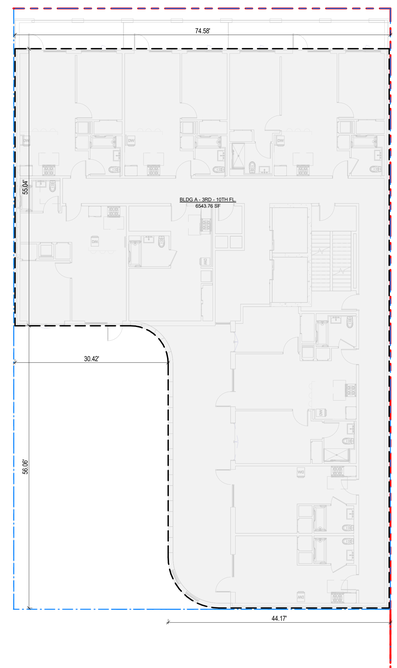
5 BLDG A - 2ND FLOOR GROSS AREA
3/32" = 1'-0"

AREA - 2ND FLOOR - BLDG A	
Name	SF
BLDG A - 2ND FL.	6543.76 SF
	6543.76 SF



6 BLDG A - 3RD TO 10TH FLOOR GROSS AREA
3/32" = 1'-0"

AREA - 3RD - 10TH FLOOR - BLDG A	
Name	SF
BLDG A - 3RD - 10TH FL.	6543.76 SF
	6543.76 SF



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SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
GROSS FLOOR AREA DIAGRAMS

Z-010A.00

Scale:	As indicated
Date:	12/1/2025 7:15:09 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

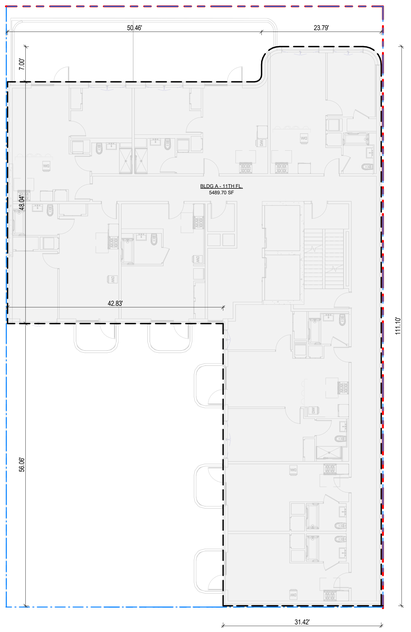
1 BLDG A - 11TH FLOOR GROSS AREA
3/32" = 1'-0"

AREA - 11TH FLOOR - BLDG A	
Name	SF
BLDG A - 11TH FL	5489.70 SF
	5489.70 SF

Building Area Legend

Gross Building Area

SULLIVAN PLACE



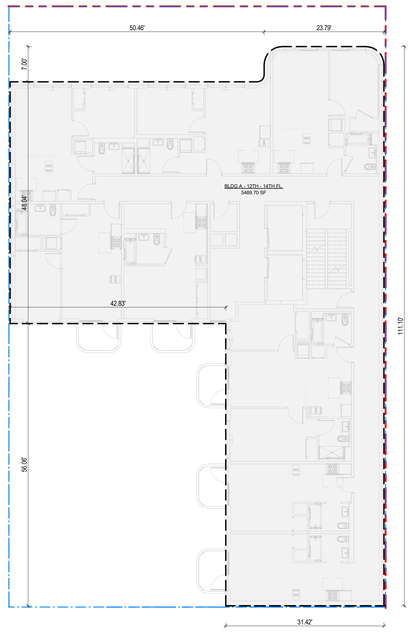
2 BLDG A - 12TH TO 14TH FLOOR GROSS AREA
3/32" = 1'-0"

AREA - 12TH - 14TH FLOOR - BLDG A	
Name	SF
BLDG A - 12TH - 14TH FL	5489.70 SF
	5489.70 SF

Building Area Legend

Gross Building Area

SULLIVAN PLACE



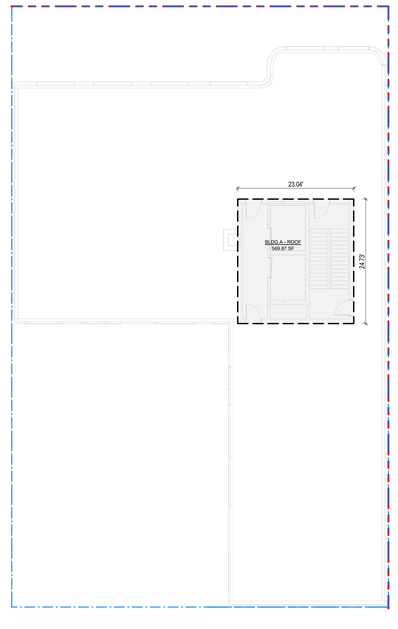
3 BLDG A - ROOF FLOOR GROSS AREA
3/32" = 1'-0"

AREA - ROOF - BLDG A	
Name	SF
BLDG A - ROOF	569.87 SF
	569.87 SF

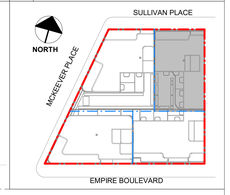
Building Area Legend

Gross Building Area

SULLIVAN PLACE



KEY PLAN
N.T.S.



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SHEET TITLE
GROSS FLOOR AREA DIAGRAMS

Z-011A.00

Scale:	As indicated
Date:	12/1/2025 7:15:19 PM
Drawn by:	
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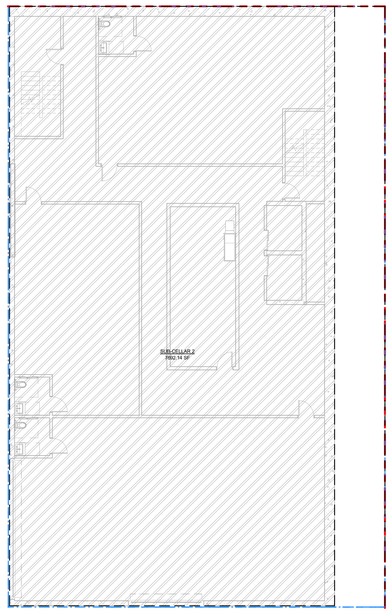
DOB JOB NUMBER:	

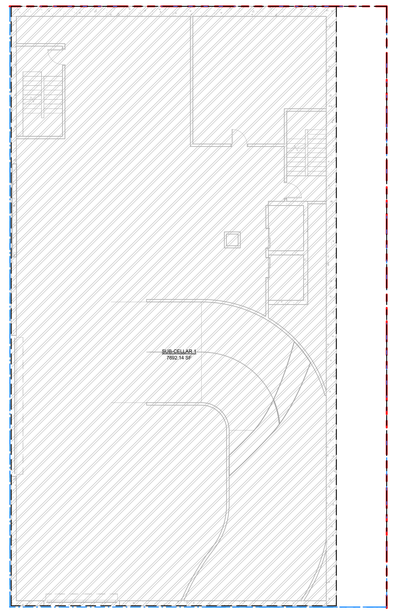
1 BLDG A - SUBCELLAR 2 DEDUCTION PLAN
3/32" = 1'-0"

DEDUCTIONS - 00_SUBCELLAR 2	
DEDUCTION	TOTAL SF
CELLAR	7692.14 SF
Grand total	7692.14 SF



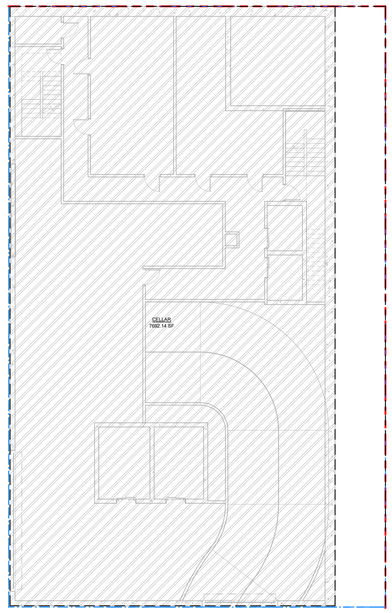
2 BLDG A - SUBCELLAR 1 DEDUCTION PLAN
3/32" = 1'-0"

DEDUCTIONS - 00_SUBCELLAR 1	
DEDUCTION	TOTAL SF
CELLAR	7692.14 SF
Grand total	7692.14 SF

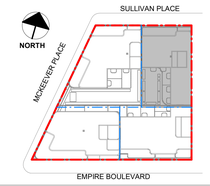


3 BLDG A - CELLAR DEDUCTION PLAN
3/32" = 1'-0"

DEDUCTIONS - 00_CELLAR	
DEDUCTION	TOTAL SF
CELLAR	7692.14 SF
Grand total	7692.14 SF



KEY PLAN
N.T.S.



4 BLDG A - 1ST FLOOR DEDUCTION PLAN
3/32" = 1'-0"

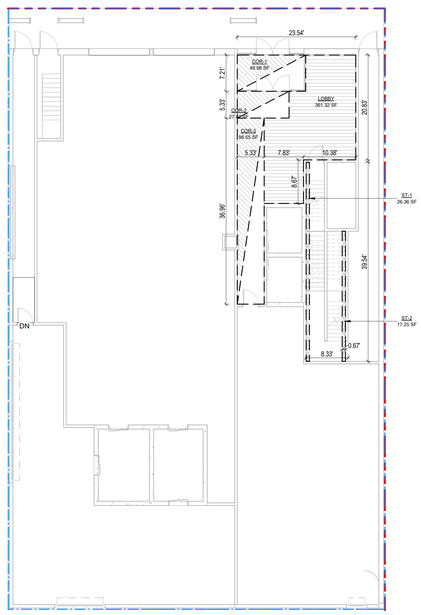
DEDUCTIONS - 1ST FLOOR	
DEDUCTION	TOTAL SF
AMENITY	361.32 SF
CORRIDOR DEDUCTION	48.96 SF
CORRIDOR DEDUCTION	27.42 SF
CORRIDOR DEDUCTION	98.55 SF
STAIRS	26.36 SF
STAIRS	17.25 SF
Grand total	579.85 SF

DEDUCTIONS LEGEND

AMENITY

CORRIDOR DEDUCTION — 50% Deduction b. Length of Corridor

STAIRS



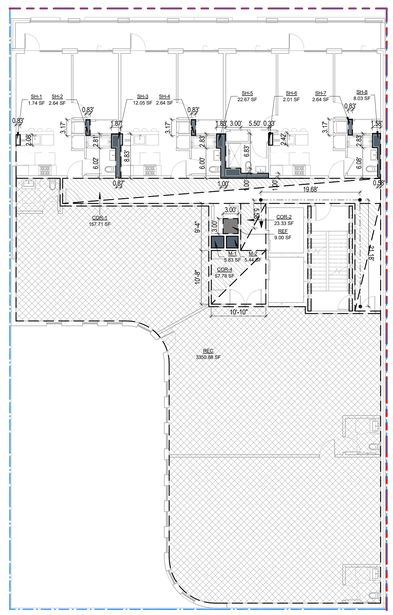
5 BLDG A - 2ND FLOOR DEDUCTION PLAN
3/32" = 1'-0"

DEDUCTIONS - 2ND FLOOR	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	157.71 SF
CORRIDOR DEDUCTION	23.33 SF
CORRIDOR DEDUCTION	53.44 SF
CORRIDOR DEDUCTION	57.78 SF
RECREATION ROOM	3350.88 SF
REFUSE ROOM	9.00 SF

DEDUCTIONS - 2ND FLOOR	
DEDUCTION	TOTAL SF
SHAFT	5.83 SF
SHAFT	5.44 SF
SHAFT	1.74 SF
SHAFT	2.64 SF
SHAFT	12.05 SF
SHAFT	2.64 SF
SHAFT	22.67 SF
SHAFT	2.01 SF
SHAFT	2.64 SF
SHAFT	8.03 SF

DEDUCTIONS - 2ND FLOOR	
DEDUCTION	TOTAL SF
STAIRS	13.92 SF
STAIRS	13.92 SF
STAIRS	14.36 SF
Grand total	3760.04 SF

50% Deduction b. Length of Corridor



6 BLDG A - 3RD TO 10TH FLOOR DEDUCTION PLAN
3/32" = 1'-0"

DEDUCTIONS - 3RD FLOOR	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	319.58 SF
CORRIDOR DEDUCTION	178.46 SF
CORRIDOR DEDUCTION	402.97 SF
REFUSE ROOM	24.00 SF
SHAFT	5.74 SF
SHAFT	5.44 SF
SHAFT	1.74 SF
SHAFT	2.64 SF
SHAFT	11.99 SF

DEDUCTIONS - 3RD FLOOR	
DEDUCTION	TOTAL SF
SHAFT	2.64 SF
SHAFT	24.83 SF
SHAFT	2.01 SF
SHAFT	2.64 SF
SHAFT	8.01 SF
SHAFT	10.00 SF
SHAFT	3.06 SF
SHAFT	10.44 SF
SHAFT	12.62 SF
SHAFT	12.02 SF
SHAFT	2.64 SF
SHAFT	1.98 SF

DEDUCTIONS - 3RD FLOOR	
DEDUCTION	TOTAL SF
SHAFT	2.25 SF
SHAFT	6.08 SF
SHAFT	12.50 SF
SHAFT	4.25 SF
SHAFT	3.75 SF
STAIRS	13.92 SF
STAIRS	13.92 SF
Grand total	1102.12 SF

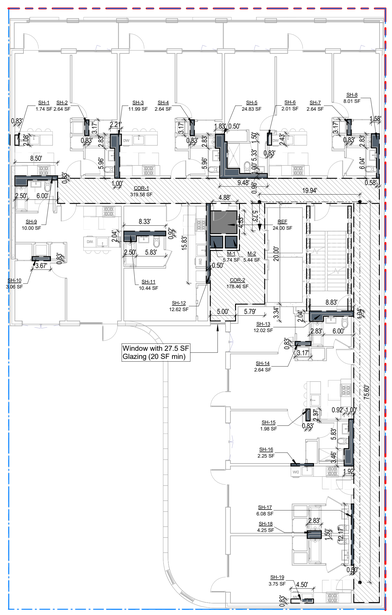
100% Deductions

a. Corridors Termination

(2) The corridor has daylighting through windows with a glazed area of at least 20 square feet, and such windows are located:

(i) Directly within the corridor;

b. Length of Corridor



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MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
FLOOR AREA DEDUCTIONS

Z-020A.00

Scale: As indicated
Date: 12/1/2025 7:15:30 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 BLDG A - 11TH FLOOR DEDUCTION PLAN
3/32" = 1'-0"

DEDUCTIONS - 11TH FLOOR	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	282.08 SF
CORRIDOR DEDUCTION	178.90 SF
CORRIDOR DEDUCTION	396.37 SF
REFUSE ROOM	24.00 SF
SHAFT	5.83 SF
SHAFT	5.44 SF
SHAFT	3.74 SF
SHAFT	3.75 SF

DEDUCTIONS - 11TH FLOOR	
DEDUCTION	TOTAL SF
SHAFT	1.73 SF
SHAFT	30.03 SF
SHAFT	4.50 SF
SHAFT	2.64 SF
SHAFT	10.35 SF
SHAFT	10.77 SF
SHAFT	2.64 SF
SHAFT	11.95 SF
SHAFT	11.58 SF
SHAFT	11.67 SF
SHAFT	2.64 SF
SHAFT	1.94 SF

DEDUCTIONS - 11TH FLOOR	
DEDUCTION	TOTAL SF
SHAFT	12.50 SF
SHAFT	2.25 SF
SHAFT	6.08 SF
SHAFT	4.25 SF
STAIRS	13.92 SF
STAIRS	13.92 SF
Grand total	1055.47 SF

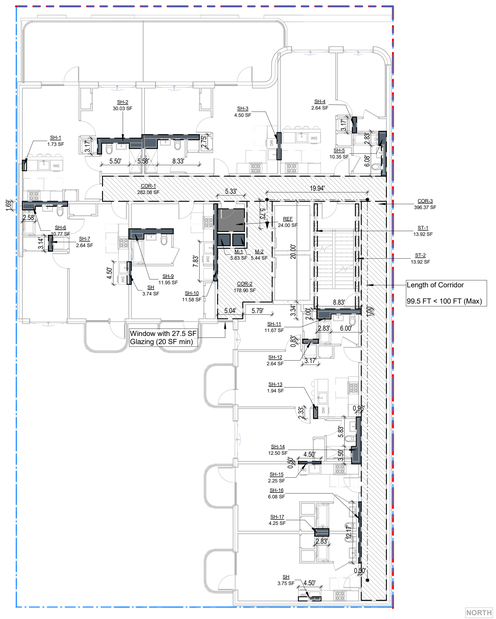
100% Deductions

a. Corridors Termination

(2) The corridor has daylighting through windows with a glazed area of at least 20 square feet, and such windows are located:

(i) Directly within the corridor;

b. Length of Corridor



2 BLDG A - 12TH TO 14TH FLOOR DEDUCTION PLAN
3/32" = 1'-0"

DEDUCTIONS - 12TH FLOOR	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	282.08 SF
CORRIDOR DEDUCTION	178.90 SF
CORRIDOR DEDUCTION	396.37 SF
REFUSE ROOM	24.00 SF
SHAFT	5.83 SF
SHAFT	5.44 SF
SHAFT	3.75 SF
SHAFT	1.73 SF

DEDUCTIONS - 12TH FLOOR	
DEDUCTION	TOTAL SF
SHAFT	30.03 SF
SHAFT	4.50 SF
SHAFT	2.64 SF
SHAFT	10.35 SF
SHAFT	10.77 SF
SHAFT	2.64 SF
SHAFT	3.74 SF
SHAFT	11.95 SF
SHAFT	11.58 SF
SHAFT	11.67 SF
SHAFT	2.64 SF
SHAFT	1.94 SF

DEDUCTIONS - 12TH FLOOR	
DEDUCTION	TOTAL SF
SHAFT	12.50 SF
SHAFT	2.25 SF
SHAFT	6.08 SF
SHAFT	4.25 SF
STAIRS	13.92 SF
STAIRS	13.92 SF
Grand total	1055.47 SF

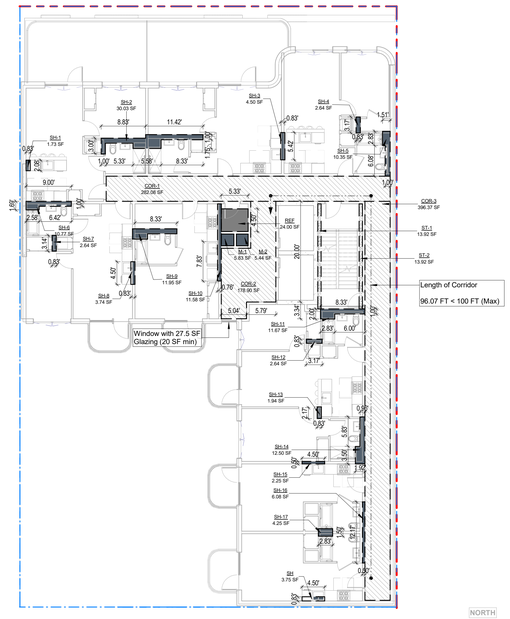
100% Deductions

a. Corridors Termination

(2) The corridor has daylighting through windows with a glazed area of at least 20 square feet, and such windows are located:

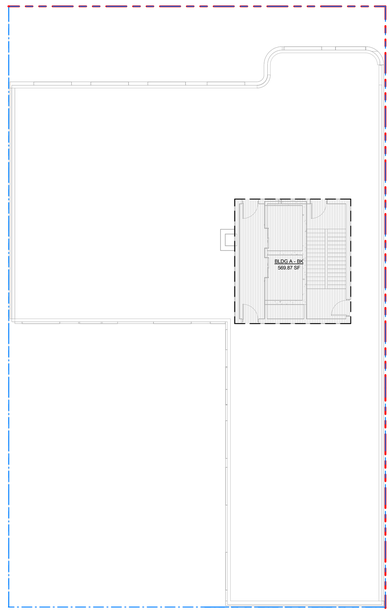
(i) Directly within the corridor;

b. Length of Corridor

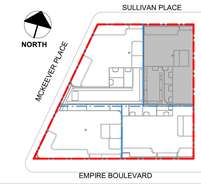


3 BLDG A - ROOF FLOOR DEDUCTION PLAN
3/32" = 1'-0"

DEDUCTIONS - ROOF	
DEDUCTION	TOTAL SF
BULKHEAD	569.87 SF
Grand total	569.87 SF



KEY PLAN
N.T.S.



BUILDING A _ TOTAL DEDUCTION BY CODE CATEGORY	
DEDUCTION	TOTAL SF
	0.00 SF
AMENITY	361.32 SF
BULKHEAD	569.87 SF
CELLAR	23076.43 SF
CORRIDOR DEDUCTION	11104.73 SF
MECHANICAL ROOM	100.82 SF
RECREATION ROOM	3350.88 SF
REFUSE ROOM	296.97 SF
SHAFT	1744.17 SF
STAIRS	419.81 SF
Grand total	41025.00 SF

BUILDING A _ DEDUCTION PER ZR 12-10	
DEDUCTION	TOTAL SF
BULKHEAD	569.87 SF
CELLAR	23076.43 SF
MECHANICAL ROOM	100.82 SF
RECREATION ROOM	3350.88 SF
SHAFT	1744.17 SF
STAIRS	419.81 SF
Grand total	29261.98 SF

BUILDING A _ DEDUCTION PER ZR 23-23	
DEDUCTION	TOTAL SF
AMENITY	361.32 SF
CORRIDOR DEDUCTION	11104.73 SF
REFUSE ROOM	296.97 SF
Grand total	11763.02 SF

BUILDING A _ ZFA AFTER ZR 12-10 DEDUCTIONS	
RESIDENTIAL GFA	102,938.55 SF
ZR 12-10 DEDUCTONS	29,261.98 SF
102,938.55 - 29,261.98	73,676.57 SF

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
FLOOR AREA DEDUCTIONS

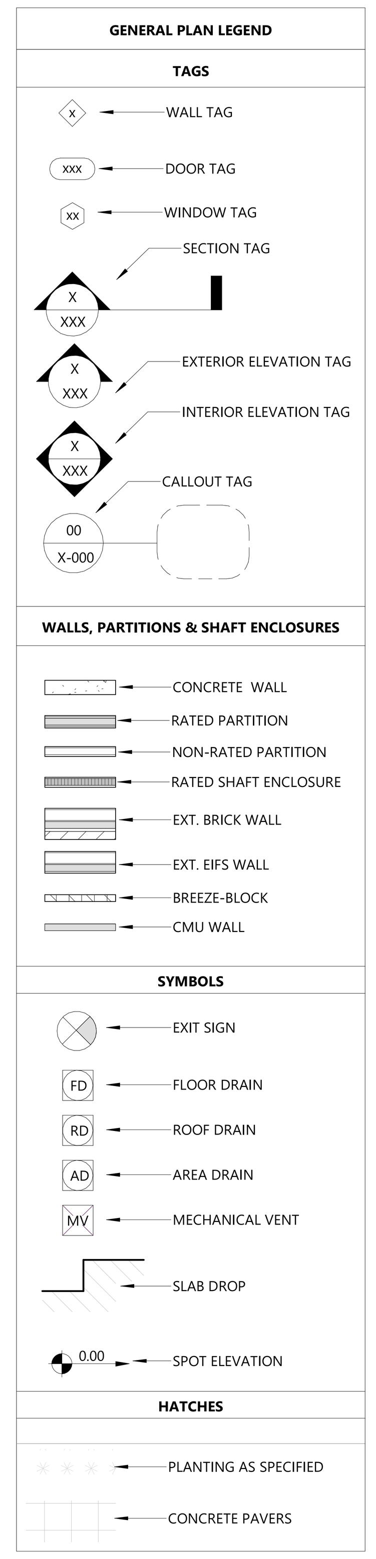
Z-021A.00

Scale: As indicated
Date: 12/1/2025 7:15:42 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

ABBREVIATIONS

A – ARCHITECTURAL
AD – ADDITION
AL – ALUMINUM
AP – ACCESS PANEL
AT – ATTIC
AV – AIR VENT
B – BUILDING
BM – BENCH MARK
BP – BUILDING PAPER
C – CONCRETE
CA – CEILING ASSEMBLY
CB – CATCH BASIN
CD – CORRIDOR DOOR
CL – CENTER LINE
CMU – CONCRETE MASONRY UNIT
CO – CLEANOUT
CP – COLUMN PIPE
CR – CORNER
CS – COLD STORAGE
CT – CERAMIC TILE
D – DOOR
DB – DOOR BUCK
DF – DIFFUSER
DG – DRAINAGE
DL – DEAD LOAD
DN – DOWNSPOUT
DP – DOWNSPOUT
DR – DRIVEWAY
DW – DOWNSPOUT
E – ELECTRICAL
EC – ELECTRICAL CABINET
ED – EMERGENCY DOOR
EL – ELEVATION
EM – EXPANSION JOINT
EN – ENTRANCE
EP – EDGE PROTECTION
ER – EMERGENCY EXIT
ES – EXIT SIGN
ET – EGRESS
EV – EXHAUST VENT
F – FIXTURE
FA – FIRE ALARM
FB – FIRE BLANKET
FC – FLOOR COVERING
FD – FLOOR DRAIN
FE – FIRE EXTINGUISHER
FF – FINISH FLOOR
FG – FIBER GLASS
FH – FIRE HOSE
FL – FINISH LINE
FM – FIRE MARSHAL
FP – FLOOR PLAN
FS – FLOOR SYSTEM
FT – FLOOR TILE
FV – FLOOR VENT
G – GLAZING
GA – GLAZING ASSEMBLY
GB – GAS BOILER
GC – GENERAL CONTRACTOR
GD – GROUND DRAIN
GF – GRADED FILL
GG – GLASS GUARD
GH – GUARDRAIL
GI – GALVANIZED IRON
GL – GLASS
GM – GUTTER
GP – GROUND PLAN
GR – GRILLE
GS – GLASS SYSTEM
GT – GUTTER
H – HVAC
HA – HEATING AIR
HB – HEAT BARRIER
HC – HEATING COIL
HD – HEAVY DUTY
HE – HEAT EXCHANGER
HF – HIGH FINISH
HG – HEAT GRID
HI – HIGH INTENSITY
HL – HEADER
HM – HEAT MAT
HP – HIGH PRESSURE
HR – HEAT RECOVERY
HS – HEAT SHIELD
HT – HIGH TEMP
I – INTERIOR
IA – INTERIOR ASSEMBLY
IB – INSULATED BOARD
IC – INTERIOR COLUMN
ID – INTERIOR DOOR
IE – INTERIOR ELEVATION
IF – INSULATED FRAME
IG – INTERIOR GLAZING
IH – INSULATION HOLDER
II – INSULATED INTERIOR
IJ – INSULATED JOINT
IL – INTERIOR LIGHTING
IM – INTERIOR METAL
IN – INTERIOR NETTING
IO – INPUT OUTLET
IP – INTERIOR PANEL
IR – INSULATED ROOF
IS – INTERIOR STAIRS
IT – INSULATED TILE
J – JUNCTION
JA – JOINT ASSEMBLY
JB – JUNCTION BOX
JC – JOINT CONNECTION
JD – JOINT DETAIL
JE – JOINT EDGE
JF – JOINT FILLER
JG – JOINT GAP
JH – JOINT HOLDER
JI – JOINT INSULATION
JJ – JOINT JAMB
JK – JOINT KIT
JL – JOINT LINE
JM – JOINT MATERIAL
JN – JOINT NAILING
JO – JOINT OPENING
JP – JOINT PANEL
JR – JOINT REPAIR
JS – JOINT SEALANT
JT – JOINT TREATMENT
K – KITCHEN
KA – KITCHEN ASSEMBLY
KB – KITCHEN CABINET
KC – KITCHEN COUNTER
KD – KITCHEN DOOR
KE – KITCHEN EQUIPMENT
KF – KITCHEN FLOOR
KG – KITCHEN GRID
KH – KITCHEN HOOD
KI – KITCHEN ISLAND
KK – KITCHEN KIT
KL – KITCHEN LAYOUT
KM – KITCHEN MONITOR
KN – KITCHEN NOOK
KO – KITCHEN OUTLET
KP – KITCHEN PANEL
KR – KITCHEN RAIL
KS – KITCHEN SINKKT – KITCHEN TILE
L – LIGHTING
LA – LIGHTING ASSEMBLY
LB – LIGHTING BRACKET
LC – LIGHTING CONTROL
LD – LIGHTING DESIGN
LE – LIGHTING ELEVATION
LF – LIGHTING FIXTURE
LG – LIGHTING GRID
LH – LIGHTING HOLDER
LI – LIGHTING INSTALLATION
LJ – LIGHTING JUNCTION
LK – LIGHTING KIT
LL – LIGHTING LAYOUT
LM – LIGHTING MOUNT
LN – LIGHTING NICHE
LO – LIGHTING OUTLET
LP – LIGHTING PANEL
LQ – LIGHTING QUALITY
LR – LIGHTING RECESS
LS – LIGHTING SWITCH
LT – LIGHTING TYPE
M – MECHANICAL
MA – MECHANICAL ASSEMBLY
MB – MECHANICAL BOX
MC – MECHANICAL CONNECTION
MD – MECHANICAL DUCT
ME – MECHANICAL EQUIPMENT
MF – MECHANICAL FITTING
MG – MECHANICAL GRID
MH – MECHANICAL HEAT
MI – MECHANICAL INSULATION
MJ – MECHANICAL JUNCTION
MK – MECHANICAL KIT
ML – MECHANICAL LAYOUT
MM – MECHANICAL MOUNT
MN – MECHANICAL NOISE
MO – MECHANICAL OUTLET
MP – MECHANICAL PANEL
MQ – MECHANICAL QUALITY
MR – MECHANICAL RECESS
MS – MECHANICAL SUPPORT
MT – MECHANICAL TYPE
N – NORTH
NA – NORTH ARROW
NB – NORTH BOUND
NC – NORTH CORNER
NE – NORTH ELEVATION
NF – NORTH FACING
NG – NORTH GRID
NH – NORTH HEADING
NI – NORTH INDEX
NJ – NORTH JUNCTION
NK – NORTH KIT
NL – NORTH LINE
NM – NORTH MARK
NN – NORTH NODE
NO – NORTH ORIENTATION
NP – NORTH PLAN
NQ – NORTH QUALITY
NR – NORTH REFERENCE
NS – NORTH SIDE
NT – NORTH TILE
O – OPENING
OA – OPENING ASSEMBLY
OB – OPENING BRACKET
OC – OPENING CONNECTION
OD – OPENING DETAIL
OE – OPENING EDGE
OF – OPENING FRAME
OG – OPENING GLASS
OH – OPENING HEIGHT
OI – OPENING INSULATION
OJ – OPENING JOINT
OK – OPENING KIT
OL – OPENING LAYOUT
OM – OPENING MATERIAL
ON – OPENING NICHE
OP – OPENING PANEL
OQ – OPENING QUALITY
OR – OPENING REVEAL
OS – OPENING SIZE
OT – OPENING TYPE
P – PLAN
PA – PLAN ASSEMBLY
PB – PLAN BLOCK
PC – PLAN CONNECTION
PD – PLAN DETAIL
PE – PLAN ELEVATION
PF – PLAN FIXTURE
PG – PLAN GRID
PH – PLAN HEIGHT
PI – PLAN INDEX
PJ – PLAN JUNCTION
PK – PLAN KIT
PL – PLAN LAYOUT
PM – PLAN MARK
PN – PLAN NODE
PO – PLAN ORIENTATION
PP – PLAN PANEL
PQ – PLAN QUALITY
PR – PLAN REFERENCE
PS – PLAN SCALE
PT – PLAN TYPE
Q – QUANTITY
QA – QUANTITY ASSEMBLY
QB – QUANTITY BLOCK
QC – QUANTITY CONTROL
QD – QUANTITY DETAIL
QE – QUANTITY ESTIMATE
QF – QUANTITY FINISH
QG – QUANTITY GRID
QH – QUANTITY HEIGHT
QI – QUANTITY INPUT
QJ – QUANTITY JUNCTION
QK – QUANTITY KIT
QL – QUANTITY LINE
QM – QUANTITY MATERIAL
QN – QUANTITY NODE
QO – QUANTITY OUTPUT
QP – QUANTITY PANEL
QR – QUANTITY REFERENCE
QS – QUANTITY SCALE
QT – QUANTITY TREATMENT
R – ROOF
RA – ROOF ASSEMBLY
RB – ROOF BEAM
RC – ROOF CONNECTION
RD – ROOF DETAIL
RE – ROOF EDGE
RF – ROOF FINISH
RG – ROOF GRID
RH – ROOF HEIGHT
RI – ROOF INSULATION
RJ – ROOF JOINT
RK – ROOF KIT
RL – ROOF LINE
RM – ROOF MATERIAL
RN – ROOF NICHE
RO – ROOF OPENING
RP – ROOF PANEL
RQ – ROOF QUALITY
RR – ROOF REVEAL
RS – ROOF SLOPE
RT – ROOF TREATMENT
S – STRUCTURAL
SA – STRUCTURAL ASSEMBLY
SB – STRUCTURAL BEAM
SC – STRUCTURAL CONNECTION
SD – STRUCTURAL DETAIL
SE – STRUCTURAL EDGE
SF – STRUCTURAL FINISH
SG – STRUCTURAL GRID
SH – STRUCTURAL HEIGHT
SI – STRUCTURAL INSULATION
SJ – STRUCTURAL JOINT
SK – STRUCTURAL KIT
SL – STRUCTURAL LINE
SM – STRUCTURAL MATERIAL
SN – STRUCTURAL NODE
SO – STRUCTURAL OPENING
SP – STRUCTURAL PANEL
SQ – STRUCTURAL QUALITY
SR – STRUCTURAL REVEAL
SS – STRUCTURAL SUPPORT
ST – STRUCTURAL TYPE
T – TILE
TA – TILE ASSEMBLY
TB – TILE BLOCK
TC – TILE CONNECTION
TD – TILE DETAIL
TE – TILE EDGE
TF – TILE FINISH
TG – TILE GRID
TH – TILE HEIGHT
TI – TILE INSULATION
TJ – TILE JOINT
TK – TILE KIT
TL – TILE LINE
TM – TILE MATERIAL
TN – TILE NICHE
TO – TILE OPENING
TP – TILE PANEL
TQ – TILE QUALITY
TR – TILE REVEAL
TS – TILE SIZE
TT – TILE TREATMENT
U – UTILITY
UA – UTILITY ASSEMBLY
UB – UTILITY BOX
UC – UTILITY CONNECTION
UD – UTILITY DETAIL
UE – UTILITY EDGE
UF – UTILITY FIXTURE
UG – UTILITY GRID
UH – UTILITY HEIGHT
UI – UTILITY INSULATION
UJ – UTILITY JOINT
UK – UTILITY KIT
UL – UTILITY LAYOUT
UM – UTILITY MATERIAL
UN – UTILITY NODE
UO – UTILITY OUTLET
UP – UTILITY PANEL
UQ – UTILITY QUALITY
UR – UTILITY REFERENCE
US – UTILITY SIZE
UT – UTILITY TYPE
V – VENTILATION
VA – VENTILATION ASSEMBLY
VB – VENTILATION BOX
VC – VENTILATION CONNECTION
VD – VENTILATION DUCT
VE – VENTILATION EQUIPMENT
VF – VENTILATION FIXTURE
VG – VENTILATION GRID
VH – VENTILATION HEIGHT
VI – VENTILATION INSULATION
VJ – VENTILATION JOINT
VK – VENTILATION KIT
VL – VENTILATION LINE
VM – VENTILATION MATERIAL
VN – VENTILATION NICHE
VO – VENTILATION OUTLET
VP – VENTILATION PANEL
VQ – VENTILATION QUALITY
VR – VENTILATION REVEAL
VS – VENTILATION SIZE
VT – VENTILATION TYPE
W – WALL
WA – WALL ASSEMBLY
WB – WALL BRACE
WC – WALL CONNECTION
WD – WALL DETAIL
WE – WALL EDGE
WF – WALL FINISH
WG – WALL GRID
WH – WALL HEIGHT
WI – WALL INSULATION
WJ – WALL JOINT
WK – WALL KIT
WL – WALL LINE
WM – WALL MATERIAL
WN – WALL NICHE
WO – WALL OPENING
WP – WALL PANEL
WQ – WALL QUALITY
WR – WALL REVEAL
WS – WALL SUPPORT
WT – WALL TYPE
X – SECTION
XA – SECTION ASSEMBLY
XB – SECTION BLOCK
XC – SECTION CONNECTION
XD – SECTION DETAIL
XE – SECTION EDGE
XF – SECTION FINISH
XG – SECTION GRID
XH – SECTION HEIGHT
XI – SECTION INSULATION
XJ – SECTION JOINT
XK – SECTION KIT
XL – SECTION LAYOUT
XM – SECTION MATERIAL
XN – SECTION NODE
XO – SECTION OPENING
XP – SECTION PANEL
XQ – SECTION QUALITY
XR – SECTION REVEAL
XS – SECTION SUPPORT
XT – SECTION TYPE
Y – YARD
YA – YARD ASSEMBLY
YB – YARD BLOCK
YC – YARD CONNECTION
YD – YARD DRAIN
YE – YARD EDGE
YF – YARD FIXTURE
YG – YARD GRID
YH – YARD HEIGHT
YI – YARD INSULATION
YJ – YARD JOINT
YK – YARD KIT
YL – YARD LAYOUT
YM – YARD MATERIAL
YN – YARD NODE
YO – YARD OPENING
YP – YARD PANEL
YQ – YARD QUALITY
YR – YARD REVEAL
YS – YARD SUPPORT
YT – YARD TYPE
Z – ZONE
ZA – ZONE ASSEMBLY
ZB – ZONE BLOCK
ZC – ZONE CONNECTION
ZD – ZONE DETAIL
ZE – ZONE EDGE
ZF – ZONE FINISH
ZG – ZONE GRID
ZH – ZONE HEIGHT
ZI – ZONE INSULATION
ZJ – ZONE JOINT
ZK – ZONE KIT
ZL – ZONE LAYOUT
ZM – ZONE MATERIAL
ZN – ZONE NODE
ZO – ZONE OPENING
ZP – ZONE PANEL
ZQ – ZONE QUALITY
ZR – ZONE REVEAL
ZS – ZONE SUPPORT
ZT – ZONE TYPE

LEGENDS AND SYMBOLS



SPECIAL INSPECTIONS

SPECIAL INSPECTIONS CATEGORIES
TR-1 ARCHITECTURAL SPECIAL INSPECTIONS

SPECIAL INSPECTIONS	Code Section 2014 BC	Code Section 2022 BC
STRUCTURAL STEEL - WELDING	BC 1704.3.1	BC 1705.2.1
STRUCTURAL STEEL - DETAILS	BC 1704.3.2	BC 1705.2.2
STRUCTURAL STEEL - HIGH STRENGTH BOLTING	BC 1704.3.3	BC 1705.2.3
STRUCTURAL COLD - FORMED STEEL	BC 1704.3.4	BC 1705.2.6
OPEN-WEB STEEL JOISTS AND JOISTS GIRDERS	N/A	BC 1705.2.7
CONCRETE - CAST-IN-PLACE	BC 1704.4	BC 1705.3
CONCRETE - PRECAST	BC 1704.4	BC 1705.3
CONCRETE - PRESTRESSED	BC 1704.4	BC 1705.3
MASONRY	BC 1704.5	BC 1705.4
WOOD - INSTALLATION OF HIGH-LOAD DIAPHRAGMS	BC 1704.6.1	BC 1705.5.1
WOOD - INSTALLATION OF METAL-PLATE-CONNECTED TRUSSES	BC 1704.6.2	BC 1705.5.2
WOOD - INSTALLATION OF PREFABRICATED I-JOISTS	BC 1704.6.3	BC 1705.5.3
WOOD - SEISMIC RESISTANCE	N/A	BC 1705.5.5
CONSTRUCTION UTILIZING CLT OR SCL, TYPE IV	N/A	BC 1705.5.6
SUBGRADE INSPECTION	BC 1704.7.1	BC 1705.6
SUBSURFACE CONDITIONS - FILL PLACEMENT & IN-PLACE DENSITY	BC 1704.7.2 / 3	BC 1705.6
SUBSURFACE INVESTIGATIONS (BORINGS / TEST PITS)	BC 1704.7.4	BC 1705.6
DEEP FOUNDATION ELEMENTS	BC 1704.7.8	BC 1705.7
PRESTRESSED ROCK AND SOIL ANCHORS...	N/A	BC 1705.8.1
HELICAL PILES (BB # 2014-020)	BC 1704.8.5	BC 1705.9
VERTICAL MASONRY FOUNDATION ELEMENTS	BC 1704.9	BC 1705.19
WALL PANELS, CURTAIN WALLS, AND VENEERS	BC 1704.10	BC 1705.20
DESIGNATED SEISMIC SYSTEM	N/A	BC 1705.12.1
SEISMIC RESISTANCE OF ACCESS FLOORS	N/A	BC 1705.12.2
SEISMIC RESISTANCE OF PLUMBING, MECHANICAL, FUEL GAS & ELECTRICAL COMPONENTS	N/A	BC 1705.12.3
SEISMIC RESISTANCE OF STORAGE RACKS	N/A	BC 1705.12.4
SPRAYED FIRE-RESISTANT MATERIALS	BC 1704.11	BC 1705.14
MASTIC AND INTUMESCENT FIRE-RESISTANT COATINGS	BC 1704.12	BC 1705.15
EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS)	BC 1704.13	DELETED
ALTERNATIVE MATERIALS - OTCR BUILDINGS BULLETIN # _________	BC 1704.14	BC 1705.1.1
COMBUSTIBLE EXTERIOR WALL COVERINGS	N/A	BC 1705.16
SMOKE CONTROL SYSTEMS TESTING	BC 1704.15	BC 1705.18
MECHANICAL SYSTEMS	BC 1704.16	BC 1705.21
FUEL-OIL STORAGE AND FUEL-OIL PIPING SYSTEMS	BC 1704.17	BC 1705.22
HIGH-PRESSURE STEAM PIPING (WELDING)	BC 1704.18	BC 1705.23
HIGH TEMPERATURE HOT WATER PIPING (WELDING)	BC 1704.18	BC 1705.23
HIGH-PRESSURE FUEL-GAS PIPING (WELDING)	BC 1704.19	BC 1705.24
STRUCTURAL STABILITY - ALTERATIONS OF EXISTING BUILDINGS	BC 1704.20.1	BC 1705.25.1
CONSTRUCTION OPERATIONS INFLUENCING ADJACENT STRUCTURES	N/A	BC 1705.25.2
EXCAVATIONS - SHEETING, SHORING, AND BRACING...	BC 1704.20.2	BC 1705.25.3
UNDERPINNING AND ALTERNATE METHODS OF SUPPORT OF BUILDINGS AND & BC1817 ADJACENT...	N/A	BC 1705.25.4
UNDERPINNING	BC 1704.20.3 & BC 1814	DELETED
MECHANICAL DEMOLITION	BC 1704.20.4	BC 1705.25.5.1
RAISING AND MOVING OF A BUILDING	BC 1704.20.5	BC 1705.25.6
TENANT PROTECTION PLAN COMPLIANCE	N/A	BC 1705.26
SOIL PERCOLATION TEST - PRIVATE ON-SITE STORM WATER DRAINAGE DISPOSAL SYSTEMS, AND DETENTION FACILITIES	BC 1704.21.1.2	BC 1705.27.1.2
PRIVATE ON-SITE STORM WATER DRAINAGE DISPOSAL SYSTEMS, AND DETENTION FACILITIES INSTALLATION	BC 1704.21.2	BC 1705.27.2
INDIVIDUAL ON-SITE PRIVATE SEWAGE DISPOSAL SYSTEMS INSTALLATION	BC 1704.22	BC 1705.28
SPRINKLER SYSTEMS	BC 1704.23	BC 1705.29
STANDPIPE SYSTEMS	BC 1704.24	BC 1705.30
HEATING SYSTEMS	BC 1704.25	BC 1705.31
CHIMNEYS AND VENTS	BC 1704.26	BC 1705.32
FIRE-RESISTANT PENETRATIONS AND JOINTS	BC 1704.27	BC 1705.17
ALUMINUM WELDING	BC 1704.28	BC 1705.33
FLOOD ZONE COMPLIANCE (ATTACH FEMA ELEVATION / DRY FLOODPROOFING CERTIFICATE WHERE APPLICABLE)	BC 1704.29 & BC G105	BC 1705.34 & BC G107.2
LUMINOUS EGRESS PATH MARKINGS	BC 1704.30 & BC 1024.8	BC 1705.35 & BC 10.25.8
EMERGENCY AND STANDBY POWER SYSTEMS (GENERATORS)	BC 1704.31	BC 1705.36
POST-INSTALLED ANCHORS (BB#2014-018, 2014-019)	BC 1704.32	BC 1705.37
NON POTABLE WATER SYSTEMS	N/A	BC 1705.38
EXHAUST AND VENT SYSTEMS IN PLENUMS AND DUCTS	N/A	BC 1705.39
SEISMIC ISOLATION SYSTEMS	BC 1707.8	BC 1705.12.5
CONCRETE DESIGN MIX	BC 1905.3 & BC 1913.5	BC 1905.3
CONCRETE SAMPLING AND TESTING	BC 1905.6 & BC 1913.10	BC 1905.6
Progress Inspection Categories	**Code Section**	
PRELIMINARY	28-116.2.1 & BC 110.2	28-116.2.1 & BC 110.2
FOOTING AND FOUNDATION	BC 110.3.1	BC 110.3.1
LOWEST FLOOR ELEVATION	BC 110.3.2	BC 110.3.2
STRUCTURAL WOOD FRAME	BC 110.3.3	BC 110.3.3
FIRE-RESISTANCE RATED CONSTRUCTION	BC 110.3.4	BC 110.3.5
ENERGY CODE COMPLIANCE INSPECTIONS (TR8)	BC 110.3.5	BC 110.3.4
PUBLIC ASSEMBLY EMERGENCY LIGHTING	28-116.2.2	28-116.2.2
FINAL (TR1)	28-116.2.4.2 & BC 110.5	28-114 / 116 & BC 110.5

TR-8 ENERGY CODE PROGRESS INSPECTIONS

The conditional* TR8s listed below are conditional only if the job type is New Building or Alteration-CO New Building with Existing Elements to Remain, except HVAC TR8s that apply to all job types.

Progress Inspections	Table Reference in 1RCNY §5000-01(h) (1)and (2)	Work Type(s)
Air sealing and insulation — testing	(IA7), (IIA7)	GC* (Residential)
Air barrier — visual inspection	(IA6), (IIA6)	AN, SG, GC*, SL**, GR**
Air barrier continuity plan testing	(IIA8)	GC
Electrical motors	(IIC7), (IIC6)	GC, MS
Exterior lighting power	(IIC4)	SG, GC, MS
Fenestration air leakage	(IA4), (IIA4)	GC*
Fenestration and door U-factor and product ratings	(IA3), (IIA3)	GC*
Fenestration areas	(IA5), (IIA5)	GC*
Fireplaces	(IB1), (IIB1)	GC, MS
HVAC-R and service water piping design and insulation	(IB5), (IIB5)	PL, GC, MS, BE*
Insulation placement and R values	(IA2), (IIA2)	SG, GC*, FO, GR
Interior lighting power	(IC2), (IIC3)	GC, MS
Lighting controls	(IIC5)	SG, GC, MS
Lighting in dwelling units	(IIC2)	GC, MS
Maintenance information	(ID1), (IID1)	PL, GC, MS, BE, SL, GR**
Metering	(IC1), (IIC1)	PL, GC, MS
Permanent certificate	(ID2)	PL, GC* (Residential), MS, BE
Protection of exposed foundation insulation	(IA1), (IIA1)	GC, FO
Solar Ready Requirements	(ID3)	GC
Ventilation and air distribution system	(IB2)	MS* (Residential), GC
Vestibules	(IIA9)	GC

FIRE-RESISTANCE-RATED CONSTRUCTION

1. FIRE WALLS, FLOORS, BARRIERS, PARTITIONS, AND SHAFT ENCLOSURES SHALL COMPLY WITH PROVISIONS OF CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODEAND SHALL BE CONTINUOUS THROUGH ANY CONCEALED SPACE IN FLOOR OR ROOF CONSTRUCTION, UNLESS OTHERWISE EXEMPTED BY BC.
2. OPENINGS IN FIRE WALLS, FLOORS, BARRIERS, PARTITIONS, AND SHAFT ENCLOSURES TO COMPLY WITH CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODE.
3. PENETRATIONS IN FIRE WALLS, FLOORS, BARRIERS, PARTITIONS, AND SHAFT ENCLOSURES FOR PIPE SLEEVES, ELECTRIC DEVICES, ETC., SHALL BE PROVIDED WITH UL APPROVED FIRE SAFING MATERIALS TO MEET OR EXCEED THE FIRE RATING OF THE FIRE RATED CONDITION AND SHALL COMPLY WITH CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODE.
4. WHERE PIPES, WIRES, CONDUITS, DUCTS, ETC., PIERCE FIRE PROTECTION OF INDIVIDUALLY ENCASED STRUCTURAL MEMBERS, SUCH PENETRATION SHALL NOT EXCEED 2 PERCENT OF ANY ONE FACE SUCH PROTECTION AND SHALL BE CLOSED OFF WITH CLOSE FITTING METAL ESCUTCHEONS OR PLATES.
5. FIRE BLOCKING: CONCEALED SPACES WITHIN PARTITIONS, WALLS, FLOORS, ROOFS, STAIRS, FURRING PIPE SPACES, COLUMN ENCLOSURES, ETC., SHALL BE FIRE-BLOCKED AND DRAFT-STOPPED IN COMPLIANCE WITH CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODE(EXCEPT WHERE CONCEALED SPACE IS SPRINKLERED OR IS CONSTRUCTED AS A SHAFT).
6. CONDUITS IN FIRE-RATED PARTITIONS SHALL NOT EXCEED 3/4 INCH DIAMETER. OUTLETS IN FIRE RATED PARTITIONS SHALL BE BACKED UP WITH APPROVED MATERIALS TO MEET OR EXCEED THE REQUIRED FIRE RATING OF THE PARTITION.
7. SMOKE/FIRE DAMPERS OR DOORS SHALL BE PROVIDED WHERE DUCTS PENETRATE FIRE RATED WALLS OR CEILING.
8. GAS RISERS NOT PERMITTED WITHIN FIRE RATED WALLS.

NYC FIRE CODE 2022 SECTION 906 & NFPA 10 -FIRE PROTECTION EQUIPMENT

1. EXITS AND EXIT ACCESS DOORS SHALL BE MARKED BY AN APPROVED EXIT SIGN READILY VISIBLE FROM ANY DIRECTION OF EGRESS TRAVEL. THE PATH OF EGRESS TRAVEL TO EXITS AND WITHIN EXITS SHALL BE MARKED BY READILY VISIBLE EXIT SIGNS TO CLEARLY INDICATE THE DIRECTION OF EGRESS TRAVEL IN CASES WHERE THE EXIT OR THE PATH OF EGRESS TRAVEL IS NOT IMMEDIATELY VISIBLE TO THE OCCUPANTS.
2. EXIT SIGNS SHALL BE INTERNALLY LIGHTED, HAVING AN INITIAL BRIGHTNESS OF THE LETTERS OF AT LEAST 25 FOOT-LAMBERTS. LETTERS SHALL BE RED, THE BACKGROUND SHALL BE CLEAR OR WHITE. LETTERS SHALL BE BLOCK LETTERING, AT LEAST 8" HIGH WITH 3/4" STROKES. EXIT LIGHTING SHALL BE ON CIRCUITS THAT ARE SEPARATE FROM ANY OTHER CIRCUITS, TAKEN OFF AHEAD OF THE MAIN SWITCH.
3. EXIT DOORS SHALL BE READILY OPERABLE AT ALL TIMES FROM THE SIDE WHICH EGRESS IS TO BE MADE. DOORS MAY BE GIVEN A LOCKING FUNCTION IN THE DIRECTION OPPOSITE EGRESS TRAVEL TO PREVENT ACCESS FROM THE OUTDOORS AT STREET LEVEL.
4. PROVIDE EXIT SIGNS AND DIRECTION EXIT SIGNS WITH A MINIMUM 6" HIGH BY 3/4" STROKE BLOCK LETTERS ON A CONTRASTING BACKGROUND.
5. WHENEVER A SPACE IS OCCUPIED, EXIT SIGNS SHALL BE LIGHTED SO THEY ARE CLEARLY VISIBLE.
6. EXIT SIGNS SHALL BE ELECTRICALLY ILLUMINATED. TWO LAMPS SHALL BE ENERGIZED FROM SEPARATE CIRCUITS. ILLUMINATION SHALL NORMALLY BE PROVIDED BY THE PREMISES WIRING SYSTEM. IN THE EVENT OF FAILURE OF THIS SYSTEM, ILLUMINATION SHALL BE AUTOMATICALLY PROVIDED FROM AN EMERGENCY SYSTEM. EMERGENCY LIGHTING SHALL GIVE A VALUE OF ONE FOOT CANDLE AT FLOOR LEVEL. VERIFY IF ILLUMINATED SIGN ARE TO HAVE BATTERY BACKUP.
7. EXIT PATH LIGHTING SHALL BE PROVIDED FOR ANY STAIRWAY, HALLWAY, EXIT PASSAGEWAY OR EGRESS TO A PUBLIC WAY ANYTIME THE BUILDING IS OCCUPIED. EMERGENCY LIGHTING SHALL BE PROVIDED GIVING LIGHT VALUE OF ONE FOOT CANDLE AT THE FLOOR LEVEL.

FIRE DEPARTMENT NOTES

1. CONTRACTOR SHALL SUBMIT SPRINKLER PLANS AND OBTAIN APPROVAL PRIOR TO INSTALLATION.
2. CONTRACTOR SHALL SUBMIT FIRE ALARM PLANS AND OBTAIN APPROVAL PRIOR TO INSTALLATION.

SEISMIC STRUCTURAL SEPARATION CALCULATION

STRUCTURES SEPARATED FROM ADJACENT STRUCTURES:
AT LEAST 1" FOR EACH 50 FEET OF HEIGHT AND A MINIMUM OF 1".
PROPOSED BUILDING HEIGHT = 145.0'
NEW BUILDING STRUCTURE SEPARATION REQUIRED = 145.0'/50' = 2.9'
NEW BUILDING STRUCTURE SEPARATION PROPOSED = 3" > 2.9" (COMPLIES)

PROPOSED BUILDING SEISMIC EVALUATION

STRUCTURAL OCCUPANCY/RISK CATEGORY: II
SEISMIC DESIGN CATEGORY: B

GENERAL CODE COMPLIANCE NOTES

1. **CODE COMPLIANCE:** ALL WORK SHALL BE DONE AND PERFORMED ACCORDING TO THE RULES, REGULATIONS, AND REQUIREMENTS OF THE NYC BUILDING CODE.
2. **PROPERTY MAINTENANCE**: THE PROPERTY OWNER IS RESPONSIBLE FOR THE ONGOING SAFETY AND UPKEEP OF THE BUILDING AND ITS FACILITIES AS OUTLINED IN ARTICLES 301 THROUGH 304 OF THE NYC BUILDING CODE.
3. **NOTIFICATION**: PROVIDE WRITTEN NOTICE TO THE COMMISSIONER AT LEAST 24 BUT NO MORE THAN 48 HOURS BEFORE COMMENCING WORK (BC 3304.3.1). NOTIFY ADJOINING LOT OWNERS AFFECTED BY FOUNDATION, EARTHWORK, OR DEMOLITION WORK AT LEAST TEN DAYS PRIOR TO STARTING (BC 3304.3.2).
4. **LICENSED CONTRACTOR**: ALL CONSTRUCTION MUST BE PERFORMED BY A LICENSED CONTRACTOR. PERMITS MUST BE OBTAINED FROM THE APPROPRIATE NYC DEPARTMENT OF BUILDINGS BOROUGH OFFICE.
5. **INSURANCE AND PERMITS**: BEFORE STARTING WORK, THE CONTRACTOR MUST FILE ALL REQUIRED INSURANCE CERTIFICATES WITH THE DEPARTMENT OF BUILDINGS AND SECURE ALL NECESSARY PERMITS, LICENSES, AND FEES.
6. **WORK OVERSIGHT**: THE CONTRACTOR IS RESPONSIBLE FOR DIRECTING AND SUPERVISING THE CONSTRUCTION WORK, INCLUDING MANAGING METHODS, TECHNIQUES, SEQUENCES, AND COORDINATION AMONG TRADES.
7. **SITE FAMILIARIZATION**: THE CONTRACTOR MUST VISIT THE SITE TO ASSESS POTENTIAL CONSTRUCTION CHALLENGES.
8. **VERIFICATION OF CONDITIONS**: VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS ON-SITE BEFORE STARTING WORK. REPORT ANY DISCREPANCIES BETWEEN DRAWINGS AND ACTUAL CONDITIONS TO THE ARCHITECT.
9. **PUBLIC AND WORKER SAFETY**: ENSURE SAFETY FOR THE PUBLIC AND CONSTRUCTION WORKERS. PROVIDE BARRIERS, MAINTAIN CLEAR FIRE EXITS, AND BARRICADE ANY UNSAFE CONDITIONS.
10. **PROTECTION AND REPAIRS**: PROTECT EXISTING CONSTRUCTION AND EQUIPMENT. REPAIR OR REPLACE ANY DAMAGE CAUSED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.
11. **DEBRIS MANAGEMENT**: CLEAN UP CONSTRUCTION DEBRIS DAILY AND DISPOSE OF MATERIALS LEGALLY OFF-SITE. ON-SITE STORAGE OR BURIAL OF DEBRIS IS NOT PERMITTED.
12. **WORK LAYOUT**: LAYOUT WORK AND PROVIDE NECESSARY DIMENSIONS FOR OTHER TRADES (PLUMBING, ELECTRICAL, ETC.).
13. **SUBCONTRACTOR COMPLIANCE**: PLUMBING, ELECTRICAL, AND OTHER SUBCONTRACTOR WORK MUST BE PERFORMED BY LICENSED PROFESSIONALS AND MUST COMPLY WITH NYC CODES. SUBCONTRACTORS ARE RESPONSIBLE FOR ARRANGING INSPECTIONS AND OBTAINING SIGN-OFFS.
14. **DESIGN DEVIATIONS**: NO DEVIATIONS FROM DESIGN DRAWINGS ARE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE ARCHITECT.
15. **DIMENSIONAL ACCURACY**: CHECK AND VERIFY ALL DIMENSIONS, NOTES, AND WORK ON-SITE BEFORE STARTING. REPORT ANY DISCREPANCIES TO THE ARCHITECT AND RELY ONLY ON WRITTEN DIMENSIONS.
16. **UNSPECIFIED ITEMS**: IF DRAWINGS AND NOTES DO NOT ADDRESS SPECIFIC ITEMS, CONSULT THE GENERAL CONTRACTOR FOR GUIDANCE. INCLUDE A CONTINGENCY FACTOR TO ENSURE A COMPLETE SYSTEM IF NO CONSULTATION IS MADE.
17. **SITE REPAIRS**: REPAIR OR REPLACE ANY DAMAGED SIDEWALKS, CURBS, OR ROADWAYS AS DIRECTED BY RELEVANT NYC AGENCIES.
18. **PLAN APPROVAL**: ALL PLANS MUST BE REVIEWED, COMMENTED ON, AND APPROVED BY THE BUILDING DEPARTMENT AND OTHER CITY AGENCIES BEFORE CONSTRUCTION BEGINS.
19. **ARCHITECT'S ROLE**: THE ARCHITECT OF RECORD IS NOT RESPONSIBLE FOR SUPERVISING CONSTRUCTION. SITE VISITS AND REPORTS BY THE ARCHITECT ARE FOR PROGRESS DOCUMENTATION AND GENERAL CONTRACTOR USE ONLY.
20. **ADDITIONAL INSTRUCTIONS**: THE ARCHITECT MAY ISSUE FURTHER DRAWINGS, DETAILS, OR INSTRUCTIONS RELATED TO DESIGN VARIATIONS, OMISSIONS, OR SUBSTITUTIONS. THE CONTRACTOR MUST CORRECT ANY DEFECTS OR FAULTS AT THEIR OWN COST.
21. **CERTIFIED DRAWINGS**: ELEVATOR OPENINGS MUST BE CERTIFIED BY THE ELEVATOR SUBCONTRACTOR BEFORE FORMING. REQUIRED MODIFICATIONS MUST BE APPROVED BY THE ARCHITECT BEFORE PROCEEDING.
22. **CONSULTATION**: CONSULT THE ARCHITECT IF DIMENSIONS, DETAILS, OR DESIGN INTENT ARE UNCLEAR.
23. **COMPLIANCE**: ALL CONSTRUCTION MUST COMPLY WITH FEDERAL, STATE, AND LOCAL CODES, ORDINANCES, RULES, AND REGULATIONS REGARDING LABOR AND MATERIALS.
24. **CONTRACTOR ACCOUNTABILITY**: EACH CONTRACTOR IS RESPONSIBLE FOR THEIR WORK AND MUST REPORT DISCREPANCIES IN PLANS OR DETAILS TO THE ARCHITECT.
25. **MATERIAL STANDARDS**: MATERIALS, ASSEMBLIES, AND CONSTRUCTION METHODS MUST MEET NYC BUILDING CODE REQUIREMENTS.
26. **INSPECTION REPORTS**: MATERIALS AND METHODS REGULATED BY THE CODE BUT NOT LISTED MUST BE SUBJECT TO INSPECTION. SIGNED COPIES OF ALL TEST AND INSPECTION REPORTS MUST BE FILED THROUGH THE ARCHITECT WITH THE DEPARTMENT OF BUILDINGS.
27. **BORING DIAGRAM**: FILE A BORING DIAGRAM BEFORE STARTING CONSTRUCTION, AS PER BC 1802.
28. **PERMIT POSTING**: PERMITS MUST BE POSTED IN A VISIBLE LOCATION FOR PUBLIC INSPECTION THROUGHOUT THE DURATION OF THE WORK AND UNTIL THE PERMIT EXPIRES.
29. **FIRE FIGHTING EQUIPMENT**: PROVIDE FIRE FIGHTING EQUIPMENT AS REQUIRED BY THE FIRE DEPARTMENT.
30. **EXIT ACCESSIBILITY**: ENSURE ALL EXITS REMAIN ACCESSIBLE AND UNOBSTRUCTED, ARE INTERNALLY ILLUMINATED, AND ARE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
31. **EXIT ILLUMINATION**: MAINTAIN AT LEAST 2 FOOT CANDLES OF ILLUMINATION AT THE FLOOR LEVEL IN EXITS AT ALL TIMES.

SMOKE DETECTING DEVICES NOTES

1. **INSTALLATION STANDARDS**: SMOKE AND CARBON MONOXIDE DETECTORS MUST BE INSTALLED PER THE HOUSING MAINTENANCE CODE, MULTIPLE DWELLING LAW, NYC BUILDING CODE, AND NYC ELECTRICAL CODE.
2. **DETECTOR REQUIREMENTS**: EACH DWELLING UNIT MUST HAVE AN APPROVED CARBON MONOXIDE AND SMOKE DETECTOR DEVICE, POWERED DIRECTLY FROM THE BUILDING'S WIRING WITH NO SWITCHES IN THE CIRCUIT (BC 28-908.7.1.1).
3. **COMBINED DETECTORS**: COMBINED SMOKE AND CARBON MONOXIDE DETECTORS ARE ACCEPTABLE IF THEY MEET THE REQUIREMENTS OF THE ADMINISTRATIVE CODE AND APPLICABLE RULES.
4. **DETECTOR PLACEMENT**: INSTALL DETECTORS WITHIN 15 FEET OF SLEEPING ROOM ENTRANCES, WALL OR CEILING MOUNTED, AND INDICATED ON PLANS AS PER NFPA #78/80.
5. **MAINTENANCE AND TESTING**: MAINTAIN AND TEST CARBON MONOXIDE DETECTION SYSTEMS ACCORDING TO ARTICLE 103 OF CHAPTER 1 OF THE GENERAL ADMINISTRATIVE PROVISIONS OF THE 2014 NYC BC, INCLUDING SYSTEMS INTERCONNECTED WITH A FIRE ALARM OR MONITORED BY A CENTRAL STATION.

ACCESSIBILITY

BUILDINGS AND FACILITIES SHALL BE DESIGNED AND CONSTRUCTED TO BE ACCESSIBLE IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE 2022 NEW YORK CITY BUILDING CODE AND ICC/ANSI A117.1-2009 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES, UNIFORM FEDERAL ACCESSIBILITY STANDARDS FOR ACCESSIBLE DESIGN AND HUD FAIR HOUSING ACT PUBLISHED ON MARCH 6, 1991.

SAFETY DURING CONSTRUCTION

ALL CONSTRUCTION SHALL CONFORM TO THE RULES AND REGULATIONS OF THE 2022 NEW YORK CITY BUILDING CODE.

ENERGY NOTES

ALL BUILDING MECHANICAL, SERVICE WATER HEATING AND ELECTRICAL SYSTEMS AND ASSOCIATED CONTROLS SHALL BE COMMISSIONED, IN ACCORDANCE WITH SECTION C408 OF THE 2020 NYC ECC.

DATUM NOTE

UNLESS OTHERWISE NOTED, ELEVATIONS INDICATED IN THESE DRAWINGS REFER TO NAVD 88 DATUM

OTHER AGENCY REQUIREMENTS

GENERAL NOTES

1. THE BUILDING IS WITHIN 200 FT OF ANY FACILITY INFRASTRUCTURE OR PROPERTY UNDER THE JURISDICTION OF THE NEW YORK CITY TRANSIT AUTHORITY, THE METROPOLITAN TRANSPORTATION AUTHORITY OR THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY. THEREFORE, BC 3304.3.5 AND AC 28-104.10 ARE APPLICABLE.

GENERAL BUILDING DATA

ALL CONSTRUCTION SHALL CONFORM TO THE RULES AND REGULATIONS OF THE 2022 NEW YORK CITY BUILDING CODE.

ADDRESS:	62 SULLIVAN PLACE, 11225
BLOCK:	1306
TAX LOT(S):	30
ZONING LOT AREA:	38,119.00 SF
DEVELOPMENT SITE LOT AREA:	8,931.67 SF
ZONING DISTRICT:	C4-4D/R8A EQUIVALENT
ZONING MAP:	16d
NO. OF STORIES:	14 STORIES MIXED USE DEVELOPMENT (RESIDENTIAL & COMMERCIAL)
ZONING USE GROUPS:	II,VI
PRIMARY OCCUPANCY:	R-2 (MULTI-FAMILY RESIDENTIAL)
SECONDARY OCCUPANCY GROUP:	M (MERCANTILE)
PRIMARY STRUCTURAL SYSTEM:	CONCRETE (CIP)
CONSTRUCTION CLASS:	I-B
HIGH RISE BUILDING:	YES
SITE SAFETY PROJECT:	YES
FLOOD ZONE:	ZONE 'X'
LANDMARK:	NO

JOB DESCRIPTION & SCOPE OF WORK

CONSTRUCTION OF A NEW 14 STORY AFFORDABLE HOUSING BUILDING (MIH) WITH 99 UNITS, TYPE-1B CONSTRUCTION

APPLICABLE BUILDING CODE

CODE
2022 NEW YORK CITY BUILDING CODE
2022 NEW YORK CITY FIRE CODE
2022 NEW YORK CITY PLUMBING CODE
2022 NEW YORK CITY MECHANICAL CODE
2022 NEW YORK CITY FUEL GAS CODE
2022 NEW YORK CITY ENERGY CODE
2010 ADA STANDARDS
2011 NEW YORK CITY ELECTRICAL CODE
ANSI A117.1 - 2009
NYC HOUSING MAINTENANCE CODE
NYC MULTIPLE DWELLING LAW
NYC LOCAL LAW
NYC TITLE 1 RCNY
FAIR HOUSING ACT
ALL WORK IS TO COMPLY WITH CODES BELOW AND ITS APPLICBLE REFERNCE SUBCODES AND AMENDMENTS

SECTION BC 403 HIGH-RISE BUILDINGS

403.1 APPLICABILITY
HIGH-RISE BUILDINGS SHALL COMPLY WITH SECTIONS 403.2 THROUGH 403.8.

EXCEPTION: THE PROVISIONS OF SECTIONS 403.2 THROUGH 403.8 SHALL NOT APPLY TO THE FOLLOWING BUILDINGS AND STRUCTURES:

1. AIR TRAFFIC CONTROL TOWERS IN ACCORDANCE WITH SECTION 412.3.
2. BUILDINGS OCCUPIED ENTIRELY BY GROUP R-3 CLASSIFICATION.
3. OPEN PARKING GARAGES IN ACCORDANCE WITH SECTION 406.5.
4. THE PORTION OF A BUILDING CONTAINING A GROUP A-5 OCCUPANCY IN ACCORDANCE WITH SECTION 303.6.
5. SPECIAL INDUSTRIAL OCCUPANCIES IN ACCORDANCE WITH SECTION 503.1.1.
6. BUILDINGS WITH:
   6.1. A GROUP H-1 OCCUPANCY;
   6.2. A GROUP H-2 OCCUPANCY IN ACCORDANCE WITH SECTION 415.8, 415.9.2, 415.9.3 OR 426.1; OR
   6.3. A GROUP H-3 OCCUPANCY IN ACCORDANCE WITH SECTION 415.8.

403.2 CONSTRUCTION
THE CONSTRUCTION OF HIGH-RISE BUILDINGS SHALL COMPLY WITH THE PROVISIONS OF SECTIONS 403.2.1 THROUGH 403.2.4.

403.2.1 TYPES OF CONSTRUCTION
THE FOLLOWING MODIFICATIONS TO THE MINIMUM FIRE-RESISTANCE RATING OF THE BUILDING ELEMENTS IN TABLE 601 SHALL BE AS FOLLOWS:

1. HIGH RISE BUILDINGS 420 FEET (128 M) OR GREATER IN BUILDING HEIGHT SHALL BE CONSTRUCTED OF TYPE IA CONSTRUCTION.

2. FOR HIGH RISE BUILDINGS NOT GREATER THAN 420 FEET (128 M) IN BUILDING HEIGHT, AND CONSTRUCTED TO MEET THE FIRE-RESISTANCE RATING REQUIREMENTS OF TYPE IB OR IIA CONSTRUCTION, THE REQUIRED FIRE-RESISTANCE RATING OF COLUMNS SUPPORTING FLOORS SHALL BE CONSTRUCTED TO MEET TYPE IA CONSTRUCTION.

403.2.2 SEISMIC CONSIDERATIONS
FOR SEISMIC CONSIDERATIONS, SEE CHAPTER 16.

403.2.3 STRUCTURAL INTEGRITY OF INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES
FOR ALL HIGH-RISE BUILDINGS, EXIT ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES SHALL COMPLY WITH SECTIONS 403.2.3.1 THROUGH 403.2.3.4.

EXCEPTION: WHERE FIRE-RESISTANCE RATING IS NOT REQUIRED BY THIS CODE FOR THE ENCLOSURE OR PORTIONS THEREOF.

403.2.3.1 WALL ASSEMBLY
THE WALL ASSEMBLIES MAKING UP THE ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES SHALL MEET OR EXCEED SOFT BODY IMPACT CLASSIFICATION LEVEL 2 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

403.2.3.2 WALL ASSEMBLY MATERIALS
THE FACE OF THE WALL ASSEMBLIES MAKING UP THE ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES THAT ARE NOT EXPOSED TO THE INTERIOR OF THE ENCLOSURES FOR INTERIOR EXIT STAIRWAYS OR ELEVATOR HOISTWAY ENCLOSURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH ONE OF THE FOLLOWING METHODS:

1. THE WALL ASSEMBLY SHALL INCORPORATE NO FEWER THAN TWO LAYERS OF IMPACT-RESISTANT CONSTRUCTION BOARD EACH OF WHICH MEETS OR EXCEEDS HARD BODY IMPACT CLASSIFICATION LEVEL 2 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

2. THE WALL ASSEMBLY SHALL INCORPORATE NO FEWER THAN ONE LAYER OF IMPACT-RESISTANT CONSTRUCTION MATERIAL THAT MEETS OR EXCEEDS HARD BODY IMPACT CLASSIFICATION LEVEL 3 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

3. THE WALL ASSEMBLY INCORPORATES MULTIPLE LAYERS OF ANY MATERIAL, TESTED IN TANDEM, THAT MEETS OR EXCEEDS HARD BODY IMPACT CLASSIFICATION LEVEL 3 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

403.2.3.3 CONCRETE AND MASONRY WALLS
CONCRETE OR MASONRY WALLS SHALL BE DEEMED TO SATISFY THE REQUIREMENTS OF SECTIONS 403.2.3.1 AND 403.2.3.2.

403.2.3.4 OTHER WALL ASSEMBLIES
ANY OTHER WALL ASSEMBLY THAT PROVIDES IMPACT RESISTANCE EQUIVALENT TO THAT REQUIRED BY SECTIONS 403.2.3.1 AND 403.2.3.2 FOR HARD BODY IMPACT CLASSIFICATION LEVEL 3, AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M, SHALL BE PERMITTED.

403.2.4 SPRAYED FIRE-RESISTANT MATERIALS (SFRM)
THE BOND STRENGTH OF THE SFRM INSTALLED THROUGHOUT THE BUILDING SHALL BE IN ACCORDANCE WITH TABLE 403.2.4.

UP TO 420 FEET - 430 PSF
GREATER THAN 420 FEET - 1,000 PSF

FOR SI: 1 FOOT = 304.8 MM, 1 POUND PER SQUARE FOOT (PSF) = 0.0479 KW/M2.
A. ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS.

403.3 AUTOMATIC SPRINKLER SYSTEM
BUILDINGS AND STRUCTURES SHALL BE EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 AND A SECONDARY WATER SUPPLY WHERE REQUIRED BY SECTION 403.3.3.

403.3.1 NUMBER OF SPRINKLER RISERS AND SYSTEM DESIGN
EACH SPRINKLER SYSTEM ZONE IN BUILDINGS THAT ARE MORE THAN 300 FEET (91 440 MM) IN BUILDING HEIGHT SHALL BE SUPPLIED BY NO FEWER THAN TWO RISERS. EACH RISER SHALL SUPPLY SPRINKLERS ON ALTERNATE FLOORS. IF MORE THAN TWO RISERS ARE PROVIDED FOR A ZONE, SPRINKLERS ON ADJACENT FLOORS SHALL NOT BE SUPPLIED FROM THE SAME RISER.

403.3.1.1 RISER LOCATION
SPRINKLER RISERS SHALL BE PLACED IN INTERIOR EXIT STAIRWAYS AND RAMPS THAT ARE REMOTELY LOCATED IN ACCORDANCE WITH SECTION 1007.1.

403.3.2 WATER SUPPLY TO REQUIRED FIRE PUMPS
REQUIRED FIRE PUMPS SHALL BE PROVIDED WITH WATER SUPPLIES IN ACCORDANCE WITH SECTION 905.2 AND NFPA 14 AS MODIFIED BY APPENDIX Q OF THIS CODE.

403.3.3 SECONDARY ON-SITE WATER SUPPLY
A SECONDARY ON-SITE WATER SUPPLY EQUAL TO THE HYDRAULICALLY CALCULATED SPRINKLER DEMAND, INCLUDING THE HOSE STREAM REQUIREMENT, SHALL BE PROVIDED FOR HIGH-RISE BUILDINGS IN SEISMIC DESIGN CATEGORY C OR D AS DETERMINED BY THIS CODE, AND IN ANY HIGH-RISE BUILDING WITH OCCUPIED FLOORS LOCATED MORE THAN 500 FEET (152 M) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS. THE SECONDARY ON-SITE WATER SUPPLY SHALL HAVE A DURATION OF NOT LESS THAN 30 MINUTES AS DETERMINED BY THE OCCUPANCY HAZARD CLASSIFICATION IN ACCORDANCE WITH NFPA 13 AS MODIFIED BY APPENDIX Q OF THIS CODE.

403.3.4 FIRE PUMP ROOM
FIRE PUMPS SHALL BE LOCATED IN ROOMS PROTECTED IN ACCORDANCE WITH SECTION 913.2.1.

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DURUKAN DESIGN
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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROJECT SUMMARY & BUILDING CODE COMPLIANCE

G-001A.00

Scale:	12" = 1'-0"
Date:	12/1/2025 7:15:49 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

403.4 EMERGENCY SYSTEMS
THE DETECTION, ALARM AND EMERGENCY SYSTEMS OF HIGH-RISE BUILDINGS SHALL COMPLY WITH SECTIONS 403.4.1 THROUGH 403.4.8.

403.4.1 SMOKE DETECTION
SMOKE DETECTION SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 907.2.13.1.

403.4.2 FIRE ALARMS SYSTEMS
A FIRE ALARM SYSTEM SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 907.2.13.

403.4.3 STANDPIPE SYSTEM
A HIGH-RISE BUILDING SHALL BE EQUIPPED WITH A STANDPIPE SYSTEM AS REQUIRED BY SECTION 905.3.

403.4.4 EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM
AN EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 907.5.2.2.

403.4.5 EMERGENCY RESPONDER RADIO COVERAGE
EMERGENCY RESPONDER RADIO COVERAGE SHALL BE PROVIDED IN ACCORDANCE WITH THE NEW YORK CITY FIRE CODE AND SECTION 907.2.13.2 OF THIS CODE.

403.4.6 FIRE COMMAND
A FIRE COMMAND CENTER COMPLYING WITH SECTION 911 SHALL BE PROVIDED IN A LOCATION APPROVED BY THE FIRE DEPARTMENT.

403.4.7 POST-FIRE SMOKE PURGE
A POST-FIRE SMOKE PURGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 917.

403.4.8 STANDBY AND EMERGENCY POWER
A STANDBY POWER SYSTEM COMPLYING WITH SECTION 2702 AND SECTION 3003 SHALL BE PROVIDED FOR THE STANDBY POWER LOADS SPECIFIED IN SECTION 403.4.8.3. AN EMERGENCY POWER SYSTEM COMPLYING WITH SECTION 2702 SHALL BE PROVIDED FOR THE EMERGENCY POWER LOADS SPECIFIED IN SECTION 403.4.8.4.

403.4.8.1 EQUIPMENT ROOM
IF THE STANDBY OR EMERGENCY POWER SYSTEM INCLUDES A GENERATOR SET INSIDE A BUILDING, THE SYSTEM SHALL BE LOCATED IN A SEPARATE ROOM IN ACCORDANCE WITH SECTION 2702.1.2.2.

403.4.8.2 FUEL LINE PIPING PROTECTION
FUEL LINES SUPPLYING A GENERATOR SET INSIDE A BUILDING SHALL COMPLY WITH SECTION 1305.9 OF THE NEW YORK CITY MECHANICAL CODE.

403.4.8.3 STANDBY POWER SYSTEMS
A STANDBY POWER SYSTEM COMPLYING WITH SECTION 2702 SHALL BE PROVIDED FOR STANDBY POWER LOADS SPECIFIED IN SECTIONS 403.4.8.3.1 AND 403.4.8.3.2. FUEL SOURCES FOR GENERATORS SHALL BE IN ACCORDANCE WITH SECTION 2702.1.1.

403.4.8.3.1 STANDBY POWER LOADS IN OCCUPANCIES OTHER THAN GROUP R-2
IN BUILDINGS OF ANY OCCUPANCY GROUP OTHER THAN GROUP R-2, THE FOLLOWING ARE CLASSIFIED AS STANDBY POWER LOADS:
1. POWER AND LIGHTING FOR FIRE COMMAND CENTER REQUIRED BY SECTION 403.4.6;
2. VENTILATION AND AUTOMATIC FIRE DETECTION EQUIPMENT FOR SMOKEPROOF ENCLOSURES;
3. ELEVATORS, IN ACCORDANCE WITH SECTION 3003; AND
4. STAIR PRESSURIZATION SYSTEMS WHEN PROVIDED.

403.4.8.3.2 STANDBY POWER LOADS IN GROUP R-2 OCCUPANCIES
GROUP R-2 OCCUPANCIES IN BUILDINGS GREATER THAN 125 FEET (38 100 MM) IN HEIGHT SHALL BE REQUIRED TO PROVIDE A STANDBY POWER SYSTEM TO SUPPORT THE FOLLOWING LOADS:
1. POWER AND LIGHTING FOR FIRE COMMAND CENTER REQUIRED BY SECTION 403.4.6;
2. VENTILATION AND AUTOMATIC FIRE DETECTION EQUIPMENT FOR SMOKEPROOF ENCLOSURES;
3. AT LEAST ONE ELEVATOR SERVING ALL FLOORS, OR ONE ELEVATOR PER BANK WHERE DIFFERENT BANKS SERVE DIFFERENT PORTIONS OF THE BUILDING; AND
4. STAIR PRESSURIZATION SYSTEMS WHEN PROVIDED.

403.4.8.4 EMERGENCY POWER SYSTEMS
AN EMERGENCY POWER SYSTEM COMPLYING WITH SECTION 2702 SHALL BE PROVIDED FOR EMERGENCY POWER LOADS SPECIFIED IN SECTIONS 403.4.8.4.1 AND 403.4.8.4.3. FUEL SOURCES FOR GENERATORS SHALL BE IN ACCORDANCE WITH SECTION 2702.1.1.

403.4.8.4.1 EMERGENCY POWER LOADS IN OCCUPANCIES OTHER THAN GROUP R-2
IN BUILDINGS OF ANY OCCUPANCY GROUP OTHER THAN GROUP R-2, THE FOLLOWING ARE CLASSIFIED AS EMERGENCY POWER LOADS:
1. EXIT SIGNS AND MEANS OF EGRESS ILLUMINATION REQUIRED BY CHAPTER 10;
2. ELEVATOR CAR LIGHTING;
3. EMERGENCY VOICE/ALARM COMMUNICATIONS SYSTEMS, INCLUDING FIRE DEPARTMENT IN-BUILDING AUXILIARY RADIO COMMUNICATION SYSTEMS (ARCS);
4. AUTOMATIC FIRE DETECTION SYSTEMS;
5. FIRE ALARM SYSTEMS; AND
6. ELECTRICALLY POWERED FIRE PUMPS, INCLUDING MANUAL FIRE PUMPS, AUTOMATIC FIRE PUMPS, AND SPRINKLER BOOSTER PUMPS.

403.4.8.4.2 EMERGENCY POWER LOADS IN GROUP R-2 OCCUPANCIES
GROUP R-2 OCCUPANCIES IN BUILDINGS GREATER THAN 125 FEET (38 100 MM) IN HEIGHT SHALL BE REQUIRED TO PROVIDE AN EMERGENCY POWER SYSTEM TO SUPPORT THE FOLLOWING LOADS:
1. EXIT SIGNS AND MEANS OF EGRESS ILLUMINATION REQUIRED BY CHAPTER 10;
2. EMERGENCY VOICE COMMUNICATIONS SYSTEMS, INCLUDING FIRE DEPARTMENT IN-BUILDING AUXILIARY RADIO COMMUNICATION SYSTEMS (ARCS); AND
3. ELECTRICALLY POWERED FIRE PUMPS, UNLESS ELECTRICAL POWER TO THE MOTOR IS TAKEN AHEAD OF THE MAIN FROM THE STREET SIDE OF THE HOUSE SERVICE SWITCH.

403.4.8.4.3 EMERGENCY POWER LOADS IN GROUP R-2 OCCUPANCIES 125 FEET OR LESS IN HEIGHT
GROUP R-2 OCCUPANCIES IN BUILDINGS 125 FEET (38 100 MM) OR LESS IN HEIGHT SHALL BE REQUIRED TO PROVIDE AN EMERGENCY POWER SYSTEM TO SUPPORT THE FOLLOWING LOADS:
1. EMERGENCY VOICE COMMUNICATIONS SYSTEMS IN BUILDINGS CONTAINING GROUP R-2 OCCUPANCIES IN ACCORDANCE WITH SECTION 907.5.2.2 OF THIS CODE, OR WHERE OTHERWISE PROVIDED. BATTERIES IN ACCORDANCE WITH THE NEW YORK CITY ELECTRICAL CODE ARE PERMITTED TO SERVE AS THE SECONDARY POWER SUPPLY FOR SUCH SYSTEMS.
2. FIRE DEPARTMENT IN-BUILDING AUXILIARY RADIO COMMUNICATION SYSTEMS (ARCS) IN BUILDINGS CONTAINING GROUP R-2 OCCUPANCIES IN ACCORDANCE WITH SECTION 916.3 OF THIS CODE, OR WHERE OTHERWISE PROVIDED. BATTERIES IN ACCORDANCE WITH THE NEW YORK CITY ELECTRICAL CODE ARE PERMITTED TO SERVE AS THE SECONDARY POWER SUPPLY FOR SUCH SYSTEMS.

403.5 MEANS OF EGRESS AND EVACUATION
THE MEANS OF EGRESS IN HIGH-RISE BUILDINGS SHALL COMPLY WITH SECTIONS 403.5.1 THROUGH 403.5.6.

403.5.1 REMOTENESS OF INTERIOR EXIT STAIRWAYS
REQUIRED INTERIOR EXIT STAIRWAYS SHALL BE SEPARATED BY A DISTANCE NOT LESS THAN 30 FEET (9144 MM) OR NOT LESS THAN 1/4 OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE BUILDING OR AREA TO BE SERVED, WHICHEVER IS LESS. THE DISTANCE SHALL BE MEASURED IN A STRAIGHT LINE BETWEEN THE NEAREST POINTS OF THE ENCLOSURE SURROUNDING THE INTERIOR EXIT STAIRWAYS. IN BUILDINGS WITH THREE OR MORE INTERIOR EXIT STAIRWAYS, NO FEWER THAN TWO OF THE INTERIOR EXIT STAIRWAYS SHALL COMPLY WITH THIS SECTION. STAIRS SHARING ANY COMMON WALL, FLOORS, CEILINGS, SCISSOR STAIR ASSEMBLIES, OR OTHER ENCLOSURES SHALL BE COUNTED AS ONE INTERIOR EXIT STAIRWAY.

EXCEPTION: GROUP R-2 OCCUPANCIES.

403.5.2 ADDITIONAL EXIT STAIRWAY
FOR BUILDINGS OTHER THAN GROUP R-2 THAT ARE MORE THAN 420 FEET (128 M) IN BUILDING HEIGHT, ONE ADDITIONAL EXIT STAIRWAY MEETING THE REQUIREMENTS OF SECTIONS 1011 AND 1023 SHALL BE PROVIDED IN ADDITION TO THE MINIMUM NUMBER OF EXITS REQUIRED BY SECTION 1006.3. THE TOTAL WIDTH OF ANY COMBINATION OF REMAINING EXIT STAIRWAYS WITH ONE EXIT STAIRWAY REMOVED SHALL NOT BE LESS THAN THE TOTAL WIDTH REQUIRED BY SECTION 1005.1. STAIRS SHARING ANY COMMON WALL, FLOORS, CEILINGS, SCISSOR STAIR ASSEMBLIES, OR OTHER ENCLOSURES SHALL NOT BE CONSIDERED THE ADDITIONAL EXIT STAIRWAY REQUIRED BY THIS SECTION.

EXCEPTIONS: AN ADDITIONAL EXIT STAIRWAY SHALL NOT BE REQUIRED TO BE INSTALLED IN ANY OF THE FOLLOWING INSTANCES:
1. IN BUILDINGS WHERE ALL PASSENGER ELEVATORS FOR GENERAL PUBLIC USE AND ALL OTHER ELEVATORS USED FOR OCCUPANT SELF-EVACUATION COMPLY WITH SECTIONS 3008.1 THROUGH 3008.11;
2. IN BUILDINGS WHERE ALL OF THE FOLLOWING CONDITIONS ARE MET:
2.1 THE COMMISSIONER HAS APPROVED A TIMED EGRESS ANALYSIS ESTABLISHING THE EGRESS TIME IT WOULD TAKE FOR A FULL BUILDING EVACUATION, UTILIZING THE STAIRS REQUIRED BY SECTION 1006 AND THE ADDITIONAL STAIR THAT WOULD HAVE BEEN REQUIRED PURSUANT TO SECTION 403.5.2;
2.2 THE COMMISSIONER HAS APPROVED A TIMED EGRESS ANALYSIS ESTABLISHING THE EGRESS TIME IT WOULD TAKE FOR A FULL BUILDING EVACUATION, UTILIZING THE COMBINATION OF THE STAIRS REQUIRED BY SECTION 1006 AND ELEVATORS USED FOR OCCUPANT SELF-EVACUATION AS FOLLOWS:
2.2.1 SUCH ANALYSIS NEED ONLY UTILIZE A NUMBER OF DESIGNATED ELEVATORS DESIGNED FOR OCCUPANT SELF-EVACUATION NECESSARY TO DEMONSTRATE AN EVACUATION TIME THAT IS LESS THAN THE TIME ESTABLISHED IN EXCEPTION 2.1; AND
2.2.2 EVERY BANK OF PASSENGER ELEVATORS FOR GENERAL PUBLIC USE SHALL BE SERVED BY AT LEAST ONE SUCH DESIGNATED ELEVATOR;
2.3 ALL ELEVATORS IN THE BUILDING THAT EITHER ARE PASSENGER ELEVATORS FOR GENERAL PUBLIC USE OR ARE USED FOR OCCUPANT SELF-EVACUATION SHALL COMPLY WITH SECTIONS 3008.1 THROUGH 3008.11. HOWEVER, THE STANDBY POWER GENERATING EQUIPMENT REQUIRED BY SECTION 3008.9 NEED ONLY BE SIZED TO SATISFY THE LOADS REQUIRED TO SIMULTANEOUSLY OPERATE THOSE ELEVATORS IDENTIFIED IN THE TIMED EGRESS ANALYSIS DESCRIBED IN EXCEPTION 2.2.

THE MINIMUM NUMBER OF EXITS REQUIRED BY SECTION 1006 ARE ALL AT LEAST 25 PERCENT WIDER THAN THE EXIT WIDTH REQUIRED BY CHAPTER 10. THE INCREASE IN THE STAIR WIDTH SHALL NOT BE UTILIZED IN THE TIMED EGRESS ANALYSES REQUIRED BY EXCEPTIONS 2.1 AND 2.2.

403.5.3 STAIRWAY DOOR OPERATION
OORS OPENING INTO INTERIOR STAIR ENCLOSURES SHALL NOT BE LOCKED FROM EITHER SIDE. HOWEVER, A DOOR LOCKED FROM THE STAIR SIDE MAY BE PERMITTED PROVIDED THAT SUCH DOOR IS EQUIPPED WITH AN AUTOMATIC FAIL SAFE SYSTEM FOR OPENING IN THE EVENT OF THE ACTIVATION OF ANY AUTOMATIC FIRE DETECTION SYSTEM, OR WHEN ANY ELEVATOR RECALL IS ACTIVATED, OR WHEN ANY SIGNAL IS RECEIVED FROM THE FIRE COMMAND CENTER. SUCH DOOR SHALL BE DEEMED AS OPENABLE FROM THE STAIR SIDE. STAIR REENTRY SIGNS SHALL BE POSTED THROUGHOUT THE STAIRWAY INDICATING THAT REENTRY IS PROVIDED ONLY DURING FIRE EMERGENCIES. SUCH SIGNS SHALL BE IN ACCORDANCE WITH SECTION 1031.4.2.

EXCEPTION: IN SCHOOLS CLASSIFIED AS GROUP E OCCUPANCIES THAT REQUIRE "LOCKDOWN DRILLS" AS PER SECTION 807 OF THE NEW YORK STATE EDUCATION LAW, STAIRWAY EGRESS DOORS FROM OCCUPIED SPACES ARE PERMITTED TO BE LOCKED FROM THE SIDE OPPOSITE THE EGRESS SIDE FOR THE DURATION OF THE LOCKDOWN DRILL, PROVIDED THEY ARE OPENABLE FROM THE OCCUPIED SIDE FOR EGRESS AND ARE UNLOCKED UPON DIRECTIONS FROM THE SCHOOL ADMINISTRATIVE PERSONNEL FOLLOWING THE COMPLETION OF THE LOCKDOWN DRILL.

403.5.3.1 STAIRWAY COMMUNICATION SYSTEM
A TELEPHONE OR OTHER TWO-WAY VOICE‡ COMMUNICATIONS SYSTEM CONNECTED TO AN APPROVED CONSTANTLY ATTENDED STATION SHALL BE PROVIDED AT NOT LESS THAN EVERY FIFTH FLOOR IN EACH STAIRWAY WHERE THE DOORS TO THE STAIRWAY ARE LOCKED IN ACCORDANCE WITH SECTION 403.5.3.

403.5.4 SMOKEPROOF ENCLOSURES
EVERY REQUIRED INTERIOR EXIT STAIRWAY SERVING FLOORS MORE THAN 75 FEET (22 860 MM) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS SHALL COMPLY WITH SECTIONS 909.20 AND 1023.11.

EXCEPTION: SMOKEPROOF ENCLOSURES ARE NOT REQUIRED IN OCCUPANCY GROUP R-2 UNLESS PROVIDED PURSUANT TO EXCEPTION 2 OF SECTION 917.1..

403.5.5 LUMINOUS EGRESS PATH MARKINGS
LUMINOUS EGRESS PATH MARKINGS SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 1025 AND APPENDIX S.

EXCEPTION: EGRESS PATHS SERVING GROUP R-2.

403.5.6 EMERGENCY ESCAPE AND RESCUE
EMERGENCY ESCAPE AND RESCUE OPENINGS SPECIFIED IN SECTION 1030 ARE NOT REQUIRED

403.6 ELEVATORS
ELEVATOR INSTALLATION AND OPERATION IN HIGH-RISE BUILDINGS SHALL COMPLY WITH CHAPTER 30 AND SECTIONS 403.6.1 AND 403.6.2.

403.6.1 FIRE SERVICE ACCESS ELEVATOR
IN BUILDINGS WITH AN OCCUPIED FLOOR MORE THAN 120 FEET (36 576 MM) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS, A MINIMUM OF ONE FIRE SERVICE ACCESS ELEVATOR SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 3007

403.6.2 OCCUPANT EVACUATION ELEVATORS
WHERE INSTALLED IN ACCORDANCE WITH SECTION 3008, PASSENGER ELEVATORS FOR GENERAL PUBLIC USE SHALL BE PERMITTED TO BE USED FOR OCCUPANT SELF-EVACUATION.

403.6.3 ELEVATOR LOBBIES
ELEVATOR LOBBIES SHALL BE PROVIDED IN ACCORDANCE WITH SECTIONS 3006.1.1 AND 3006.1.2.

403.7 OUTDOOR AIR INTAKES
FOR HIGH-RISE BUILDINGS, OUTDOOR AIR INTAKES SERVING SPACES ABOVE THE SECOND STORY AND SERVING SPACES GREATER THAN 10,000 SQUARE FEET (929 M2) OF FLOOR AREA SHALL BE LOCATED IN ACCORDANCE WITH SECTION 401.5 OF THE NEW YORK CITY MECHANICAL CODE.

EXCEPTION: GROUP R-2 OCCUPANCY.

403.8 OPEN WEB STEEL JOISTS
THE USE OF OPEN WEB STEEL JOISTS SHALL BE PROHIBITED IN HIGH-RISE BUILDINGS UNTIL THE COMMISSIONER PROMULGATES RULES ESTABLISHING MINIMUM ACCEPTABLE FIREPROOFING METHODS.

TABLE 504.3a
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION									
	SEE FOOTNOTES	TYPE I		TYPE II		TYPE III		TYPE IVi	TYPE V	
		A	Bi	A	B	A	B	HT	A	B
A-1	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-2	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-3	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-4	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-5	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
B	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
E	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
F-1	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
F-2	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
H-1	S	UL	160	65	55	65	55	65	50	NP
H-2f	S	UL	160	65	55	65	55	65	50	40
H-3f	S	UL	160	65	55	65	55	65	50	40
H-4	S	UL	180	85	75	85	75	85	70	60
H-5	S	UL	160	65	55	65	55	65	50	40
I-1	S13D	60	60	60	NP	60	55	60	NP	NP
	S13R	60	60	60	NP	60	55	60	NP	NP
	S	UL	420	85	NP	85	75	85	NP	NP
I-2	S	UL	180	85	55	65	55	65	50	NP
I-3	S	UL	180	85	75	85	75	85	70	NP
I-4	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
M	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
R-1	S13R	60	60	60	NP	60	NP	60	NP	NP
	S	UL	420	85	NP	85	NP	85	NP	NP
R-2	S13R	60	60	60	NP	60	60	60	NP	NP
	S	UL	420	85	NP	85	75	85	NP	NP
R-3	NSb,c	UL	160	65	55	65	55	65	50g,h	40g
	S13D	60	60	60	60	60	55	60	50g,h	40g
	S13R	60	60	60	60	60	60	60	60g,h	60g
	S	UL	420	85	75	85	75	85	70g,h	60g
S-1	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
S-2d,e	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
Ue	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60

	NOT PERMITTED IN FIRE DISTRICT		NOT PERMITTED IN FIRE DISTRICT WITHOUT SPRINKLERS

X = Number of stories in nonsprinklered 1- & 2-family buildings shall be limited by Section 903.2.8

Note: UL = Unlimited; NP = Not permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See the following sections for general exceptions to Table 504.4:
1. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
2. Section 506.3, Allowable area increase due to frontage.
3. Section 507, Unlimited area building.
b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
c. The NS value is only for use in buildings not required by this code to be equipped throughout with an automatic sprinkler system.
d. For open parking structures, see Section 406.5.
e. For private garages, see Section 406.3.
f. See Section 415.8 for limitations.
g. See Exception 9 of Section D105.1 for allowances of Type VA and VB construction for R-3 occupancies.
h. See Exception 12 of Section D105.1 for allowances of Type VA construction and height limitations for R-3 occupancies in Lower Density Growth Management Areas.
i. Type IV construction utilizing cross-laminated timber or structural composite lumber shall be sprinklered where required by Section 903.2.13.

TABLE 504.3
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
S-2[d,a]	NS[b,c]	UL	160	65	55	65	55	65	50	40

GENERAL BUILDING HEIGHTS AND AREAS; SEPARATION OF OCCUPANCIES

	S	UL	420	85	75	85	75	85	70	60
U[e]	NS[b,c]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60

= Not permitted in Fire District
= Not permitted in Fire District without sprinklers

For SI: 1 foot 304.8 mm.
Note: UL-Unlimited; NP-Not permitted; NS-Buildings not equipped throughout with an automatic sprinkler system; S-Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R - Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.
a. See the following sections for general exceptions to Table 504.3:
1. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
2. Section 506.3, Allowable area increase due to frontage.
3. Section 507, Unlimited area building
b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
c. The NS value is only for use in buildings not required by this code to be equipped throughout with an automatic sprinkler system.
d. For open parking structures, see Section 406.5.
e. For private garages, see Section 406.3.
f. See Section 415.8 for limitations.
g. See Exception 9 of Section D105.1 for allowances of Type VA and VB construction for R-3 occupancies.
h. See Exception 12 of Section D105.1 for allowances of Type VA construction and height limitations for R-3 occupancies in Lower Density Growth Management Areas.
i. See Section 403.2.1 for additional requirements for high-rise buildings.
j. Type IV construction utilizing cross-laminated timber or structural composite lumber shall be sprinklered where required by Section 903.2.13.

19. TABLE 508.4 OF 2022 NYC BC CHAPTER 5 GENERAL BUILDING HEIGHTS AND AREAS; SEPARATION OF OCCUPANCIES, SECTION BC 508 MIXED USE AND OCCUPANCY.

TABLE 508
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

Occupancy	A, E		I-1, I-3, 1-4		I-2		R[a]		F-2, S-2[b], U		B		F-1		M		S-1		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A, E	N	N	1	2	2	NP	1	2	N	1	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
I-1, I-3, 1-4	--	--	N	N	2	NP	1	NP	1	2	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
I-2	--	--	--	--	N	N	2	NP	2	NP	2	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
R[a]	--	--	--	--	--	--	N	N	1[c]	2[c]	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2[b], U	--	--	--	--	--	--	--	--	N	N	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
B	--	--	--	--	--	--	--	--	--	--	N	N	2	3	1	2	2	3	NP	NP	2	3	1	2	1	NP
F-1	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	2	3	NP	NP	2	3	1	2	1	NP
M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	NP	NP	2	3	1	2	1	NP
S-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	NP	NP	2	3	1	2	1	NP
H-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	NP	NP	NP	NP	NP	NP
H-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	1	NP	1	NP
H-3, H-4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1[d]	NP	1	NP
H-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement
NP = Not permitted
a. See Section 420
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.1.4.
d. Separation is not required between occupancies of the same classification.

MULTIPLE DWELLING LAW

GENERAL PROVISIONS

1. LIGHTING AND VENTILATION OF ROOMS SHALL BE AS PER SECTION 30, MDL.
2. SIZE OF ROOMS SHALL BE AS PER SECTION 31, MDL.
3. ALCOVES SHALL BE AS PER SECTION 32, MDL.
4. COOKING SPACES (KITCHENS & KITCHENETTES) SHALL BE AS PER SECTION 33, MDL.
5. BUILDING ENTRANCE DOORS AND LIGHTS SHALL BE AS PER SECTION 35, MDL.
6. MAIL RECEPTACLES SHALL BE AS PER SECTION 57, MDL.
7. ALL INCOMBUSTIBLE MATERIALS SHALL BE AS PER SECTION 58, MDL.
8. PARAPETS AND GUARD RAILINGS SHALL BE AS PER SECTION 62, MDL.
9. SUB-CURB USES SHALL BE AS PER SECTION 63, MDL.
10. LIGHTING, GAS METERS, GAS AND OIL APPLIANCES SHALL BE AS PER SECTION 64, MDL.
11. BOILER ROOMS SHALL BE AS PER SECTION 65, MDL.
12. WATER-CLOSET AND BATH ACCOMMODATIONS SHALL BE AS PER SECTION 76, MDL.
13. PLUMBING AND DRAINAGE SHALL BE AS PER SECTION 77, MDL.
14. REPAIRS SHALL BE MADE AS PER SECTION 78, MDL.
15. HEAT SHALL BE PROVIDED AS PER SECTION 79, MDL.
16. CLEANLINESS SHALL BE AS PER SECTION 80, MDL.
17. RECEPTACLES FOR WASTE MATTER SHALL BE AS PER SECTION 81, MDL.
18. PRIVACY SHALL BE AS PER SECTION 82, MDL.
19. JANITORIAL SERVICES SHALL BE AS PER SECTION 83, MDL.
20. CONSTRUCTION STANDARDS FOR THE CONTROL OF NOISE SHALL BE AS ER SECTION 84, MDL.

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

OCCUPANCY	A, E		I-1a, I-3, I-4		I-2		Ra		F-2, S-2b, U		Be		F-1		M		S-1		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A, E	N	N	1	2	2	NP	1	2	Nf	1f	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
I-1a, I-3, I-4	--	--	N	N	2	NP	1	NP	1	2	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
I-2	--	--	--	--	N	N	2	NP	2	NP	2	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
Ra	--	--	--	--	--	--	N	N	1c	2c	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2b, U	--	--	--	--	--	--	--	--	N	N	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
Be	--	--	--	--	--	--	--	--	--	--	N	N	2	3	1	2	2	3	NP	NP	2	3	1	2	1	NP
F-1	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	2	3	NP	NP	2	3	1	2	1	NP
M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	NP	NP	2	3	1	2	1	NP
S-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	NP	NP	2	3	1	2	1	NP
H-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	NP	NP	NP	NP	NP	NP
H-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	1	NP	1	NP
H-3, H-4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1d	NP	1	NP
H-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.
a. See Section 420.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.3.4.
d. Separation is not required between occupancies of the same classification.
e. See Section 422.2 for ambulatory care facilities.
f. A commercial kitchen in Group F-2 that does not comply with Section 508.1, Exception 5 shall be separated from adjoining dining spaces with 1-hour fire separation where the dining spaces are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, and separated with 2-hour fire separation where the dining spaces is not equipped throughout with an automatic sprinkler system.

OCCUPANCY FIRE-RESISTANCE RATINGS NOTES

20. TABLE 601 OF 2022 NYC BC CHAPTER 6 TYPES OF CONSTRUCTION, SECTION BC 601 GENERAL.

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame (see section 202)	3[a]	2[a,i]	1[i]	0	1	0	HT	1	0
Bearing walls Exterior Interior	3 3[a]	2 2[a]	1 1	0 0	2 1	2 0	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior	0	0	0	0	0	0	See Section 602.4.6.	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1[1/2b,c]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.
a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
b. 1. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members within any portion of the roof, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant- treated wood members shall be allowed to be used for such unprotected members.
2. Except in Group F occupancies subject to regulation under Sections 264(1) and 264(2) of the New York State Labor Law, and in Group I-1, R-1, and R-2 occupancies, in Types I and II construction, fire-retardant-treated wood shall be allowed in buildings including girders and trusses as part of the roof construction when the building is:
i. Type II construction of any height; or
ii. Type I construction two stories or less; or when over two stories, the vertical distance from the upper floor to the roof is 20 feet or more. c. Except in Group F occupancies subject to regulation under Sections 264(1) and 264(2) of the New York State Labor Law, and in Group I-1, R-1 and R-2 occupancies, heavy timber shall be allowed where a 1- hour or less fire-resistance rating is required.
d. Not less than the fire-resistance rating required by other sections of this code.
e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
f. Not less than the fire-resistance rating as referenced in Section 704.10.
g. See note g of Table 602.
h. See Section 711.2.4 for additional requirements.
i. Type V construction is not permitted inside fire districts except as provided for in Section D105.1 of Appendix D.
j. See Section 403.2.1 for additional requirements for high-rise buildings and fire-resistance rating of columns in such buildings.

21. TABLE 602 OF 2022 NYC BC CHAPTER 6 TYPES OF CONSTRUCTION, SECTION BC 602 CONSTRUCTION CLASSIFICATION.

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H[f]	OCCUPANCY GROUP F-1, M, S-1[g,i] [a,e,g,h,i]	OCCUPANCY GROUP A, B, E, F-2, I, R, S-2, U[b]
X<5[c]	All	3	2	1
5 < x < 10	IA	3	2	1
	Others	2	1	1
10 ≤ X < 30	IA,IB	2	1	1[d]
	IIB,VB	1	0	0
	Others	1	1	1[d]
X>30	All	0	0	0

For SI: 1 foot 304.8 mm.
a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
b. Group U when used as accessory to Group R-3 shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet or more for free standing private garages in compliance with Section 406.1, and when the separation distance is 3 feet or more for other freestanding Group U buildings. For free standing private garages where the fire separation distance is less than 5 feet, refer to Section 406.3.4 for required fire-resistance rating for exterior walls.
c. See Section 706.1.1 for party walls.
d. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
e. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
f. For special requirements for Group H occupancies, see Section 415.6.
g. Inside the fire district, exterior load-bearing walls of Type II buildings shall have a fire-resistance rating not less than prescribed below:
X<5 2 hours
5 < x <10 2 hours
10 <X<30 1 hour
X230 As per Table 602.
h. Inside the fire district, exterior nonload-bearing walls of Type II buildings shall have a fire-resistance rating not less than prescribed below: X<5 As per Table 602
5≤ X ≤10 As per Table 602
10<X<30 X230 1 hour
X>30 As per Table 602.
i. For special requirements for Group S aircraft hangars, see Section 412.4.1.
j. Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE Vi	
	A	B	A	B	A	B	HT	A	B
Primary structural framef (see Section 202)	3a	2a, j	1j	0	1	0	HT	1	0
Bearing walls									
Exteriore,f,g	3	2	1	0	2	2	2	1	0
Interior	3a	2a	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interiord	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor constructionh and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	11/2b,c	1b,c	1b,c	0c	1b,c	0	HT	1b,c	0

FOR SI: 1 FOOT = 304.8 MM.
A. ROOF SUPPORTS: FIRE-RESISTANCE RATINGS OF PRIMARY STRUCTURAL FRAME AND BEARING WALLS ARE PERMITTED TO BE REDUCED BY 1 HOUR WHERE SUPPORTING A ROOF ONLY.
B. 1.EXCEPT IN GROUP F-1, H, M AND S-1 OCCUPANCIES, FIRE PROTECTION OF STRUCTURAL MEMBERS IN ROOF CONSTRUCTION SHALL NOT BE REQUIRED, INCLUDING PROTECTION OF PRIMARY STRUCTURAL FRAME MEMBERS WITHIN ANY PORTION OF THE ROOF, ROOF FRAMING AND DECKING WHERE EVERY PART OF THE ROOF CONSTRUCTION IS 20 FEET OR MORE ABOVE ANY FLOOR IMMEDIATELY BELOW. FIRE-RETARDANT- TREATED WOOD MEMBERS SHALL BE ALLOWED TO BE USED FOR SUCH UNPROTECTED MEMBERS.
2. EXCEPT IN GROUP F OCCUPANCIES SUBJECT TO REGULATION UNDER SECTIONS 264(1) AND 264(2) OF THE NEW YORK STATE LABOR LAW, AND IN GROUP I-1, R-1, AND R-2 OCCUPANCIES, IN TYPES I AND II CONSTRUCTION, FIRE-RETARDANT—TREATED WOOD SHALL BE ALLOWED IN BUILDINGS INCLUDING GIRDERS AND TRUSSES AS PART OF THE ROOF CONSTRUCTION WHEN THE BUILDING IS:
i.TYPE II CONSTRUCTION OF ANY HEIGHT; OR
ii. TYPE I CONSTRUCTION TWO STORIES OR LESS; OR WHEN OVER TWO STORIES, THE VERTICAL DISTANCE FROM THE UPPER FLOOR TO THE ROOF IS 20 FEET OR MORE.
C. EXCEPT IN GROUP F OCCUPANCIES SUBJECT TO REGULATION UNDER SECTIONS 264(1) AND 264(2) OF THE NEW YORK STATE LABOR LAW, AND IN GROUP I-1, R-1 AND R-2 OCCUPANCIES, HEAVY TIMBER SHALL BE ALLOWED WHERE A 1-HOUR OR LESS FIRE-RESISTANCE RATING IS REQUIRED.
D. NOT LESS THAN THE FIRE-RESISTANCE RATING REQUIRED BY OTHER SECTIONS OF THIS CODE.
E. NOT LESS THAN THE FIRE-RESISTANCE RATING BASED ON FIRE SEPARATION DISTANCE (SEE TABLE 602).
F. NOT LESS THAN THE FIRE-RESISTANCE RATING AS REFERENCED IN SECTION 704.10.
G. SEE NOTE G OF TABLE 602.
H. SEE SECTION 711.2.4 FOR ADDITIONAL REQUIREMENTS.
I. TYPE V CONSTRUCTION IS NOT PERMITTED INSIDE FIRE DISTRICTS EXCEPT AS PROVIDED FOR IN SECTION D105.1 OF APPENDIX D.
J. SEE SECTION 403.2.1 FOR ADDITIONAL REQUIREMENTS FOR HIGH-RISE BUILDINGS AND FIRE-RESISTANCE RATING OF COLUMNS IN SUCH BUILDINGS.FOR SI: 1 FOOT = 304.8 MM.

HOUSING MAINTENANCE CODE

1. OWNER SHALL FILE REGISTRATION STATEMENT AS PER §27–2097 HMC.
2. OWNER SHALL PROVIDE A SIGN IDENTIFYING OWNER, MANAGEMENT AND SUPERINTENDENT AS PER § 27–2104 HMC.
3. FLOOR SIGNS SHALL BE PLACED AND MAINTAINED ON EACH FLOOR LEVEL AS PER §27–2048 HMC.
4. ALL APARTMENT ENTRANCE DOORS SHALL BE A MINIMUM 3/4 HOUR RATED, SELF CLOSING WITH PEEPHOLES AS PER §27–2041 HMC AND LOCKS AS PER §27–2043 HMC.
5. MIRRORS IN ELEVATORS SHALL BE AS PER §27–2042 HMC.
6. THE BUILDING'S HEATING AND HOT WATER SUPPLY SHALL COMPLY WITH §27–2028 THROUGH § 27–2033 HMC.
7. LIGHTING SHALL BE PROVIDED AS PER §27–2037 THROUGH §27–2040 AND C26-605AC, C26-1203AC AND SECTION 26-35 MDL.
8. RECEPTACLES AND COLLECTION FOR WASTE MATTER SHALL BE PROVIDED AS PER §27–2021 AND §27–2022 HMC.
9. U.S. MAIL SERVICE SHALL BE PROVIDED AS PER §27–2047 HMC.
10. THE BUILDING STREET NUMBER SHALL BE DISPLAYED AS §27–2049 HMC.
11. JANITORIAL SERVICES SHALL BE PROVIDED AS PER §27–2053 AND §27–2054 HMC.
12. OWNER SHALL PAINT ALL PUBLIC PARTS OF A MULTIPLE DWELLING AS PER §27–2013 HMC.
13. INTERIOR OF DWELLING UNITS SHALL BE CLEANED §27–2012 HMC
14. DUTIES OF OWNER SHALL BE AS PER §27–2005 HMC.
15. DUTIES OF TENANTS SHALL BE AS PER §27–2006 AND §27–2007 HMC.
16. OWNER'S RIGHT OF ACCESS SHALL BE AS PER §27–2008 HMC.
17. NOTICE AND REPORTING OF BEDBUG INFESTATION SHALL BE AS PER §27–2018
18. WATER SHALL BE SUPPLIED AS PER §27–2024 AND §27–2025 HMC.
19. THE PLUMBING AND DRAINAGE SYSTEM SHALL BE MAINTAINED AS PER §27–2026 HMC.
20. DRAINAGE OF ROOFS AND COURT YARDS SHALL BE AS PER §27–2027 HMC.
21. NATURAL LIGHT AND VENTILATION SHALL BE PROVIDED AS PER §27–2057 HMC FOR MULTIPLE DWELLINGS.
22. SANITARY FACILITIES IN MULTIPLE DWELLINGS AND LIGHT AND VENTILATION FOR TOILET COMPARTMENTS SHALL BE AS PER §27–2064, §27–2065, §27–2066 AND §27–2067 HMC.
23. KITCHENS AND KITCHENETTES SHALL BE PROVIDED WITH PROPER FACILITIES, EQUIPMENT, LIGHTING, VENTILATION AND FIRE PROTECTION AS PER §27–2070, §27–2071, AND §27–2072 HMC.
24. MINIMUM ROOM SIZES SHALL BE AS PER §27–2074 AND MAXIMUM OCCUPANCY SHALL BE AS PER §27–2075 HMC.

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) NOTES

1. EIFS SHALL BE CONSTRUCTED SUCH THAT IT MEETS THE PERFORMANCE CHARACTERISTICS REQUIRED IN ASTM E 2568.

2. THE UNDERLYING STRUCTURAL FRAMING AND SUBSTRATE SHALL BE DESIGNED AND CONSTRUCTED TO RESIST LOADS AS REQUIRED BY NUC B 2014, CHAPTER 16.

3. EIFS SHALL BE DESIGNED AND CONSTRUCTED TO RESIST WIND AND RAIN IN ACCORDANCE WITH THIS THE MANUFACTURER'S APPLICATION INSTRUCTIONS.

4. EIFS WITH DRAINAGE SHALL HAVE AN AVERAGE MINIMUM DRAINAGE EFFICIENCY OF 90 PERCENT WHEN TESTED IN ACCORDANCE WITH REQUIREMENTS OF ASTM E 2273.

5. EIFS WITH DRAINAGE SHALL HAVE A WATER-RESISTIVE BARRIER COMPLYING WITH SECTION 1404.2 OR ASTM E 2570.

6. INSTALLATION OF EIFS AND EIFS WITH DRAINAGE SHALL BE IN ACCORDANCE WITH THE EIFS MANUFACTURER'S INSTRUCTIONS.

7. EIFS INSTALLATION SPECIAL INSPECTIONS SHALL COMPLY WITH THE PROVISIONS OF NYC BC 2014, CHAPTER 17.

SMOKE DETECTING DEVICES NOTES

1. SMOKE DETECTING DEVICES SHALL CONFORM TO THE 2014 NYC BC SECTION BC 907 FIRE ALARM AND DETECTION SYSTEMS. SYSTEMS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH NFPA 72 AS MODIFIED IN APPENDIX Q AND THE NEW YORK CITY ELECTRICAL CODE.

2. SMOKE DETECTORS WITHIN DWELLING UNITS ARE REQUIRED IN THE FOLLOWING AREAS AS PER SECTION 907.2.8.3: IN SLEEPING AREAS AND IN EVERY ROOM IN THE PATH OF THE MEANS OF EGRESS FROM THE SLEEPING AREA TO THE DOOR LEADING FROM THE DWELLING UNIT.

3. AS PER SECTION 907.2.11.2, REQUIRED SMOKE ALARMS SHALL RECEIVE THEIR PRIMARY POWER FROM A DEDICATED BRANCH CIRCUIT OR THE UNSWITCHED PORTION OF A BRANCH CIRCUIT ALSO USED FOR POWER AND LIGHTING, AND SHALL BE EQUIPPED WITH A BATTERY BACKUP. SMOKE ALARMS SHALL EMIT A SIGNAL WHEN THE BATTERIES ARE LOW. WIRING SHALL BE PERMANENT AND WITHOUT A DISCONNECTING SWITCH OTHER THAN AS REQUIRED FOR OVER- CURRENT PROTECTION. EXCEPTION: SMOKE ALARMS WITH INTEGRAL STROBES SHALL NOT REQUIRE BATTERY BACKUP PROVIDED THAT THE SMOKE ALARMS ARE CONNECTED TO AN EMERGENCY ELECTRICAL SOURCE.

4. ACCESSIBLE AUDIBLE AND VISIBLE ALARMS AND NOTIFICATION APPLIANCES SHALL BE INSTALLED IN ACCORDANCE WITH ICC/ANSI A117.1.

5. AS PER SECTION 901.2, FIRE PROTECTION SYSTEMS SHALL BE INSTALLED, REPAIRED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE 2014 NYC BC AND THE NEW YORK CITY FIRE CODE.

6. AS PER SECTION 901.5 ACCEPTANCE TESTS, FIRE PROTECTION SYSTEMS SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2014 NYC BC AND THE NEW YORK CITY FIRE CODE.

CARBON MONOXIDE DETECTING DEVICES NOTES

1. CARBON MONOXIDE ALARMS AND DETECTORS SHALL CONFORM TO THE 2014 NYC BC SECTION BC 908.7.

2. CARBON MONOXIDE ALARMS OR DETECTORS WITHIN DWELLING UNITS ARE REQUIRED IN THE FOLLOWING AREAS AS PER SECTION 908.7.1.1: OUTSIDE ANY ROOM USED FOR SLEEPING PURPOSES, WITHIN 15 FEET OF THE ENTRANCE TO SUCH ROOM AND IN ANY ROOM USED FOR SLEEPING PURPOSES.

3. AS PER SECTION 908.7.1.1.2, CARBON MONOXIDE ALARMS OR DETECTORS SHALL COMPLY WITH THE POWER SOURCE, INTERCONNECTION, AND ACCEPTANCE TESTING REQUIREMENTS AS REQUIRED FOR SMOKE ALARMS IN ACCORDANCE WITH SECTIONS 907.2.11.2 THROUGH 907.2.11.3.

4. AS PER SECTION 908.7.4 INSTALLATION, CARBON MONOXIDE ALARMS AND DETECTORS SHALL BE LISTED IN ACCORDANCE WITH UL 2034 AND UL 2075.

5. ACCESSIBLE AUDIBLE AND VISIBLE ALARMS AND NOTIFICATION APPLIANCES SHALL BE INSTALLED IN ACCORDANCE WITH ICC/ANSI A117.1.

6. THE MAINTENANCE OF CARBON MONOXIDE DETECTION AND ALARM SYSTEMS AND THE INSTALLATION AND TESTING OF CARBON MONOXIDE DETECTING DEVICES THAT ARE INTERCONNECTED WITH A FIRE ALARM SYSTEM OR MONITORED BY A CENTRAL STATION SHALL BE ENFORCED AS PER ARTICLE 103 OF CHAPTER 1 OF THE GENERAL ADMINISTRATIVE PROVISIONS OF THE 2014 NYC BC.

ROOF ASSEMBLY REFLECTANCE NOTES

1. ROOF COVERING REFLECTANCE SHALL BE PROVIDED AS PER NYC BC 2014, SECTION 1504.9.

2. ROOF COVERINGS ON ROOFS OR SETBACKS WITH SLOPE EQUAL TO OR LESS THAN TWO UNITS VERTICAL IN 12 UNITS HORIZONTAL (17 PERCENT) SHALL HAVE:

A. A MINIMUM INITIAL SOLAR REFLECTANCE OF 0.7 IN ACCORDANCE WITH ASTM C 1549 OR ASTM E 1918, AND A MINIMUM THERMAL EMITTANCE OF 0.75 AS DETERMINED IN ACCORDANCE WITH ASTM C 1371 OR ASTM E 408; OR

B. A MINIMUM SRI OF 78 AS DETERMINED IN ACCORDANCE WITH ASTM E 1980. EXCEPTIONS:

a. TERRACES ON SETBACKS COMPRISING LESS THAN 25 PERCENT OF THE AREA OF THE LARGEST FLOOR PLATE IN THE BUILDING.

b. ANY PORTION OF A ROOF COVERED BY A GREEN ROOF SYSTEM, INCLUDING SUCH A SYSTEM WITH AGRICULTURAL PLANTINGS, IN COMPLIANCE WITH SECTION 1507.16.

c. ANY PORTION OF A ROOF USED AS OUTDOOR RECREATION SPACE BY THE OCCUPANTS OF THE BUILDING THAT IS LANDSCAPED COVERED BY WOOD DECKING OR COVERED WITH A WALKING SURFACE OR OTHER PROTECTIVE SURFACE, PROVIDED THAT SUCH WALKING SURFACE OR PROTECTIVE SURFACE HAS A MINIMUM INITIAL SOLAR REFLECTANCE OF 0.3 AS DETERMINED IN ACCORDANCE WITH ASTM C 1549 OR ASTM E 1918.

d. ANY PORTION OF A ROOF THAT IS UNDER MECHANICAL EQUIPMENT, FLUSH MOUNTED SOLAR PANELS LYING DIRECTLY ON THE ROOF SURFACE, DUCKBOARDING, DECKING, PLATFORM, ROOF TANK, COOLING TOWER OR ANY OTHER ROOFTOP STRUCTURE OR EQUIPMENT EXEMPTED BY RULE BY THE COMMISSIONER.

e. ANY ROOF OR PORTION OF A ROOF COMPOSED OF GLASS, METAL, CLAY OR CONCRETE TILE OR PLASTIC/RUBBER INTENDED TO SIMULATE CLAY OR CONCRETE TILE, WOOD, OR SLATE.

f. ANY PORTION OF A ROOF USED BY A SCHOOL OR DAYCARE CENTER AS A PLAYGROUND FOR CHILDREN

g. ANY ROOF, IF THE AMOUNT OF ROOFTOP SPACE N

WIND LOADS NOTES

1. BUILDINGS, STRUCTURES AND PARTS THEREOF SHALL BE DESIGNED TO WITHSTAND THE MINIMUM WIND LOADS PRESCRIBED IN THE 2014 NYC BC, CHAPTER 16 STRUCTURAL DESIGN, SECTION BC 1609 WIND LOADS. DECREASES IN WIND LOADS SHALL NOT BE MADE FOR THE EFFECT OF SHIELDING BY OTHER STRUCTURES.

2. AS PER SECTION 1609.1.1 DETERMINATION OF WIND LOADS, WIND LOADS ON EVERY BUILDING OR STRUCTURE SHALL BE DETERMINED IN ACCORDANCE WITH CHAPTER 6 OF ASCE 7, WITH THE BASIC WIND SPEED AND THE EXPOSURE CATEGORY DETERMINED IN ACCORDANCE WITH SECTIONS 1609.3 THROUGH 1609.4. WIND LOADS MAY ALSO BE DETERMINED USING PROVISIONS OF THE ALTERNATE METHODS DESCRIBED IN SECTION 1609.6. WIND S HALL BE ASSUMED TO COME FROM ANY HORIZONTAL DIRECTION AND WIND PRESSURES SHALL BE ASSUMED TO ACT NORMAL TO THE SURFACE CONSIDERED.

MECHANICAL SYSTEMS NOTES

1. MECHANICAL APPLIANCES, EQUIPMENT AND SYSTEMS SHALL BE CONSTRUCTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW YORK CITY MECHANICAL CODE AND THE NEW YORK CITY FUEL GAS CODE. MASONRY CHIMNEYS, FIREPLACES AND BARBECUES SHALL COMPLY WITH THE NYC 2014 MECHANICAL CODE AND NYC BC 2014, CHAPTER 21 MASONRY.

2. ALL BATHROOM AND TOILET ROOMS IN DWELLING UNITS TO HAVE MECHANICAL EXHAUST SYSTEM OF MIN. 50 CFM WHEN DESIGNED TO OPERATE INTERMITTENTLY AND MIN. OF 25 CFM WHEN DESIGNED TO OPERATE CONTINUOUSLY DURING NORMAL HOURS OF USE.

3. PUBLIC TOILETS SHALL BE VENTILATED WITH MECHANICAL EXHAUST SYSTEM OF 50/70 CFM RATES PER WATER CLOSET OR URINAL. THE HIGHER RATE SHALL BE PROVIDED WHERE PERIODS OF HEAVY USE ARE EXPECTED TO OCCUR, SUCH AS TOILETS IN THEATERS, SCHOOLS AND SPORTS FACILITIES. THE LOWER RATE SHALL BE PERMITTED WHERE PERIODS OF HEAVY USE ARE NOT EXPECTED.

4. IN DWELLING UNITS, WHEN KITCHEN REQUIRED TO HAVE MECHANICAL EXHAUST SYSTEM AND ALL KITCHENETTES TO BE PROVIDED WITH MIN. OF 100 CFM WHEN DESIGNED TO OPERATE INTERMITTENTLY AND MIN. OF 25 CFM WHEN DESIGNED TO OPERATE CONTINUOUSLY DURING NORMAL HOURS OF USE.

5. DUCT RISERS TO BE FIRE PROTECTED WITH TWO (2) HOUR FIRE RATED CONSTRUCTION ON ALL SIDES.

6. WHERE DUCTS PASS THROUGH FLOOR, FLOOR OPENINGS TO BE CUT TIGHT TO DUCT, AND REMAINING GAP BETWEEN DUCT AND FLOOR CONSTRUCTION TO BE FILLED WITH MINERAL WOOL OR EQUAL.

7. WHEN EACH BATHROOM AND KITCHEN TO BE EQUIPPED WITH ITS OWN INDEPENDENT EXHAUST BLOWER BACKDRAFT DAMPER TO BE PROVIDED OR AS PER MECHANICAL DOCUMENTS.

8. EACH BATHROOM AND KITCHEN/KITCHENETTE OUTLET TO BE EQUIPPED WITH APPROVED FIRE DAMPER WHEN REQUIRED.

9. MINIMUM FRESH AIR INTAKE (F.A.I.) WITH APPROVED FIRE DAMPER TO BE PROVIDED FOR BOILER ROOM AS PER MECHANICAL DOCUMENTS.

10. BATHROOMS CONTAINING BATHTUBS, SHOWERS, SPAS AND SIMILAR BATHING FIXTURES IN OTHER THAN R AND I-1 OCCUPANCIES SHALL BE MECHANICALLY VENTILATED IN ACCORDANCE WITH THE NYC 2014 MECHANICAL CODE, WHETHER OR NOT THEY ARE ALSO PROVIDED WITH NATURAL VENTILATION.

11. AIR INTAKE OPENING LOCATIONS SHALL COMPLY WITH THE FOLLOWING:

· INTAKE OPENINGS SHALL BE LOCATED A MINIMUM OF 10 FEET FROM LOT LINES OR BUILDINGS ON THE SAME LOT.

· FOR BUILDINGS ON LOTS MEASURING LESS THAN 20 FEET IN WIDTH, INTAKE OPENINGS SHALL BE LOCATED AT THE CENTERLINE BETWEEN LOT LINES. WHERE OPENINGS FRONT ON A STREET OR PUBLIC WAY, THE DISTANCE SHALL BE MEASURED TO THE CENTERLINE OF THE STREET OR PUBLIC WAY.

· OUTDOOR INTAKES FOR HIGH-RISE OFFICE BUILDINGS HAVING OCCUPIED FLOORS LOCATED MORE THAN 75 FEET ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS SERVING SPACES ABOVE THE SECOND STORY AND SERVING SPACES GREATER THAN 10,000 SQUARE FEET OF FLOOR AREA SHALL BE LOCATED AT LEAST 20 FEET ABOVE GROUND LEVEL, AT LEAST 30 FEET FROM EXHAUST OUTLETS AND OTHER EXHAUST DISCHARGES, AND AT LEAST 20 FEET FROM AREAS THAT MAY COLLECT VEHICULAR EXHAUST, SUCH AS OFF STREET LOADING BAYS.

· MECHANICAL AND GRAVITY OUTDOOR AIR INTAKE OPENINGS SHALL BE LOCATED NOT LESS THAN 10 FEET HORIZONTALLY FROM ANY HAZARDOUS OR NOXIOUS CONTAMINANT SOURCE.

· INTAKE OPENINGS ON STRUCTURES IN FLOOD HAZARD AREAS SHALL COMPLY WITH APPENDIX G OF THE NYC BC 2014.

· EXCEPTION: GROUP R-3 OCCUPANCIES ARE NOT REQUIRED TO COMPLY WITH ABOVE.

10. AIR INTAKE OPENINGS THAT TERMINATE OUTDOORS SHALL BE PROTECTED WITH CORROSION-RESISTANT SCREENS, LOUVERS OR GRILLES. OPENINGS IN LOUVERS, GRILLES AND SCREENS SHALL BE SIZED IN ACCORDANCE WITH TABLE 401.5, NYC 2014 MECHANICAL CODE AND SHALL BE PROTECTED AGAINST LOCAL WEATHER CONDITIONS. OUTDOOR AIR INTAKE OPENINGS LOCATED IN EXTERIOR WALLS SHALL MEET THE PROVISIONS FOR EXTERIOR WALL OPENING PROTECTIVES IN ACCORDANCE WITH THE NYC BC 2014.

11. FOR HIGH-RISE BUILDINGS, OUTDOOR AIR INTAKES SERVING SPACES ABOVE THE SECOND STORY AND SERVING SPACES GREATER THAN 10,000 SQUARE FEET OF FLOOR AREA SHALL BE LOCATED IN ACCORDANCE WITH SECTION 401.5 OF THE NYC 2014 MECHANICAL CODE. EXCEPTION: GROUP R-2 OCCUPANCY.

12. ENCLOSED PARKING GARAGES. MECHANICAL VENTILATION SYSTEMS FOR ENCLOSED PARKING GARAGES SHALL BE PERMITTED TO OPERATE INTERMITTENTLY WHERE THE SYSTEM IS ARRANGED TO OPERATE AUTOMATICALLY UPON DETECTION OF A CONCENTRATION OF CARBON MONOXIDE.

PLUMBING SYSTEMS NOTES

1. THE 2014 NEW YORK CITY PLUMBING CODE SHALL GOVERN THE ERECTION, INSTALLATION, ALTERATION, REPAIR, RELOCATION, REPLACEMENT, ADDITION TO, USE OR MAINTENANCE OF PLUMBING SYSTEMS. PLUMBING SYSTEMS AND EQUIPMENT SHALL BE CONSTRUCTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW YORK CITY PLUMBING CODE.

2. ALL MATERIALS, FIXTURES, AND APPLIANCES SHALL COMPLY WITH CHAPTER 3 GENERAL REGULATIONS, SECTION PC 303 MATERIALS .

3. ALL GAS-FIRED EQUIPMENT AND ACCESSORY EQUIPMENT SHALL COMPLY WITH THE 2014 NYC MECHANICAL CODE AND THE 2014 NYC FUEL GAS CODE.

4. PLUMBING CONTRACTOR TO EXAMINE PROPOSED LAYOUT WITH REGARD TO EXISTING FIELD CONDITIONS, AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BETWEEN ASSUMED FIELD CONDITIONS AND THOSE ENCOUNTERED DURING CONSTRUCTION. PLUMBING CONTRACTOR SHALL INFORM ARCHITECT OF ANY REVISIONS TO PLAN WHICH SHALL BE NECESSARY (BASED ON CONDITIONS UNCOVERED IN THE FIELD), IN ORDER TO INSTALL ALL FIXTURES, EQUIPMENT AND PIPING IN STRICT ACCORDANCE WITH REQUIREMENTS OF THE 2014 NYC BC, THE 2014 NYC PLUMBING CODE, AND/OR AS PER DESIGNS SHOWN IN THE CONTRACT DOCUMENTS.

5. PLUMBING CONTRACTOR SHALL ARRANGE AND OBTAIN INSPECTIONS AND REQUIRED SIGN-OFFS AS PER SECTION PC 107 INSPECTION AND TESTING, SECTION 107.5 SIGN-OFF OF COMPLETED WORK. REFER TO ARTICLE 116 OF CHAPTER 28 OF THE ADMINISTRATIVE CODE.

DIMENSIONING NOTES

1. ALL WALLS ARE ORTHOGONAL TO THE PROPERTY LINES UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL BE KNOWLEDGEABLE OF WHICH PROPERTY LINE DETERMINES THE ORIENTATION OF EACH WALL, AND SHALL NOTIFY THE ARCHITECT OF ANY CONDITIONS REQUIRING CLARIFICATION BEFORE PROCEEDING WITH THE WORK.

2. PARTITIONS ARE DIMENSIONED TO THE FURNISHED FACE OF THE WALL UNLESS OTHERWISE NOTED.

3. ALL DIMENSIONS SHALL HAVE PREFERENCE OVER SCALE. DO NOT SCALE THE DRAWINGS.

4. ALL DIMENSIONS OF EXISTING CONDITIONS ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD BEFORE PROCEEDING WITH THE WORK. THE ARCHITECT SHALL BE NOTIFIED OF ANY CORRECTIONS.

5. WHEN UNDIMENSIONED PARTITIONS APPEAR IN CONJUNCTION WITH DOOR OPENINGS, THE DOOR WIDTH AND DOOR FRAME DETAILS DETERMINE THE LOCATION OF THE ADJACENT WALLS AND FRAMES.

6. ALL ACCESSIBLE DIMENSIONS TO BE PROVIDED TO FINISH WALL, CEILING AND FLOORS.

PARTITION NOTES

1. DEFLECTION FOR ALL PARTITIONS SHALL NOT EXCEED 1/240TH OF THE SPAN MAXIMUM FOR TYPICAL GYPSUM PARTITIONS, OR 1/360 FOR WOOD-CLAD PARTITIONS OR STONE-CLAD PARTITION SYSTEMS.

2. WATER RESISTANT DRYWALL (FOR THE FULL HEIGHT OF THE PARTITION CONSTRUCTION) SHALL BE USED IN TOILETS, SHOWERS, SERVICE ROOMS, ETC. USE STANDARD GYPSUM BOARD FOR CEILING CONSTRUCTION.

3. PENETRATIONS: COORDINATE WITH MECHANICAL CONTRACTOR FOR OPENINGS REQUIRED FOR RETURN AIR IN FULL HEIGHT PARTITIONS.

4. PROVIDE LATERAL BRACING TO STRUCTURE ABOVE FINISHED CEILINGS FOR PARTITIONS EXCEEDING UNSUPPORTED HEIGHTS INDICATED ON DRAWINGS.

5. PROVIDE HORIZONTAL CONTROL JOINTS AT 12'-0' O.C. IN THE VERTICAL DIRECTION UNLESS NOTED OTHERWISE.

6. PROVIDE CONTROL JOINTS IN GYPSUM WALLBOARD CONSTRUCTION SUCH THAT PARTITION OR FURRING RUNS DO NOT EXCEED 30' AND CEILING DIMENSIONS DO NOT EXCEED 50' IN EITHER DIRECTION WITH PERIMETER RELIEF OR 30' WITHOUT PERIMETER RELIEF.

7. PROVIDE VERTICAL CONTROL JOINTS WITH SEALANT IN MASONRY WALLS AS SHOWN ON DRAWINGS, WITH MAXIMUM SPACING OF 25'-0'.

8. COMPLETELY SEAL WITH ACOUSTICAL SEALANT HEADS, BASES, AND ENDS, PLUS ALL PENETRATIONS (INCLUDING BUT NOT LIMITED TO MECHANICAL, ELECTRICAL, AND PLUMBING WORK).

9. PROVIDE SOUND BLANKETS AS INDICATED.

FINISHES & DETAILS NOTES - NYC BC 2014, CHAPTER 8

1. AS PER SECTION BC 803.1.1.2 INTERIOR FLAME SPREAD INDEX REQUIREMENTS BASED ON OCCUPANCY GROUP, INTERIOR WALL AND CEILING FINISH SHALL HAVE A FLAME SPREAD INDEX NOT GREATER THAN THAT FOR THE CLASSIFICATION RATING SPECIFIED IN TABLE 803.1 'INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY' FOR THE GROUP AND LOCATION DESIGNATED.

2. AS PER SECTION BC 803.1.1.3 INTERIOR SMOKE DEVELOPED INDEX REQUIREMENTS BASED ON OCCUPANCY GROUP, EXCEPT WHERE PERMITTED FOR INTERIOR TRIM IN SECTION 806.5, ACCEPTABLE SMOKE-DEVELOPED INDICES SHALL RANGE FROM 0-450 WITH THE FOLLOWING RESTRICTIONS:

EXITS, CORRIDORS .... 25 OR LESS
OCCUPANCY GROUP I .... 50 OR LESS
ROOMS IN WHICH THE NET FLOOR AREA PER OCCUPANT IS 10 SQUARE FEET OR LESS .... 100 OR LESS

3. WHERE INTERIOR FINISH MATERIALS ARE APPLIED ON WALLS, CEILINGS OR STRUCTURAL ELEMENTS REQUIRED TO HAVE A F FIRE-RESISTANCE RATING OR TO BE OF NONCOMBUSTIBLE CONSTRUCTION, THEY SHALL COMPLY WITH THE PROVISIONS OF SECTION BC 803.3.

4. AS PER SECTION BC 803.5 TOXICITY, INTERIOR WALL OR CEILING FINISHES, OTHER THAN TEXTILES, UPON EXPOSURE TO FIRE, SHALL NOT PRODUCE PRODUCTS OF DECOMPOSITION OR COMBUSTION THAT ARE MORE TOXIC IN POINT OF CONCENTRATION THAN THOSE GIVEN OFF BY WOOD OR PAPER WHEN DECOMPOSING OR BURNING UNDER COMPARABLE CONDITIONS AS TESTED IN ACCORDANCE WITH NFPA 269.

5. COMBUSTIBLE FLOORING MATERIALS ARE PERMITTED AS PER SECTION BC 805 COMBUSTIBLE FLOORING MATERIALS IN TYPES I AND II CONSTRUCTION.

6. THERMAL AND ACOUSTICAL INSULATION SHALL COMPLY WITH SECTION BC 807.

7. ACOUSTICAL CEILING SYSTEMS SHALL COMPLY WITH SECTION BC 808.

8. COMBUSTIBLE MATERIALS USED FOR MILLWORK, DOORS, AND TRIM ARE PERMITTED AS PER THE 2014 NYC BC CHAPTER 6 TYPES OF CONSTRUCTION, SECTION BC 603 COMBUSTIBLE MATERIAL IN TYPE I AND II CONSTRUCTION.

9. ALL GLASS FOR INTERIOR USE IN BOTH VERTICAL AND SLOPED APPLICATIONS SHALL COMPLY WITH THE NYC BC 2014, CHAPTER 24 GLASS AND GLAZING.

10. FLOORS AND WALL BASE FINISH MATERIALS IN TOILET, BATHING AND SHOWER ROOM FLOOR FINISH MATERIALS SHALL HAVE A SMOOTH, HARD, NONABSORBENT SURFACE. THE INTERSECTIONS OF SUCH FLOORS WITH WALLS SHALL HAVE A SMOOTH, HARD, NONABSORBENT VERTICAL BASE THAT EXTENDS UPWARD ONTO THE WALLS AT LEAST 4 INCHES. EXCEPTION: OCCUPANCY CLASSES I-1, R-1 AND R-2 SHALL HAVE A VERTICAL BASE THAT EXTENDS UPWARD ONTO WALLS AT LEAST 6 INCHES.

SEISMIC/EARTHQUAKE NOTES

1. THE PROPOSED BUILDING HAS BEEN DESIGNED IN COMPLIANCE WITH THE NEW YORK CITY SEISMIC CODE: LOCAL LAW 17/95.

2. EVERY STRUCTURE, AND PORTION THEREOF, INCLUDING NONSTRUCTURAL COMPONENTS THAT ARE PERMANENTLY ATTACHED TO STRUCTURES AND THEIR SUPPORTS AND ATTACHMENTS, SHALL BE DESIGNED AND CONSTRUCTED TO RESIST THE EFFECTS OF EARTHQUAKE MOTIONS IN ACCORDANCE WITH THE 2014 NYC BC, CHAPTER 16 STRUCTURAL DESIGN, SECTION BC 1613 EARTHQUAKE LOADS, AND ASCE 7-10 (2010 EDITION), EXCLUDING CHAPTER 14 AND APPENDIX 11A. THE SEISMIC DESIGN CATEGORY FOR A STRUCTURE SHALL BE DETERMINED IN ACCORDANCE WITH EITHER SECTION 1613 OR ASCE 7-10 (2010 EDITION).

3. THE PROPOSED BUILDING HAS BEEN DESIGNED WITH STRUCTURAL SEPARATIONS AS PER 2014 NYC BC 1613.7. ALL STRUCTURES SHALL BE SEPARATED FROM ADJACENT STRUCTURES. WHEN A STRUCTURE ADJOINS A PROPERTY LINE NOT COMMON TO A PUBLIC WAY (TYPICALLY SIDE OR REAR LOT LINES), THAT STRUCTURE SHALL ALSO BE SET BACK FROM THE PROPERTY LINE BY AT LEAST 1 INCH FOR EACH 50 FEET OF HEIGHT AND A MINIMUM OF 1 INCH FOR STRUCTURES WITH HEIGHTS LESS THAN 50 FEET. FOR STRUCTURES IN SEISMIC DESIGN CATEGORY D, REFER TO ASCE 7-10 FOR ADDITIONAL REQUIREMENTS.

4. FOR STRUCTURES ADJACENT TO EXISTING UN REINFORCED MASONRY BEARING WALL STRUCTURES, THE STRUCTURAL SEPARATION SHALL BE FILLED WITH A MATERIAL WITH A MINIMUM COMPRESSIVE STRENGTH OF 25 PSI AND A MAXIMUM COMPRESSIVE STRENGTH OF 100 PSI. ADDITIONALLY, WHEN THE ADJACENT WALL IS A PARTY WALL, THE PARTY WALL SHALL BE MADE SECURE BY THE PARTY RESPONSIBLE FOR THE NEW CONSTRUCTION AS PER CHAPTER 33.

5. THE INFILL MATERIAL SHALL BE COVERED ON ALL SIDES AND SHALL MEET THE APPROPRIATE PROVISIONS OF CHAPTER 26. THE COVERING MUST BE OF ADEQUATE STRENGTH TO RESIST THE WIND LOADS FOR CLADDING AS SPECIFIED IN CHAPTER 16 AND SHALL CONFORM TO ALL APPLICABLE PROVISIONS IN CHAPTER 14.

6. WHEN A BUILDING SEPARATION WIDER THAN 5 INCHES IS CREATED PURSUANT TO SECTION 1613.7, SUCH SEPARATION, AT THE ROOF LEVEL OF THE PROPOSED NEW BUILDING, OR AT THE ROOF LEVEL OF AN EXISTING ADJOINING BUILDING WHERE IF THAT BUILDING IS LOWER THAN THE PROPOSED NEW BUILDING, SHALL HAVE A HORIZONTAL COVER/CLOSURE THAT CONFORMS WITH THE FOLLOWING:

a. THE COVER/CLOSURE MATERIAL SHALL BE NON COMBUSTIBLE; AND
EXCEPTION: THE COVER/CLOSURE MATERIAL USED SHALL BE PERMITTED TO BE COMBUSTIBLE MATERIAL IN ACCORDANCE WITH SECTION 1509.9 IF ALL THE MATERIAL ON THE APPROPRIATE ROOF CONFORMS TO THE LIMITATIONS THEREIN, THERE ARE NO MASONRY OPENINGS IN EITHER WALL ABUTTING THE BUILDING SEPARATION, AND BOTH BUILDINGS ARE NON COMBUSTIBLE.

b. THE COVER/CLOSURE SHALL BE CAPABLE OF WITHSTANDING THE ROOF LIVE LOAD OF 30 PSF SECURELY
FASTENED TO THE NEW BUILDING, AND BE OF A TYPE THAT WOULD BE CAPABLE OF PREVENTING UNAUTHORIZED OR ACCIDENTAL ACCESS TO THE SPACE.

7. SEISMIC DESIGN REQUIREMENTS FOR MASONRY STRUCTURES AND COMPONENTS SHALL COMPLY WITH THE REQUIREMENTS IN SECTION 1.17 OF TMS 402/ACI 530/ASCE 5 DEPENDING ON THE STRUCTURE'S SEISMIC DESIGN CATEGORY AS DETERMINED IN SECTION 1613 OF THIS CODE.

OTHER AGENCY REQUIREMENTS

508.1- EACH PORTION OF A BUILDING SHALL BE INDIVIDUALLY CLASSIFIED IN ACCORDANCE WITH § 302.1.
EXCEPTIONS:
• OCCUPANCIES SEPARATED IN ACCORDANCE WITH SECTION 510.
• WHERE IDENTIFIED IN TABLE 509, ROOMS OR SPACES SHALL BE TREATED AS INCIDENTAL USES.
• WHERE NOT IDENTIFIED IN TABLE 509, MECHANICAL AND/OR ELECTRICAL EQUIPMENT ROOMS SHALL BE PERMITTED TO BE CLASSIFIED AS THE OCCUPANCY WITHIN WHICH THEY ARE LOCATED, OR AT THE OPTION OF THE APPLICANT, CLASSIFIED AS GROUP F-2 OCCUPANCY IN ACCORDANCE WITH SECTION 306.3.

508.3-NONSEPARATED OCCUPANCIES
PROPOSED MIXED USE BUILDING COMPLIES WITH ALL PROVISIONS OF 508.3

508.3.1 OCCUPANCY CLASSIFICATION.
NONSEPARATED OCCUPANCIES SHALL BE INDIVIDUALLY CLASSIFIED IN ACCORDANCE WITH SECTION 302.1. THE REQUIREMENTS OF THIS CODE SHALL APPLY TO EACH PORTION OF THE BUILDING BASED ON THE OCCUPANCY CLASSIFICATION OF THAT SPACE. IN ADDITION, THE MOST RESTRICTIVE PROVISIONS OF CHAPTER 9 WHICH APPLY TO THE NONSEPARATED OCCUPANCIES SHALL APPLY TO THE TOTAL NONSEPARATED OCCUPANCY AREA. WHERE NONSEPARATED OCCUPANCIES OCCUR IN A HIGH-RISE BUILDING, THE MOST RESTRICTIVE REQUIREMENTS OF SECTION 403 WHICH APPLY TO THE NONSEPARATED OCCUPANCIES SHALL APPLY THROUGHOUT THE HIGH-RISE BUILDING.

508.3.2 ALLOWABLE BUILDING AREA AND HEIGHT.
THE ALLOWABLE BUILDING AREA AND HEIGHT OF THE BUILDING OR PORTION THEREOF SHALL BE BASED ON THE MOST RESTRICTIVE ALLOWANCES FOR THE OCCUPANCY GROUPS UNDER CONSIDERATION FOR THE TYPE OF CONSTRUCTION OF THE BUILDING IN ACCORDANCE WITH SECTION 503.1.
[PROPOSED BUILDING COMPLIES - PROPOSED USES ARE UNLIMITED IN HEIGHT AND AREA AS PER § 503.1]

508.3.3 SEPARATION.
NO SEPARATION IS REQUIRED BETWEEN NONSEPARATED OCCUPANCIES.

EXCEPTIONS:
1. GROUP H-2, H-3, H-4 AND H-5 OCCUPANCIES SHALL BE SEPARATED FROM ALL OTHER OCCUPANCIES IN ACCORDANCE WITH SECTION 508.4.
2. SEPARATED TENANCIES IN ACCORDANCE WITH SECTION 510.10.
3. KITCHENS SHALL BE SEPARATED IN ACCORDANCE WITH SECTION 508.4.4.

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
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Brooklyn, NY 11225

SHEET TITLE
GENERAL NOTES

G-002A.00

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Date:	12/1/2025 7:15:52 PM
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MEANS OF EGRESS

SECTION BC 1003 GENERAL MEANS OF EGRESS

1003.1 APPLICABILITY
THE GENERAL REQUIREMENTS SPECIFIED IN SECTIONS 1003 THROUGH 1015 SHALL APPLY TO ALL THREE ELEMENTS OF THE MEANS OF EGRESS SYSTEM, IN ADDITION TO THOSE SPECIFIC REQUIREMENTS FOR THE EXIT ACCESS, THE EXIT AND THE EXIT DISCHARGE DETAILED ELSEWHERE IN THIS CHAPTER.

1003.2 CEILING HEIGHT
THE MEANS OF EGRESS SHALL HAVE A CEILING HEIGHT OF NOT LESS THAN 7 FEET, 6 INCHES (2286 MM).
EXCEPTIONS:
1. CEILINGS THAT ARE PERMITTED TO BE LESS THAN 7 FEET, 6 INCHES (2286 MM) IN ACCORDANCE WITH SECTION 1208.2.
2. CEILINGS OF DWELLING UNITS AND SLEEPING UNITS WITHIN RESIDENTIAL OCCUPANCIES IN ACCORDANCE WITH SECTION 1208.2.
3. ALLOWABLE PROJECTIONS IN ACCORDANCE WITH SECTION 1003.3.
4. STAIR HEADROOM IN ACCORDANCE WITH SECTION 1011.3.
5. DOOR HEIGHT IN ACCORDANCE WITH SECTION 1010.1.3.
6. RAMP HEADROOM IN ACCORDANCE WITH SECTION 1012.5.2.
7. THE CLEAR HEIGHT OF FLOOR LEVELS IN VEHICULAR AND PEDESTRIAN TRAFFIC AREAS OF PUBLIC AND PRIVATE PARKING GARAGES IN ACCORDANCE WITH SECTION 406.4.1.
8. AREAS ABOVE AND BELOW MEZZANINE FLOORS IN ACCORDANCE WITH SECTION 505.2.

1003.3 PROTRUDING OBJECTS
PROTRUDING OBJECTS ON CIRCULATION PATHS SHALL COMPLY WITH THE REQUIREMENTS OF SECTIONS 1003.3.1 THROUGH 1003.3.4.

1003.3.3 HORIZONTAL PROJECTIONS
EXCEPTION: HANDRAILS ARE PERMITTED TO PROTRUDE 41/2 INCHES (114.3 MM) FROM THE WALL.

1003.4 FLOOR SURFACE
WALKING SURFACES OF THE MEANS OF EGRESS SHALL HAVE A SLIP-RESISTANT SURFACE AND BE SECURELY ATTACHED.

1003.5 ELEVATION CHANGE
WHERE CHANGES IN ELEVATION OF LESS THAN 12 INCHES (304.8 MM) EXIST IN THE MEANS OF EGRESS, SLOPED SURFACES SHALL BE USED. WHERE THE SLOPE IS GREATER THAN ONE UNIT VERTICAL IN 20 UNITS HORIZONTAL (5-PERCENT SLOPE), RAMPS COMPLYING WITH SECTION 1012 SHALL BE USED. WHERE THE DIFFERENCE IN ELEVATION IS 6 INCHES (152.4 MM) OR LESS, THE RAMP SHALL BE EQUIPPED WITH HANDRAILS OR FLOOR FINISH MATERIALS THAT CONTRAST WITH ADJACENT FLOOR FINISH MATERIALS.
EXCEPTIONS: AT LOCATIONS THAT ARE NOT REQUIRED TO BE ACCESSIBLE BY CHAPTER 11:
1. A SINGLE STEP WITH A MAXIMUM RISER HEIGHT OF 7 INCHES (177.8 MM) IS PERMITTED FOR BUILDINGS WITH OCCUPANCIES IN GROUPS F, H, R-2, R-3, S AND U AT EXTERIOR DOORS.
2. A STEP WITH A SINGLE RISER OR A STAIR WITH TWO RISERS AND A TREAD IS PERMITTED WHERE THE RISERS AND TREADS COMPLY WITH SECTION 1011.5, THE MINIMUM DEPTH OF THE TREAD IS 13 INCHES (330 MM) AND NOT LESS THAN ONE HANDRAIL COMPLYING WITH SECTION 1014 IS PROVIDED WITHIN 30 INCHES (762 MM) OF THE CENTERLINE OF THE NORMAL PATH OF EGRESS TRAVEL ON THE STEP OR STAIR.
3. A STEP IS PERMITTED IN AISLES SERVING SEATING THAT HAS A DIFFERENCE IN ELEVATION LESS THAN 12 INCHES (304.8 MM) PROVIDED THAT THE RISERS AND TREADS COMPLY WITH SECTION 1029.13 AND THE AISLE IS PROVIDED WITH A HANDRAIL COMPLYING WITH SECTION 1029.15.
4. THROUGHOUT A STORY IN A GROUP I-2 OCCUPANCY, ANY CHANGE IN ELEVATION IN PORTIONS OF THE MEANS OF EGRESS THAT SERVE NONAMBULATORY PERSONS SHALL BE BY MEANS OF A RAMP OR SLOPED WALKWAY.

1003.6 MEANS OF EGRESS CONTINUITY
THE PATH OF EGRESS TRAVEL ALONG A MEANS OF EGRESS SHALL NOT BE INTERRUPTED BY A BUILDING ELEMENT OTHER THAN A MEANS OF EGRESS COMPONENT AS SPECIFIED IN THIS CHAPTER. OBSTRUCTIONS SHALL NOT BE PLACED IN THE MINIMUM WIDTH OR REQUIRED CAPACITY OF A MEANS OF EGRESS COMPONENT EXCEPT PROJECTIONS PERMITTED BY THIS CHAPTER. THE MINIMUM WIDTH OR REQUIRED CAPACITY OF A MEANS OF EGRESS SYSTEM SHALL NOT BE DIMINISHED ALONG THE PATH OF EGRESS TRAVEL.

1003.7 ELEVATORS, ESCALATORS AND MOVING WALKS
ELEVATORS, ESCALATORS AND MOVING WALKS SHALL NOT BE USED AS A COMPONENT OF A REQUIRED MEANS OF EGRESS FROM ANY OTHER PART OF THE BUILDING.

SECTION BC 1004 OCCUPANT LOAD

1004.1 DESIGN OCCUPANT LOAD
IN DETERMINING MEANS OF EGRESS REQUIREMENTS, THE NUMBER OF OCCUPANTS FOR WHOM MEANS OF EGRESS FACILITIES SHALL BE PROVIDED SHALL BE ESTABLISHED BY THE LARGEST NUMBER COMPUTED IN ACCORDANCE WITH SECTION 1004.1.3, UNLESS OTHERWISE PERMITTED BY SECTION 1004.1.3.1, 1004.1.3.2 OR 1004.2.

TABLE 1004.1.3 MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR
ACCESSORY STORAGE AREAS, MECHANICAL EQUIPMENT ROOM	300 GROSS
AGRICULTURAL BUILDING	300 GROSS
AIRCRAFT HANGARS	500 GROSS
ASSEMBLY	
GAMING FLOORS (KENO, SLOTS, ETC.)	11 GROSS
EXHIBIT GALLERY AND MUSEUM	30 NET
ASSEMBLY WITH FIXED SEATS	SEE SECTION 1004.3
ASSEMBLY WITHOUT FIXED SEATS	
CONCENTRATED (CHAIRS ONLY—NOT FIXED)	7 NET
DANCE FLOOR	5 NET
DANCE FLOOR (BALLROOM)	10 NET
STANDING SPACE	5 NET
UNCONCENTRATED (TABLES AND CHAIRS)	15 NET
BOWLING CENTERS, ALLOW 5 PERSONS FOR EACH LANE INCLUDING 15 FEET OF RUNWAY, AND FOR ADDITIONAL AREAS	7 NET
BUSINESS AREAS, INCLUDING ACCESSORY AREAS ON TERRACES AND ROOFTOPS	100 GROSSb, d
COURTROOMS — OTHER THAN FIXED SEATING AREAS	40 NET
DAY CARE:	
AGE UNDER 6 MONTHS	50 NET
AGE 6 MONTHS — 2 YEARS	40 NET
AGE 2 YEARS — 6 YEARS	30 NET
AGE ABOVE 6 YEARS	50 NET
DORMITORIES	50 GROSS
EDUCATIONAL	
CLASSROOM AREA	20 NET
SHOPS AND OTHER VOCATIONAL ROOM AREAS	50 NET
KINDERGARTEN, AND PRE-KINDERGARTEN	30 NET
EXERCISE ROOMS	50 GROSS
GYMNASIUMS	15 NET
GROUP H-5 FABRICATION AND MANUFACTURING AREAS	200 GROSS
INDUSTRIAL AREAS	100 GROSS
INSTITUTIONAL AREAS	
INPATIENT TREATMENT AREAS	240 GROSS
OUTPATIENT AREAS	100 GROSS
SLEEPING AREAS	120 GROSS
KITCHENS, COMMERCIAL	200 GROSS
LIBRARY	
READING ROOMS	50 NET
STACK AREA	100 GROSS
LOCKER ROOMS	50 GROSS
MALL BUILDINGS - COVERED AND OPEN	SEE SECTION 402.8.2
MERCANTILE	
AREAS ON OTHER FLOORS	60 GROSS
BASEMENT AND GRADE FLOOR AREAS	30 GROSS
STORAGE, STOCK, SHIPPING AREAS	300 GROSS
PARKING GARAGES	200 GROSS
PASSENGER TERMINAL	
BAGGAGE CLAIM	20 GROSS
BAGGAGE HANDLING	300 GROSS
CONCOURSE	100 GROSS
PASSENGER TERMINAL OR PLATFORM	1.5 X C*
WAITING AREA (STANDING)	15 GROSS
WAITING AREAS (SEATED)	5 NET
RESIDENTIAL	
WITHIN DWELLING UNITS	200 GROSS
ROOFTOP AND TERRACE ACCESSORY TO GROUPS R-2 AND R-3	200 GROSSb, c, d
INDOOR RESIDENTIAL AMENITY SPACES ACCESSORY TO GROUP R-2 (CONCENTRATED)	15 NET
INDOOR RESIDENTIAL AMENITY SPACES ACCESSORY TO GROUP R-2 (UNCONCENTRATED)	50 NET
SKATING RINKS, SWIMMING POOLS	
RINK AND POOL	50 GROSS
DECKS	15 GROSS
STAGES AND PLATFORMS	15 NET FOR PERFORMING AREA AND 50 NET REMAINING AREA
WAREHOUSES	500 GROSS

Assembly Code

C*-CAPACITY OF ALL PASSENGER VEHICLES THAT CAN BE UNLOADED SIMULTANEOUSLY.
FOR SI: 1 SQUARE FOOT = 0.0929 M2, 1 FOOT = 304.8 MM.*

a. FLOOR AREA IN SQUARE FEET PER OCCUPANT.
b. FOR THE PURPOSES OF OCCUPANT LOAD CALCULATION, PERMANENT FIXTURES AND AMENITIES SUCH AS SHRUBS, DECORATIVE POOLS, NON-WALKABLE PAVING SURFACES, ETC. MAY BE DEDUCTED FROM THE TOTAL FLOOR AREA.
c. A ROOFTOP OR TERRACE IN GROUP R-2 OR R-3 OCCUPANCIES THAT IS PROVIDED FOR THE INCIDENTAL, RECREATIONAL USE BY THE RESIDENTIAL TENANTS RESIDING IN THE SAME RESIDENTIAL BUILDING.
d. WHERE THE MAXIMUM OCCUPANT LOAD OF THE ROOFTOP OR TERRACE EXCEEDS 74 PERSONS BASED ON OCCUPANT LOAD CALCULATIONS, A PLACE OF ASSEMBLY CERTIFICATE OF OPERATION IS REQUIRED PURSUANT TO SECTION 28-117.1 OF THE ADMINISTRATIVE CODE AND ITEM 1 OF SECTION 303.7 OF THIS CODE.
e. TO BE USED ONLY WHEN THE OCCUPANT LOAD FOR THE FUNCTION OF THE SPACE IS NOT LISTED ELSEWHERE IN TABLE 1004.1.3.

SECTION BC 1005 MEANS OF EGRESS SIZING

1005.1 GENERAL
ALL PORTIONS OF THE MEANS OF EGRESS SYSTEM SHALL BE SIZED IN ACCORDANCE WITH THIS SECTION.
1005.2 MINIMUM WIDTH BASED ON COMPONENT
THE MINIMUM WIDTH, IN INCHES (MM), OF ANY MEANS OF EGRESS COMPONENTS SHALL BE NOT LESS THAN THAT SPECIFIED FOR SUCH COMPONENT, ELSEWHERE IN THIS CODE.
1005.3 REQUIRED CAPACITY BASED ON OCCUPANT LOAD
THE REQUIRED CAPACITY, IN INCHES (MM), OF THE MEANS OF EGRESS FOR ANY ROOM, AREA, SPACE OR STORY SHALL BE NOT LESS THAN THAT DETERMINED IN ACCORDANCE WITH SECTIONS 1005.3.1 AND 1005.3.2.
1005.3.1 STAIRWAYS
THE CAPACITY, IN INCHES, OF MEANS OF EGRESS STAIRWAYS SHALL BE CALCULATED BY MULTIPLYING THE OCCUPANT LOAD SERVED BY SUCH STAIRWAYS BY A MEANS OF EGRESS CAPACITY FACTOR OF 0.3 INCH (7.6 MM) PER OCCUPANT. WHERE STAIRWAYS SERVE MORE THAN ONE STORY, ONLY THE OCCUPANT LOAD OF EACH STORY CONSIDERED INDIVIDUALLY SHALL BE USED IN CALCULATING THE REQUIRED CAPACITY OF THE STAIRWAYS SERVING THAT STORY.
EXCEPTIONS:
1. FACILITIES WITH SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO USE THE CAPACITY FACTORS IN TABLE 1029.6.2 INDICATED FOR STEPPED AISLES FOR EXIT ACCESS OR EXIT STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS PROVIDED WITH A SMOKE CONTROL SYSTEM COMPLYING WITH SECTION 909.
2. FACILITIES WITH OUTDOOR SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO THE CAPACITY FACTORS IN SECTION 1029.6.3 INDICATED FOR STEPPED AISLES FOR EXIT ACCESS OR EXIT STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS OPEN TO THE OUTDOORS.
1005.3.2 OTHER EGRESS COMPONENTS
THE CAPACITY, IN INCHES, OF MEANS OF EGRESS COMPONENTS OTHER THAN STAIRWAYS SHALL BE CALCULATED BY MULTIPLYING THE OCCUPANT LOAD SERVED BY SUCH COMPONENT BY A MEANS OF EGRESS CAPACITY FACTOR OF 0.2 INCH (5.1 MM) PER OCCUPANT.
EXCEPTIONS:
1. FACILITIES WITH SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO USE THE CAPACITY FACTORS IN TABLE 1029.6.2 INDICATED FOR LEVEL OR RAMPED AISLES FOR MEANS OF EGRESS COMPONENTS OTHER THAN STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS PROVIDED WITH A SMOKE CONTROL SYSTEM COMPLYING WITH SECTION 909.
2. FACILITIES WITH OUTDOOR SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO THE CAPACITY FACTORS IN SECTION 1029.6.3 INDICATED FOR LEVEL OR RAMPED AISLES FOR MEANS OF EGRESS COMPONENTS OTHER THAN STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS OPEN TO THE OUTDOORS.

1005.4 CONTINUITY
THE MINIMUM WIDTH OR REQUIRED CAPACITY OF THE MEANS OF EGRESS REQUIRED FROM ANY STORY OF A BUILDING SHALL NOT BE REDUCED ALONG THE PATH OF EGRESS TRAVEL UNTIL ARRIVAL AT THE PUBLIC WAY.

1005.5 DISTRIBUTION OF MINIMUM WIDTH AND REQUIRED CAPACITY
WHERE MORE THAN ONE EXIT, OR ACCESS TO MORE THAN ONE EXIT, IS REQUIRED, THE MEANS OF EGRESS SHALL BE CONFIGURED SUCH THAT THE LOSS OF ANY ONE EXIT, OR ACCESS TO ONE EXIT, SHALL NOT REDUCE THE AVAILABLE CAPACITY OR WIDTH TO LESS THAN 50 PERCENT OF THE REQUIRED CAPACITY OR WIDTH.

1005.6 EGRESS CONVERGENCE
WHERE THE MEANS OF EGRESS FROM STORIES ABOVE AND BELOW CONVERGE AT AN INTERMEDIATE LEVEL, THE CAPACITY OF THE MEANS OF EGRESS FROM THE POINT OF CONVERGENCE SHALL BE NOT LESS THAN THE LARGEST MINIMUM WIDTH OR THE SUM OF THE REQUIRED CAPACITIES FOR THE STAIRWAYS OR RAMPS SERVING THE TWO ADJACENT STORIES, WHICHEVER IS LARGER.

1005.7 ENCROACHMENT
ENCROACHMENTS INTO THE REQUIRED MEANS OF EGRESS WIDTH SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THIS SECTION.

1005.7.1 DOORS
DOORS, WHEN FULLY OPENED, SHALL NOT REDUCE THE REQUIRED WIDTH BY MORE THAN 7 INCHES (177.8 MM). DOORS IN ANY POSITION SHALL NOT REDUCE THE REQUIRED WIDTH BY MORE THAN ONE-HALF.
EXCEPTIONS:
1. SURFACE-MOUNTED LATCH RELEASE HARDWARE SHALL BE EXEMPT FROM INCLUSION IN THE 7-INCH (177.8 MM) MAXIMUM ENCROACHMENT WHERE BOTH OF THE FOLLOWING CONDITIONS EXIST:
   1. THE HARDWARE IS MOUNTED TO THE SIDE OF THE DOOR FACING AWAY FROM THE ADJACENT WALL WHERE THE DOOR IS IN THE OPEN POSITION.
   2. THE HARDWARE IS MOUNTED NOT LESS THAN 34 INCHES (865 MM) NOR MORE THAN 48 INCHES (1220 MM) ABOVE THE FINISHED FLOOR.
2. THE RESTRICTIONS ON DOOR SWING SHALL NOT APPLY TO DOORS WITHIN INDIVIDUAL DWELLING UNITS AND SLEEPING UNITS OF GROUP R-2 OCCUPANCIES AND WITHIN INDIVIDUAL DWELLING UNITS OF GROUP R-3 OCCUPANCIES.

1005.7.2 OTHER PROJECTIONS
HANDRAIL PROJECTIONS SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1014.8. OTHER NONSTRUCTURAL PROJECTIONS SUCH AS TRIM AND SIMILAR DECORATIVE FEATURES SHALL BE PERMITTED TO PROJECT INTO THE REQUIRED WIDTH NOT MORE THAN 11/2 INCHES (38.1 MM) ON EACH SIDE.
EXCEPTION: PROJECTIONS ARE PERMITTED IN CORRIDORS WITHIN GROUP I-2 IN ACCORDANCE WITH SECTION 407.4.3.

1005.7.3 PROTRUDING OBJECTS
PROTRUDING OBJECTS SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF SECTION 1003.3.

SECTION BC 1006 NUMBER OF EXITS AND EXIT ACCESS DOORWAYS

1006.2 EGRESS FROM SPACES
ROOMS, AREAS OR SPACES, INCLUDING MEZZANINES, WITHIN A STORY OR BASEMENT SHALL BE PROVIDED WITH THE NUMBER OF EXITS OR ACCESS TO EXITS IN ACCORDANCE WITH THIS SECTION.

SECTION BC 1006 NUMBER OF EXITS AND EXIT ACCESS DOORWAYS

1006.2 EGRESS FROM SPACES
ROOMS, AREAS OR SPACES, INCLUDING MEZZANINES, WITHIN A STORY OR BASEMENT SHALL BE PROVIDED WITH THE NUMBER OF EXITS OR ACCESS TO EXITS IN ACCORDANCE WITH THIS SECTION.

TABLE 1006.2.1 SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet): Without Sprinkler System (feet), Occupant Load OL ≤ 30	Without Sprinkler System (feet), Occupant Load OL > 30	With Sprinkler System (feet)
Ac, Ef, M	74	76	75	75a
B	74	100	75	100a
F	49	75	75	100a
H-1, H-2, H-3	3	NP	NP	25b
H-4b, H-5b, I-1, I-3, I-4	10	NP	NP	75a
I-2d	See Section 407	NP	NP	75a
R-1	20	NP	NP	75a
R-2	20g	NP	NP	125a
S	29	100	75e	100a
U	74	100	75	75a

Assembly Code

FOR SI: 1 FOOT = 304.8 MM.
NP = NOT PERMITTED.

a. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2. SEE SECTION 903 FOR OCCUPANCIES WHERE AUTOMATIC SPRINKLER SYSTEMS ARE PERMITTED IN ACCORDANCE WITH SECTION 903.3.1.2.
b. GROUP H OCCUPANCIES EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.2.5.
c. FOR A ROOM OR SPACE USED FOR ASSEMBLY PURPOSES HAVING FIXED SEATING, SEE SECTION 1029.8.
d. FOR THE TRAVEL DISTANCE LIMITATIONS IN GROUP I-2, SEE SECTION 407.4.
e. THE LENGTH OF COMMON PATH OF EGRESS TRAVEL DISTANCE IN A GROUP S-2 OPEN PARKING GARAGE SHALL BE NOT MORE THAN 100 FEET (30 480 MM).
f. DAY CARE MAXIMUM OCCUPANT LOAD IS 10.
g. ROOMS, AREAS, OR SPACES THAT ARE ACCESSORY TO A GROUP R-2 OCCUPANCY MAY HAVE A MAXIMUM OCCUPANT LOAD OF 49.

1006.3.1 EGRESS BASED ON OCCUPANT LOAD
EACH STORY OR OCCUPIED ROOF DESIGNED FOR HUMAN OCCUPANCY OR USE SHALL HAVE THE MINIMUM NUMBER OF EXITS, OR ACCESS TO EXITS, AS SPECIFIED IN TABLE 1006.3.1. A SINGLE EXIT OR ACCESS TO A SINGLE EXIT SHALL BE PERMITTED IN ACCORDANCE WITH SECTION 1006.3.2. THE REQUIRED NUMBER OF EXITS, OR EXIT ACCESS STAIRWAYS OR RAMPS PROVIDING ACCESS TO EXITS, FROM ANY SUCH STORY OR OCCUPIED ROOF SHALL BE MAINTAINED UNTIL ARRIVAL AT THE EXIT DISCHARGE OR A PUBLIC WAY.

TABLE 1006.3.1
MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS PER STORY

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

Assembly Code

1006.3.2 SINGLE EXITS
A SINGLE EXIT OR ACCESS TO A SINGLE EXIT SHALL BE PERMITTED FROM ANY STORY OR OCCUPIED ROOF DESIGNED FOR HUMAN OCCUPANCY OR USE WHERE ONE OF THE FOLLOWING CONDITIONS EXISTS:
1. THE OCCUPANT LOAD, NUMBER OF DWELLING UNITS AND EXIT ACCESS TRAVEL DISTANCE DO NOT EXCEED THE VALUES IN TABLE 1006.3.2.
2. ROOMS, AREAS AND SPACES COMPLYING WITH SECTION 1006.2.1 WITH EXITS THAT DISCHARGE DIRECTLY TO THE EXTERIOR AT THE LEVEL OF EXIT DISCHARGE ARE PERMITTED TO HAVE ONE EXIT OR ACCESS TO A SINGLE EXIT.
3. OPEN OR ENCLOSED PARKING GARAGES WHERE VEHICLES ARE MECHANICALLY PARKED SHALL BE PERMITTED TO HAVE ONE EXIT PROVIDED SUCH EXIT SHALL NOT BE A VEHICLE RAMP.
4. GROUP R-3 OCCUPANCIES SHALL BE PERMITTED TO HAVE ONE EXIT OR ACCESS TO A SINGLE EXIT.
5. INDIVIDUAL SINGLE-STORY OR MULTISTORY DWELLING UNITS SHALL BE PERMITTED TO HAVE A SINGLE EXIT OR ACCESS TO A SINGLE EXIT FROM THE DWELLING UNIT PROVIDED THAT BOTH OF THE FOLLOWING CRITERIA ARE MET:
   1. THE DWELLING UNIT COMPLIES WITH SECTION 1006.2.1 AS A SPACE WITH ONE MEANS OF EGRESS.
   2. EITHER THE EXIT FROM THE DWELLING UNIT DISCHARGES DIRECTLY TO THE EXTERIOR AT THE LEVEL OF EXIT DISCHARGE, OR THE EXIT ACCESS OUTSIDE THE DWELLING UNIT'S ENTRANCE DOOR PROVIDES ACCESS TO NOT LESS THAN TWO APPROVED INDEPENDENT EXITS.
6. BUILDINGS OF OCCUPANCY GROUP R-2 WHERE ALL OF THE FOLLOWING CONDITIONS ARE MET:
   1. THE BUILDING DOES NOT EXCEED FOUR STORIES;
   2. THE BUILDING CONTAINS NOT MORE THAN THREE DWELLING UNITS PER STORY;
   3. THE BUILDING IS OF CONSTRUCTION TYPE I OR II;
   4. THE BUILDING DOES NOT EXCEED 2,500 SQUARE FEET (232.3 M2) PER STORY;
   5. EACH DWELLING UNIT HAS AT LEAST ONE WINDOW FACING THE STREET, OR FACING A LAWFUL YARD WITH OPEN, UNOBSTRUCTED, AND DIRECT ACCESS TO THE STREET. SUCH YARD OR DIRECT ACCESS SHALL BE A MINIMUM WIDTH EQUAL TO 25 PERCENT OF THE VERTICAL DISTANCE FROM THE WINDOWSILL OF THE HIGHEST OPERABLE WINDOW, FACING SUCH YARD OR DIRECT ACCESS, TO THE GRADE OF SUCH YARD OR DIRECT ACCESS DIRECTLY BELOW SUCH WINDOW, BUT SHALL IN NO CASE BE LESS THAN 36 INCHES (914.4 MM) WIDE;
   6. THE STAIRWAY EXTENDS TO THE ROOF SURFACE THROUGH A STAIRWAY BULKHEAD COMPLYING WITH SECTION 1509.2, PROVIDED THE ROOF HAS A SLOPE NOT STEEPER THAN 20 DEGREES (0.35 RAD), OR THE STAIRWAY IS CONSTRUCTED AGAINST THE STREET WALL, WITH ONE WINDOW FACING THE STREET AT EACH LANDING AND ACCESS TO THE ROOF IS PROVIDED VIA A SCUTTLE WITH A STATIONARY, NONCOMBUSTIBLE ACCESS LADDER;
   7. THE STAIRWAY IS ENCLOSED IN 2-HOUR FIRE-RATED WALLS WITH ALL EXIT DOORS LEADING INTO THE STAIRWAY HAVING AT LEAST 11/2-HOUR FIRE RATING; AND
   8. THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.2.
7. BUILDINGS OF OCCUPANCY GROUP R-2 OF CONSTRUCTION TYPE I OR II NOT EXCEEDING SIX STORIES AND NOT EXCEEDING 2,000 SQUARE FEET (185.8 M2) PER STORY.

TABLE 1006.3.2
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT

STORY	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER FLOOR	MAXIMUM TRAVEL DISTANCE (feet)
FIRST STORY ABOVE GRADE PLANE OR CELLAR	A, Bb, Ec, Fb, M, U, Sb	49	75
	H-2, H-3	3	25
	H-4, H-5, I, Re	10	75
	Sa	29	100
SECOND STORY ABOVE GRADE PLANE	B, F, M, Sa	29	75
	R-2d,e	NA	50
THIRD STORY ABOVE GRADE PLANE	R-2d,e	NA	50

Assembly Code

FOR SI: 1 FOOT = 304.8 MM.
NP = NOT PERMITTED.
NA = NOT APPLICABLE.

a. FOR THE REQUIRED NUMBER OF EXITS FOR OPEN OR ENCLOSED PARKING GARAGES, SEE SECTION 1006.3.2, ITEM 3.
b. GROUP B, F AND S OCCUPANCIES IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 SHALL HAVE A MAXIMUM TRAVEL DISTANCE OF 100 FEET.
c. DAY CARE OCCUPANCIES SHALL HAVE A MAXIMUM OCCUPANT LOAD OF 10.
d. MAXIMUM FOUR DWELLING UNITS PER FLOOR.
e. BUILDINGS CLASSIFIED AS OCCUPANCY GROUP R-2 EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2 AND PROVIDED WITH EMERGENCY ESCAPE AND RESCUE OPENINGS IN ACCORDANCE WITH SECTION 1030.
f. LIMITED TO THE CELLAR CLOSEST TO GRADE PLANE.

1006.3.2.1 MIXED OCCUPANCIES
WHERE ONE EXIT, OR EXIT ACCESS STAIRWAY OR RAMP PROVIDING ACCESS TO EXITS AT OTHER STORIES, IS PERMITTED TO SERVE INDIVIDUAL STORIES, MIXED OCCUPANCIES SHALL BE PERMITTED TO BE SERVED BY SINGLE EXITS PROVIDED EACH INDIVIDUAL OCCUPANCY COMPLIES WITH THE APPLICABLE REQUIREMENTS OF TABLE 1006.3.2 FOR THAT OCCUPANCY. WHERE APPLICABLE, CUMULATIVE OCCUPANT LOADS FROM ADJACENT OCCUPANCIES SHALL BE CONSIDERED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1004.1. IN EACH STORY OF A MIXED OCCUPANCY BUILDING, THE MAXIMUM NUMBER OF OCCUPANTS SERVED BY A SINGLE EXIT SHALL BE SUCH THAT THE SUM OF THE RATIOS OF THE CALCULATED NUMBER OF OCCUPANTS OF THE SPACE DIVIDED BY THE ALLOWABLE NUMBER OF OCCUPANTS INDICATED IN TABLE 1006.3.2 FOR EACH OCCUPANCY DOES NOT EXCEED ONE. WHERE DWELLING UNITS ARE LOCATED ON A STORY WITH OTHER OCCUPANCIES, THE ACTUAL NUMBER OF DWELLING UNITS DIVIDED BY FOUR PLUS THE RATIO FROM THE OTHER OCCUPANCY DOES NOT EXCEED ONE.

1006.4 OPEN OR ENCLOSED PARKING GARAGES
OPEN OR ENCLOSED PARKING GARAGES SHALL NOT HAVE LESS THAN TWO EXITS FROM EACH PARKING TIER. AN UNENCLOSED VEHICLE RAMP CONSTRUCTED IN ACCORDANCE WITH SECTION 1012.1 MAY SERVE AS ONE OF THE REQUIRED EXITS WHEN PROVIDED WITH PEDESTRIAN FACILITIES ALONG THE RAMP. SUCH RAMPS SERVING AS PART OF A NONASSESSABLE MEANS OF EGRESS IN OPEN OR ENCLOSED PARKING GARAGES THREE STORIES OR LESS IN HEIGHT AND SERVING NOT MORE THAN ONE LEVEL BELOW GRADE IS PERMITTED TO COMPLY WITH SECTION 1012.2, EXCEPTION 2.
EXCEPTION: ONE EXIT SHALL BE PERMITTED IN PARKING GARAGES COMPLYING WITH ITEM 3 OF SECTION 1006.3.2.

SECTION BC 1007 EXIT AND EXIT ACCESS DOORWAY CONFIGURATION

1007.1 GENERAL
EXITS, EXIT ACCESS DOORWAYS, AND EXIT ACCESS STAIRWAYS AND RAMPS SERVING SPACES, INCLUDING INDIVIDUAL BUILDING STORIES, SHALL BE SEPARATED IN ACCORDANCE WITH THE PROVISIONS OF THIS SECTION.

1007.1.1 TWO EXITS OR EXIT ACCESS DOORWAYS
ASSEMBLY
WHERE TWO EXITS, EXIT ACCESS DOORWAYS, EXIT ACCESS STAIRWAYS OR RAMPS, OR ANY COMBINATION THEREOF, ARE REQUIRED FROM ANY PORTION OF THE EXIT ACCESS, THEY SHALL BE PLACED A DISTANCE APART EQUAL TO NOT LESS THAN ONE-HALF OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE BUILDING OR AREA TO BE SERVED MEASURED IN A STRAIGHT LINE BETWEEN THEM. STAIRS SHARING ANY COMMON WALL, FLOOR, CEILING, SCISSOR STAIR ASSEMBLY, OR OTHER ENCLOSURE SHALL BE COUNTED AS ONE EXIT STAIRWAY.

EXCEPTIONS:
1. CORRIDOR MEASUREMENTS. WHERE INTERIOR EXIT STAIRWAYS OR RAMPS ARE INTERCONNECTED BY A 1-HOUR FIRE-RESISTANCE-RATED CORRIDOR CONFORMING TO THE REQUIREMENTS OF SECTION 1020, THE REQUIRED EXIT SEPARATION SHALL BE MEASURED ALONG THE SHORTEST DIRECT LINE OF TRAVEL WITHIN THE CORRIDOR.
2. REMOTE LOCATION IN SPRINKLERED BUILDINGS. WHERE A BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2, THE SEPARATION DISTANCE SHALL BE NOT LESS THAN ONE-THIRD OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE AREA SERVED.
3. GROUP R-2 OCCUPANCIES. IN GROUP R-2 OCCUPANCIES, WHERE STAIRS ARE ENCLOSED IN WALLS HAVING AT LEAST A 2-HOUR FIRE RESISTANCE RATING AND CONSTRUCTED OF MASONRY OR MASONRY EQUIVALENT IN ACCORDANCE WITH DEPARTMENT RULES:
   A. THE EXIT DOORS TO SUCH STAIRS SHALL BE PLACED A DISTANCE APART EQUAL TO NO LESS THAN 15 FEET (4572 MM); AND
   B. SUCH STAIRS SHALL BE PERMITTED TO SHARE COMMON WALLS, FLOORS, CEILINGS OR SCISSOR STAIRS ASSEMBLIES OR OTHER ENCLOSURES PROVIDED THAT THE CONSTRUCTION SEPARATING THE STAIRS IS ALSO OF AT LEAST A 2-HOUR FIRE-RESISTANCE RATING AND CONSTRUCTED OF MASONRY OR MASONRY EQUIVALENT IN ACCORDANCE WITH DEPARTMENT RULES.
   C. THE EXIT DOORS TO SUCH STAIRS SHALL BE PLACED A DISTANCE APART EQUAL TO NO LESS THAN 15 FEET (4572 MM); AND
   D. SUCH STAIRS SHALL BE PERMITTED TO SHARE COMMON WALLS, FLOORS, CEILINGS OR SCISSOR STAIRS ASSEMBLIES.

1007.1.1.1 MEASUREMENT POINT
THE SEPARATION DISTANCE REQUIRED IN SECTION 1007.1.1 SHALL BE MEASURED IN ACCORDANCE WITH THE FOLLOWING:
1. THE SEPARATION DISTANCE TO EXIT OR EXIT ACCESS DOORWAYS SHALL BE MEASURED TO THE CENTER POINT OF THE REQUIRED DOORWAY.
2. THE SEPARATION DISTANCE TO EXIT ACCESS STAIRWAYS SHALL BE MEASURED TO THE CENTER POINT OF THE CLOSEST RISER.
3. THE SEPARATION DISTANCE TO EXIT ACCESS RAMPS SHALL BE MEASURED TO THE CENTER POINT OF THE START OF THE RAMP RUN.

1007.1.2 THREE OR MORE EXITS OR EXIT ACCESS DOORWAYS
WHERE ACCESS TO THREE OR MORE EXITS IS REQUIRED, NOT LESS THAN TWO EXIT OR EXIT ACCESS DOORWAYS SHALL BE ARRANGED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1007.1.1. ADDITIONAL REQUIRED EXIT OR EXIT ACCESS DOORWAYS SHALL BE ARRANGED A REASONABLE DISTANCE APART SO THAT IF ONE BECOMES BLOCKED, THE OTHERS WILL BE AVAILABLE.

1007.1.3 REMOTENESS OF EXIT ACCESS STAIRWAYS OR RAMPS
WHERE TWO EXIT ACCESS STAIRWAYS OR RAMPS PROVIDE THE REQUIRED MEANS OF EGRESS TO EXITS AT ANOTHER STORY, THE REQUIRED SEPARATION DISTANCE SHALL BE MAINTAINED FOR ALL PORTIONS OF SUCH EXIT ACCESS STAIRWAYS OR RAMPS..

SECTION BC 1016 EXIT ACCESS

1016.1 GENERAL
THE EXIT ACCESS SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF SECTIONS 1003 THROUGH 1015. EXIT ACCESS ARRANGEMENT SHALL COMPLY WITH SECTIONS 1016 THROUGH 1021.
1016.2 EGRESS THROUGH INTERVENING SPACES
EGRESS THROUGH INTERVENING SPACES SHALL COMPLY WITH THIS SECTION.
1. EXIT ACCESS THROUGH AN ENCLOSED ELEVATOR LOBBY IS PERMITTED. ACCESS TO NOT LESS THAN ONE OF THE REQUIRED EXITS SHALL BE PROVIDED WITHOUT TRAVEL THROUGH THE ENCLOSED ELEVATOR LOBBIES REQUIRED BY SECTION 3006. WHERE THE PATH OF EXIT ACCESS TRAVEL PASSES THROUGH AN ENCLOSED ELEVATOR LOBBY, THE LEVEL OF PROTECTION REQUIRED FOR THE ENCLOSED ELEVATOR LOBBY IS NOT REQUIRED TO BE EXTENDED TO THE EXIT UNLESS DIRECT ACCESS TO AN EXIT IS REQUIRED BY OTHER SECTIONS OF THIS CODE.
2. EGRESS FROM A ROOM OR SPACE SHALL NOT PASS THROUGH ADJOINING OR INTERVENING ROOMS OR AREAS, EXCEPT WHERE SUCH ADJOINING ROOMS OR AREAS AND THE AREA SERVED ARE ACCESSORY TO ONE OR THE OTHER, ARE NOT A GROUP H OCCUPANCY AND PROVIDE A DISCERNIBLE PATH OF EGRESS TRAVEL TO AN EXIT.
   EXCEPTION: MEANS OF EGRESS ARE NOT PROHIBITED THROUGH ADJOINING OR INTERVENING ROOMS OR SPACES IN A GROUP H, S OR F OCCUPANCY WHERE THE ADJOINING OR INTERVENING ROOMS OR SPACES ARE THE SAME OR A LESSER HAZARD OCCUPANCY GROUP.
3. AN EXIT ACCESS SHALL NOT PASS THROUGH A ROOM THAT CAN BE LOCKED TO PREVENT EGRESS.
4. MEANS OF EGRESS FROM DWELLING UNITS OR SLEEPING AREAS SHALL NOT LEAD THROUGH OTHER SLEEPING AREAS, TOILET ROOMS OR BATHROOMS.
5. EGRESS SHALL NOT PASS THROUGH KITCHENS, STORAGE ROOMS, CLOSETS OR SPACES USED FOR SIMILAR PURPOSES.
   EXCEPTIONS:
6. MEANS OF EGRESS ARE NOT PROHIBITED THROUGH A KITCHEN AREA SERVING ADJOINING ROOMS CONSTITUTING PART OF THE SAME DWELLING UNIT OR SLEEPING UNIT.
7. MEANS OF EGRESS ARE NOT PROHIBITED THROUGH STOCKROOMS IN GROUP M WHERE ALL OF THE FOLLOWING ARE MET:
   1. THE STOCK IS OF THE SAME HAZARD CLASSIFICATION AS THAT FOUND IN THE MAIN RETAIL AREA.
   2. NOT MORE THAN 50 PERCENT OF THE EXIT ACCESS IS THROUGH THE STOCKROOM.
   3. THE STOCKROOM IS NOT SUBJECT TO LOCKING FROM THE EGRESS SIDE.
   4. THERE IS A DEMARCATED, MINIMUM 44-INCH (1117.6 MM) WIDE AISLE DEFINED BY FULL- OR PARTIAL-HEIGHT FIXED WALLS OR SIMILAR CONSTRUCTION THAT WILL MAINTAIN THE REQUIRED WIDTH AND LEAD DIRECTLY FROM THE RETAIL AREA TO THE EXIT WITHOUT OBSTRUCTIONS.

1016.2.1 MULTIPLE TENANTS
WHERE MORE THAN ONE TENANT OCCUPIES ANY ONE FLOOR OF A BUILDING OR STRUCTURE, EACH TENANT SPACE, DWELLING UNIT AND SLEEPING UNIT SHALL BE PROVIDED WITH ACCESS TO THE REQUIRED EXITS WITHOUT PASSING THROUGH ADJACENT TENANT SPACES, DWELLING UNITS AND SLEEPING UNITS.
EXCEPTION: THE MEANS OF EGRESS FROM A SMALLER TENANT SPACE SHALL NOT BE PROHIBITED FROM PASSING THROUGH A LARGER ADJOINING TENANT SPACE WHERE THE FOLLOWING CONDITIONS ARE MET:
1. SUCH ROOMS OR SPACES OF THE SMALLER TENANT OCCUPY LESS THAN 10 PERCENT OF THE AREA OF THE LARGER TENANT SPACE THROUGH WHICH THEY PASS;
2. THE LARGER TENANT IS A GROUP M OCCUPANCY AND THE SMALLER TENANT SPACE IS OF THE SAME OR SIMILAR OCCUPANCY GROUP;
3. A DISCERNIBLE PATH OF EGRESS TRAVEL IS PROVIDED FROM THE SMALLER TENANT SPACE TO AN EXIT;
4. THE MEANS OF EGRESS INTO THE ADJOINING SPACE IS NOT SUBJECT TO LOCKING FROM THE EGRESS SIDE OF THE SMALLER TENANT SPACE; AND
5. THE SMALLER TENANT SPACE SERVES THE SAME OCCUPANTS, CUSTOMERS, OR PATRONS AS THE LARGER TENANT SPACE.

1016.3 INTERVENING PUBLIC HALL IN GROUP R-2 OCCUPANCIES
BUILDINGS IN OCCUPANCY GROUP R-2 SHALL COMPLY WITH THE INTERVENING PUBLIC HALL REQUIREMENTS IN ACCORDANCE WITH SECTIONS 1016.3.1 AND 1016.3.2.
1016.3.1 GROUP R-2 NONHIGH-RISE OCCUPANCIES
IN BUILDINGS IN OCCUPANCY GROUP R-2 NOT SUBJECT TO SECTION 403, A DOOR FROM A DWELLING UNIT SHALL OPEN INTO AN INTERVENING PUBLIC HALL. SUCH PUBLIC HALL SHALL BE CONSTRUCTED AS A PUBLIC CORRIDOR IN ACCORDANCE WITH SECTION 1020. OPENING PROTECTIVES IN ACCORDANCE WITH EXCEPTION 3 OF SECTION 707.6 SHALL NOT BE PERMITTED.
EXCEPTIONS:
1. NO INTERVENING PUBLIC HALL SHALL BE REQUIRED FOR ANY OF THE FOLLOWING:
2. A BUILDING THAT IS BOTH THREE STORIES OR LESS IN HEIGHT, AND CONTAINS TWO OR FEWER DWELLING UNITS PER STORY; OR
3. A BUILDING THAT COMPLIES WITH ITEM 6 OF SECTION 1006.3.2.
4. NO INTERVENING PUBLIC HALL SHALL BE REQUIRED WHERE THE DOORS OPENING TO THE APARTMENTS ARE SMOKE AND DRAFT CONTROLLED DOORS COMPLYING WITH UL 1784 WITHOUT ARTIFICIAL BOTTOM SEALS, IN ACCORDANCE WITH SECTIONS 716.5 AND 716.5.7.3 OF THIS CODE, AND THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1 OF THIS CODE. THIS EXCEPTION SHALL NOT APPLY TO ANY BUILDING THAT COMPLIES WITH ITEM 7 OF SECTION 1006.3.2 OF THIS CODE WHERE THERE IS MORE THAN ONE APARTMENT PER STORY.

1016.3.2 GROUP R-2 HIGH-RISE OCCUPANCIES
IN HIGH-RISE BUILDINGS IN OCCUPANCY GROUP R-2, ALL DOORS FROM A DWELLING UNIT SHALL OPEN INTO AN INTERVENING PUBLIC HALL. SUCH PUBLIC HALL SHALL BE CONSTRUCTED AS A PUBLIC CORRIDOR IN ACCORDANCE WITH SECTION 1020. OPENING PROTECTIVES IN ACCORDANCE WITH EXCEPTION 3 OF SECTION 707.6 SHALL NOT BE PERMITTED. SUCH PUBLIC HALL SHALL PROVIDE ACCESS TO AT LEAST TWO EXITS.
EXCEPTION: WHERE THE ONLY DWELLING UNITS ON A STORY OF A BUILDING ARE THE UPPER STORIES OF MULTISTORY (DUPLEX) DWELLING UNITS;
1. ANY PUBLIC HALLS SHALL BE PERMITTED TO PROVIDE ACCESS TO ONLY ONE EXIT; OR
2. NO SUCH PUBLIC HALL SHALL BE REQUIRED WHERE SMOKE AND DRAFT CONTROLLED DOORS COMPLYING WITH UL 1784 WITHOUT ARTIFICIAL BOTTOM SEALS, IN ACCORDANCE WITH SECTIONS 716.5 AND 716.5.7.3 OF THIS CODE, ARE PROVIDED. THIS EXCEPTION SHALL NOT BE CONSTRUED TO EFFECT, ALTER, OR CHANGE ANY REQUIREMENT OF THIS CODE TO PROVIDE TWO MEANS OF EGRESS FROM EACH APARTMENT ON EACH STORY.

SECTION BC 1017 EXIT ACCESS TRAVEL DISTANCE

1017.1 GENERAL
TRAVEL DISTANCE WITHIN THE EXIT ACCESS PORTION OF THE MEANS OF EGRESS SYSTEM SHALL BE IN ACCORDANCE WITH THIS SECTION.

1017.2 LIMITATIONS
EXIT ACCESS TRAVEL DISTANCE SHALL NOT EXCEED THE VALUES GIVEN IN TABLE 1017.2.

TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCEa

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A	See Section 1029.7	
E, F-1, M, R, S-1	150	200b
B	200	300c
F-2, S-2, U	200	250c
H-1	Not Permitted	75d
H-2	Not Permitted	100d
H-3	Not Permitted	150d
H-4	Not Permitted	175d
H-5	Not Permitted	200c
I-1, I-2, I-3, I-4	Not Permitted	200c

FOR SI: 1 FOOT = 304.8 MM. Assembly Code

a. SEE THE FOLLOWING SECTIONS FOR MODIFICATIONS TO EXIT ACCESS TRAVEL DISTANCE REQUIREMENTS:
   SECTION 402.8: FOR THE DISTANCE LIMITATION IN MALLS.
   SECTION 404.9: FOR THE DISTANCE LIMITATION THROUGH AN ATRIUM SPACE.
   SECTION 407.4: FOR THE DISTANCE LIMITATION IN GROUP I-2.
   SECTIONS 408.6.1 AND 408.8.1: FOR THE DISTANCE LIMITATIONS IN GROUP I-3.
   SECTION 411.4: FOR THE DISTANCE LIMITATION IN SPECIAL AMUSEMENT BUILDINGS.
   SECTION 412.7: FOR THE DISTANCE LIMITATIONS IN AIRCRAFT MANUFACTURING FACILITIES.
   SECTION 407.4.2: FOR THE DISTANCE LIMITATION IN GROUP I-2 HOSPITAL SUITES.
   SECTION 1006.2.2.2: FOR THE DISTANCE LIMITATION IN REFRIGERATION MACHINERY ROOMS.
   SECTION 1006.2.2.3: FOR THE DISTANCE LIMITATION IN REFRIGERATED ROOMS AND SPACES.
   SECTION 1006.3.2: FOR BUILDINGS WITH ONE EXIT.
   SECTION 1029.7: FOR INCREASED LIMITATION IN ASSEMBLY SEATING.
   SECTION 3103.4: FOR TEMPORARY STRUCTURES.
   SECTION 3104.9: FOR PEDESTRIAN WALKWAYS.
b. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2. SEE SECTION 903 FOR OCCUPANCIES WHERE SPRINKLER SYSTEMS ARE PERMITTED IN ACCORDANCE WITH SECTION 903.3.1.2.
c. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1.
   GROUP H OCCUPANCIES EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.2.5.1.

1017.2.1 EXTERIOR EGRESS BALCONY INCREASE
EXIT ACCESS TRAVEL DISTANCES SPECIFIED IN TABLE 1017.2 SHALL BE INCREASED UP TO AN ADDITIONAL 100 FEET (30 480 MM) PROVIDED THE LAST PORTION OF THE EXIT ACCESS LEADING TO THE EXIT OCCURS ON AN EXTERIOR EGRESS BALCONY CONSTRUCTED IN ACCORDANCE WITH SECTION 1021. THE LENGTH OF SUCH BALCONY SHALL BE NOT LESS THAN THE AMOUNT OF THE INCREASE TAKEN.

1017.3 MEASUREMENT
EXIT ACCESS TRAVEL DISTANCE SHALL BE MEASURED FROM THE MOST REMOTE POINT WITHIN A STORY ALONG THE NATURAL AND UNOBSTRUCTED PATH OF HORIZONTAL AND VERTICAL EGRESS TRAVEL TO THE ENTRANCE TO AN EXIT.
EXCEPTIONS:
1. IN OPEN PARKING GARAGES, EXIT ACCESS TRAVEL DISTANCE IS PERMITTED TO BE MEASURED TO THE CLOSEST RISER OF AN EXIT ACCESS STAIRWAY OR THE CLOSEST SLOPE OF AN EXIT ACCESS RAMP.
2. IN BUILDINGS OF GROUP A-5 WITH OPEN-AIR SEATING SERVED BY EXIT ACCESS STAIRWAYS AND RAMPS, EXIT ACCESS TRAVEL DISTANCE IS PERMITTED TO BE MEASURED TO THE CLOSEST RISER OF AN EXIT ACCESS STAIRWAY OR THE CLOSEST SLOPE OF AN EXIT ACCESS RAMP.
3. EXIT ACCESS TRAVEL DISTANCE IN ASSEMBLY OCCUPANCIES SHALL BE MEASURED IN ACCORDANCE WITH SECTION 1029.

1017.3.1 EXIT ACCESS STAIRWAYS AND RAMPS
TRAVEL DISTANCE ON EXIT ACCESS STAIRWAYS OR RAMPS SHALL BE INCLUDED IN THE EXIT ACCESS TRAVEL DISTANCE MEASUREMENT. THE MEASUREMENT ALONG STAIRWAYS SHALL BE MADE ON A PLANE PARALLEL AND TANGENT TO THE STAIR TREAD NOSINGS IN THE CENTER OF THE STAIR AND LANDINGS. THE MEASUREMENT ALONG RAMPS SHALL BE MADE ON THE WALKING SURFACE IN THE CENTER OF THE RAMP AND LANDINGS.

SECTION BC 1018 AISLES

1018.1 GENERAL
AISLES AND AISLE ACCESSWAYS SERVING AS A PORTION OF THE EXIT ACCESS IN THE MEANS OF EGRESS SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION. AISLES OR AISLE ACCESSWAYS SHALL BE PROVIDED FROM ALL OCCUPIED PORTIONS OF THE EXIT ACCESS THAT CONTAIN SEATS, TABLES, FURNISHINGS, DISPLAYS AND SIMILAR FIXTURES OR EQUIPMENT. THE MINIMUM WIDTH OR REQUIRED CAPACITY OF AISLES SHALL BE UNOBSTRUCTED.
EXCEPTION: ENCROACHMENTS COMPLYING WITH SECTION 1005.7.
1018.2 AISLES IN ASSEMBLY SPACES
AISLES AND AISLE ACCESSWAYS SERVING A ROOM OR SPACE USED FOR ASSEMBLY PURPOSES SHALL COMPLY WITH SECTION 1029.

1018.3 AISLES IN GROUPS B AND M
IN GROUP B AND M OCCUPANCIES, THE MINIMUM CLEAR AISLE WIDTH SHALL BE DETERMINED BY SECTION 1005 FOR THE OCCUPANT LOAD SERVED, BUT SHALL BE NOT LESS THAN 36 INCHES (914.4 MM).
EXCEPTION: NONPUBLIC AISLES SERVING LESS THAN 50 PEOPLE AND NOT REQUIRED TO BE ACCESSIBLE BY CHAPTER 11 NEED NOT EXCEED 28 INCHES (711.2 MM) IN WIDTH.

1018.4 AISLE ACCESSWAYS IN GROUP M
AN AISLE ACCESSWAY SHALL BE PROVIDED ON NOT LESS THAN ONE SIDE OF EACH ELEMENT WITHIN THE MERCHANDISE PAD. THE MINIMUM CLEAR WIDTH FOR AN AISLE ACCESSWAY NOT REQUIRED TO BE ACCESSIBLE SHALL BE 30 INCHES (762 MM). THE REQUIRED CLEAR WIDTH OF THE AISLE ACCESSWAY SHALL BE MEASURED PERPENDICULAR TO THE ELEMENTS AND MERCHANDISE WITHIN THE MERCHANDISE PAD. THE 30-INCH (762 MM) MINIMUM CLEAR WIDTH SHALL BE MAINTAINED TO PROVIDE A PATH TO AN ADJACENT AISLE OR AISLE ACCESSWAY. THE COMMON PATH OF EGRESS TRAVEL SHALL NOT EXCEED 30 FEET (9144 MM) FROM ANY POINT IN THE MERCHANDISE PAD.
EXCEPTION: FOR AREAS SERVING NOT MORE THAN 50 OCCUPANTS, THE COMMON PATH OF EGRESS TRAVEL SHALL NOT EXCEED 75 FEET (22 860 MM).

SECTION BC 1019 EXIT ACCESS STAIRWAYS AND RAMPS

1019.1 GENERAL
EXIT ACCESS STAIRWAYS AND RAMPS SERVING AS AN EXIT ACCESS COMPONENT IN A MEANS OF EGRESS SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION. THE NUMBER OF STORIES CONNECTED BY EXIT ACCESS STAIRWAYS AND RAMPS SHALL INCLUDE BASEMENTS, BUT NOT MEZZANINES.

1019.2 ALL OCCUPANCIES
EXIT ACCESS STAIRWAYS AND RAMPS THAT SERVE FLOOR LEVELS WITHIN A SINGLE STORY ARE NOT REQUIRED TO BE ENCLOSED.

1019.3 OCCUPANCIES OTHER THAN GROUPS H, I-2 AND I-3
IN OTHER THAN GROUP H, I-2 AND I-3 OCCUPANCIES, EXIT ACCESS STAIRWAYS OR RAMPS SHALL BE ENCLOSED WITH A SHAFT ENCLOSURE CONSTRUCTED IN ACCORDANCE WITH SECTION 713.
EXCEPTION: IN OTHER THAN GROUP H, I-2 AND I-3 OCCUPANCIES, EXIT ACCESS STAIRWAYS OR RAMPS THAT COMPLY WITH ONE OF THE FOLLOWING CONDITIONS NEED NOT BE ENCLOSED:
1. A MAXIMUM OF 50 PERCENT OF THE EXIT ACCESS STAIRWAYS AND RAMPS THAT SERVE ONLY TWO CONSECUTIVE STORIES NEED NOT BE ENCLOSED, PROVIDED EACH SUCH INTERCONNECTED STORY HAS ACCESS TO THE MINIMUM NUMBER OF APPROVED INDEPENDENT EXITS AS REQUIRED BY SECTION 1006, AND IN NO CASE BE LESS THAN TWO MEANS OF EGRESS. SUCH INTERCONNECTED STORIES SHALL NOT BE OPEN TO OTHER STORIES. UNENCLOSED EXIT ACCESS STAIRWAYS AND RAMPS SHALL BE REMOTELY LOCATED IN ACCORDANCE WITH SECTION 1007.
2. IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, EXIT ACCESS STAIRWAYS AND RAMPS THAT SERVE BETWEEN ONLY THE FIRST AND SECOND STORIES ABOVE GRADE, PROVIDED THE FIRST AND SECOND STORIES HAVE ACCESS TO THE MINIMUM NUMBER OF APPROVED INDEPENDENT EXITS AS REQUIRED BY SECTION 1006, AND IN NO CASE BE LESS THAN TWO MEANS OF EGRESS. SUCH INTERCONNECTED STORIES SHALL NOT BE OPEN TO OTHER STORIES. UNENCLOSED EXIT ACCESS STAIRWAYS AND RAMPS SHALL BE REMOTELY LOCATED IN ACCORDANCE WITH SECTION 1007.
3. IN GROUP R-1, R-2 OR R-3 OCCUPANCIES THAT ARE FULLY SPRINKLERED IN ACCORDANCE WITH SECTION 903.3.1.1, 903.3.1.2 OR 903.3.1.3, EXIT ACCESS STAIRWAYS AND RAMPS CONNECTING FOUR STORIES OR LESS AND CONTAINED WITHIN AN INDIVIDUAL RESIDENTIAL DWELLING UNIT.
4. EXIT ACCESS STAIRWAYS AND RAMPS IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, WHERE THE AREA OF THE VERTICAL OPENING BETWEEN STORIES DOES NOT EXCEED TWICE THE HORIZONTAL PROJECTED AREA OF THE STAIRWAY OR RAMP AND THE OPENING IS PROTECTED BY A DRAFT CURTAIN AND CLOSELY SPACED SPRINKLERS IN ACCORDANCE WITH NFPA 13 AS MODIFIED BY APPENDIX Q. IN OTHER THAN GROUP B AND M OCCUPANCIES, THIS PROVISION IS LIMITED TO OPENINGS THAT DO NOT CONNECT MORE THAN FOUR STORIES.
5. EXIT ACCESS STAIRWAYS AND RAMPS WITHIN AN ATRIUM COMPLYING WITH THE PROVISIONS OF SECTION 404.
6. EXIT ACCESS STAIRWAYS AND RAMPS IN OPEN PARKING GARAGES THAT SERVE ONLY THE PARKING GARAGE.
7. EXIT ACCESS STAIRWAYS AND RAMPS SERVING OPEN-AIR SEATING IN BUILDINGS OF GROUP A-5, WHERE ALL PORTIONS OF THE MEANS OF EGRESS ARE ESSENTIALLY OPEN TO THE OUTSIDE.
8. EXIT ACCESS STAIRWAYS AND RAMPS SERVING THE BALCONY, GALLERY OR PRESS BOX AND THE MAIN ASSEMBLY FLOOR IN OCCUPANCIES SUCH AS THEATERS, PLACES OF RELIGIOUS WORSHIP, AUDITORIUMS AND SPORTS FACILITIES.
1019.4 GROUP I-2 AND I-3 OCCUPANCIES
IN GROUP I-2 AND I-3 OCCUPANCIES, FLOOR OPENINGS BETWEEN STORIES CONTAINING EXIT ACCESS STAIRWAYS OR RAMPS ARE REQUIRED TO BE ENCLOSED WITH A SHAFT ENCLOSURE CONSTRUCTED IN ACCORDANCE WITH SECTION 713.
EXCEPTION: IN GROUP I-3 OCCUPANCIES, EXIT ACCESS STAIRWAYS OR RAMPS CONSTRUCTED IN ACCORDANCE WITH SECTION 408 ARE NOT REQUIRED TO BE ENCLOSED.

SECTION BC 1020 CORRIDORS

1020.1 CONSTRUCTION
CORRIDORS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THIS SECTION. INTERIOR CORRIDOR WALLS REQUIRED TO BE FIRE-RESISTANCE RATED SHALL COMPLY WITH SECTION 708 FOR FIRE PARTITIONS. PUBLIC CORRIDOR WALLS SHALL COMPLY WITH SECTION 707 FOR FIRE BARRIERS.

1020.1.1 INTERIOR CORRIDORS
INTERIOR CORRIDORS SHALL BE FIRE-RESISTANCE RATED IN ACCORDANCE WITH TABLE 1020.1.1.
EXCEPTIONS:
1. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS IN AN OCCUPANCY IN GROUP E WHERE EACH ROOM THAT IS USED FOR INSTRUCTION HAS NOT LESS THAN ONE DOOR OPENING DIRECTLY TO THE EXTERIOR AND ROOMS FOR ASSEMBLY PURPOSES HAVE NOT LESS THAN ONE-HALF OF THE REQUIRED MEANS OF EGRESS DOORS OPENING DIRECTLY TO THE EXTERIOR. EXTERIOR DOORS SPECIFIED IN THIS EXCEPTION ARE REQUIRED TO BE AT GROUND LEVEL.
2. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS CONTAINED WITHIN A DWELLING UNIT OR SLEEPING UNIT IN AN OCCUPANCY IN GROUP R.
3. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS IN OPEN PARKING GARAGES.
4. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS IN AN OCCUPANCY IN GROUP B THAT IS A SPACE REQUIRING ONLY A SINGLE MEANS OF EGRESS COMPLYING WITH SECTION 1006.2.
5. CORRIDORS ADJACENT TO THE EXTERIOR WALLS OF BUILDINGS SHALL BE PERMITTED TO HAVE UNPROTECTED OPENINGS ON UNRATED EXTERIOR WALLS WHERE UNRATED WALLS ARE PERMITTED BY TABLE 602 AND UNPROTECTED OPENINGS ARE PERMITTED BY TABLE 705.8.
6.

TABLE 1020.1.1
INTERIOR CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY INTERIOR CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours): WITHOUT SPRINKLER SYSTEM	WITH SPRINKLER SYSTEMc
H-1, H-2, H-3	ALL	NOT PERMITTED	1
H-4, H-5	GREATER THAN 30	NOT PERMITTED	1
A, B, E, F, M, S, U	GREATER THAN 30	1	0
R	GREATER THAN 10	1d	0
I-2a, I-4	ALL	NOT PERMITTED	0
I-1, I-3	ALL	NOT PERMITTED	1b

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a. FOR REQUIREMENTS FOR OCCUPANCIES IN GROUP I-2, SEE SECTIONS 407.2 AND 407.3.
b. FOR A REDUCTION IN THE FIRE-RESISTANCE RATING FOR OCCUPANCIES IN GROUP I-3, SEE SECTION 408.8.
c. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2 WHERE ALLOWED.
d. INTERIOR CORRIDORS WITHIN DWELLING OR SLEEPING UNITS IN GROUP R OCCUPANCIES PURSUANT TO SECTION 1020.1.1, EXCEPTION 2 SHALL NOT REQUIRE FIRE-RESISTANCE RATING.

1020.1.2 PUBLIC CORRIDORS
PUBLIC CORRIDORS SHALL BE FIRE-RESISTANCE RATED IN ACCORDANCE WITH TABLE 1020.1.2.

TABLE 1020.1.2
PUBLIC CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	REQUIRED FIRE-RESISTANCE RATING (hours)
H-1, H-2, H-3	2
H-4, H-5	1
A, E, F, M, S, U	1
B	1a
R (Noncombustible)	1c
R (Combustible)	2b
I-1, I-2, I-3, I-4	1

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a. PUBLIC CORRIDORS NEED NOT BE FIRE RATED IN HIGH-RISE BUILDINGS IN OCCUPANCY GROUP B EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, WHERE SUCH BUILDING IS PROVIDED WITH SMOKEPROOF ENCLOSURES IN STAIRWAYS IN ACCORDANCE WITH SECTION 403.5.4.
b. PUBLIC CORRIDORS IN BUILDINGS NOT EXCEEDING TWO STORIES IN HEIGHT, OR THAT ARE THREE STORIES IN HEIGHT AND OCCUPIED BY NOT MORE THAN ONE FAMILY ON EACH STORY, MAY BE CONSTRUCTED WITH 1-HOUR FIRE-RESISTANCE RATING.
c. CORRIDORS SERVING ACCESSORY ROOMS OR SPACES IN GROUP R-2 OCCUPANCIES PURSUANT TO SECTION 1004.1.1.2.3 SHALL BE CONSTRUCTED WITH FIRE BARRIERS WITH 1-HOUR FIRE-RESISTANCE RATING, AND 2-HOUR FIRE-RESISTANCE RATING WHERE THE DEAD-END DISTANCE EXCEEDS 40 FEET (12 192 MM) IN LENGTH.

1020.2 WIDTH AND CAPACITY
THE REQUIRED CAPACITY OF CORRIDORS SHALL BE DETERMINED AS SPECIFIED IN SECTION 1005, BUT THE MINIMUM WIDTH SHALL BE NOT LESS THAN THAT SPECIFIED IN TABLE 1020.2.
EXCEPTION: IN GROUP I-2 OCCUPANCIES, CORRIDORS ARE NOT REQUIRED TO HAVE A CLEAR WIDTH OF 96 INCHES (2438.4 MM) IN AREAS WHERE THERE WILL NOT BE STRETCHER OR BED MOVEMENT FOR ACCESS TO CARE OR AS PART OF THE DEFEND-IN-PLACE STRATEGY.

TABLE 1020.2
MINIMUM CORRIDOR WIDTH

OCCUPANCY	MINIMUM WIDTH (inches)
ANY FACILITIES NOT LISTED BELOW	44
ACCESS TO AND UTILIZATION OF MECHANICAL, PLUMBING OR ELECTRICAL SYSTEMS OR EQUIPMENT	24
WITH AN OCCUPANT LOAD OF 50 OR LESS, EXCEPT AS OTHERWISE REQUIRED BY CHAPTER 11	36
WITHIN A DWELLING UNIT, IN OCCUPANCY GROUPS I-1 AND R-1, EXCEPT AS OTHERWISE REQUIRED BY SECTION 1107	36
WITHIN A DWELLING UNIT, IN OCCUPANCY GROUPS R-2 AND R-3, EXCEPT AS OTHERWISE REQUIRED BY SECTION 1107	30
IN GROUP E SERVING CLASSROOMS	66
IN CORRIDORS AND AREAS SERVING STRETCHER TRAFFIC IN OCCUPANCIES WHERE PATIENTS RECEIVE OUTPATIENT MEDICAL CARE THAT CAUSES THE PATIENTS TO BE INCAPABLE OF SELF-PRESERVATION	72
GROUP I-2 IN AREAS WHERE REQUIRED FOR BED MOVEMENT	96

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1020.3 OBSTRUCTION
THE MINIMUM WIDTH OR REQUIRED CAPACITY OF CORRIDORS SHALL BE UNOBSTRUCTED.
EXCEPTION: ENCROACHMENTS COMPLYING WITH SECTION 1005.7.

1020.4 DEAD ENDS
WHERE MORE THAN ONE EXIT OR EXIT ACCESS DOORWAY IS REQUIRED, THE EXIT ACCESS SHALL BE ARRANGED SUCH THAT THERE ARE NO DEAD ENDS IN CORRIDORS MORE THAN 20 FEET (6096 MM) IN LENGTH.
EXCEPTIONS:
1. IN OCCUPANCIES IN GROUP I-3 OF CONDITION 2, 3 OR 4, THE DEAD END IN A CORRIDOR SHALL NOT EXCEED 50 FEET (15 240 MM).
2. IN OCCUPANCIES IN GROUPS B, E, F, I-1, M, R-1, S AND U, WHERE THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, THE LENGTH OF THE DEAD-END CORRIDORS SHALL NOT EXCEED 50 FEET (15 240 MM).
3. DEAD-END LENGTH NOT EXCEEDING 2.5 TIMES THE LEAST WIDTH OF THE DEAD-END CORRIDOR.
4. IN OCCUPANCIES IN GROUP R-2, THE DEAD END IN A CORRIDOR SHALL NOT EXCEED 40 FEET (12 192 MM). HOWEVER, WHERE THE CORRIDORS ARE COMPLETELY ENCLOSED IN CONSTRUCTION HAVING A 2-HOUR FIRE-RESISTANCE RATING WITH ALL DOORS OPENING INTO THE CORRIDOR BEING SELF-CLOSING AND HAVING A FIRE-RESISTANCE RATING OF 11/2 HOURS, THE LENGTH OF DEAD-END CORRIDOR SHALL NOT EXCEED 80 FEET (24 384 MM).

SECTION BC 1022 EXITS

1022.1 GENERAL
EXITS SHALL COMPLY WITH SECTIONS 1022 THROUGH 1027 AND THE APPLICABLE REQUIREMENTS OF SECTIONS 1003 THROUGH 1015. AN EXIT SHALL NOT BE USED FOR ANY PURPOSE THAT INTERFERES WITH ITS FUNCTION AS A MEANS OF EGRESS. ONCE A GIVEN LEVEL OF EXIT PROTECTION IS ACHIEVED, SUCH LEVEL OF PROTECTION SHALL NOT BE REDUCED UNTIL ARRIVAL AT THE EXIT DISCHARGE. EXITS SHALL BE CONTINUOUS FROM THE POINT OF ENTRY INTO THE EXIT TO THE EXIT DISCHARGE.
EXCEPTION: INTERIOR EXIT STAIRWAYS WITH DOORS THAT ARE AUTOMATIC-CLOSING BY SMOKE DETECTION PURSUANT TO THE EXCEPTION SET FORTH IN SECTION 713.7 MAY BE USED FOR TRAVEL BETWEEN FLOORS AND THIS USE SHALL NOT BE DEEMED TO INTERFERE WITH FUNCTION AS A MEANS OF EGRESS.

1022.2 EXTERIOR EXIT DOORS
BUILDINGS OR STRUCTURES USED FOR HUMAN OCCUPANCY SHALL HAVE NOT LESS THAN ONE EXTERIOR DOOR THAT MEETS THE REQUIREMENTS OF SECTION 1010.1.1.

1022.2.1 DETAILED REQUIREMENTS
EXTERIOR EXIT DOORS SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF SECTION 1010.1.

1022.2.2 ARRANGEMENT
EXTERIOR EXIT DOORS SHALL LEAD DIRECTLY TO THE EXIT DISCHARGE OR THE PUBLIC WAY.

SECTION BC 1023 INTERIOR EXIT STAIRWAYS AND RAMPS

1023.1 GENERAL
INTERIOR EXIT STAIRWAYS AND RAMPS SERVING AS AN EXIT COMPONENT IN A MEANS OF EGRESS SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION. INTERIOR EXIT STAIRWAYS AND RAMPS SHALL BE ENCLOSED AND LEAD DIRECTLY TO THE EXTERIOR OF THE BUILDING OR SHALL BE EXTENDED TO THE EXTERIOR OF THE BUILDING WITH AN EXIT PASSAGEWAY CONFORMING TO THE REQUIREMENTS OF SECTION 1024, EXCEPT AS PERMITTED IN SECTION 1028.1. AN INTERIOR EXIT STAIRWAY OR RAMP SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN AS A MEANS OF EGRESS AND A CIRCULATION PATH.

1023.2 CONSTRUCTION
ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND RAMPS SHALL BE CONSTRUCTED AS FIRE BARRIERS IN ACCORDANCE WITH SECTION 707 OR HORIZONTAL ASSEMBLIES CONSTRUCTED IN ACCORDANCE WITH SECTION 711, OR BOTH. INTERIOR EXIT STAIRWAY AND RAMP ENCLOSURES SHALL HAVE A FIRE-RESISTANCE RATING OF NOT LESS THAN 2 HOURS WHERE CONNECTING FOUR STORIES OR MORE AND NOT LESS THAN 1 HOUR WHERE CONNECTING LESS THAN FOUR STORIES. THE NUMBER OF STORIES CONNECTED BY THE INTERIOR EXIT STAIRWAYS OR RAMPS SHALL INCLUDE ANY BASEMENTS, BUT NOT ANY MEZZANINES. INTERIOR EXIT STAIRWAYS AND RAMPS SHALL HAVE A FIRE-RESISTANCE RATING NOT LESS THAN THE FLOOR ASSEMBLY PENETRATED, BUT NEED NOT EXCEED 2 HOURS. IN GROUP R-1 AND R-2 OCCUPANCIES, WHERE INTERIOR EXIT STAIRWAYS AND RAMPS ARE REQUIRED TO HAVE A FIRE-RESISTANCE RATING OF 2 HOURS, SUCH ENCLOSURES SHALL BE CONSTRUCTED OF MASONRY OR MASONRY EQUIVALENT. WALL ASSEMBLIES CONSTITUTING MASONRY EQUIVALENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH DEPARTMENT RULES.
EXCEPTIONS:
1. INTERIOR EXIT STAIRWAYS AND RAMPS IN GROUP I-3 OCCUPANCIES IN ACCORDANCE WITH THE PROVISIONS OF SECTION 408.3.8.
2. INTERIOR EXIT STAIRWAYS WITHIN AN ATRIUM ENCLOSED IN ACCORDANCE WITH SECTION 404.6.

1023.3 TERMINATION
INTERIOR EXIT STAIRWAYS AND RAMPS SHALL TERMINATE AT AN EXIT DISCHARGE OR A PUBLIC WAY.
EXCEPTION: A COMBINATION OF INTERIOR EXIT STAIRWAYS, INTERIOR EXIT RAMPS AND EXIT PASSAGEWAYS, CONSTRUCTED IN ACCORDANCE WITH SECTIONS 1023.2, 1023.3.1 AND 1024, RESPECTIVELY, AND FORMING A CONTINUOUS PROTECTED ENCLOSURE, SHALL BE PERMITTED TO EXTEND AN INTERIOR EXIT STAIRWAY OR RAMP TO THE EXIT DISCHARGE OR A PUBLIC WAY.

1023.3.1 EXTENSION
WHERE INTERIOR EXIT STAIRWAYS AND RAMPS ARE EXTENDED TO AN EXIT DISCHARGE OR A PUBLIC WAY BY AN EXIT PASSAGEWAY, THE INTERIOR EXIT STAIRWAY AND RAMP SHALL BE SEPARATED FROM THE EXIT PASSAGEWAY BY A FIRE BARRIER CONSTRUCTED IN ACCORDANCE WITH SECTION 707 OR A HORIZONTAL ASSEMBLY CONSTRUCTED IN ACCORDANCE WITH SECTION 711, OR BOTH. THE FIRE-RESISTANCE RATING SHALL BE NOT LESS THAN THAT REQUIRED FOR THE INTERIOR EXIT STAIRWAY AND RAMP. A FIRE DOOR ASSEMBLY COMPLYING WITH SECTION 716.5 SHALL BE INSTALLED IN THE FIRE BARRIER TO PROVIDE A MEANS OF EGRESS FROM THE INTERIOR EXIT STAIRWAY AND RAMP TO THE EXIT PASSAGEWAY. OPENINGS IN THE FIRE BARRIER OTHER THAN THE FIRE DOOR ASSEMBLY ARE PROHIBITED. PENETRATIONS OF THE FIRE BARRIER ARE PROHIBITED.
EXCEPTIONS:
1. PENETRATIONS OF THE FIRE BARRIER IN ACCORDANCE WITH SECTION 1023.5 SHALL BE PERMITTED.
2. SEPARATION BETWEEN AN INTERIOR EXIT STAIRWAY OR RAMP AND THE EXIT PASSAGEWAY EXTENSION SHALL NOT BE REQUIRED WHERE THERE ARE NO OPENINGS INTO THE EXIT PASSAGEWAY EXTENSION.

1023.4 OPENINGS
INTERIOR EXIT STAIRWAY AND RAMP OPENING PROTECTIVES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 716. OPENINGS IN INTERIOR EXIT STAIRWAYS AND RAMPS OTHER THAN UNPROTECTED EXTERIOR OPENINGS SHALL BE LIMITED TO THOSE NECESSARY FOR EXIT ACCESS TO THE ENCLOSURE FROM NORMALLY OCCUPIED SPACES AND FOR EGRESS FROM THE ENCLOSURE. ELEVATORS SHALL NOT OPEN INTO INTERIOR EXIT STAIRWAYS AND RAMPS.

1023.5 PENETRATIONS
PENETRATIONS INTO OR THROUGH INTERIOR EXIT STAIRWAYS AND RAMPS ARE PROHIBITED EXCEPT FOR EQUIPMENT AND DUCTWORK NECESSARY FOR INDEPENDENT VENTILATION OR PRESSURIZATION, HYDRONIC PIPING AND RELATED HEATING EQUIPMENT LIMITED TO SERVING THE INTERIOR EXIT STAIRWAY OR RAMP IN WHICH SUCH PIPING AND EQUIPMENT IS LOCATED, SPRINKLER PIPING, STANDPIPES, ELECTRICAL RACEWAY FOR FIRE DEPARTMENT COMMUNICATION SYSTEMS AND ELECTRICAL RACEWAY SERVING THE INTERIOR EXIT STAIRWAY AND RAMP AND TERMINATING AT A STEEL BOX NOT EXCEEDING 16 SQUARE INCHES (0.010 M2). SUCH PENETRATIONS SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 714. THERE SHALL NOT BE PENETRATIONS OR COMMUNICATION OPENINGS, WHETHER PROTECTED OR NOT, BETWEEN ADJACENT INTERIOR EXIT STAIRWAYS AND RAMPS.
EXCEPTION: MEMBRANE PENETRATIONS SHALL BE PERMITTED ON THE OUTSIDE OF THE INTERIOR EXIT STAIRWAY AND RAMP. SUCH PENETRATIONS SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 714.3.2.

1023.6 VENTILATION
EQUIPMENT AND DUCTWORK FOR INTERIOR EXIT STAIRWAY AND RAMP VENTILATION AS PERMITTED BY SECTION 1023.5 SHALL COMPLY WITH ONE OF THE FOLLOWING ITEMS:
1. SUCH EQUIPMENT AND DUCTWORK SHALL BE LOCATED EXTERIOR TO THE BUILDING AND SHALL BE DIRECTLY CONNECTED TO THE INTERIOR EXIT STAIRWAY AND RAMP BY DUCTWORK ENCLOSED IN CONSTRUCTION AS REQUIRED FOR SHAFTS.
2. WHERE SUCH EQUIPMENT AND DUCTWORK IS LOCATED WITHIN THE INTERIOR EXIT STAIRWAY AND RAMP, THE INTAKE AIR SHALL BE TAKEN DIRECTLY FROM THE OUTDOORS AND THE EXHAUST AIR SHALL BE DISCHARGED DIRECTLY TO THE OUTDOORS, OR SUCH AIR SHALL BE CONVEYED THROUGH DUCTS ENCLOSED IN CONSTRUCTION AS REQUIRED FOR SHAFTS.
3. WHERE LOCATED WITHIN THE BUILDING, SUCH EQUIPMENT AND DUCTWORK SHALL BE SEPARATED FROM THE REMAINDER OF THE BUILDING, INCLUDING OTHER MECHANICAL EQUIPMENT, WITH CONSTRUCTION AS REQUIRED FOR SHAFTS.
   IN EACH CASE, OPENINGS INTO THE FIRE-RESISTANCE-RATED CONSTRUCTION SHALL BE LIMITED TO THOSE NEEDED FOR MAINTENANCE AND OPERATION AND SHALL BE PROTECTED BY OPENING PROTECTIVES IN ACCORDANCE WITH SECTION 716 FOR SHAFT ENCLOSURES. THE INTERIOR EXIT STAIRWAY AND RAMP VENTILATION SYSTEMS SHALL BE INDEPENDENT OF OTHER BUILDING VENTILATION SYSTEMS.

1023.7 INTERIOR EXIT STAIRWAY AND RAMP EXTERIOR WALLS
EXTERIOR WALLS OF THE INTERIOR EXIT STAIRWAY OR RAMP SHALL COMPLY WITH THE REQUIREMENTS OF SECTION 705 FOR EXTERIOR WALLS. WHERE NONRATED WALLS OR UNPROTECTED OPENINGS ENCLOSE THE EXTERIOR OF THE STAIRWAY OR RAMPS AND THE WALLS OR OPENINGS ARE EXPOSED BY OTHER PARTS OF THE BUILDING AT AN ANGLE OF LESS THAN 180 DEGREES (3.14 RAD), THE BUILDING EXTERIOR WALLS WITHIN 10 FEET (3048 MM) HORIZONTALLY OF A NONRATED WALL OR UNPROTECTED OPENING SHALL HAVE A FIRE-RESISTANCE RATING OF NOT LESS THAN 1 HOUR. OPENINGS WITHIN SUCH EXTERIOR WALLS SHALL BE PROTECTED BY OPENING PROTECTIVES HAVING A FIRE PROTECTION RATING OF NOT LESS THAN 3/4 HOUR. THIS CONSTRUCTION SHALL EXTEND VERTICALLY FROM THE GROUND TO A POINT 10 FEET (3048 MM) ABOVE THE TOPMOST LANDING OF THE STAIRWAY OR RAMP, OR TO THE ROOF LINE, WHICHEVER IS LOWER.

1023.8 DISCHARGE IDENTIFICATION
AN INTERIOR EXIT STAIRWAY AND RAMP SHALL NOT CONTINUE BELOW ITS LEVEL OF EXIT DISCHARGE UNLESS AN APPROVED BARRIER IS PROVIDED AT THE LEVEL OF EXIT DISCHARGE TO PREVENT PERSONS FROM UNINTENTIONALLY CONTINUING INTO LEVELS BELOW. DIRECTIONAL EXIT SIGNS SHALL BE PROVIDED AS SPECIFIED IN SECTION 1013. AN APPROVED BARRIER SHALL CONSIST OF PARTITIONS, DOORS, OR GATES SEPARATING THE PORTION OF THE INTERIOR EXIT STAIRWAY ABOVE GRADE FROM THE PORTION BELOW GRADE. WHERE DOORS OR GATES ARE PROVIDED AS APPROVED BARRIERS, SUCH DOORS OR GATES SHALL BE SELF-CLOSING, OPENING IN THE DIRECTION OF EXIT TRAVEL FROM THE FLOORS BELOW GRADE, AND PROVIDED WITH LANDINGS IN ACCORDANCE WITH SECTIONS 1010.1.5 AND 1010.1.6.
EXCEPTIONS:
1. SUCH BARRIER SEPARATING THE ABOVE-GRADE PORTION OF THE INTERIOR EXIT STAIRWAYS AND RAMPS FROM THE PORTION BELOW GRADE SHALL NOT BE REQUIRED IN GROUP E AND R-3 OCCUPANCIES.
2. SUCH BARRIER SEPARATING THE ABOVE-GRADE PORTION OF THE INTERIOR EXIT STAIRWAYS AND RAMPS FROM THE PORTION BELOW GRADE SHALL NOT BE REQUIRED WHERE THE STAIRWAY OR RAMP DESIGN IS INTENDED TO CONTINUE THE PATH OF EGRESS THROUGH A BELOW GRADE LEVEL.

1023.9 STAIRWAY IDENTIFICATION AND FLOOR LEVEL SIGNS
SIGNS IDENTIFYING STAIRWAYS SHALL COMPLY WITH SECTION 1023.9.1. SIGNS IDENTIFYING FLOOR LEVELS SHALL COMPLY WITH SECTIONS 1023.9.2 THROUGH 1023.9.5.

1023.9.1 STAIRWAY IDENTIFICATION SIGNS
A STAIRWAY IDENTIFICATION SIGN INDICATING EACH STAIR BY ALPHABETIC LETTER SHALL BE POSTED ON BOTH SIDES OF EACH STAIR DOOR. THE ALPHABETIC LETTERS DESIGNATING THE IDENTIFICATION OF THE INTERIOR EXIT STAIRWAY AND RAMP SHALL BE NOT LESS THAN 3 INCHES (76.2 MM) IN HEIGHT. SUCH SIGN SHALL COMPLY WITH ITEMS 2, 5 AND 6 OF SECTION 1023.9.4.

1023.9.2 FLOOR IDENTIFICATION SIGNS
A FLOOR IDENTIFICATION SIGN SHALL BE PROVIDED AT EACH FLOOR LANDING IN AN INTERIOR EXIT STAIRWAY AND RAMP CONNECTING MORE THAN THREE STORIES. SUCH SIGN SHALL DESIGNATE:
- THE FLOOR LEVEL;
- THE TERMINUS OF THE TOP AND BOTTOM OF THE INTERIOR EXIT STAIRWAY AND RAMP;
- THE IDENTIFICATION OF THE INTERIOR EXIT STAIRWAY AND RAMP;
- THE STORY OF THE EXIT DISCHARGE; AND
- THE AVAILABILITY OF ROOF ACCESS FROM THE INTERIOR EXIT STAIRWAY AND RAMP FOR THE FIRE DEPARTMENT.

1023.9.3 ACCESSIBLE FLOOR LEVEL IDENTIFICATION SIGNS
FLOOR LEVEL IDENTIFICATION SIGNS IN VISUAL CHARACTERS, RAISED CHARACTERS AND BRAILLE COMPLYING WITH ICC A117.1 SHALL BE LOCATED AT EACH FLOOR LEVEL LANDING ADJACENT TO THE DOOR ON THE STAIR SIDE.

1023.9.4 SIGNAGE REQUIREMENTS
FLOOR IDENTIFICATION SIGNS REQUIRED BY SECTION 1023.9.2 SHALL COMPLY WITH ALL OF THE FOLLOWING REQUIREMENTS:
1. THE SIGNS SHALL BE A MINIMUM SIZE OF 18 INCHES (457.2 MM) BY 12 INCHES (304.8 MM).
2. THE TOP OF THE SIGNS SHALL BE LOCATED 5 FEET (1524 MM) ABOVE THE FLOOR LANDING IN A POSITION THAT IS READILY VISIBLE WHEN THE DOORS ARE IN THE OPEN AND CLOSED POSITIONS.
3. THE NUMBER DESIGNATING THE FLOOR LEVEL SHALL BE NOT LESS THAN 5 INCHES (127 MM) IN HEIGHT AND LOCATED IN THE CENTER OF THE SIGN.
4. OTHER LETTERING AND NUMBERS SHALL BE NOT LESS THAN 1 INCH (25.4 MM) IN HEIGHT.
5. CHARACTERS AND THEIR BACKGROUND SHALL HAVE A NONGLARE FINISH. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND, WITH EITHER LIGHT CHARACTERS ON A DARK BACKGROUND OR DARK CHARACTERS ON A LIGHT BACKGROUND.
6. WHERE SIGNS REQUIRED BY SECTION 1023.9 ARE INSTALLED IN THE INTERIOR EXIT STAIRWAYS AND RAMPS OF BUILDINGS SUBJECT TO SECTION 1025, THE SIGNS SHALL BE MADE OF THE SAME LUMINOUS MATERIALS AS REQUIRED BY SECTION 1025.4.

1023.9.5 DIRECTIONS TO OPENABLE DOORS
WHERE DOORS SERVING INTERIOR EXIT STAIRWAYS ARE LOCKED ON THE STAIR SIDE, SIGNAGE SHALL BE POSTED IN COMPLIANCE WITH SECTIONS 1031.4.1, 1031.4.2 AND 1031.4.3.

1023.10 ELEVATOR LOBBY IDENTIFICATION SIGNS
AT LANDINGS IN INTERIOR EXIT STAIRWAYS WHERE TWO OR MORE DOORS LEAD TO THE FLOOR LEVEL, ANY DOOR WITH DIRECT ACCESS TO AN ENCLOSED ELEVATOR LOBBY SHALL BE IDENTIFIED BY SIGNAGE LOCATED ON THE DOOR OR DIRECTLY ADJACENT TO THE DOOR STATING "ELEVATOR LOBBY." SIGNAGE SHALL BE IN ACCORDANCE WITH SECTION 1023.9.4, ITEMS 4, 5 AND 6.
1023.11 SMOKEPROOF ENCLOSURES AND PRESSURIZATION ALTERNATIVE
IN BUILDINGS REQUIRED TO COMPLY WITH SECTION 403 OR 405, EACH OF THE INTERIOR EXIT STAIRWAYS AND RAMPS SERVING A STORY WITH A FLOOR SURFACE LOCATED MORE THAN 75 FEET (22 860 MM) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS OR MORE THAN 30 FEET (9144 MM) BELOW THE FINISHED FLOOR OF A LEVEL OF EXIT DISCHARGE SERVING SUCH STORIES SHALL BE PROTECTED BY A SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE IN ACCORDANCE WITH SECTION 909.20.

1023.11.1 TERMINATION AND EXTENSION
A SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE SHALL TERMINATE AT AN EXIT DISCHARGE OR A PUBLIC WAY. THE SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE SHALL BE PERMITTED TO BE EXTENDED BY AN EXIT PASSAGEWAY IN ACCORDANCE WITH SECTION 1023.3. THE EXIT PASSAGEWAY SHALL BE WITHOUT OPENINGS OTHER THAN THE FIRE DOOR ASSEMBLY REQUIRED BY SECTION 1023.3.1 AND THOSE NECESSARY FOR EGRESS FROM THE EXIT PASSAGEWAY. THE EXIT PASSAGEWAY SHALL BE SEPARATED FROM THE REMAINDER OF THE BUILDING BY 2-HOUR FIRE BARRIERS CONSTRUCTED IN ACCORDANCE WITH SECTION 707 OR HORIZONTAL ASSEMBLIES CONSTRUCTED IN ACCORDANCE WITH SECTION 711, OR BOTH.
EXCEPTIONS:
1. OPENINGS IN THE EXIT PASSAGEWAY SERVING A SMOKEPROOF ENCLOSURE ARE PERMITTED WHERE THE EXIT PASSAGEWAY IS PROTECTED AND PRESSURIZED IN THE SAME MANNER AS THE SMOKEPROOF ENCLOSURE, AND OPENINGS ARE PROTECTED AS REQUIRED FOR ACCESS FROM OTHER FLOORS.
2. OPENINGS IN THE EXIT PASSAGEWAY SERVING A PRESSURIZATION ALTERNATIVE ARE PERMITTED WHERE THE EXIT PASSAGEWAY IS PROTECTED AND PRESSURIZED IN THE SAME MANNER AS THE PRESSURIZATION ALTERNATIVE.
3. THE FIRE BARRIER SEPARATING THE SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE FROM THE EXIT PASSAGEWAY IS NOT REQUIRED, PROVIDED THE EXIT PASSAGEWAY IS PROTECTED AND PRESSURIZED IN THE SAME MANNER AS THE SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE.
4. A SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE SHALL BE PERMITTED TO EGRESS THROUGH AREAS ON THE LEVEL OF EXIT DISCHARGE OR VESTIBULES AS PERMITTED BY SECTION 1028.
1023.11.2 ENCLOSURE ACCESS
ACCESS TO THE STAIRWAY OR RAMP WITHIN A SMOKEPROOF ENCLOSURE SHALL BE BY WAY OF A VESTIBULE OR AN OPEN EXTERIOR BALCONY.
EXCEPTION: ACCESS IS NOT REQUIRED BY WAY OF A VESTIBULE OR EXTERIOR BALCONY FOR STAIRWAYS AND RAMPS USING THE PRESSURIZATION ALTERNATIVE COMPLYING WITH SECTION 909.20.5.

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
MEANS OF EGRESS NOTES

G-004A.00

Scale:
Date: 12/1/2025 7:16:03 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

ACCESSIBILITY NOTES:

1. ALL MEASUREMENTS TO BE VERIFIED ON FIELD BY GC.
2. ALL SECTIONS IN DIAGRAMS REFERENCE THE ANSI A117.1 2009 WITH NYC MODIFICATIONS U.N.O.

NYC 2022 BUILDING CODE CHAPTER 11 - ACCESSIBILITY NOTES:

1101.3 CHAPTER 11 APPLIES TO ALTERATIONS, INCLUDING MINOR ALTERATIONS BUT EXCLUDING ORDINARY REPAIRS, AND CHANGES OF USE OR OCCUPANCY TO PRIOR CODE BUILDINGS, PORTIONS OF SUCH BUILDINGS, AND SPACES WITHIN SUCH BUILDINGS. THIS SECTION SHALL NOT IMPOSE A REQUIREMENT FOR GREATER ACCESSIBILITY THAN THAT WHICH WOULD BE REQUIRED FOR NEW CONSTRUCTION, NOR SHALL IT REDUCE OR HAVE THE EFFECT OF REDUCING ACCESSIBILITY.

1103.1 ALL SITES, BUILDINGS, STRUCTURES, FACILITIES, ELEMENTS AND SPACES, TEMPORARY OR PERMANENT, SHALL BE ACCESSIBLE TO INDIVIDUALS WITH DISABILITIES.

1104.5 ACCESSIBLE ROUTES SHALL COINCIDE WITH OR BE LOCATED IN THE SAME AREA AS A GENERAL CIRCULATION PATH. WHERE THE CIRCULATION PATH IS INTERIOR, THE ACCESSIBLE ROUTE SHALL ALSO BE INTERIOR. WHERE ONLY ONE ACCESSIBLE ROUTE IS PROVIDED, THE ACCESSIBLE ROUTE SHALL NOT PASS THROUGH KITCHENS, STORAGE ROOMS, RESTROOMS, CLOSETS OR SIMILAR SPACES.

1105.1 IN ADDITION TO ACCESSIBLE ENTRANCES REQUIRED BY § 1105.1.1 THROUGH 1105.1.8, ALL PUBLIC ENTRANCES SHALL BE ACCESSIBLE.

1105.1.7 DOORS AND DOORWAYSAT ENTRANCE(S) TO ACCESSIBLE UNITS AND TYPE B+NYC UNITS, INCLUDING HARDWARE, SHALL COMPLY WITH § 404 OF ICC A117.1. DOORS AND DOORWAYS, INCLUDING HARDWARE, AT ENTRANCE(S) TO TYPE B UNITS SHALL COMPLY WITH § 1003.5 OF ICC A117.1.

1106.1 WHERE PARKING IS PROVIDED, 5% OF THE TOTAL NUMBER OF PARKING SPACES PROVIDED FOR A FACILITY, BUT NOT LESS THAN ONE PARKING SPACE, SHALL BE ACCESSIBLE PARKING SPACES. VAN-ACCESSIBLE PARKING SPACES SHALL BE PROVIDED IN ACCORDANCE WITH 1106.5. ACCESSIBLE PARKING SPACES SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH § 502 OF ICC A117.1.

1106.6 ACCESSIBLE PARKING SPACES SHALL BE LOCATED ON THE SHORTEST ACCESSIBLE ROUTE OF TRAVEL FROM ADJACENT PARKING TO AN ACCESSIBLE BUILDING ENTRANCE.

1106.7 PASSENGER LOADING ZONES.PASSENGER LOADING ZONES SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH ICC A117.1 INCLUDING § 503.

1106.8.1 WHERE VEHICLE CHARGING STATIONS ARE PROVIDED FOR COMMON USE, AT LEAST FIVE PERCENT OF THE TOTAL NUMBER OF ELECTRICAL VEHICLE CHARGING STATIONS PER FACILITY, BUT NOT LESS THAN ONE FOR EACH TYPE OF ELECTRIC VEHICLE CHARGING STATION, SHALL BE ACCESSIBLE.

1107.2 DWELLING UNITS AND SLEEPING UNITS WHICH ARE REQUIRED TO BE ACCESSIBLE UNITS, TYPE B+NYC UNITS, OR TYPE B UNITS SHALL COMPLY WITH CHAPTER 10 OF ICC A117.1.

1107.2.2.5 LAVATORIES SHALL COMPLY WITH § 606 OF ICC A117.1.

1107.2.2.6 MIRRORS ABOVE LAVATORIES SHALL HAVE THE BOTTOM EDGE OF THE REFLECTING SURFACE 40" (1016 MM) MAX. ABOVE THE FLOOR OR GROUND. MEDICINE CABINETS, IF PROVIDED, MUST INCLUDE A STORAGE SHELF NO HIGHER THAN 44 " (1117.6 MM) ABOVE THE FLOOR.

1107.2.2.7.1 THE WATER CLOSET SHALL BE POSITIONED WITH A WALL TO THE REAR AND TO ONE SIDE. THE CENTERLINE OF THE WATER CLOSET SHALL BE 18" (457.2 MM) FROM THE SIDE WALL.

1107.2.2.7.2 CLEARANCE AROUND THE WATER CLOSET SHALL COMPLY WITH SECTIONS 1107.2.2.7.2.1 THROUGH 1107.2.2.7.2.3.

1107.2.2.7.3 GRAB BARS FOR WATER CLOSETS SHALL COMPLY § 609 OF ICC A117.1 AND 1107.2.2.7.3.1 THROUGH 1107.2.2.7.3.2.

1107.2.3 WHERE KITCHENS AND KITCHENETTES ARE PROVIDED IN ATYPE B+NYC DWELLING UNIT OR SLEEPING UNIT, THE PRIMARY KITCHEN OR KITCHENETTE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE KITCHEN REQUIREMENTS OF § 1003.12 AND 1003.3.2 OF ICC A117.1.

1107.2.8 WHERE WASHING MACHINES OR CLOTHES DRYERS ARE PROVIDED WITHIN A TYPE B+NYC DWELLING UNIT OR SLEEPING UNIT, SUCH EQUIPMENT SHALL COMPLY WITH § 611 OF ICC A117.1 AND SHALL BE FRONT LOADING.

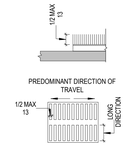
1107.3 ROOMS AND SPACES AVAILABLE TO THE GENERAL PUBLIC OR AVAILABLE FOR COMMONUSE BY RESIDENTS AND SERVINGACCESSIBLE UNITS, TYPE B+NYCUNITS ORTYPE B UNITS SHALL BE ACCESSIBLE.

1107.4 AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ACCESSIBLE BUILDING OR FACILITY ENTRANCES WITH THE REQUIRED ACCESSIBLE ENTRANCE(S) OF EACH ACCESSIBLE UNIT, TYPE B+NYC UNIT,AND TYPE B UNIT WITHIN THE BUILDING OR FACILITY AND WITH THOSE EXTERIOR AND INTERIOR SPACES AND FACILITIES THAT SERVE THE UNITS.

1111.1 REQUIRED ACCESSIBLE ELEMENTS SHALL BE IDENTIFIED BY THE DYNAMIC ACCESSIBILITY SYMBOL AT THE FOLLOWING LOCATIONS:

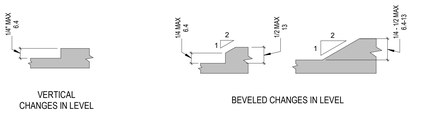
- ACCESSIBLE PARKING SPACES REQUIRED PER 1106.1 AND 1106.2.
- ACCESSIBLE PASSENGER LOADING ZONES.
- ACCESSIBLE ROOMS WHERE MULTIPLE SINGLE-OCCUPANT TOILET ROOMS OR BATHING ROOMS ARE CLUSTERED AT A SINGLE LOCATION.
- ACCESSIBLE ENTRANCES WHERE NOT ALL ENTRANCES ARE ACCESSIBLE.
- ACCESSIBLE CHECK-OUT AISLES WHERE NOT ALL AISLES ARE ACCESSIBLE.
- FAMILY OR ASSISTED-USE TOILET AND BATHING ROOMS.
- ACCESSIBLE DRESSING, FITTING AND LOCKER ROOMS WHERE NOT ALL SUCH ROOMS ARE ACCESSIBLE.
- ACCESSIBLE AREAS OF RESCUE ASSISTANCE.
- EXTERIOR AREAS FOR ASSISTED RESCUE.
- REFUSE DISPOSAL AND REFUSE STORAGE ROOMS.

302 FLOOR SURFACES



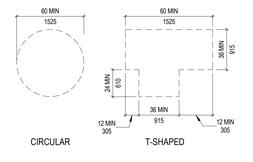
EXPOSED CARPET EDGES MUST BE FASTENED TO THE FLOOR AND PROVIDED WITH A FINISH TRIM COMPLYING W/ § 303.

303 CHANGES IN LEVEL

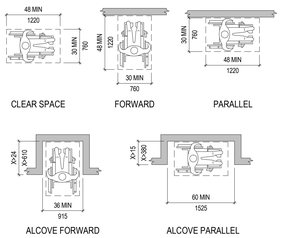


CHANGES IN LEVEL GREATER THAN 1/2" (13mm) SHALL BE CONSIDERED RAMPS COMPLYING W/ § 405 & 406

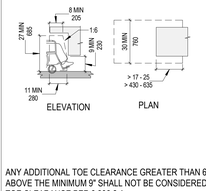
304 TURNING SPACE



305 CLEAR FLOOR SPACE

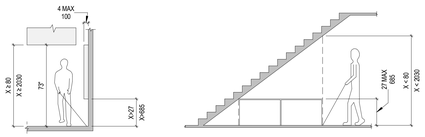


306 KNEE & TOE CLEARANCE



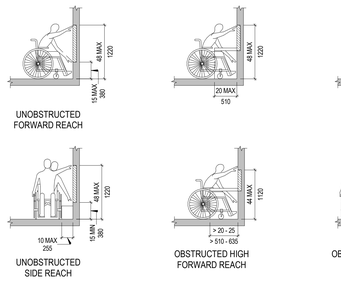
ANY ADDITIONAL TOE CLEARANCE GREATER THAN 6" ABOVE THE MINIMUM 9" SHALL NOT BE CONSIDERED TOE CLEARANCE PER § 306.2.4

307 PROTRUDING OBJECTS



EXCEPTIONS: HANDRAILS CAN PROTRUDE 4-1/2" (115mm) MAX. INTO CIRCULATION PATHS PER § 307.2. DOOR CLOSERS AND DOOR STOPS SHALL BE PERMITTED TO BE 78" (1980mm) A.F.F. PER § 307.4.

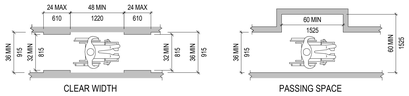
308 REACH RANGES

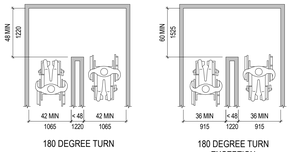


EXCEPTIONS: EXISTING ELEMENTS THAT ARE NOT ALTERED SHALL BE PERMITTED AT 54" (1370mm) A.F.F. ON SIDE REACH PER § 308.3.1. FOR WASHING MACHINES AND CLOTHES DRYERS OBSTRUCTION HEIGHT SHALL BE PERMITTED AT 36" (915mm) A.F.F. PER § 308.3.2.

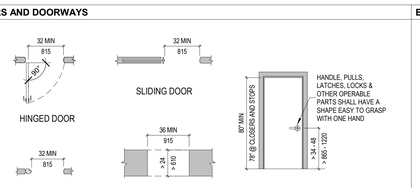
402/3 ACCESSIBLE ROUTES & WALKING SURFACES

ACCESSIBLE ROUTES CONSIST OF WALKING SURFACES WITH A MAX. SLOPE OF 1:20, DOORS/DOORWAYS, RAMPS, CURB RAMPS, ELEVATORS AND PLATFORM LIFTS. CROSS SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 1:48 PER § 402.

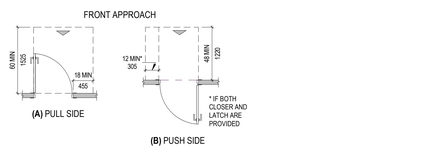




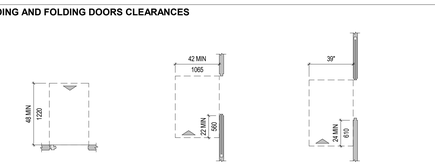
404 DOORS AND DOORWAYS



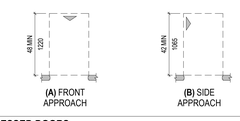
MANUAL SWING DOORS CLEARANCES



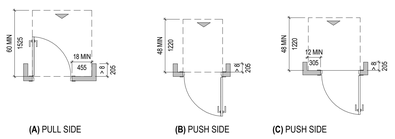
SLIDING AND FOLDING DOORS CLEARANCES



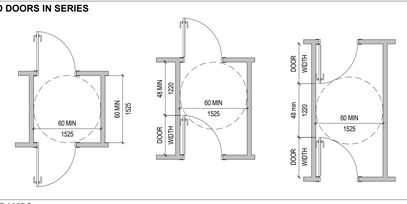
DOORWAYS CLEARANCE



RECESSED DOORS

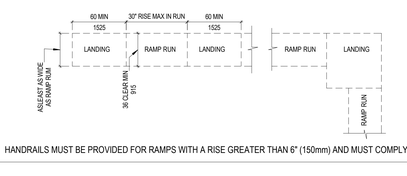


TWO DOORS IN SERIES



405 RAMPS

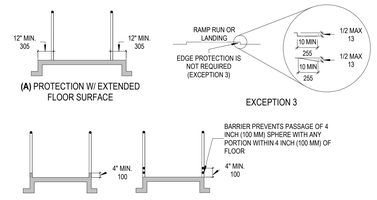
RAMPS SHOULD HAVE A SLOPE GREATER THAN 1:20 BUT NOT STEEPER THAN 1:12. CROSS SLOPE SHALL NOT BE STEEPER THAN 1:48 PER § 405. EXCEPTIONS: IN EXISTING BUILDINGS, RAMPS WITH A STEEPER SLOPE SHALL BE PERMITTED DUE TO SPACE LIMITATIONS BUT NOT STEEPER THAN 1:8. PER § 405.2.



HANDRAILS MUST BE PROVIDED FOR RAMPS WITH A RISE GREATER THAN 6" (150mm) AND MUST COMPLY WITH § 505.

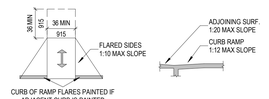
EDGE PROTECTION

PER § 405.9 EDGE PROTECTION MUST BE PROVIDED ON EACH SIDE OF RAMP RUNS AND LANDINGS. EXCEPTIONS: EDGE PROTECTIONS NOT REQUIRED ON 1) CURB RAMPS WITH FLARES AND W/OUT HANDRAILS 2) RAMP LANDINGS SERVING A RUN OR STAIRWAY 3) SIDES OF RAMPS HAVING A VERTICAL DROP OFF OF 1/2" (13mm) MAX WITHIN 10" (255mm) OUTSIDE MINIMUM LANDING AREA 4) RAMP AISLES PROVIDING ACCESS TO SEATS OF AISLE WAYS.



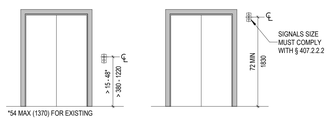
406 CURB RAMPS

DETECTABLE WARNINGS SHALL BE PROVIDED FOR CURB RAMPS COMPLYING WITH § 406.13 AND 705



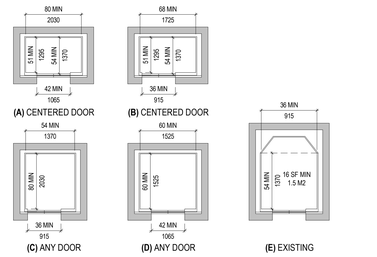
407 ELEVATORS

ELEVATORS SHALL BE PROVIDED FOR BUILDINGS WITH 5 STORIES OR MORE IN HEIGHT PER NYC BC § 3002.4 AND ONE MUST ACCOMMODATE AN AMBULANCE STRETCHER PER NYC BC § 3003.3. ALL ELEVATORS SHALL COMPLY WITH § 407 OF ANSI A117.1 2009 AND ASME A17.1/CSA B44. ELEVATORS CONTROLS SHALL HAVE A CLEAR FLOOR SPACE COMPLYING WITH § 305. EXISTING ELEVATORS SHALL NOT COMPLY WITH MINIMUM HEIGHTS OF § 407.2.2.2. AUDIBLE SIGNALS SHALL BE PROVIDED AND COMPLYING WITH § 407.2.2.3



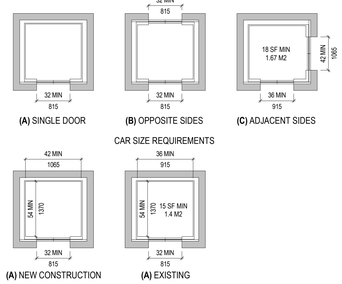
CAR REQUIREMENTS

IF OTHER ELEVATORS ARE PROVIDED BESIDES THE ELEVATOR-IN-READINESS MUST COMPLY WITH § 407.4



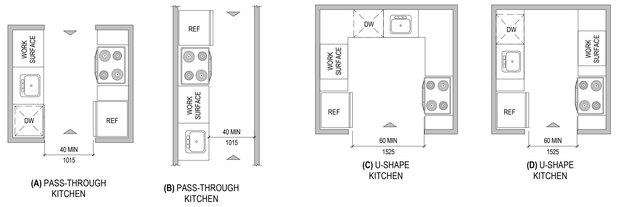
408 LIMITED-USE/LIMITED-APPLICATION ELEVATORS

ALL LIMITED-USE ELEVATORS SHALL COMPLY WITH § 408 OF ANSI A117.1 2009 AND ASME A17.1/CSA B44.



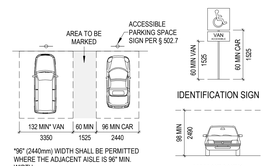
804 KITCHENS AND KITCHENETTES

PER § 804.25 EXCEPTION: SPACES THAT DO NOT PROVIDE COOKTOP OR CONVENTIONAL RANGE SHALL NOT REQUIRE TO COMPLY PROVIDED A 40" MIN DISTANCE BETWEEN OPPOSING CABINETS, COUNTERTOPS OR WALLS

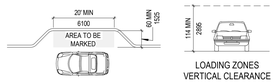


502 PARKING SPACES

PER § 502.5 PARKING SPACES SURFACES SHALL NOT HAVE A SLOPE STEEPER 1:48.



503 PASSENGER LOADING ZONES

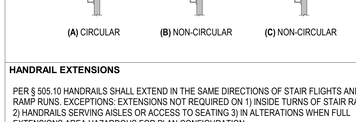


505 HANDRAILS

PER § 505 HANDRAILS SHALL BE PROVIDED ON BOTH SIDES OF STAIRS AND RAMPS. HANDRAILS SHALL BE CONTINUOUS WITHIN THE FULL LENGTH OF EACH STAIR FLIGHT AND RAMP RUN.

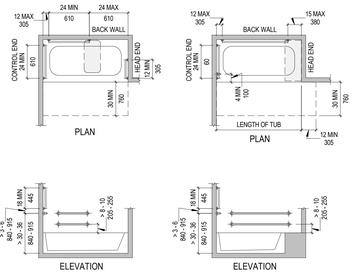
HANDRAIL EXTENSIONS

PER § 505.10 HANDRAILS SHALL EXTEND IN THE SAME DIRECTIONS OF STAIR FLIGHTS AND RAMP RUNS. EXCEPTIONS: EXTENSIONS NOT REQUIRED ON 1) INSIDE TURNS OF STAIR RAMPS 2) HANDRAILS SERVING AISLES OR ACCESS TO SEATING 3) IN ALTERATIONS WHEN FULL EXTENSIONS AREA HAZARDOUS FOR PLAN CONFIGURATION.



607 BATHTUBS

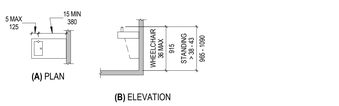
GRAB BARS SHALL BE PROVIDED PER § 607.4. EXCEPTIONS: GRAB BARS SHALL NOT BE PROVIDED ON SINGLE OCCUPANT RESTROOMS ACCESSED THROUGH PRIVATE OFFICE NOT FOR COMMON/PUBLIC USE. L-SHAPED CONTINUOUS GRAB BAR SHALL BE PERMITTED ON CONTROL END WALL WITH EQUIVALENT DIMENSIONS PER § 607.4 W/ PERMANENT SEAT.



(A) W/OUT PERMANENT SEAT (B) W/ PERMANENT SEAT

602 DRINKING FOUNTAINS

DRINKING FOUNTAINS MUST HAVE A CLEAR SPACE AND CLEARANCES PER § 305.



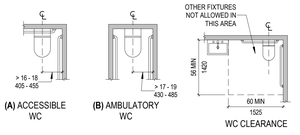
603 TOILET AND BATHING ROOMS

DOORS SHALL NOT SWING INTO CLEARANCE FOR ANY FIXTURE PER § 603.2.2. EXCEPTIONS: DOOR SWING SHALL BE PERMITTED ON FIXTURES CLEARANCES ON: 1) SINGLE OCCUPANT TOILET OR BATHING ROOMS 2) INDIVIDUAL USE ROOMS WHERE CLEAR FLOOR SPACE IS PROVIDED BEYOND DOOR SWING.

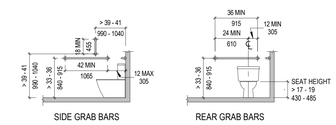
CLEAR FLOOR SPACE COMPLYING W/ § 305.3 (FORWARD APPROACH) SHALL BE PROVIDED AND KNEE AND TOE CLEARANCE SHALL BE PROVIDED PER § 306. EXCEPTIONS: 1) PARALLEL APPROACH SHALL BE PERMITTED FOR KITCHEN SINKS WHEN TOP RANGE IS NOT PROVIDED 2) KNEE AND TOE CLEARANCE SHALL NOT BE PROVIDED FOR SINGLE OCCUPANT TOILETS 3) KNEE AND TOE REQUIREMENTS ARE NOT REQUIRED TO FOR MORE THAN ONE BOWL IN MULTIBOWL SINKS.

604 WATER CLOSERS AND TOILET COMPARTMENTS

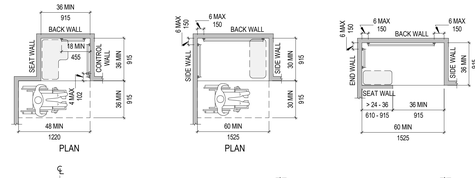
PER § 604.3.2 THE WATER CLOSET CLEARANCE CAN OVERLAP W/ GRAB BARS, PAPER DISPENSERS, SANITARY NAPKINS RECEPTACLES, COAT HOOKS, SHELVES AND OTHER FIXTURES CLEARANCES.

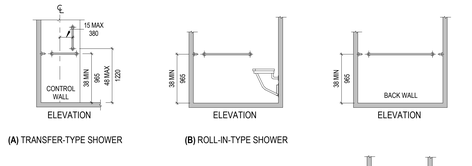


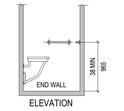
GRAB BARS SHALL COMPLY SHALL BE PROVIDED IN REAR AND SIDE WALLS CLOSEST TO THE WATER CLOSET PER § 604.5. EXCEPTIONS: GRAB BARS SHALL NOT BE PROVIDED ON 1) SINGLE OCCUPANT RESTROOMS ACCESSED THROUGH PRIVATE OFFICE NOT FOR COMMON/PUBLIC USE 2) DETENTION OR CORRECTION FACILITIES.



608 SHOWER COMPARTMENTS



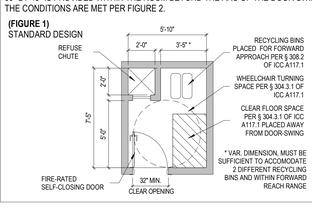




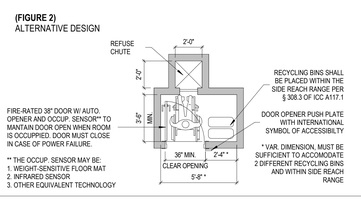
BUILDINGS BULLETIN 2019-001 - ACCESSIBLE REFUSE ROOM

STANDARD DESIGN. IN MULTIPLE DWELLINGS, REFUSE DISPOSAL, RECYCLABLE, AND STORAGE ROOMS INTENDED FOR THE GENERAL COMMON-USE SHALL COMPLY WITH BULLETIN 2019-001. EACH ROOM MUST COMPLY W/ ICC A117.11, INCLUDING BUT NOT LIMITED TO, § 304 (TURNING SPACE), § 305 (CLEAR FLOOR SPACE), § 309 (OPERABLE PARTS) AND § 404 (DOORS AND DOORWAYS). THE REFUSE AND RECYCLABLE STORAGE ROOM DOOR MAY SWING INTO THE ROOM PROVIDED THAT A CLEAR FLOOR SPACE NOT LESS THAN 30" BY 48" IS PROVIDED WITHIN THE ROOM BEYOND THE ARC OF THE DOOR SWING. SEE FIGURE 1. **ALTERNATIVE DESIGN.** AN ALTERNATIVE DESIGN IS PERMITTED PROVIDED THAT THE CONDITIONS ARE MET PER FIGURE 2.

(FIGURE 1)
STANDARD DESIGN



(FIGURE 2)
ALTERNATIVE DESIGN



KAO-HWA LEE
ARCHITECTS P.C.
227 CATHERINE STREET
SOUTH AMBOY, NJ 08879
(609) 216 2975

CLIENT:
THE RABSKY GROUP
505 Flushing Ave
Brooklyn, NY 11205

Architect:
KHO-HWA LEE ARCHITECTS P.C.
227 Catherine Street
South Amboy, NJ 08879

Structure Engineer:
STRUCTURAL ENGINEERING TECHONOLOGIES P.C
40-12 28th Street
Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

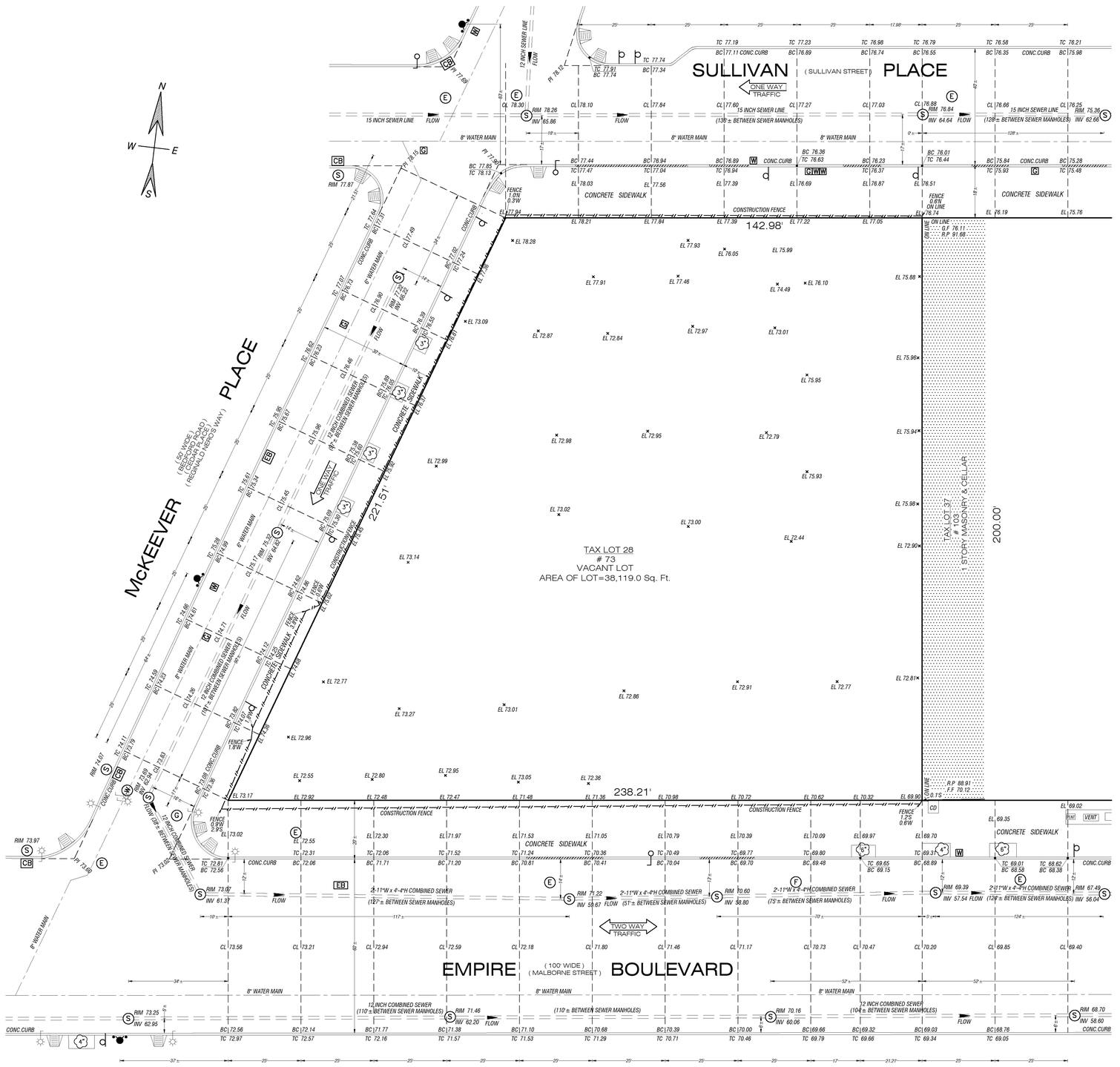
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ACCESSIBILITY NOTES

G-005A.00

Scale: 1/4" = 1'-0"
Date: 12/1/2025 7:16:06 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

JOB # CM 5022 ADDRESS: 73 EMPIRE BOULEVARD



SCALE: 1 INCH = 25 FEET

GENERAL NOTES:

1. This survey was prepared only for the party (parties) and purpose indicated hereon.
2. Property corner monuments or markers were (not) placed as part of this survey.
3. Certifications on this survey map signify that the map was prepared in accordance with the current existing Code of Practice for Land Surveys adopted by the New York State Association of Professional Land Surveyors, Inc. Said certifications are limited to the party (parties) for whom the survey is prepared and are not transferable.
4. The location and nature of underground structures, internal walls and improvements or encroachments not visible to the surveyor are not covered under this certification.
5. Easements of record are only guaranteed if an Abstract of Title is furnished to the surveyor.
6. This is to certify that there are no streams nor natural water courses on the property except as shown on this survey.
7. Elevations refer to NAVD 1988 datum.

CAPTION	ARCHITECTURAL SURVEY				
DATE	REVISIONS				
10-20-2025	ARCHITECTURAL SURVEY UPDATE				
07-02-2025	ARCHITECTURAL SURVEY				
	DATE	BY		DATE	BY
SURVEYED	07-02-2025	V.B,V.J,P.J	DRAWN	07-05-2025	V.B

LEGEND

F.F	FIRST FLOOR ELEVATION
R.P	ROOF PARAPET ELEVATION
G.F	GARAGE FLOOR ELEVATION
TC	TOP OF CURB
BC	BOTTOM OF CURB
CL	CENTERLINE
EL	SPOT ELEVATION
INV	INVERT ELEVATION
CD	CELLAR DOOR
CONC.	CONCRETE
G	GAS MANHOLE
W	WATER MANHOLE
E	ELECTRIC MANHOLE
S	SEWER MANHOLE
F	FIRE DEPARTMENT MANHOLE
W	WATER VALVE
G	GAS VALVE
CB	CATCH BASIN
EB	ELECTRIC BOX
	TRAFFIC LIGHT
	LIGHT POLE
	STREET SIGN
	HYDRANT
	CHAIN LINK FENCE
	CONSTRUCTION FENCE
	DROP CURB
	PEDESTRIAN RAMP
30"	TREE & SIZE

VINCENT TEUTONICO, L.S.
NEW YORK LICENSE 050307

MAP OF SURVEY OF PROPERTY

BOROUGH AND COUNTY OF BROOKLYN
CITY AND STATE OF NEW YORK
TAX MAP: BLOCK 1306, LOT 28

STATEWIDE LAND SURVEYING P.C.
16 FLAGG PLACE
STATEN ISLAND
NY 10304
TEL: 718-751-6871
email: citymapping@yahoo.com

KAO-HWA LEE
ARCHITECTS P.C.
227 CATHERINE STREET
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CLIENT:
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40-12 28th Street
Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

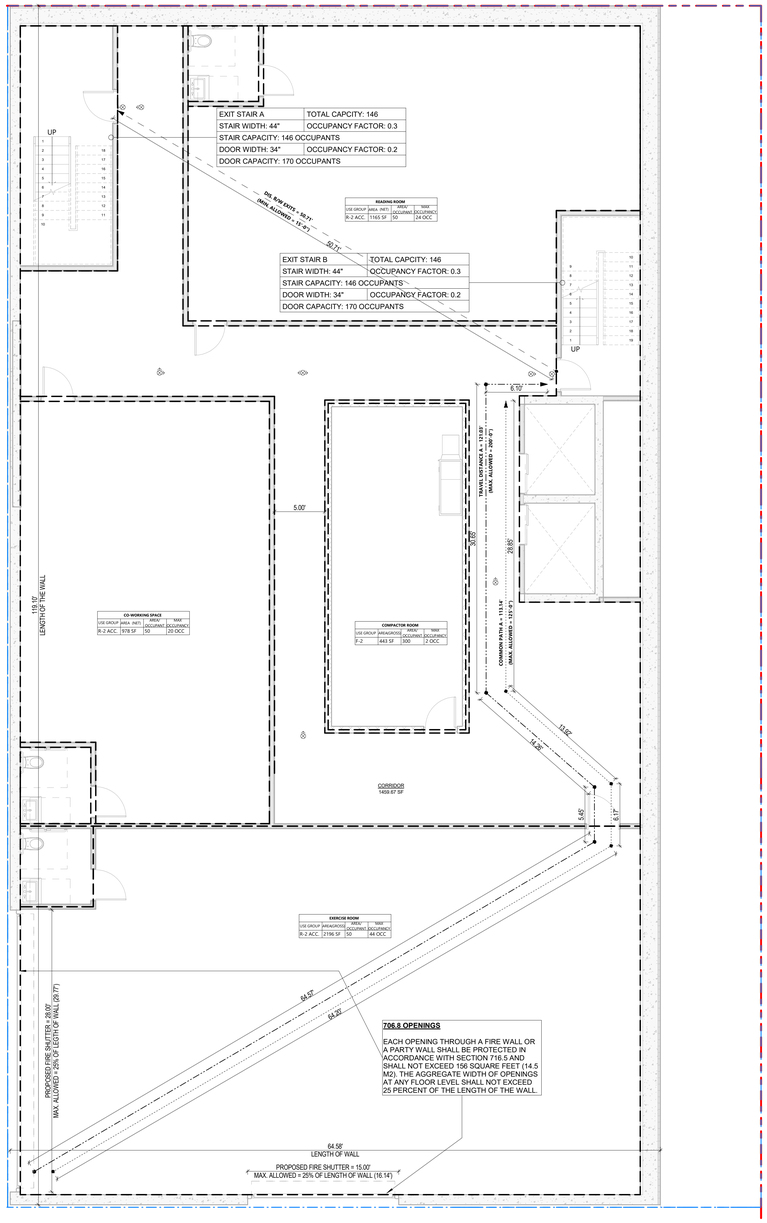
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ARCHITECTURAL SURVEY

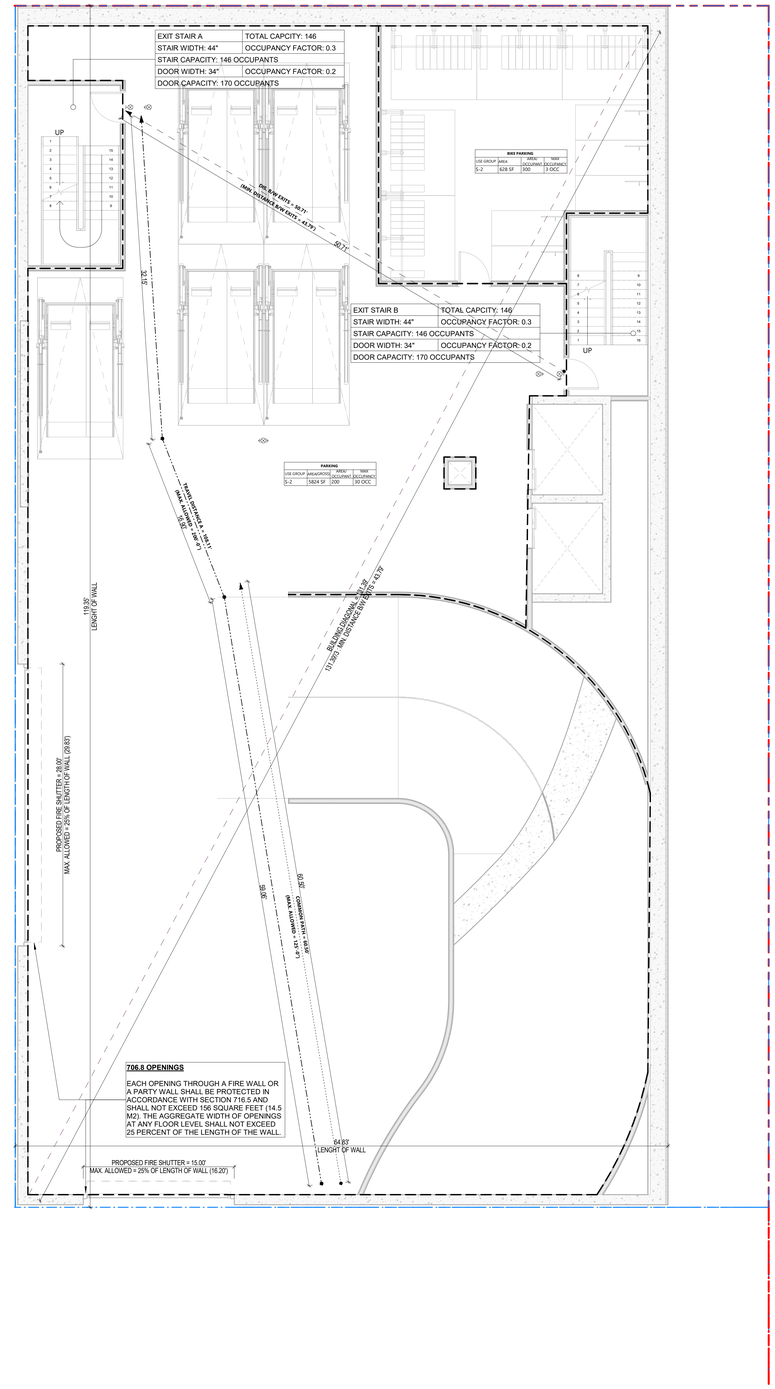
V-001A.00

Scale:
Date: 12/1/2025 7:16:07 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

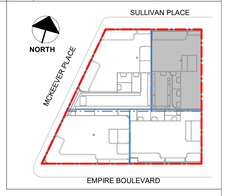
1 BLDG A - SUBCELLAR 2 LIFE SAFETY PLAN
3/16" = 1'-0"



2 BLDG A - SUBCELLAR 1 LIFE SAFETY PLAN
3/16" = 1'-0"



KEY PLAN
N.T.S.



SUB-CELLAR 2 EGRESS STAIRS - BLDG A				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	45	13.5	44"
EGRESS STAIR B	0.3	44	13.2	44"

SUB-CELLAR 2 EGRESS DOORS - BLDG A				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	45	9	36"
EGRESS DOOR B	0.2	44	8.8	36"

SUB-CELLAR 2 CORRIDOR CAPACITY - BLDG A				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	89	17.8	60"

SUB-CELLAR 2 OCCUPANT LOAD - BLDG A		
Name	Area	# of Occupants
CO-WORKING SPACE	978 SF	20
EXERCISE ROOM	2196 SF	44
READING ROOM	1165 SF	24
	4339 SF	88
COMPACTOR ROOM	443 SF	2
	443 SF	2
TOTAL	4782 SF	90

SUB-CELLAR 2 TRAVEL DISTANCE - BLDG A			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2 ACC.	MAX. ALLOWED = 125'-0"	113' - 2"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2 ACC.	MIN. ALLOWED = 15'-0"	50' - 8"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2 ACC.	MAX. ALLOWED = 200'-0"	121' - 0"

SUB-CELLAR 1 EGRESS STAIRS - BLDG A				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	17	5.1	44"
EGRESS STAIR B	0.3	16	4.8	44"

SUB-CELLAR 1 EGRESS DOORS - BLDG A				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	17	3.4	36"
EGRESS DOOR B	0.2	16	3.2	36"

SUB-CELLAR 1 CORRIDOR CAPACITY - BLDG A				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width

SUB-CELLAR 1 OCCUPANT LOAD - BLDG A		
Name	Area	# of Occupants
BIKE PARKING	628 SF	3
PARKING	5824 SF	30
	6452 SF	33
TOTAL	6452 SF	33

SUB-CELLAR 1 TRAVEL DISTANCE - BLDG A			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH	S-2	MAX. ALLOWED = 125'-0"	60' - 6"
DIS. B/W EXITS			
DIS. B/W EXITS	S-2	MIN. DISTANCE B/W EXITS = 43.79'	50' - 8"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	S-2	MAX. ALLOWED = 200'-0"	108' - 1"

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227 CATHERINE STREET
SOUTH AMBOY, NJ 08879
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THE RABSKY GROUP
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Brooklyn, NY 11205

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South Amboy, NJ 08879

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40-12 28th Street
Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
SUBCELLAR 1 & 2 LIFE SAFETY PLANS

A-001A.00

Scale:	As indicated
Date:	12/1/2025 7:16:19 PM
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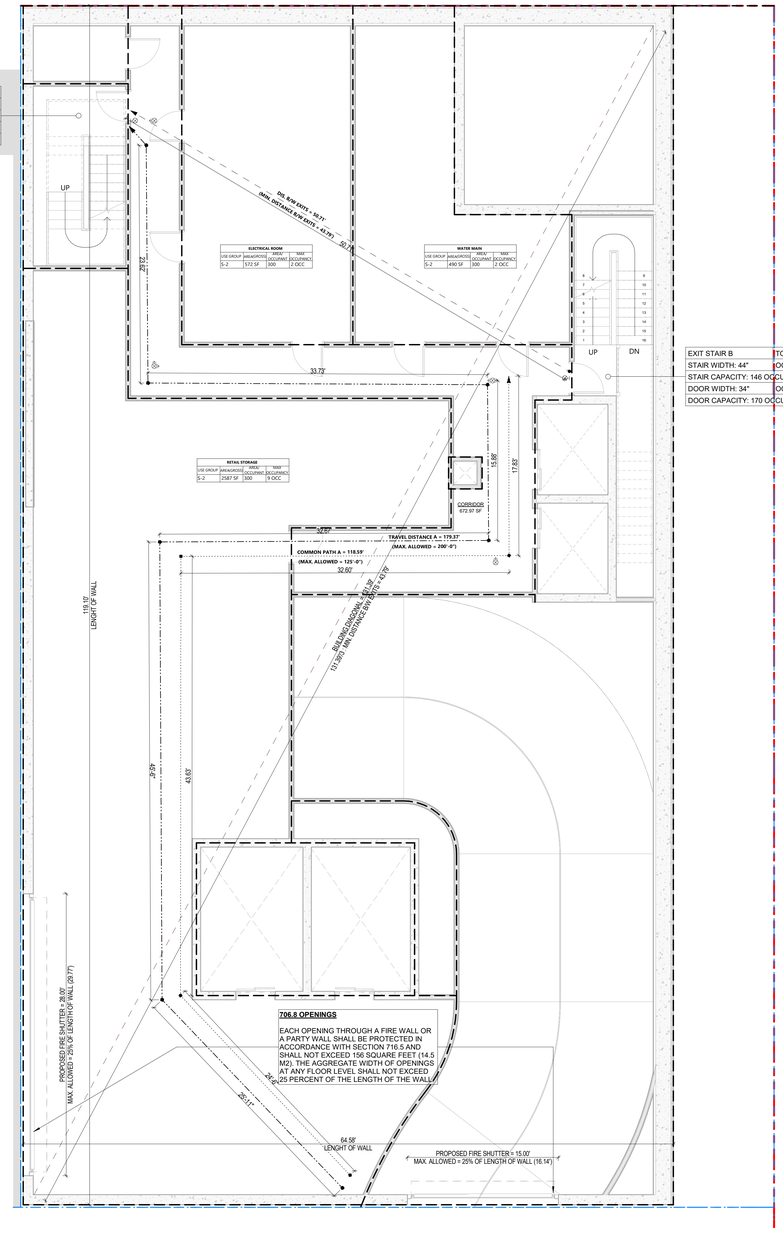
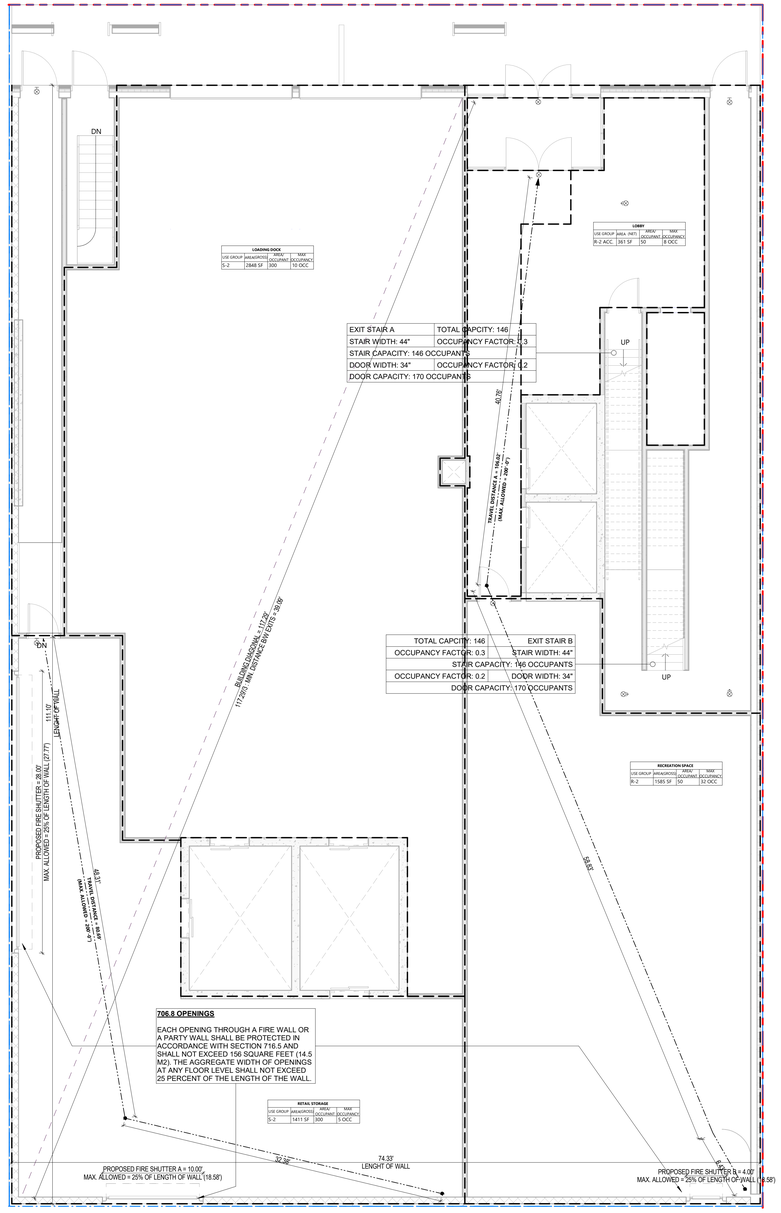
DOB JOB NUMBER:	

1 BLDG A - CELLAR LIFE SAFETY PLAN
3/16" = 1'-0"



2 BLDG A - 1ST FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"



KEY PLAN
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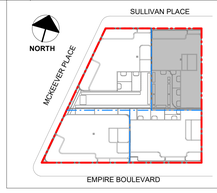

CELLAR EGRESS STAIRS- BLDG A				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR B	0.3	14	4.2	44"

CELLAR EGRESS STAIRS- BLDG A LOADING DOCK				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width

CELLAR EGRESS DOORS - BLDG A				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	6	1.2	36"
EGRESS DOOR A	0.2	20	4	81"
EGRESS DOOR B	0.2	7	1.4	36"

CELLAR CORRIDOR CAPACITY - BLDG A				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	13	2.6	60"

CELLAR OCCUPANT LOAD - BLDG A		
Name	Area	# of Occupants
RETAIL STORAGE	2587 SF	9
	2587 SF	9
ELECTRICAL ROOM	572 SF	2
WATER MAIN	490 SF	2
	1062 SF	4
TOTAL	3649 SF	13

CELLAR TRAVEL DISTANCE - BLDG A			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	M	MAX. ALLOWED = 125'-0"	118' - 7"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2 ACC.	MIN. DISTANCE B/W EXITS = 43.79'	50' - 8"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	M	MAX. ALLOWED = 200'-0"	179' - 4"

1ST FLOOR EGRESS STAIRS - BLDG A				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR B	0.3	14	4.2	44"

1ST FLOOR EGRESS DOORS - BLDG A				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	14	2.8	78"
EGRESS DOOR B	0.2	14	2.8	42"
EGRESS DOOR C	0.2	14	2.8	42"
EGRESS DOOR C	0.2	13	2.6	42"

1ST FLOOR CORRIDOR CAPACITY - BLDG A				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width

1ST FLOOR OCCUPANT LOAD - BLDG A		
Name	Area	# of Occupants
RECREATION SPACE	1585 SF	32
	1585 SF	32
LOBBY	361 SF	8
	361 SF	8
RETAIL STORAGE	1411 SF	5
	1411 SF	5
LOADING DOCK	2848 SF	10
	2848 SF	10
TOTAL	6206 SF	55

1ST FLOOR TRAVEL DISTANCE - BLDG A			
Name	Occupancy Group	Required Distance	Proposed Distance

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
CELLAR - 1ST FLOOR LIFE SAFETY PLANS

A-002A.00

Scale: As indicated
Date: 12/1/2025 7:16:32 PM
Drawn by:
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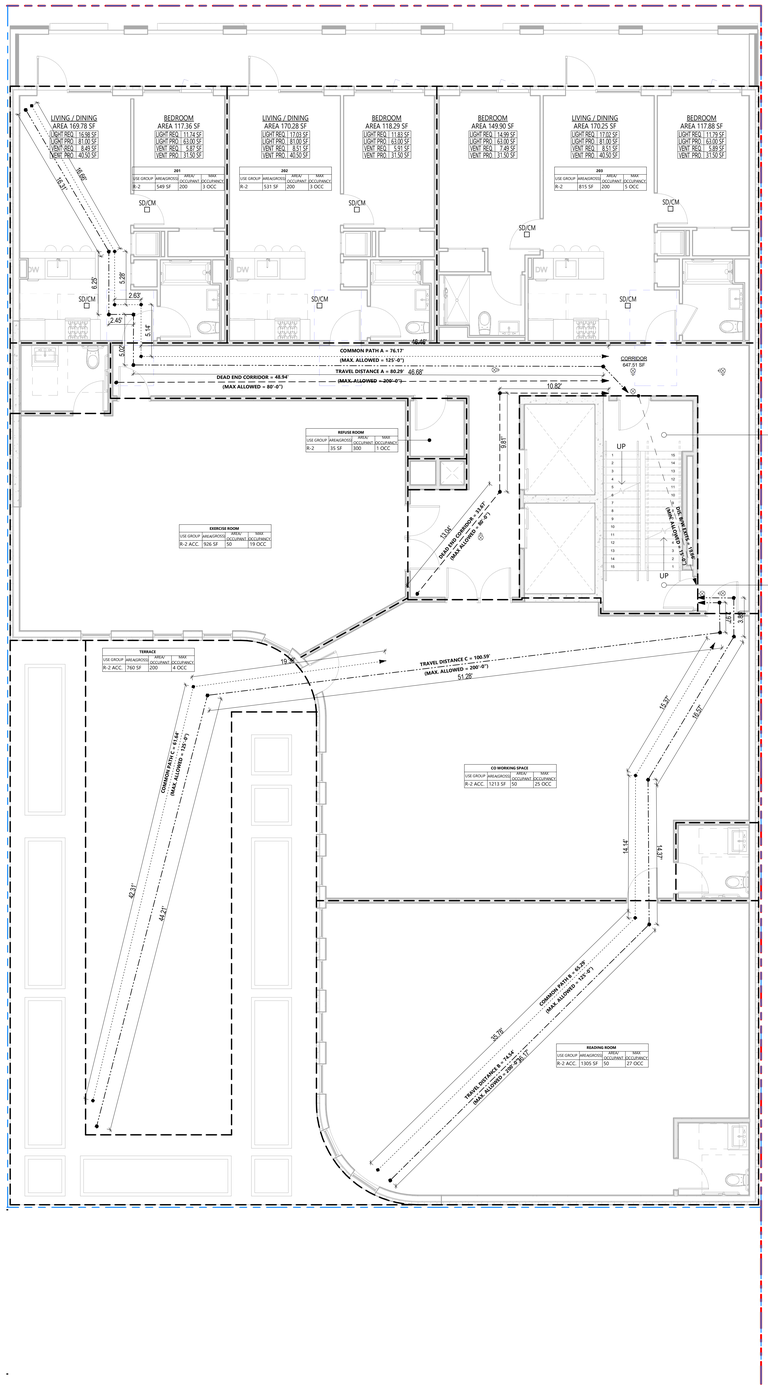
DOB JOB NUMBER:

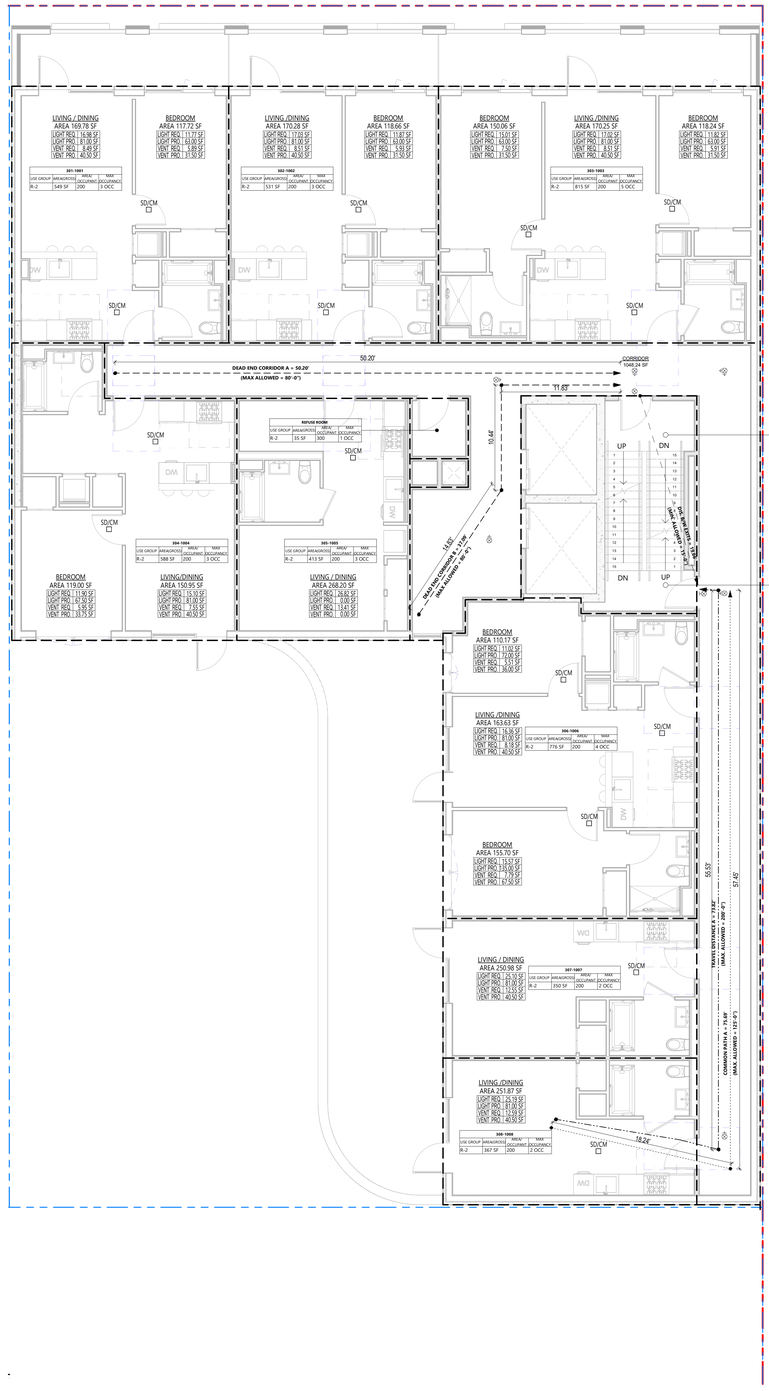
1 BLDG A - 2ND FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"



EXIT STAIR A	TOTAL CAPCITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146 OCCUPANTS	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPCITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146 OCCUPANTS	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

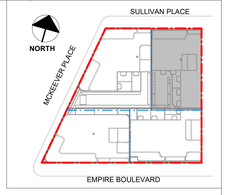
2 BLDG A - 3RD TO 10TH FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"



EXIT STAIR B	TOTAL CAPCITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146 OCCUPANTS	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR A	TOTAL CAPCITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146 OCCUPANTS	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

KEY PLAN
N.T.S.



2ND FLOOR EGRESS STAIRS - BLDG A

Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	41	12.3	44"
EGRESS STAIR B	0.3	41	12.3	44"

2ND FLOOR EGRESS DOORS - BLDG A

Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	41	8.2	36"
EGRESS DOOR B	0.2	41	8.2	36"

2ND FLOOR CORRIDOR CAPACITY - BLDG A

Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	82	16.4	60"

2ND FLOOR OCCUPANT LOAD - BLDG A

Name	Area	# of Occupants
201	549 SF	3
202	531 SF	3
203	815 SF	5
	1895 SF	11
CO WORKING SPACE	1213 SF	25
EXERCISE ROOM	926 SF	19
READING ROOM	1305 SF	27
TERRACE	760 SF	4
	4204 SF	75
REFUSE ROOM	35 SF	1
	35 SF	1
TOTAL	6134 SF	87

2ND FLOOR TRAVEL DISTANCE - BLDG A

Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	76' - 2"
COMMON PATH B	R-2 ACC.	MAX. ALLOWED = 125'-0"	65' - 3"
DEAD END			
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	33' - 8"
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	48' - 11"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	19' - 8"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	80' - 3"
TRAVEL DISTANCE B	R-2 ACC.	MAX. ALLOWED = 200'-0"	74' - 7"
TRAVEL DISTANCE C	R-2	MAX. ALLOWED = 200'-0"	100' - 7"

BLDG A - 2ND FL. -LIGHT AND AIR CALCULATION

Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
02A_2ND FL.					
212	EXERCISE ROOM	85.239268	192.50 SF	42.619634	96.25 SF
1207-1827	BEDROOM	11.829448	63.00 SF	5.914724	31.50 SF
1207-1828	BEDROOM	14.989634	63.00 SF	7.494817	31.50 SF
1207-1829	BEDROOM	11.787552	63.00 SF	5.893776	31.50 SF
1207-1830	BEDROOM	11.735676	63.00 SF	5.867838	31.50 SF
1207-1831	LIVING / DINING	16.977851	81.00 SF	8.488925	40.50 SF
1207-1832	LIVING / DINING	17.028061	81.00 SF	8.51403	40.50 SF
1207-1833	LIVING / DINING	17.024557	81.00 SF	8.512278	40.50 SF
1207-2208	READING ROOM	113.733938	275.00 SF	56.866969	137.50 SF
1207-2209	CO-WORKING SPACE	113.900904	165.00 SF	56.950452	82.50 SF

3RD FLOOR EGRESS STAIRS - BLDG A

Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	12	3.6	44"
EGRESS STAIR B	0.3	12	3.6	44"

3RD FLOOR EGRESS DOORS - BLDG A

Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	12	2.4	36"
EGRESS DOOR B	0.2	12	2.4	36"

3RD FLOOR CORRIDOR CAPACITY - BLDG A

Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	24	4.8	60"

3RD FLOOR OCCUPANT LOAD - BLDG A

Name	Area	# of Occupants
301-1001	549 SF	3
302-1002	531 SF	3
303-1003	815 SF	5
304-1004	588 SF	3
305-1005	413 SF	3
306-1006	776 SF	4
308-1008	367 SF	2
	4040 SF	23
REFUSE ROOM	35 SF	1
	35 SF	1
TOTAL	4075 SF	24

3RD FLOOR TRAVEL DISTANCE - BLDG A

Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	75' - 8"
DEAD END			
DEAD END CORRIDOR A	R-2	MAX ALLOWED = 80'-0"	50' - 2"
DEAD END CORRIDOR B	R-2	MAX ALLOWED = 80'-0"	37' - 1"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	19' - 8"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	73' - 10"

BLDG A - 3RD FL. -LIGHT AND AIR CALCULATION

Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
03A_3RD FL.					
301-1001	LIVING / DINING	16.977851	81.00 SF	8.488925	40.50 SF
301-1001	BEDROOM	11.772114	63.00 SF	5.886057	31.50 SF
302-1002	BEDROOM	11.865877	63.00 SF	5.932938	31.50 SF
302-1002	LIVING /DINING	17.028061	81.00 SF	8.51403	40.50 SF
303-1003	BEDROOM	15.006081	63.00 SF	7.503041	31.50 SF
303-1003	BEDROOM	11.824326	63.00 SF	5.912163	31.50 SF
303-1003	LIVING /DINING	17.024557	81.00 SF	8.512278	40.50 SF
304-1004	BEDROOM	11.900286	67.50 SF	5.950143	33.75 SF
304-1004	LIVING/DINING	15.09526	81.00 SF	7.54763	40.50 SF
305-1005	LIVING / DINING	26.81953	0.00 SF	13.409765	0.00 SF
306-1006	BEDROOM	15.57005	135.00 SF	7.785025	67.50 SF
306-1006	BEDROOM	11.016722	72.00 SF	5.508361	36.00 SF
306-1006	LIVING /DINING	16.362994	81.00 SF	8.181497	40.50 SF
307-1007	LIVING / DINING	25.097573	81.00 SF	12.548786	40.50 SF
308-1008	LIVING /DINING	25.186532	81.00 SF	12.593266	40.50 SF

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
2ND - 10TH FLOOR
LIFE SAFETY PLANS

A-003A.00

Scale: As indicated
Date: 12/1/2025 7:16:47 PM
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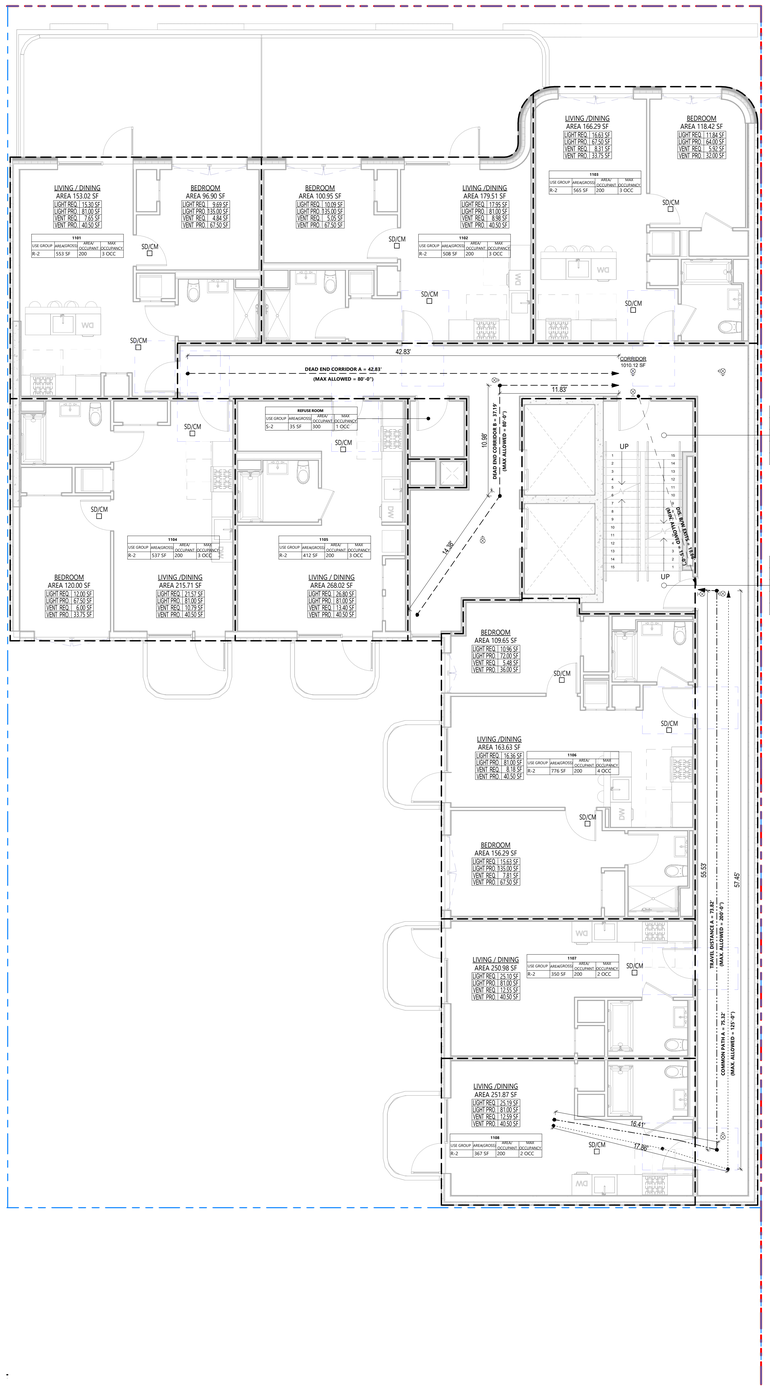
Checked by:
DOB JOB NUMBER:

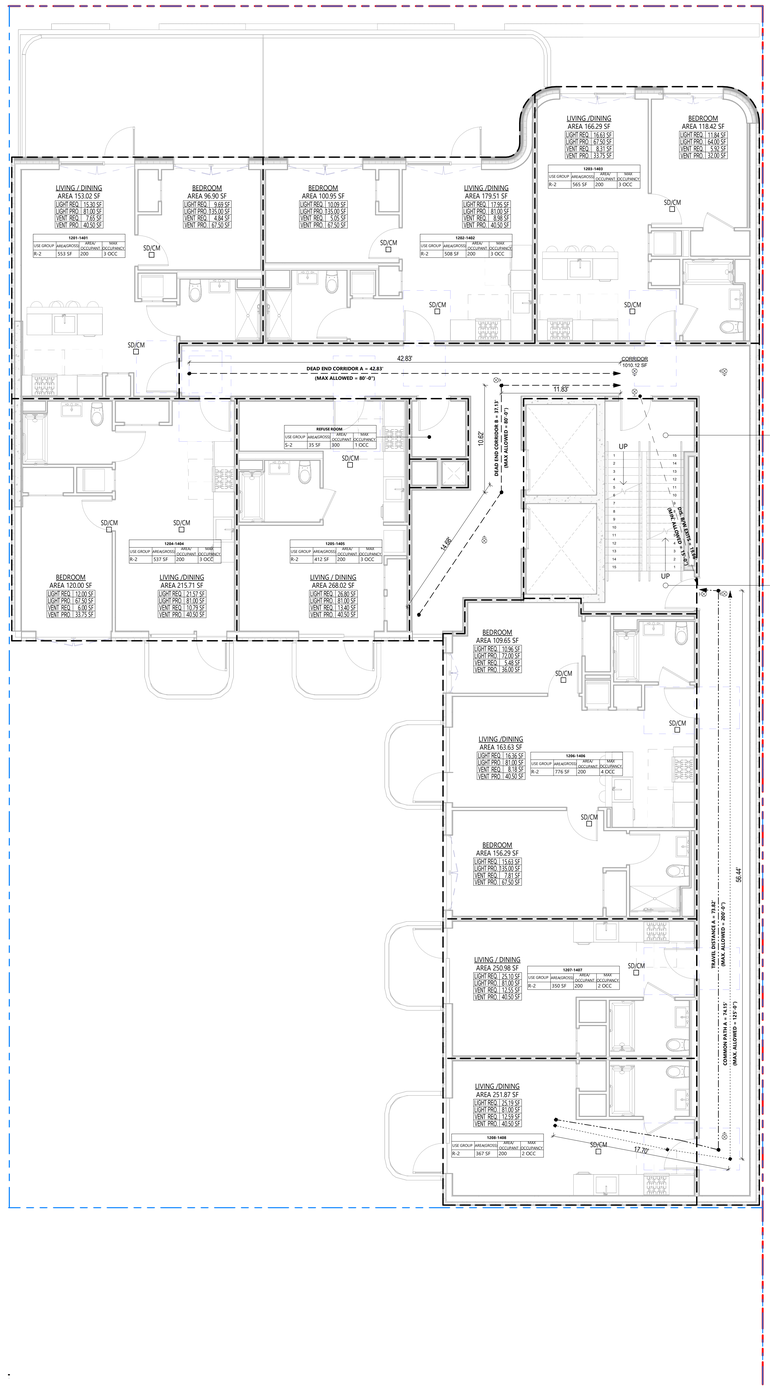
1 BLDG A - 11TH FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"



EXIT STAIR B	TOTAL CAPCITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146 OCCUPANTS	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR A	TOTAL CAPCITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146 OCCUPANTS	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

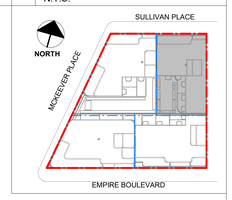
2 BLDG A - 12TH TO 14TH FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"



EXIT STAIR A	TOTAL CAPCITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146 OCCUPANTS	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPCITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146 OCCUPANTS	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

KEY PLAN
N.T.S.



11TH FLOOR EGRESS STAIRS- BLDG A

Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	11	3.3	44"
EGRESS STAIR B	0.3	11	3.3	44"

11TH FLOOR EGRESS DOORS - BLDG A

Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	11	2.2	36"
EGRESS DOOR B	0.2	11	2.2	36"

11TH FLOOR CORRIDOR CAPACITY - BLDG A

Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	22	4.4	60"

11TH FLOOR OCCUPANT LOAD - BLDG A

Name	Area	# of Occupants
1101	553 SF	3
1102	508 SF	3
1103	565 SF	3
1104	537 SF	3
1105	412 SF	3
1106	776 SF	4
1108	367 SF	2
	3719 SF	21
REFUSE ROOM	35 SF	1
	35 SF	1
TOTAL	3754 SF	22

11TH FLOOR TRAVEL DISTANCE - BLDG A

Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	75' - 4"
DEAD END			
DEAD END CORRIDOR A	R-2	MAX ALLOWED = 80'-0"	42' - 10"
DEAD END CORRIDOR B	R-2	MAX ALLOWED = 80'-0"	37' - 2"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	19' - 8"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	73' - 10"

BLDG A - 11TH FL. -LIGHT AND AIR CALCULATION

Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
11A_11TH FL.					
1101	LIVING / DINING	15.301583	81.00 SF	7.650791	40.50 SF
1101	LIVING/DINING	22.489762	18.33 SF	11.244881	9.17 SF
1102	LIVING /DINING	17.950732	81.00 SF	8.975366	40.50 SF
1102	BEDROOM	9.689598	135.00 SF	4.844799	67.50 SF
1102	BEDROOM	10.094849	135.00 SF	5.047424	67.50 SF
1103	LIVING /DINING	16.628792	67.50 SF	8.314396	33.75 SF
1103	BEDROOM	11.842323	64.00 SF	5.921161	32.00 SF
1104	LIVING /DINING	21.570507	81.00 SF	10.785254	40.50 SF
1104	BEDROOM	11.999867	67.50 SF	5.999933	33.75 SF
1105	LIVING / DINING	26.802124	81.00 SF	13.401062	40.50 SF
1106	LIVING /DINING	16.362994	81.00 SF	8.181497	40.50 SF
1106	BEDROOM	15.629261	135.00 SF	7.81463	67.50 SF
1106	BEDROOM	10.964765	72.00 SF	5.482382	36.00 SF
1107	LIVING /DINING	25.186532	81.00 SF	12.593266	40.50 SF
1107	LIVING / DINING	25.097573	81.00 SF	12.548786	40.50 SF

12TH FLOOR EGRESS STAIRS- BLDG A

Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	11	3.3	44"
EGRESS STAIR B	0.3	11	3.3	44"

12TH FLOOR EGRESS DOORS - BLDG A

Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	11	2.2	36"
EGRESS DOOR B	0.2	11	2.2	36"

12TH FLOOR CORRIDOR CAPACITY - BLDG A

Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	22	4.4	60"

12TH FLOOR OCCUPANT LOAD - BLDG A

Name	Area	# of Occupants
1201-1401	553 SF	3
1202-1402	508 SF	3
1203-1403	565 SF	3
1204-1404	537 SF	3
1205-1405	412 SF	3
1206-1406	776 SF	4
1208-1408	367 SF	2
	3719 SF	21
REFUSE ROOM	35 SF	1
	35 SF	1
TOTAL	3754 SF	22

12TH FLOOR TRAVEL DISTANCE - BLDG A

Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	74' - 2"
DEAD END			
DEAD END CORRIDOR A	R-2	MAX ALLOWED = 80'-0"	42' - 10"
DEAD END CORRIDOR B	R-2	MAX ALLOWED = 80'-0"	37' - 2"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	19' - 8"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	73' - 10"

BLDG A - 12TH-14TH FL. -LIGHT AND AIR CALCULATION

Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
11A_11TH FL.					
1101	LIVING / DINING	15.301583	81.00 SF	7.650791	40.50 SF
1101	LIVING/DINING	22.489762	18.33 SF	11.244881	9.17 SF
1102	LIVING /DINING	17.950732	81.00 SF	8.975366	40.50 SF
1102	BEDROOM	9.689598	135.00 SF	4.844799	67.50 SF
1102	BEDROOM	10.094849	135.00 SF	5.047424	67.50 SF
1103	LIVING /DINING	16.628792	67.50 SF	8.314396	33.75 SF
1103	BEDROOM	11.842323	64.00 SF	5.921161	32.00 SF
1104	LIVING /DINING	21.570507	81.00 SF	10.785254	40.50 SF
1104	BEDROOM	11.999867	67.50 SF	5.999933	33.75 SF
1105	LIVING / DINING	26.802124	81.00 SF	13.401062	40.50 SF
1106	LIVING /DINING	16.362994	81.00 SF	8.181497	40.50 SF
1106	BEDROOM	15.629261	135.00 SF	7.81463	67.50 SF
1106	BEDROOM	10.964765	72.00 SF	5.482382	36.00 SF
1107	LIVING /DINING	25.186532	81.00 SF	12.593266	40.50 SF
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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

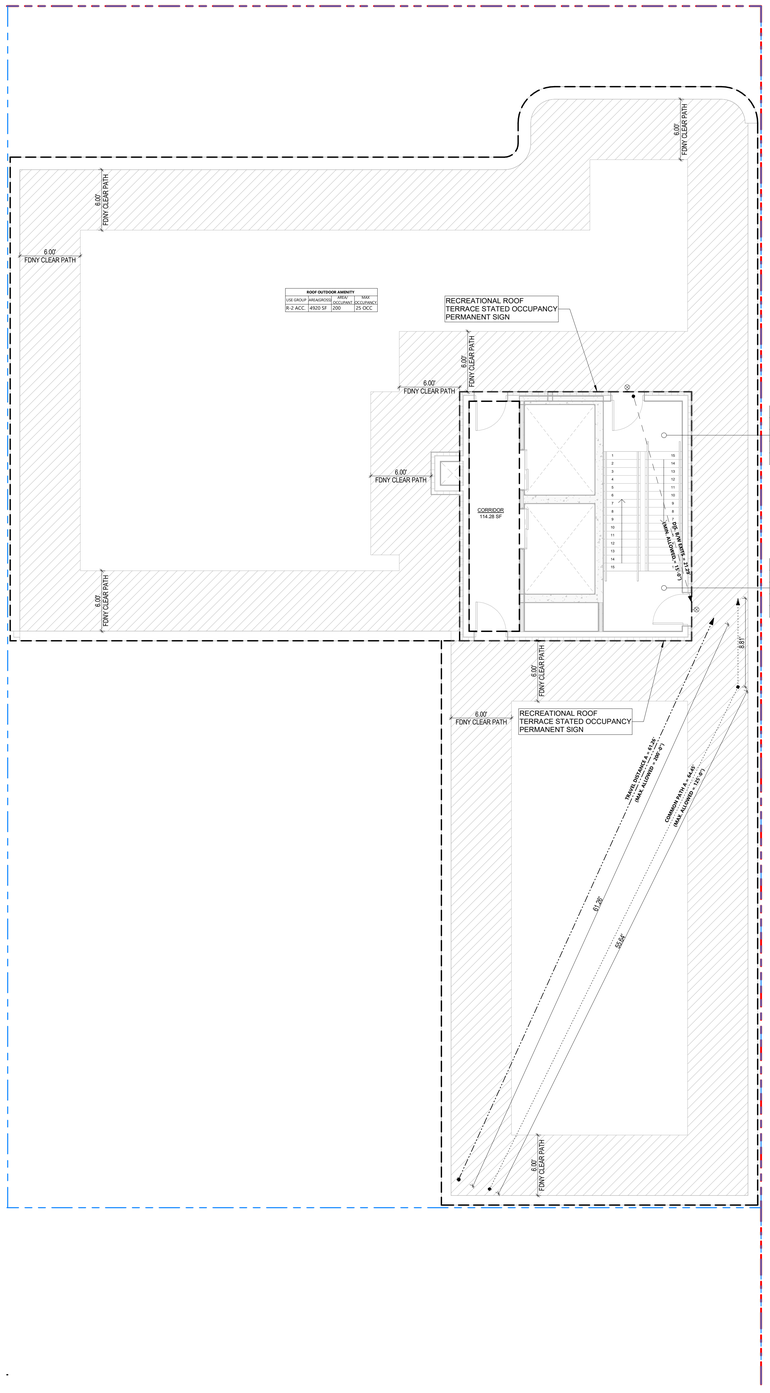
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
11TH - 14TH FLOOR LIFE SAFETY PLANS

A-004A.00

Scale: As indicated
Date: 12/1/2025 7:17:03 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 BLDG A - ROOF LIFE SAFETY PLAN
3/16" = 1'-0"



EXIT STAIR A	TOTAL CAPCITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146 OCCUPANTS	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPCITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146 OCCUPANTS	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

ROOF EGRESS STAIRS- BLDG A

Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	13	3.9	44"
EGRESS STAIR B	0.3	12	3.6	44"

ROOF EGRESS DOORS - BLDG A

Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	13	2.6	36"
EGRESS DOOR B	0.2	12	2.4	36"

ROOF CORRIDOR CAPACITY - BLDG A

Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	25	5	60"

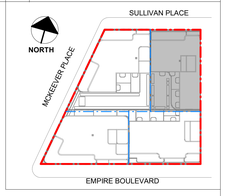
ROOF OCCUPANT LOAD - BLDG A

Name	Area	# of Occupants
ROOF OUTDOOR AMENITY	4920 SF	25
	4920 SF	25
TOTAL	4920 SF	25

ROOF TRAVEL DISTANCE - BLDG A

Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	64' - 5"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	21' - 3"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	61' - 3"

KEY PLAN
N.T.S.



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00	INITIAL SUBMISSION	12/01/2025

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DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

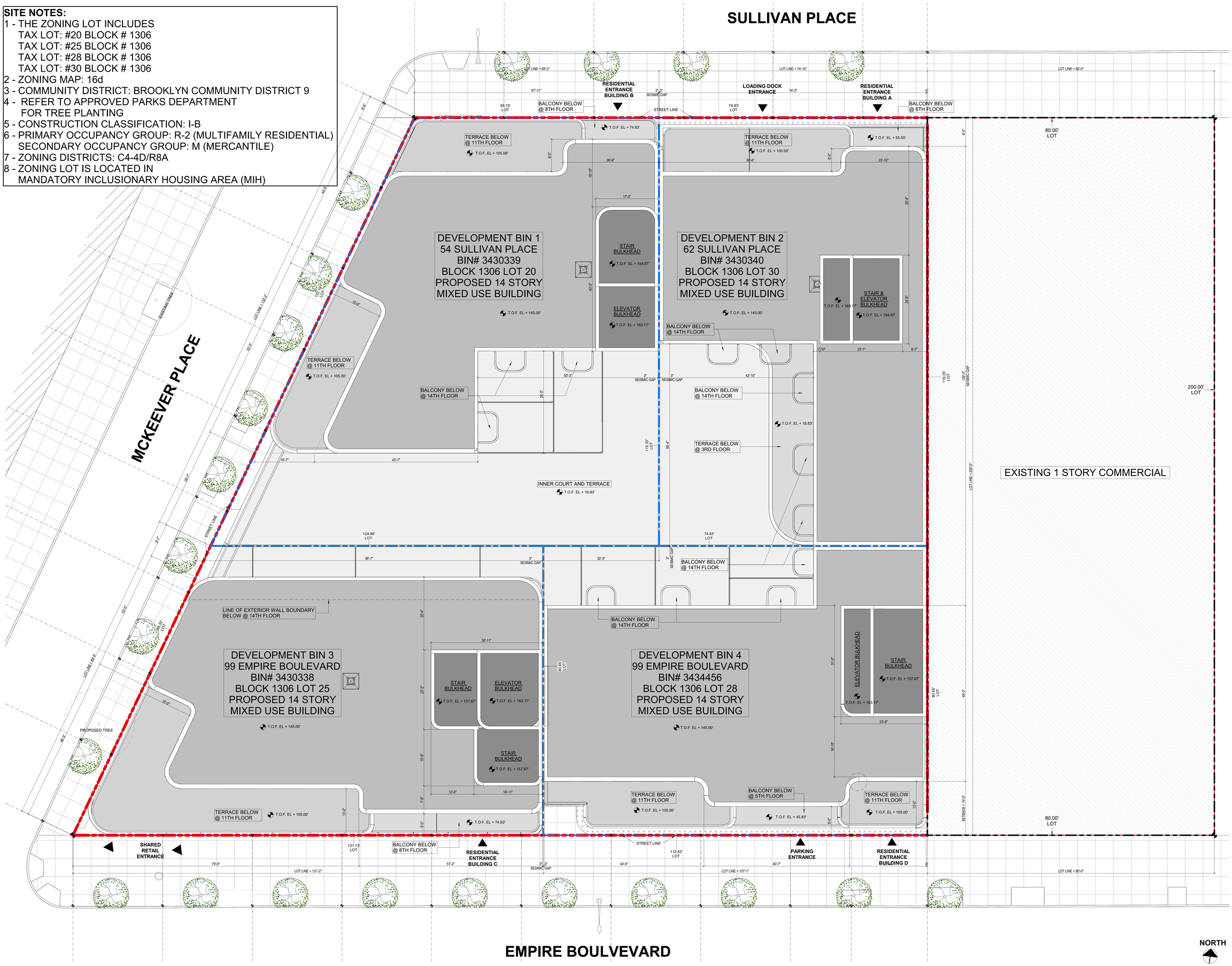
SHEET TITLE
ROOF LIFE SAFETY PLANS

A-005A.00

Scale: As indicated
Date: 12/1/2025 7:17:10 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 | SITE PLAN
1/8" = 1'-0"

SITE NOTES:
1 - THE ZONING LOT INCLUDES
TAX LOT: #20 BLOCK # 1306
TAX LOT: #25 BLOCK # 1306
TAX LOT: #28 BLOCK # 1306
TAX LOT: #30 BLOCK # 1306
2 - ZONING MAP: 16d
3 - COMMUNITY DISTRICT: BROOKLYN COMMUNITY DISTRICT 9
4 - REFER TO APPROVED PARKS DEPARTMENT FOR TREE PLANTING
5 - CONSTRUCTION CLASSIFICATION: I-B
6 - PRIMARY OCCUPANCY GROUP: R-2 (MULTIFAMILY RESIDENTIAL)
SECONDARY OCCUPANCY GROUP: M (MERCANTILE)
7 - ZONING DISTRICTS: C4-4D/R8A
8 - ZONING LOT IS LOCATED IN MANDATORY INCLUSIONARY HOUSING AREA (MIH)



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00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

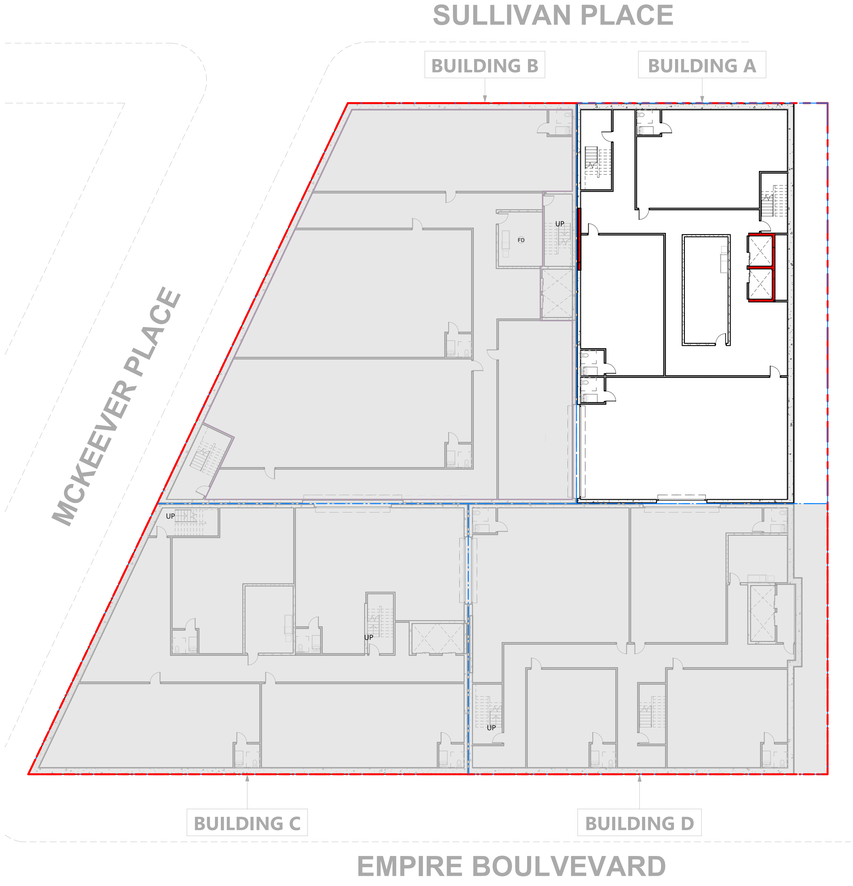
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
SITE PLAN

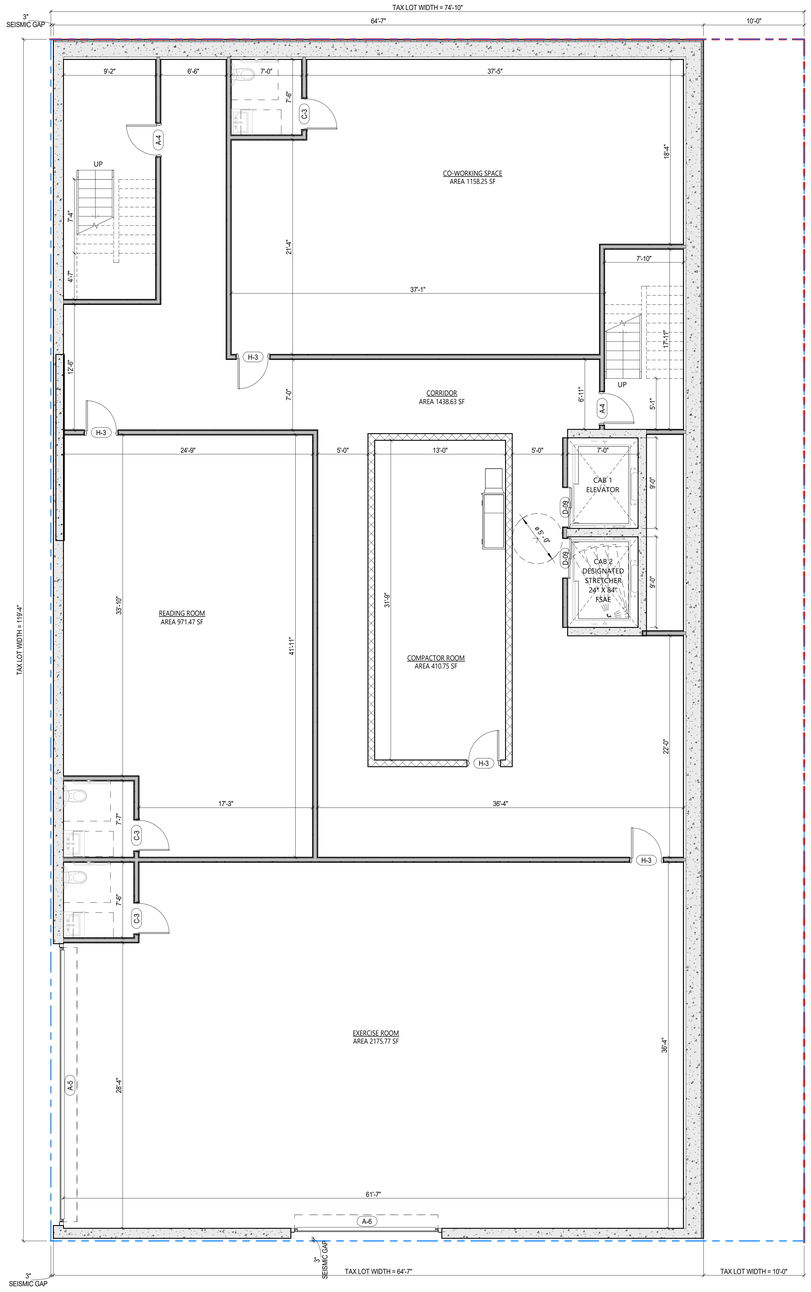
A-006A.00

Scale:	1/8" = 1'-0"
Date:	12/1/2025 7:17:15 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

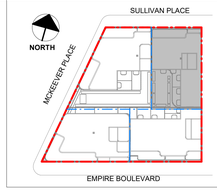
1 | 00 SUBCELLAR 2 OVERALL PLAN
1/16" = 1'-0"



2 | BLDG A - SUB-CELLAR 2 ENLARGED PLAN
3/16" = 1'-0"



KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

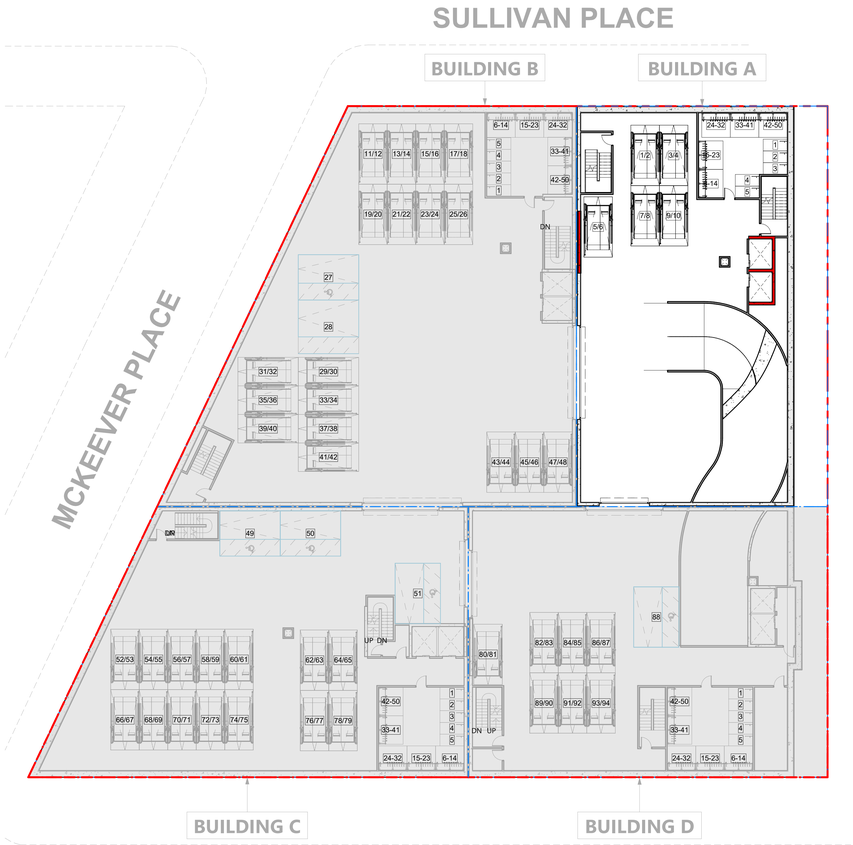
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED
SUB-CELLAR 02 PLAN

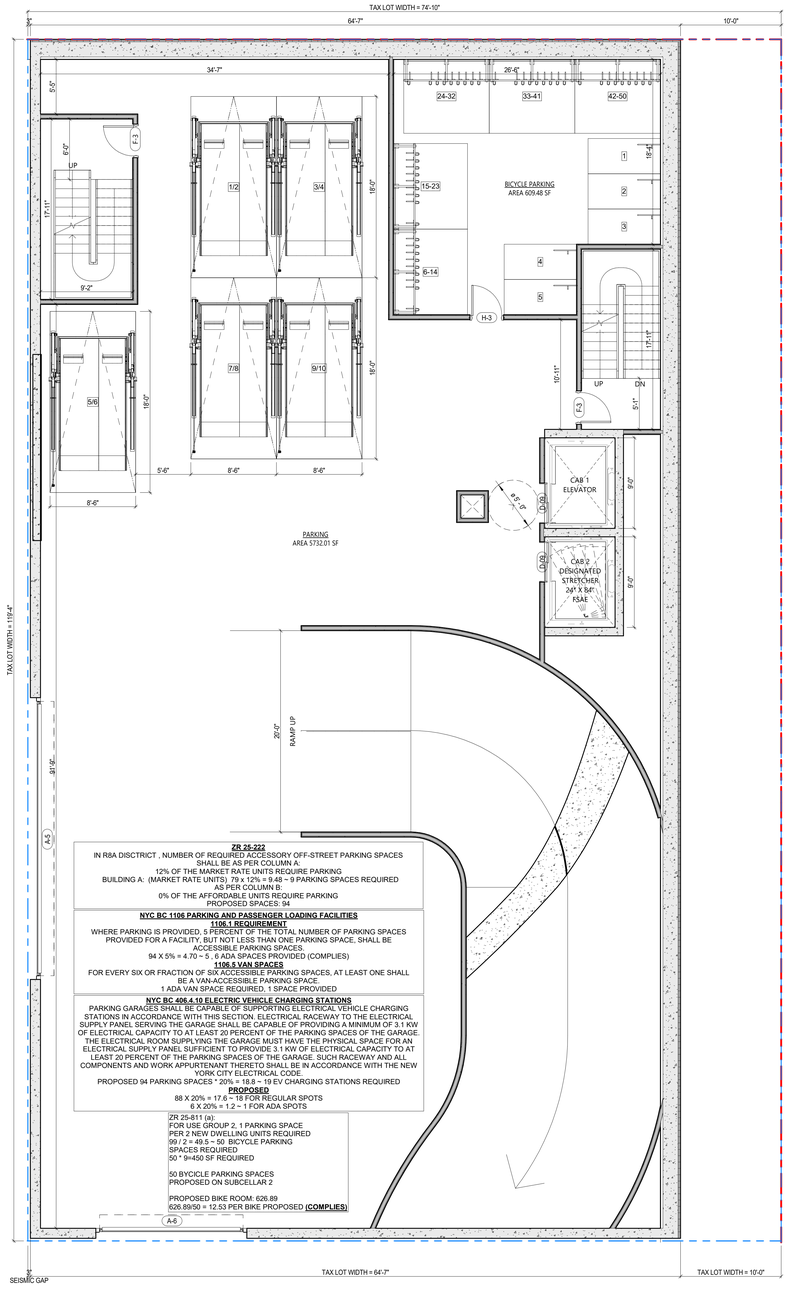
A-100A.00

Scale:	As indicated
Date:	12/1/2025 7:17:18 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 | 00 SUBCELLAR 1 OVERALL PLAN
1/16" = 1'-0"



2 | BLDG A - SUB-CELLAR 1 ENLARGED PLAN
3/16" = 1'-0"



ZR 25-222
IN R8A DISCTRICT , NUMBER OF REQUIRED ACCESSORY OFF-STREET PARKING SPACES SHALL BE AS PER COLUMN A:
12% OF THE MARKET RATE UNITS REQUIRE PARKING
BUILDING A: (MARKET RATE UNITS) 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED
AS PER COLUMN B:
0% OF THE AFFORDABLE UNITS REQUIRE PARKING
PROPOSED SPACES: 94

NYC BC 1106 PARKING AND PASSENGER LOADING FACILITIES
1106.1 REQUIREMENT
WHERE PARKING IS PROVIDED, 5 PERCENT OF THE TOTAL NUMBER OF PARKING SPACES PROVIDED FOR A FACILITY, BUT NOT LESS THAN ONE PARKING SPACE, SHALL BE ACCESSIBLE PARKING SPACES.
94 X 5% = 4.70 ~ 5 . 6 ADA SPACES PROVIDED (COMPLIES)
1106.5 VAN SPACES
FOR EVERY SIX OR FRACTION OF SIX ACCESSIBLE PARKING SPACES, AT LEAST ONE SHALL BE A VAN-ACCESSIBLE PARKING SPACE.
1 ADA VAN SPACE REQUIRED, 1 SPACE PROVIDED

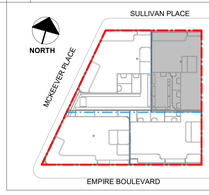
NYC BC 406.4.10 ELECTRIC VEHICLE CHARGING STATIONS
PARKING GARAGES SHALL BE CAPABLE OF SUPPORTING ELECTRICAL VEHICLE CHARGING STATIONS IN ACCORDANCE WITH THIS SECTION. ELECTRICAL RACEWAY TO THE ELECTRICAL SUPPLY PANEL SERVING THE GARAGE SHALL BE CAPABLE OF PROVIDING A MINIMUM OF 3.1 KW OF ELECTRICAL CAPACITY TO AT LEAST 20 PERCENT OF THE PARKING SPACES OF THE GARAGE. THE ELECTRICAL ROOM SUPPLYING THE GARAGE MUST HAVE THE PHYSICAL SPACE FOR AN ELECTRICAL SUPPLY PANEL SUFFICIENT TO PROVIDE 3.1 KW OF ELECTRICAL CAPACITY TO AT LEAST 20 PERCENT OF THE PARKING SPACES OF THE GARAGE. SUCH RACEWAY AND ALL COMPONENTS AND WORK APPURTENANT THERETO SHALL BE IN ACCORDANCE WITH THE NEW YORK CITY ELECTRICAL CODE.
PROPOSED 94 PARKING SPACES * 20% = 18.8 ~ 19 EV CHARGING STATIONS REQUIRED
PROPOSED
88 X 20% = 17.6 ~ 18 FOR REGULAR SPOTS
6 X 20% = 1.2 ~ 1 FOR ADA SPOTS

ZR 25-811 (a):
FOR USE GROUP 2, 1 PARKING SPACE
PER 2 NEW DWELLING UNITS REQUIRED
99 / 2 = 49.5 ~ 50 BICYCLE PARKING SPACES REQUIRED
50 * 9=450 SF REQUIRED

50 BYCICLE PARKING SPACES
PROPOSED ON SUBCELLAR 2

PROPOSED BIKE ROOM: 626.89
626.89/50 = 12.53 PER BIKE PROPOSED **(COMPLIES)**

KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

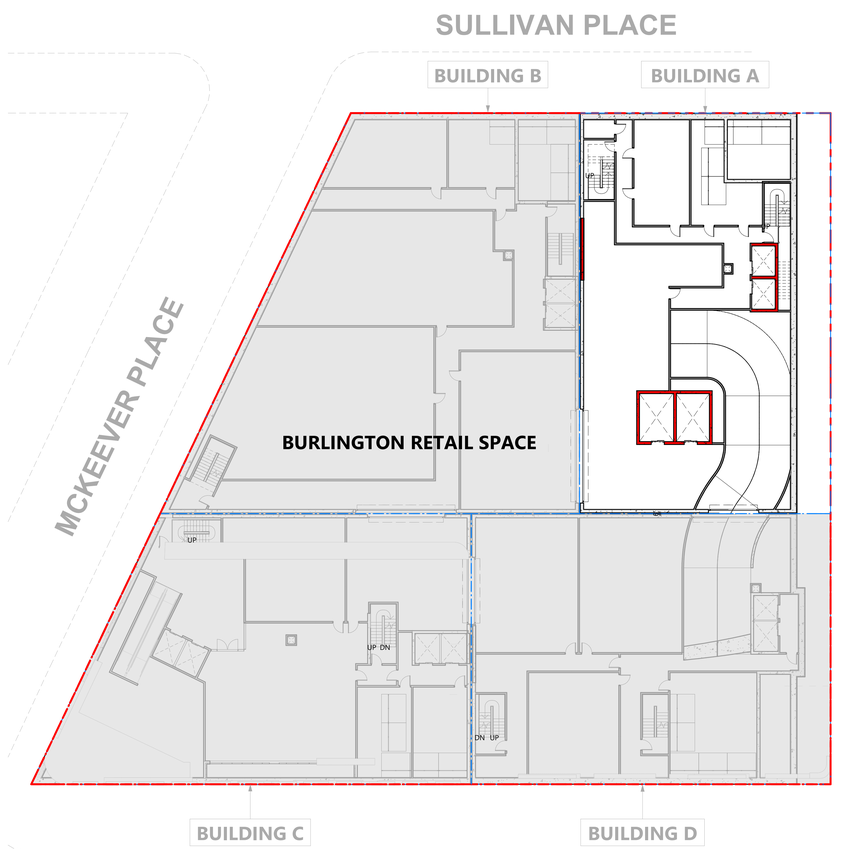
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED
SUB-CELLAR 01 PLAN

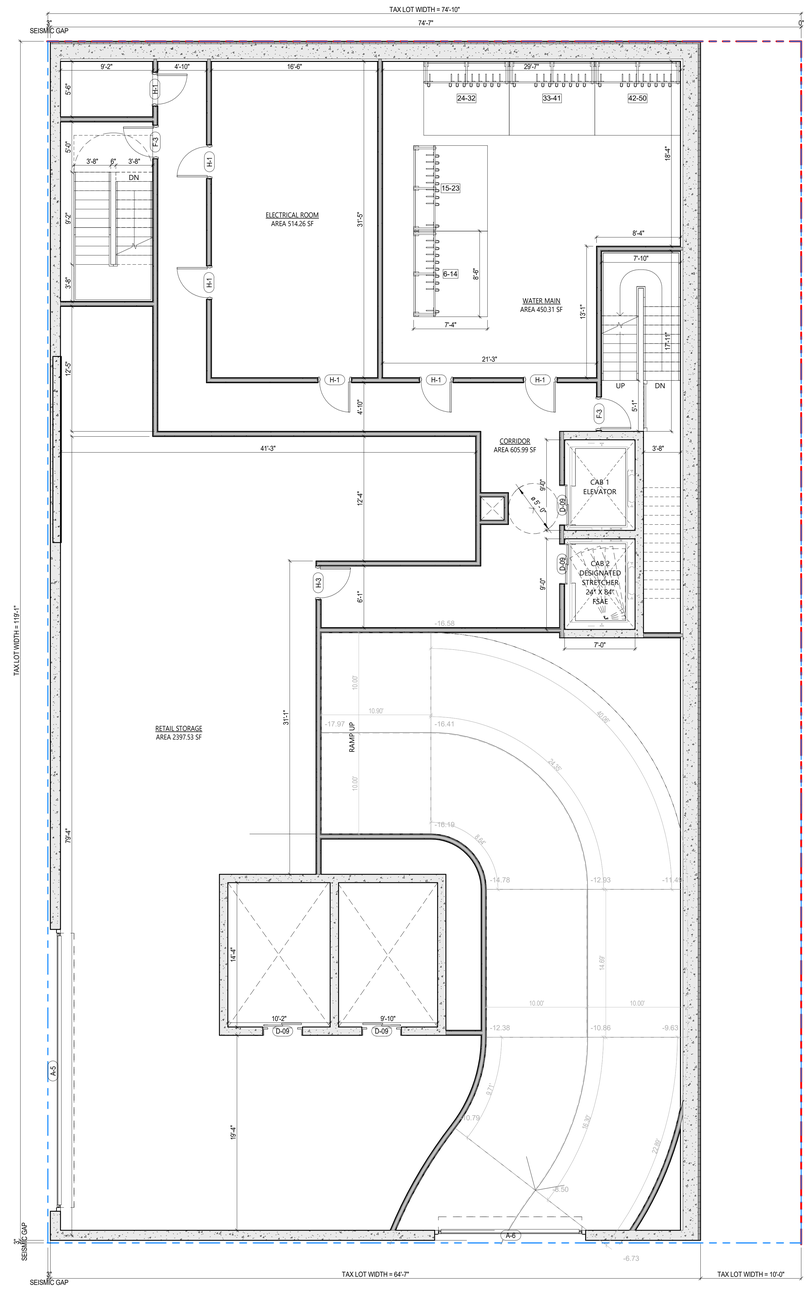
A-101A.00

Scale:	As indicated
Date:	12/1/2025 7:17:21 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 CELLAR OVERALL PLAN
1/16" = 1'-0"



2 BLDG A - CELLAR ENLARGED PLAN
3/16" = 1'-0"



KEY PLAN
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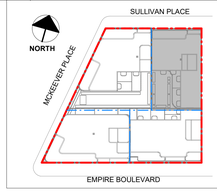

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

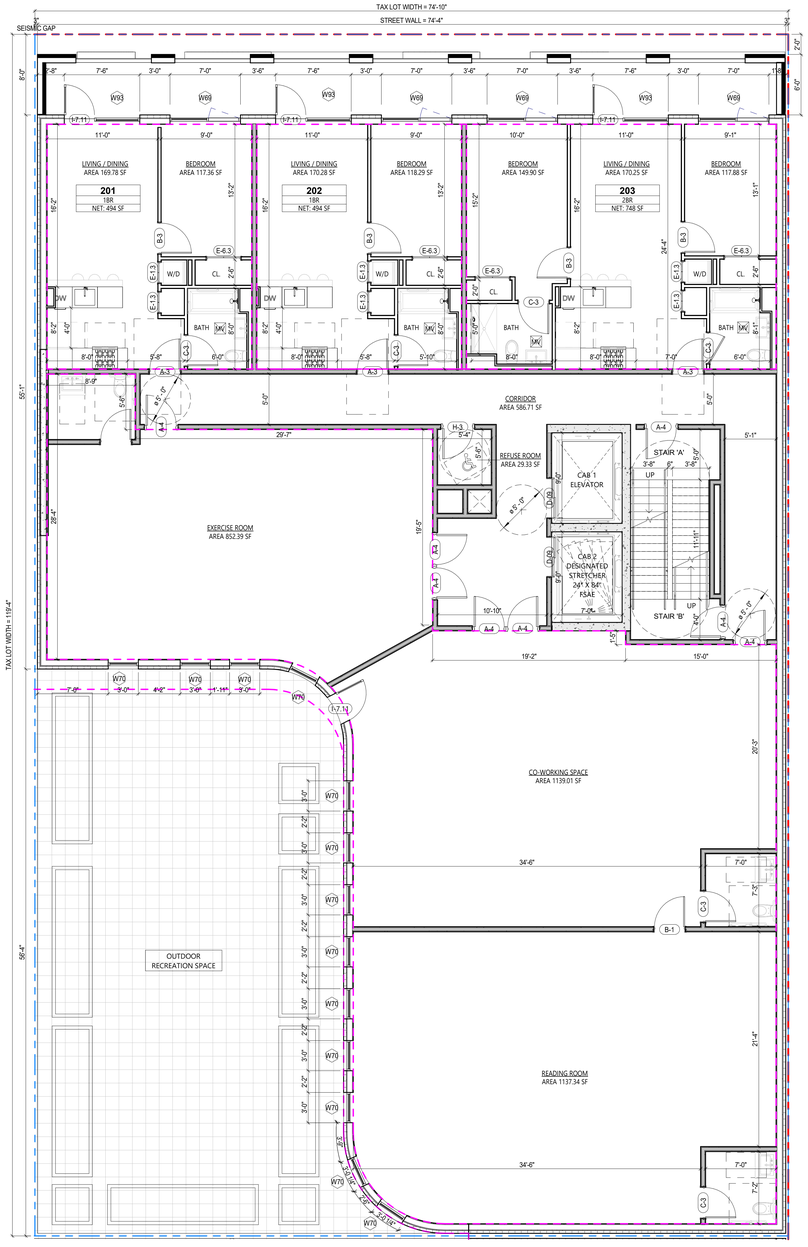
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED CELLAR PLAN

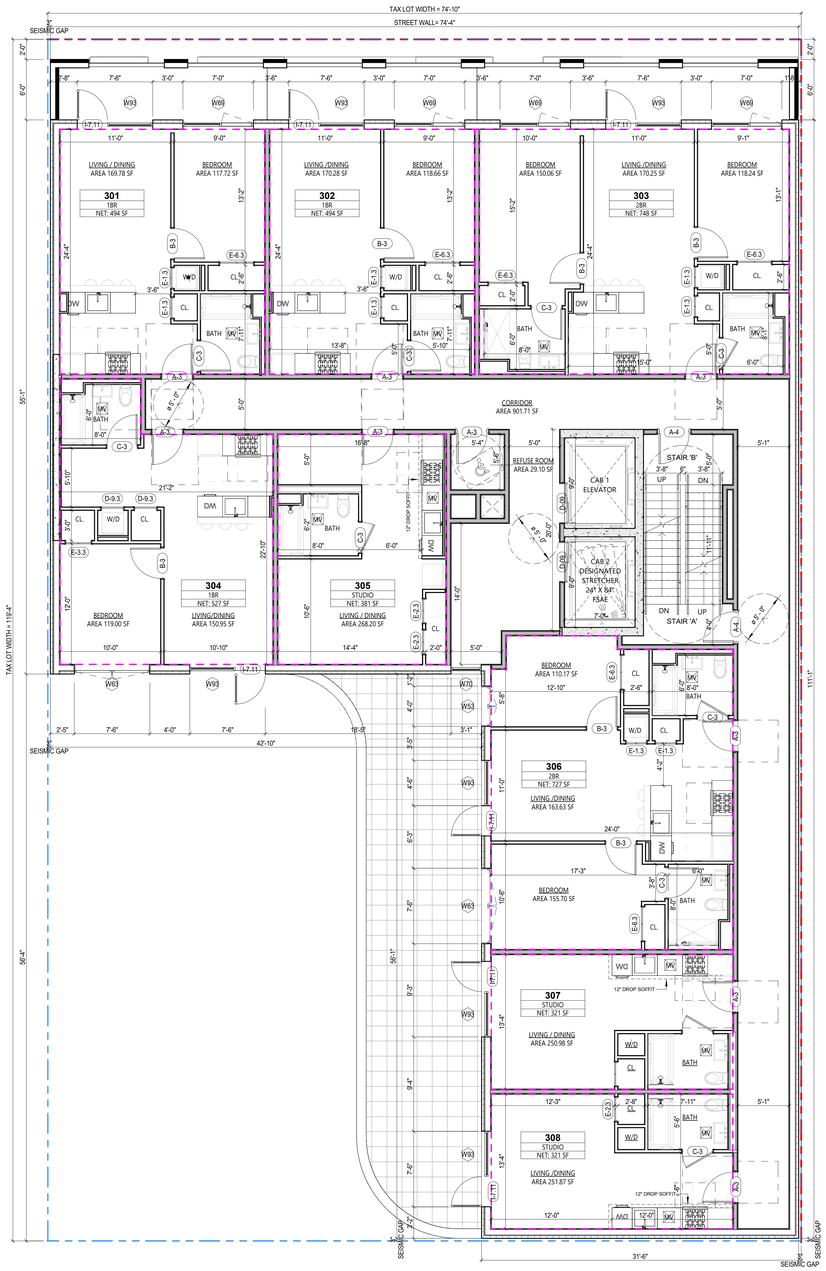
A-102A.00

Scale:	As indicated
Date:	12/1/2025 7:17:24 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG A - 2ND FLOOR ENLARGED PLAN
3/16" = 1'-0"



2 BLDG A - 3RD FLOOR ENLARGED PLAN
3/16" = 1'-0"



KEY PLAN
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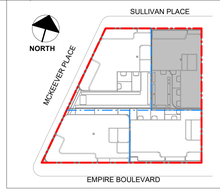

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00	INITIAL SUBMISSION	12/01/2025

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DOB SCAN STICKER:

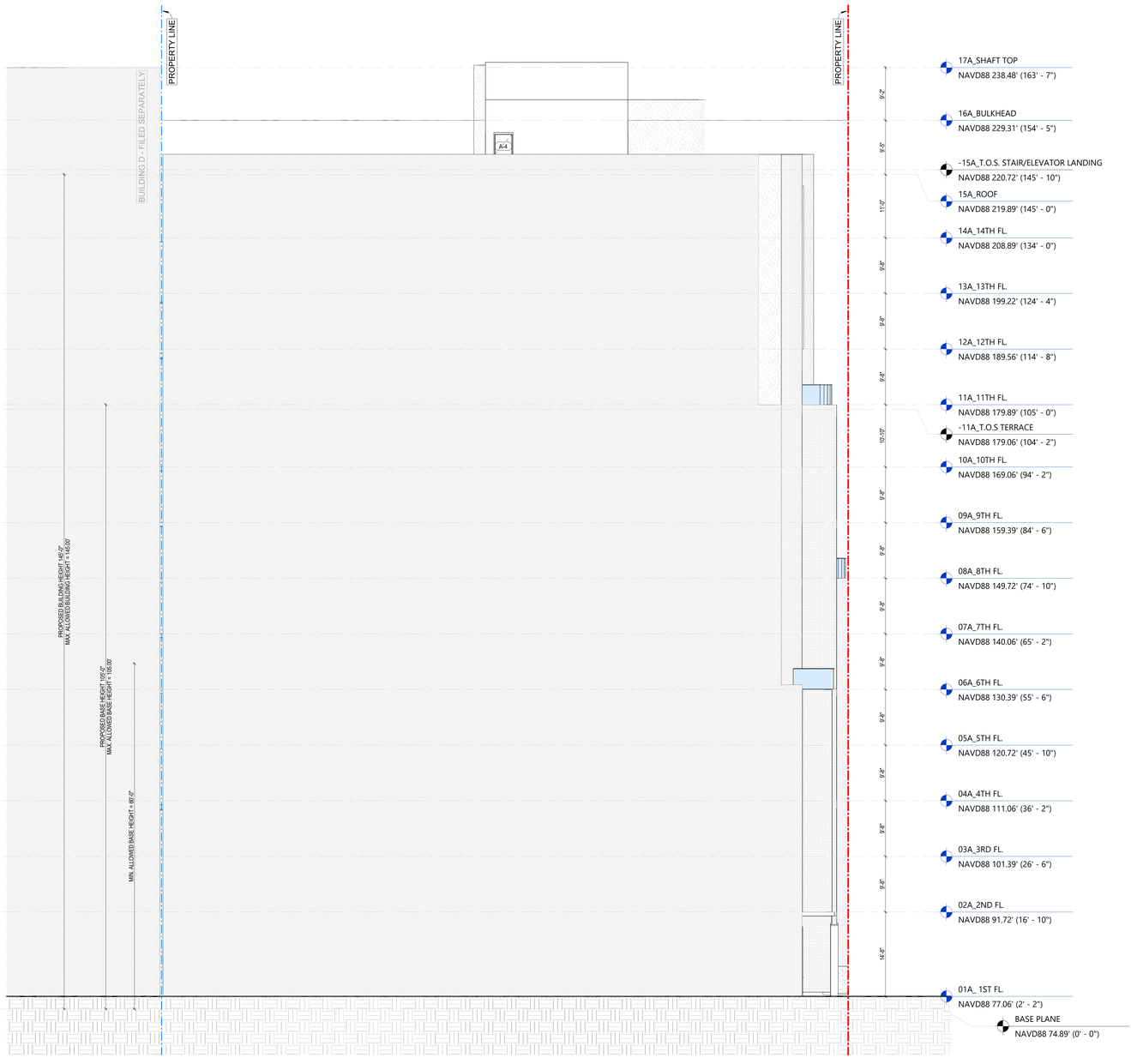
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED 2ND - 3RD FLOOR PLAN

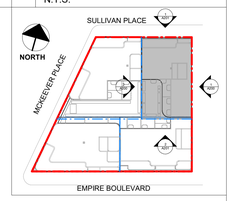
A-104A.00

Scale:	As indicated
Date:	12/1/2025 7:17:29 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG A - EAST ELEVATION
1/8" = 1'-0"



KEY PLAN
N.T.S.



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(609) 216 2975

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Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
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Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

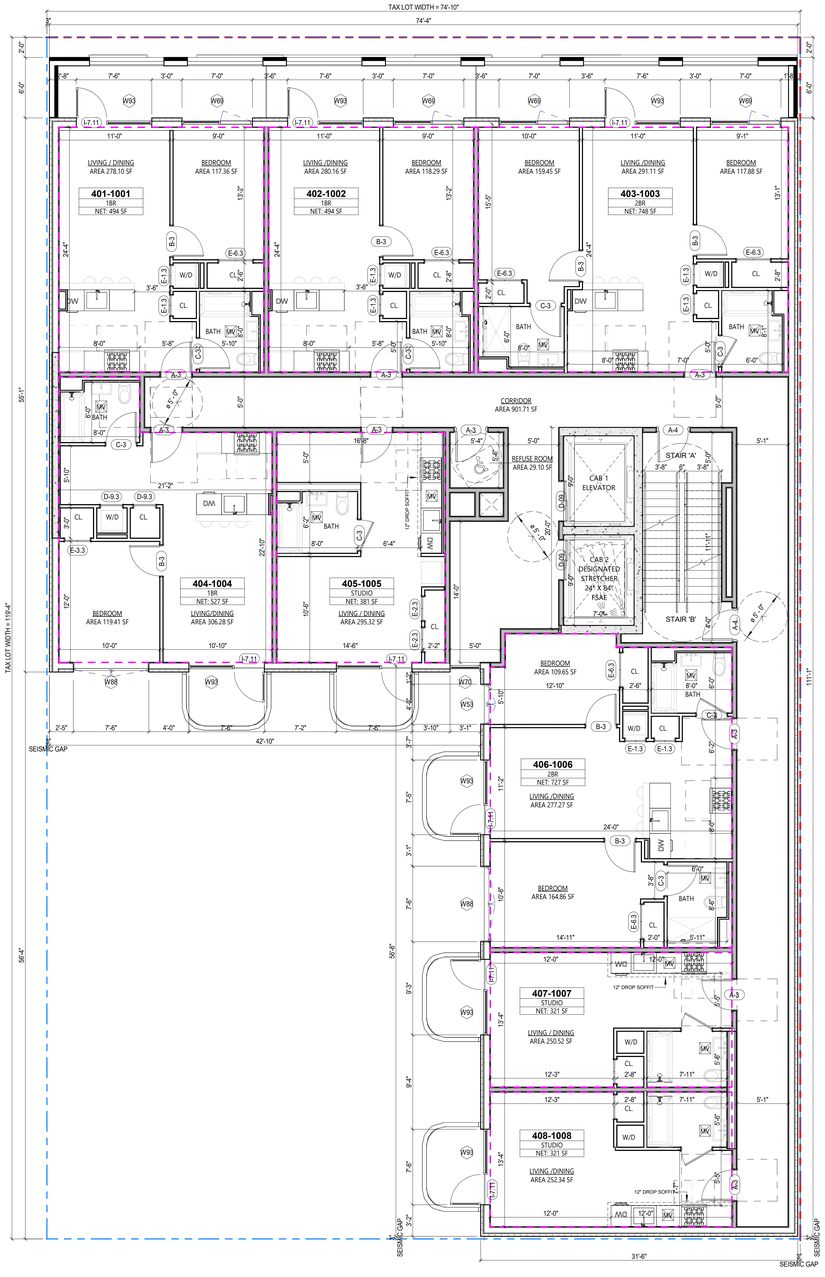
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
EAST ELEVATION

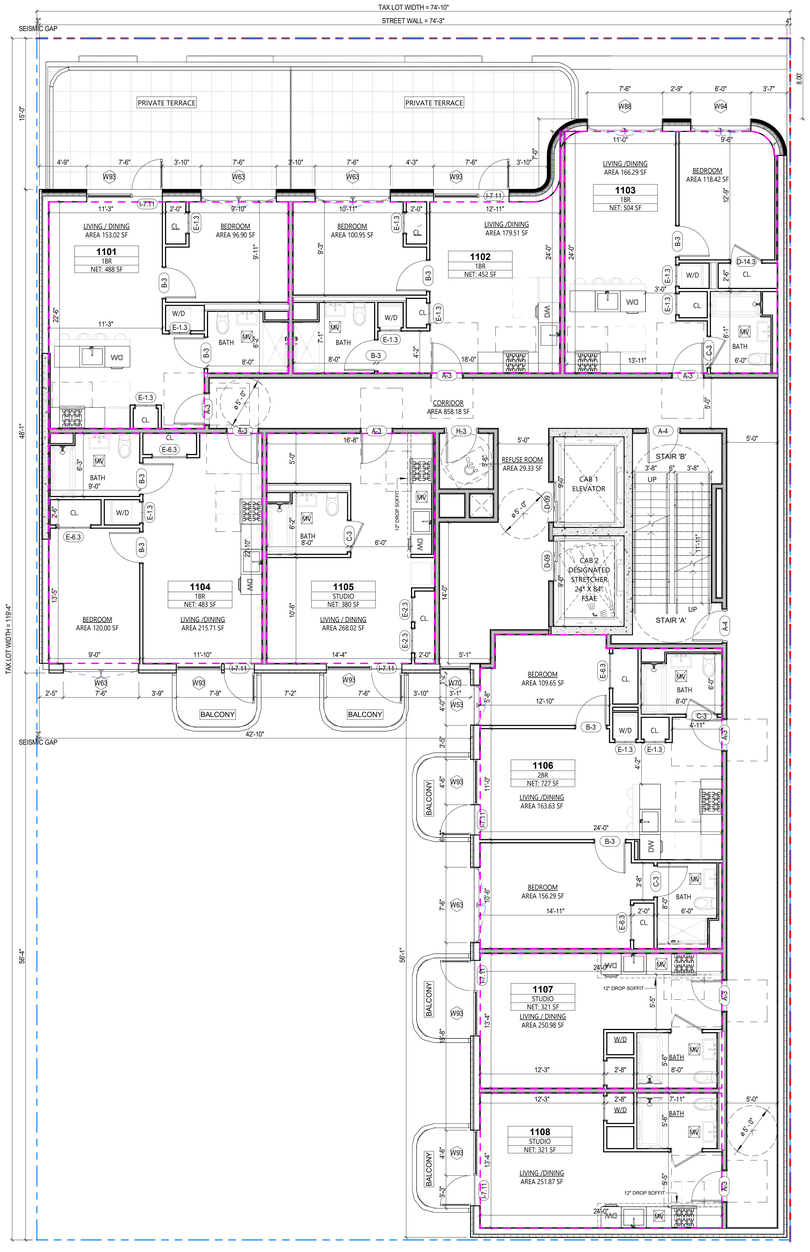
A-200A.00

Scale:	As indicated
Date:	12/1/2025 7:17:33 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

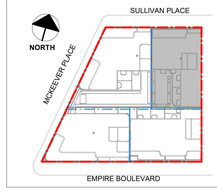
1 BLDG A - 4TH TO 10TH FLOOR ENLARGED PLAN
3/16" = 1'-0"



2 BLDG A - 11TH FLOOR ENLARGED PLAN
3/16" = 1'-0"



KEY PLAN
N.T.S.



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00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

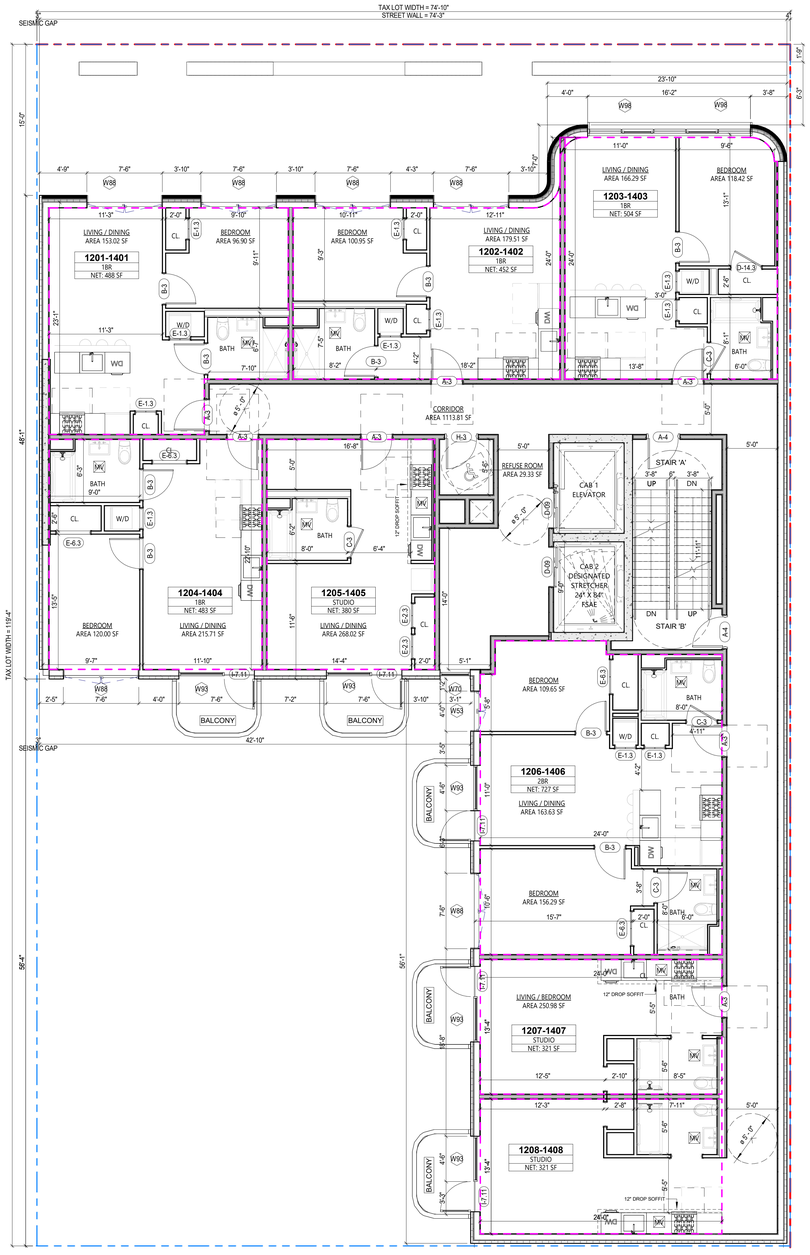
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED 4TH - 11TH FLOOR PLAN

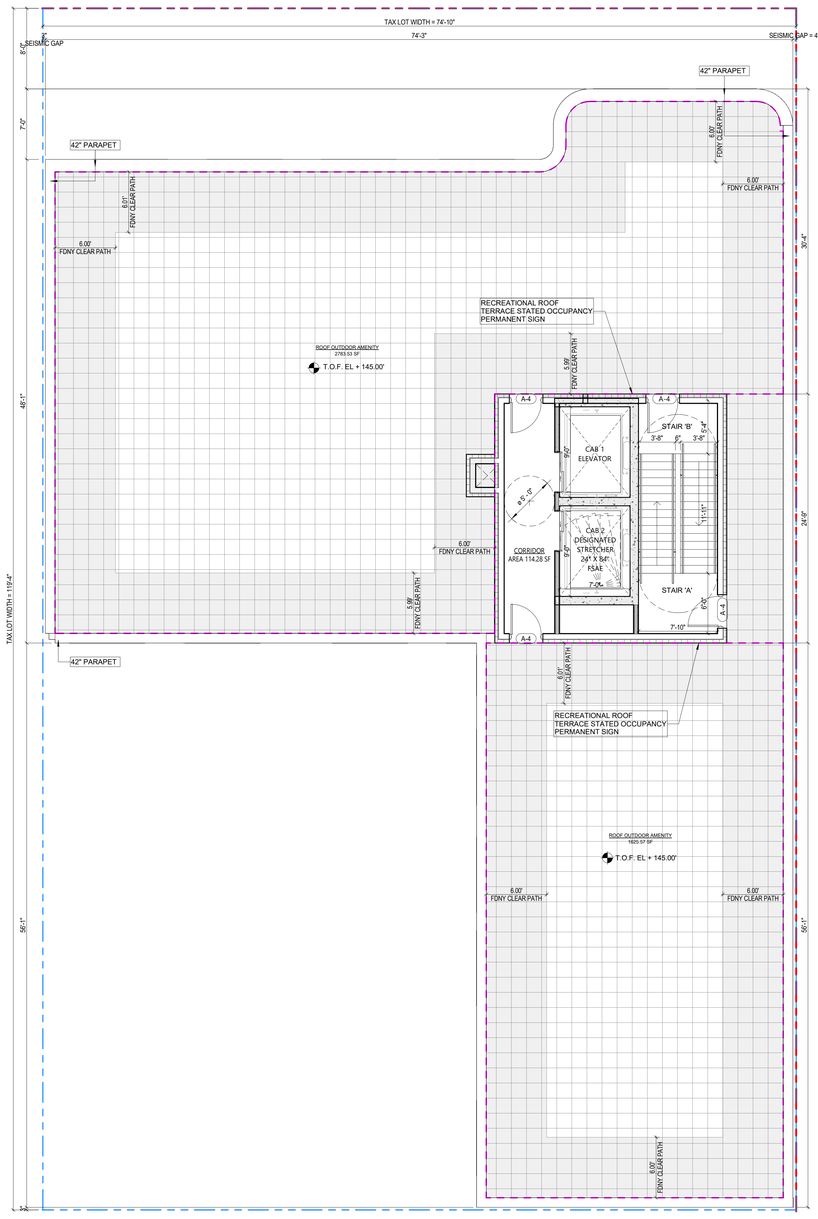
A-105A.00

Scale:	As indicated
Date:	12/1/2025 7:17:37 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG A - 12TH TO 14TH FLOOR ENLARGED PLAN
3/16" = 1'-0"



2 BLDG A - ROOF FLOOR ENLARGED PLAN
3/16" = 1'-0"



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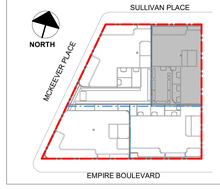
KEY PLAN
N.T.S.



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00	INITIAL SUBMISSION	12/01/2025

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DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED 12TH - ROOF PLAN

A-106A.00

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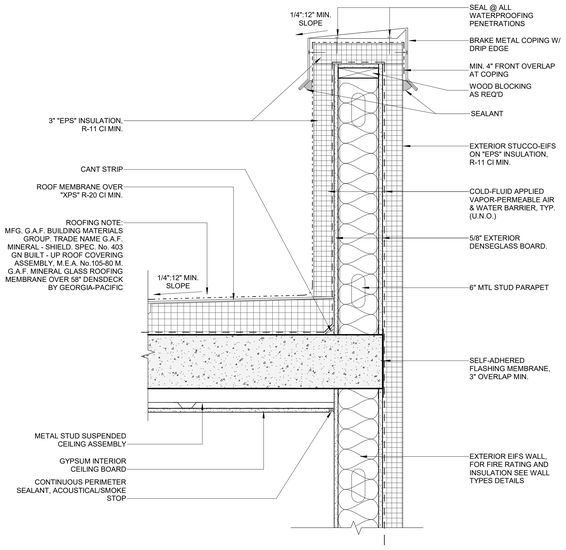
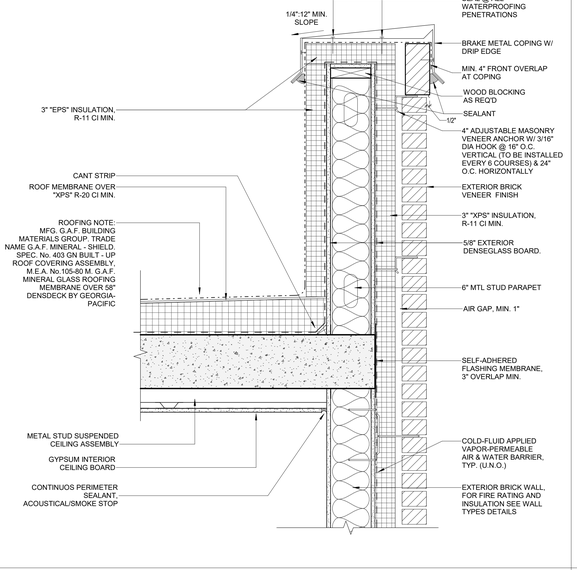
Date:	12/1/2025 7:17:40 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	



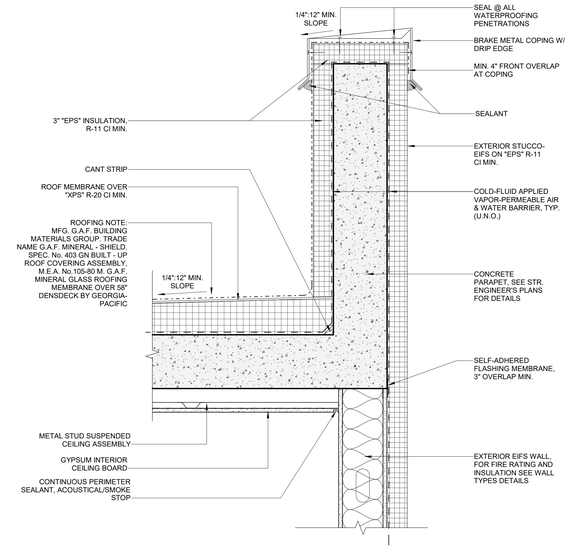
1 EIFS WALL @ STUD PARAPET

SCALE: 1 1/2" = 1'-0"



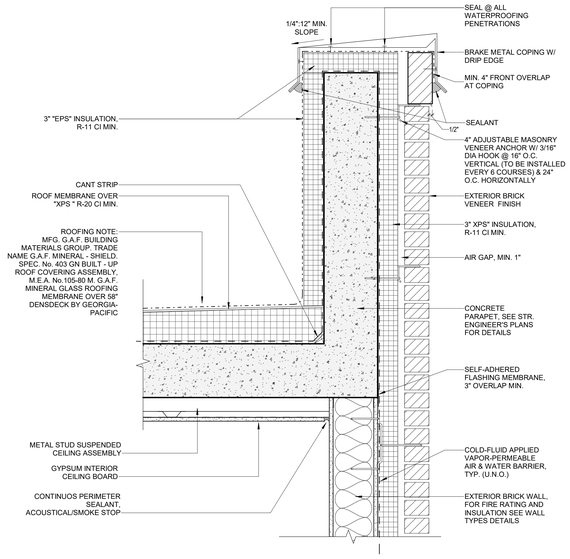
4 BRICK WALL 1HR @ STUD PARAPET

SCALE: 1 1/2" = 1'-0"



7 EIFS WALL @ CONC. PARAPET

SCALE: 1 1/2" = 1'-0"



9 BRICK WALL 1HR @ CONC. PARAPET

SCALE: 1 1/2" = 1'-0"

2 EIFS WALL @ CONC. SLAB

SCALE: 1 1/2" = 1'-0"

5 BRICK WALL 1HR @ CONC. SLAB

SCALE: 1 1/2" = 1'-0"

8 EIFS WALL @ CMU PARAPET

SCALE: 1 1/2" = 1'-0"

10 BRICK WALL 1HR @ CMU PARAPET

SCALE: 1 1/2" = 1'-0"

3 EIFS WALL @ BALCONY

SCALE: 1 1/2" = 1'-0"

6 BRICK WALL 1HR @ BALCONY

SCALE: 1 1/2" = 1'-0"

11 DETAIL @ FOUNDATION WALL

SCALE: 1 1/2" = 1'-0"

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

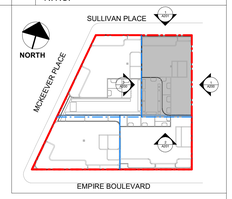
SHEET TITLE
SECTION DETAILS

A-510A.00

Scale:	1 1/2" = 1'-0"
Date:	12/1/2025 7:17:42 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG A - WEST ELEVATION
1/8" = 1'-0"

KEY PLAN
N.T.S.



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00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
WEST ELEVATION

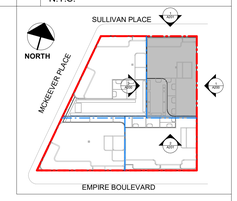
A-201A.00

Scale:	As indicated
Date:	12/1/2025 7:17:46 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG A - NORTH ELEVATION
1/8" = 1'-0"

2 BLDG A - SOUTH ELEVATION
1/8" = 1'-0"

KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

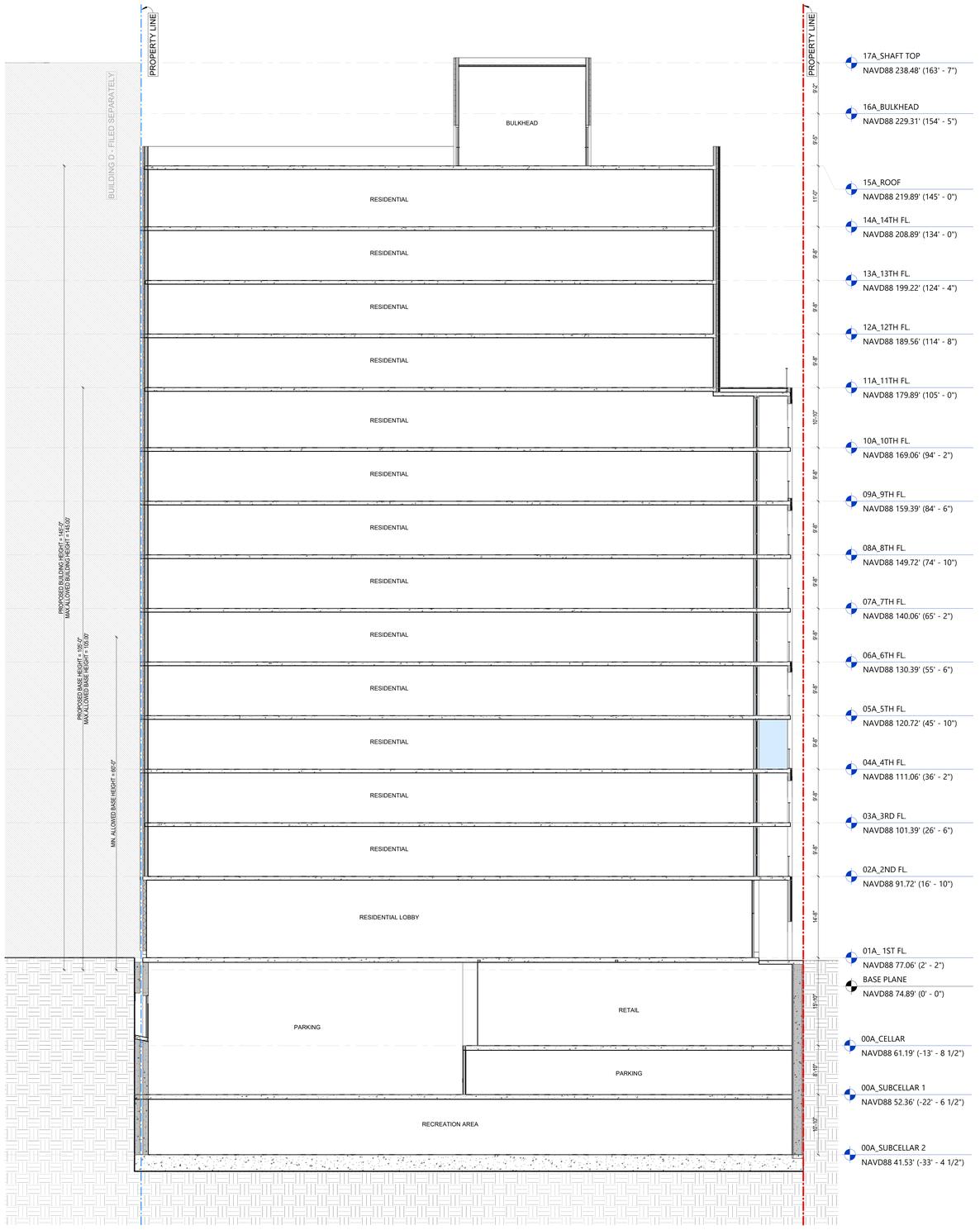
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
NORTH & SOUTH ELEVATION

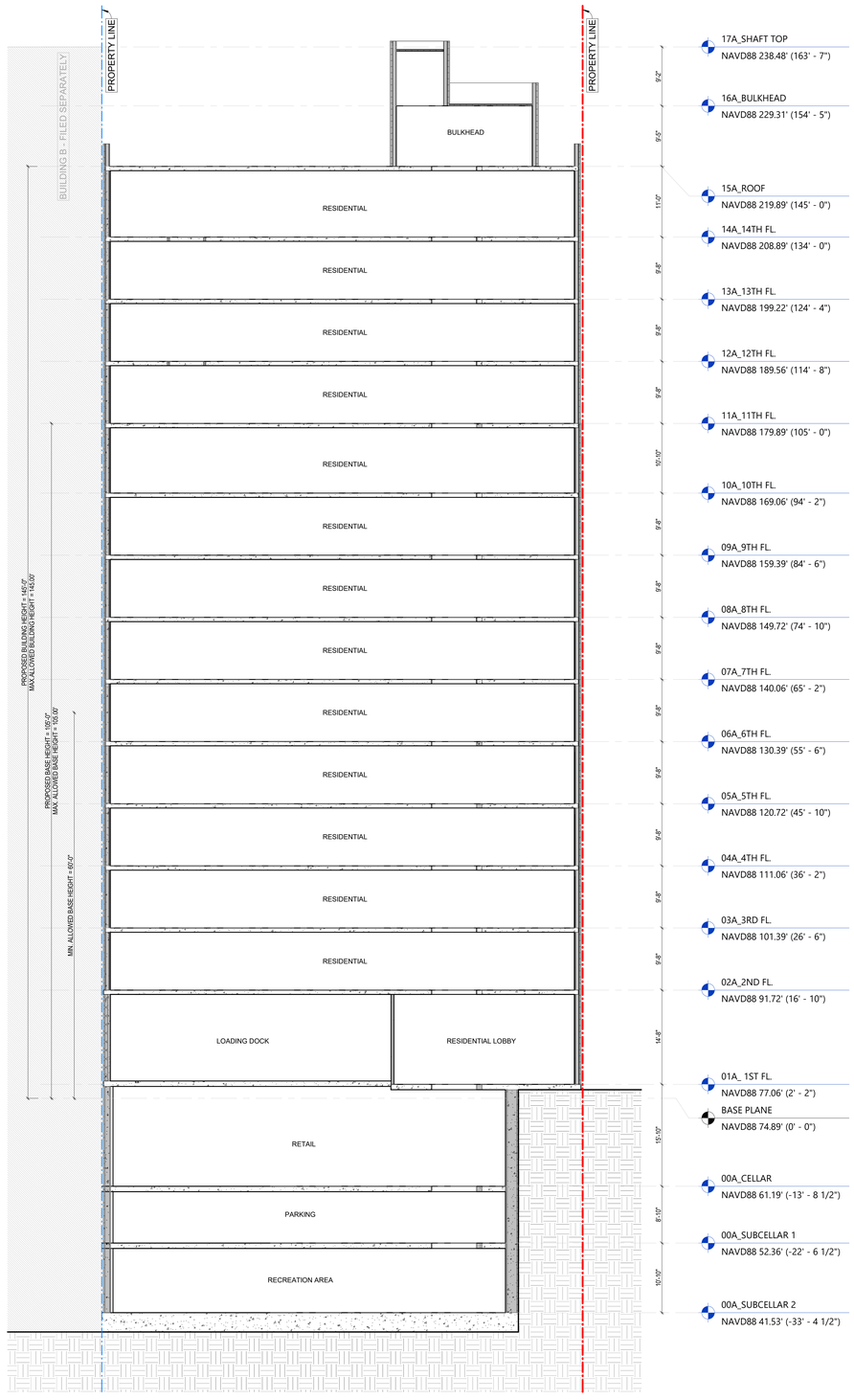
A-202A.00

Scale:	As indicated
Date:	12/1/2025 7:17:53 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

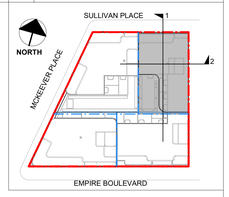
1 LONGITUDINAL SECTION
1/8" = 1'-0"



2 CROSS SECTION
1/8" = 1'-0"



KEY PLAN
N.T.S.



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55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

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DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
BUILDING SECTIONS

A-300A.00

Scale:	As indicated
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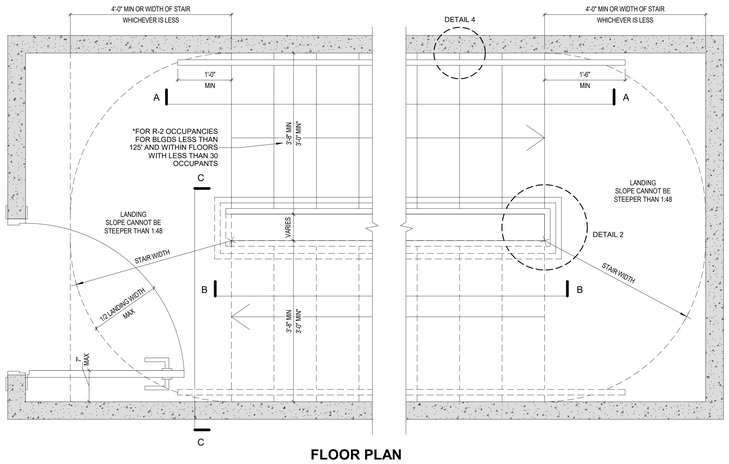
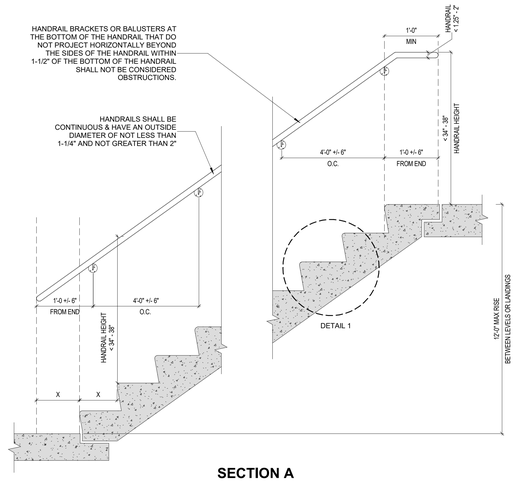
Checked by:	
DOB JOB NUMBER:	

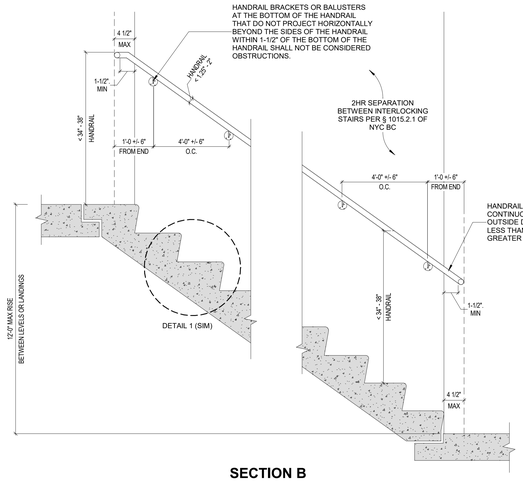
1 U-SHAPE STAIRS DETAILS



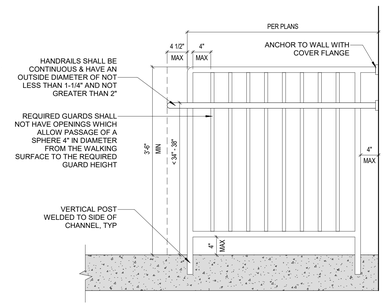
FLOOR PLAN



SECTION A



SECTION B



SECTION C
(ONLY ON 1ST FLOOR)

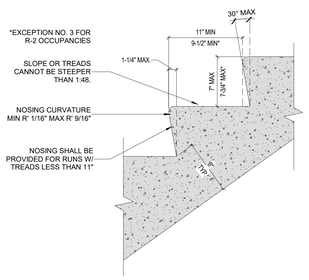
2 TWO INTERLOCKING / SCISSORS STAIRS DETAILS

FLOOR PLAN

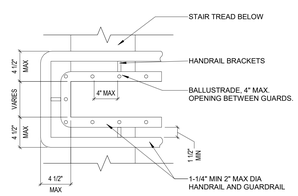
SECTION A

SECTION B

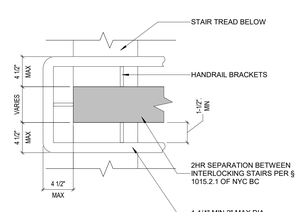
STAIRS DETAILS



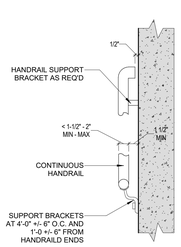
DETAIL 1



DETAIL 2



DETAIL 3

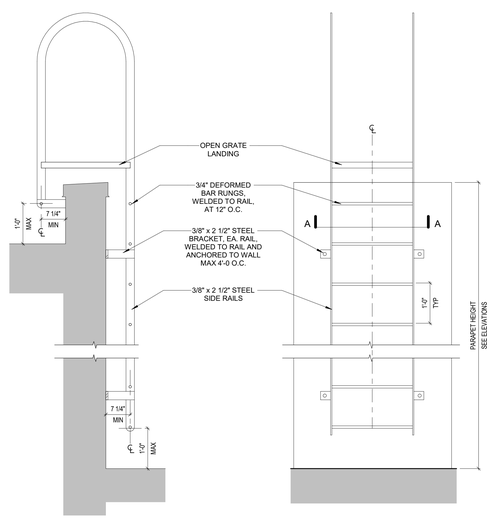


DETAIL 4

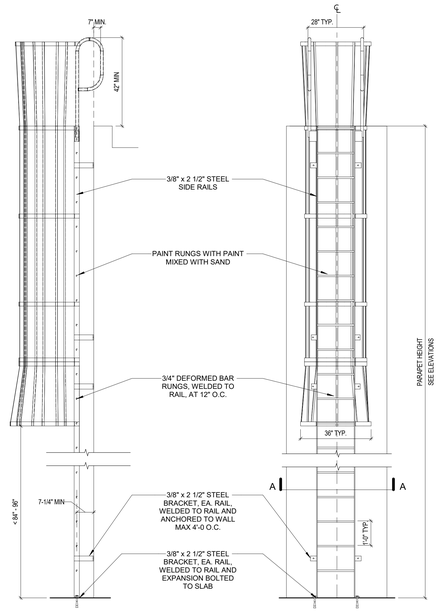
3 ROOF LADDERS

ROOF LADDERS NOTES

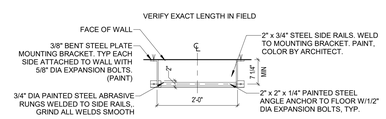
1. PER OSHA 1910.28(B)(9) LADDERS OVER 24 FT HIGH SHALL HAVE A PERSONAL FALL ARREST SYSTEM MEETING OSHA 1926.502(D)
2. ALL LADDERS SHALL MEET OSHA REGULATIONS FOR FIXED LADDERS 29 CFR SECTION 1910.23



ROOF LADDER - STRADDLE



ROOF LADDER - W/ CAGE



SECTION A

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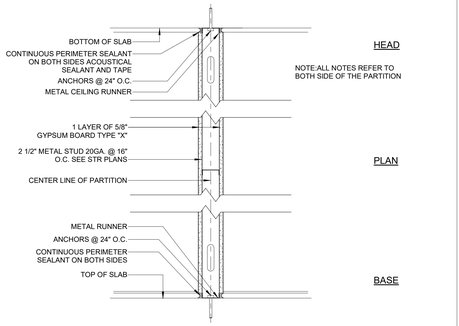
DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
STAIRS DETAILS

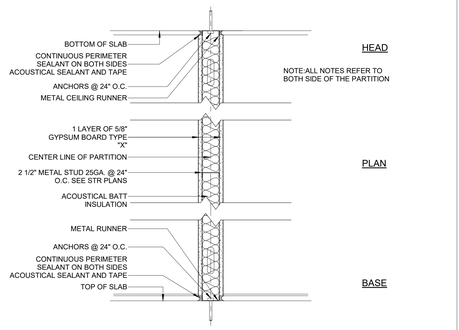
A-404A.00

Scale: As indicated
Date: 12/1/2025 7:17:58 PM
Drawn by:
Checked by:
DOB JOB NUMBER:



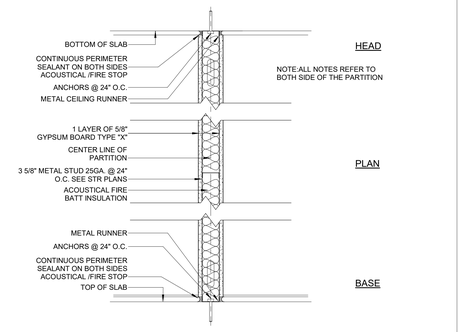
1 INTERIOR PARTITION

FIRE RATING: NON FIRE RATED
STC: NO STC REQUIRED



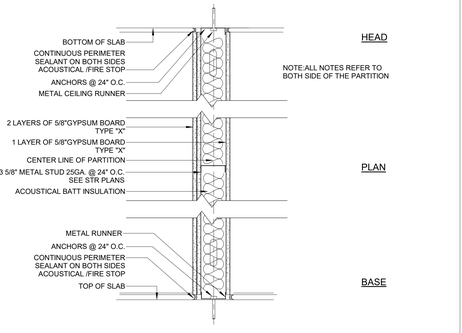
2 INTERIOR PARTITION

FIRE RATING: NON FIRE RATED
STC: +48 STC



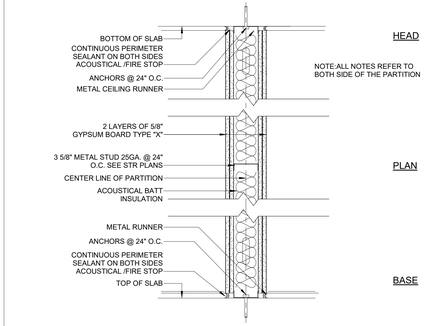
3 INTERIOR PARTITION

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U417 & U465
STC: +48 STC



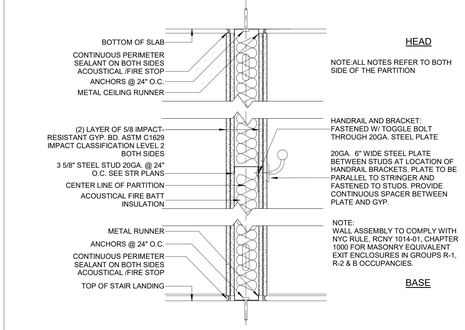
4 INTERIOR PARTITION

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U419
STC: +50 STC



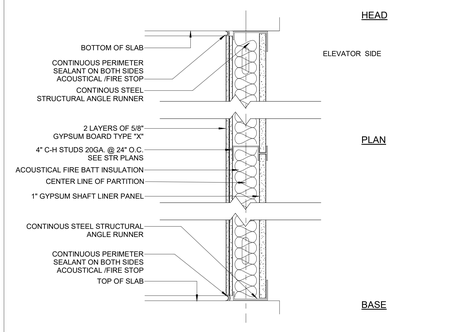
5 INTERIOR PARTITION

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC



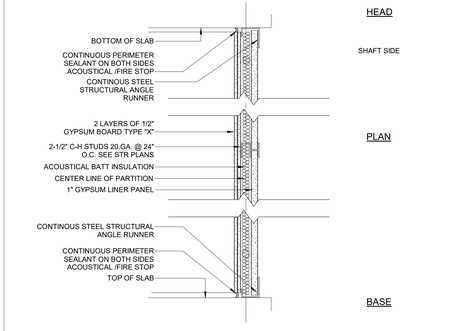
6 EXIT ENCLOUSURE RCNY 1014-01

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC



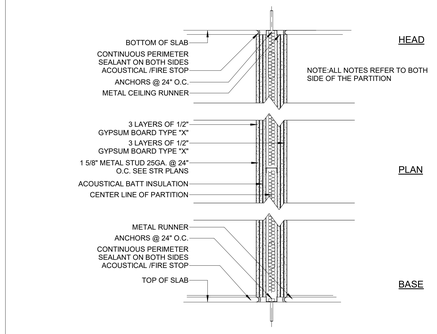
7 ELEVATOR SHAFT

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U415
STC: +50 STC



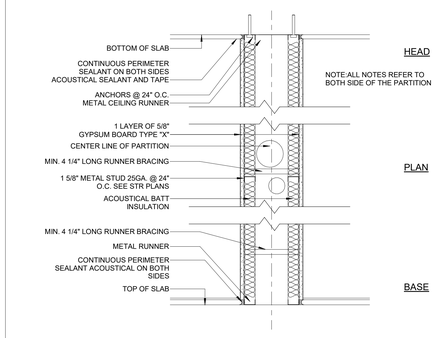
8 MECHANICAL DUCT SHAFT WALL

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U415
STC: +50 STC



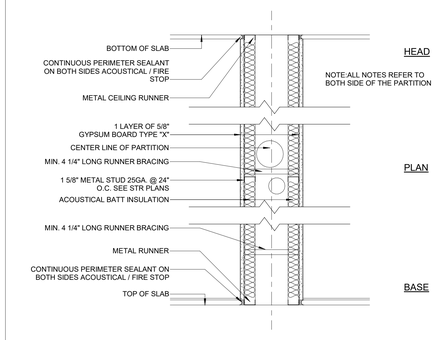
9 INTERIOR PARTITION

FIRE RATING: 3HR
FIRE TEST: UL. DESIGN NO: U455
STC: +50 STC



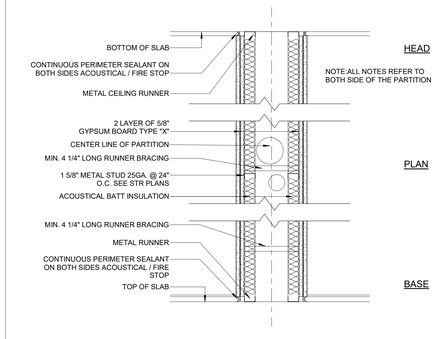
10 PLUMBING CHASE

FIRE RATING:NON FIRE RATED
STC: +48 STC



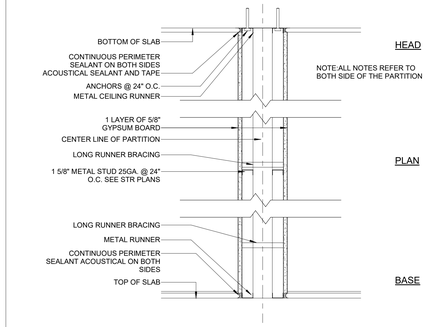
11 PIPE CHASE

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U420
STC: +50 STC



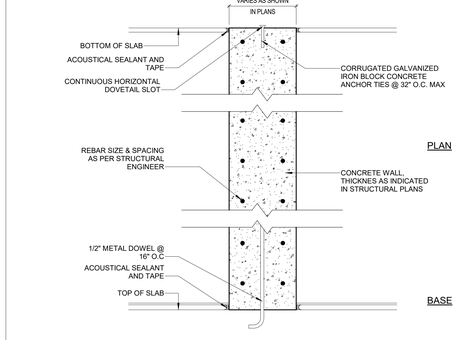
12 PIPE CHASE

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U420
STC: +50 STC



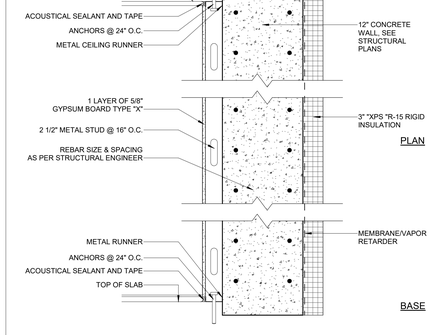
13 POCKET WALL

FIRE RATING: NON FIRE RATED
STC: NO STC REQUIRED



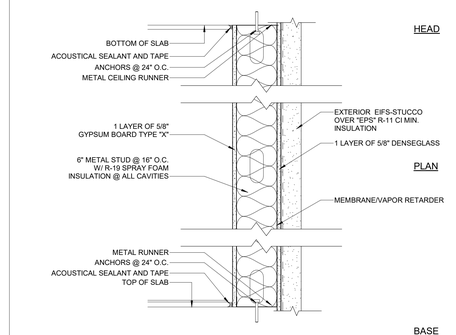
M1 CONCRETE MASONRY WALL

FIRE RATING: NON FIRE RATED
STC: NO STC REQUIRED



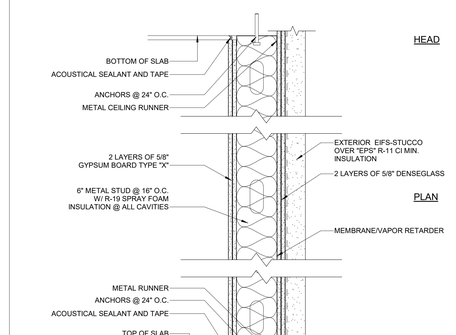
S1 INTERIOR SHEAR WALL

FIRE RATING: 2HR
STC: NO STC REQUIRED



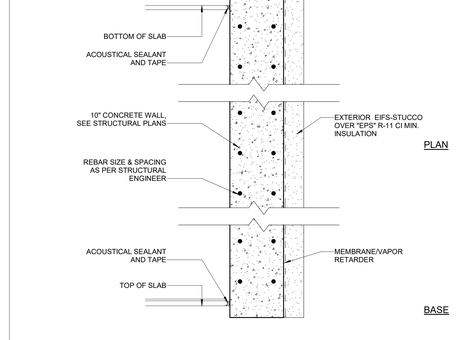
E2 EXTERIOR STUCCO WALL

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U419
STC: +50 STC



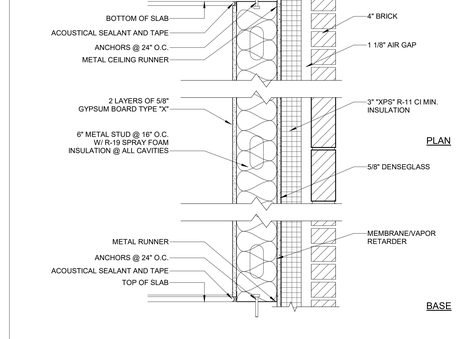
E3 EXTERIOR STUCCO WALL

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC



E1 EXTERIOR BASEMENT WALL

FIRE RATING: 2HR
STC: NO STC REQUIRED



E4 EXTERIOR BRICK WALL

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC

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South Amboy, NJ 08879

Structure Engineer:
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Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

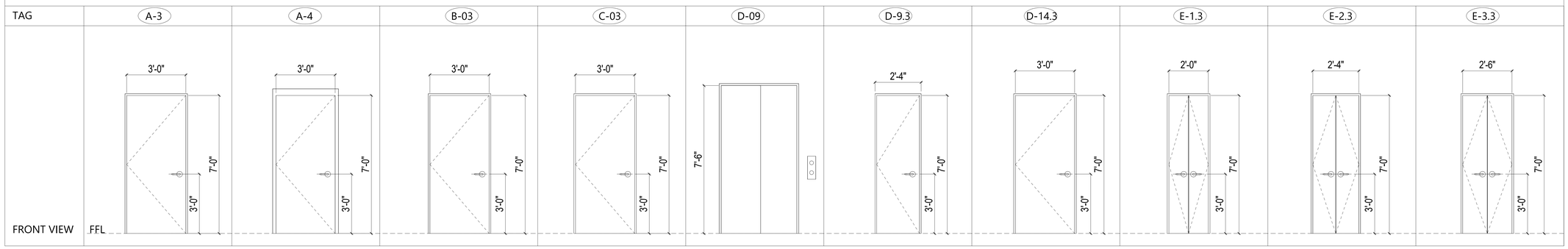
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
WALL TYPES & DETAILS

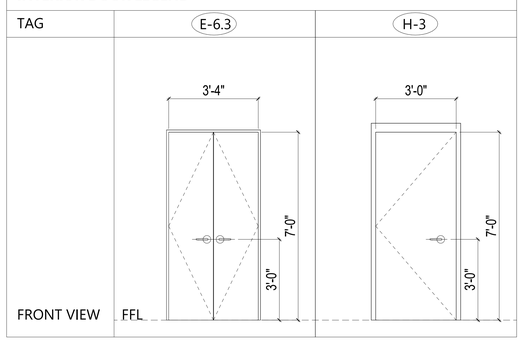
A-500A.00

Scale:	1 1/2" = 1'-0"
Date:	12/1/2025 7:18:00 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

INTERIOR DOOR LEGEND



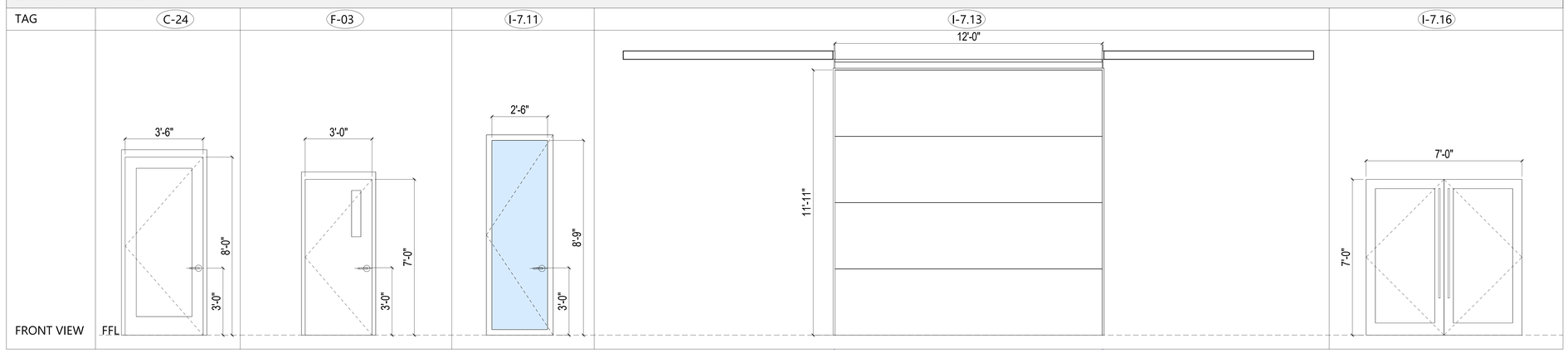
INTERIOR DOOR LEGEND



INTERIOR DOOR SCHEDULE - BUILDING A							
TAG	QTY	Operation	TYPE	COMMENTS	Fire Rating	WIDTH	HEIGHT
A-3	63	SINGLE SWING	HINGED DOOR	METAL APARTMENT DOOR 1-1/2 HR HSPF	1.5 HR FPSC	3' - 0"	7' - 0"
A-4	27	SINGLE SWING	HINGED DOOR	METAL APARTMENT DOOR 1-1/2 HR HSPF	1.5 HR FPSC	3' - 0"	7' - 0"
B-3	96	SINGLE SWING	HINGED DOOR	NON-RATED INTERIOR DOOR		3' - 0"	7' - 0"
C-3	114	SINGLE SWING	HINGED DOOR	NON-RATED INTERIOR DOOR		3' - 0"	7' - 0"
D-09	26	SLIDING	ELEVATOR DOOR	SLIDING ELEVATOR DOOR		<varies>	7' - 6"
D-9.3	16	SINGLE SWING	HINGED DOOR	NON-RATED INTERIOR DOOR		2' - 2"	7' - 0"
D-14.3	4	SINGLE SWING	HINGED DOOR	NON-RATED INTERIOR DOOR		3' - 0"	7' - 0"
E-1.3	114	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		2' - 0"	7' - 0"
E-2.3	24	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		2' - 4"	7' - 0"
E-3.3	8	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		2' - 6"	7' - 0"
E-6.3	68	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		3' - 4"	7' - 0"
H-3	3	SINGLE SWING	HINGED DOOR	METAL APARTMENT DOOR 1-1/2 HR HSPF	1.5 HR FPSC	3' - 0"	7' - 0"

EXTERIOR DOOR SCHEDULE - BUILDING A													
TAG	COUNT	Manufacturer	Model	Construction Type	Operation	TYPE	COMMENTS	WIDTH	HEIGHT	U-FACTOR	SHGC	AIR LEAKAGE	VT	Area
C-24	3	PELLA	SUPER 82	METAL	SWINGING	FULL GLASS ENTRY DOOR	GLAZED DOUBLE DOOR ENTRY	3' - 6"	8' - 0"	.25	.27	<0.02 CFM SF	0.56	84.00 SF
F-3	4	PELLA	SUPER 82	METAL	SINGLE SWING	HINGED DOOR	METAL APARTMENT DOOR 1-1/2 HR HSPF	3' - 0"	7' - 0"	N/A	N/A	<0.02 CFM SF	0.56	0.00 SF
I-7.11	76	PELLA	SUPER 82	METAL	SINGLE SWING	SINGLE GLASS	GLAZED BALCONY DOOR	3' - 0"	9' - 0"	.25	.27	<0.02 CFM SF	0.56	2052.00 SF
I-7.13	2	OVERHEAD DOOR	FIREKING 631	METAL	ROLLING	GARAGE	STEEL CORE_Insulation-CHD-Polystyrene	12' - 0"	11' - 11"	N/A	N/A	<0.02 CFM SF	0.56	286.00 SF
I-7.16	2	PELLA	SUPER 82	METAL	SWINGING	DOUBLE GLASS DOOR	GLAZED DOUBLE DOOR ENTRY	6' - 6"	7' - 11 1/2"	.25	.27	<0.02 CFM SF	0.56	103.38 SF
														2525.38 SF

EXTERIOR DOOR LEGEND



COLUMBIA GREEN TECHNOLOGIES

TECHNICAL INFORMATION SHEET

Pre-Grown Tray System

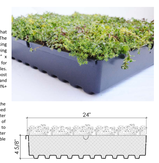
(Patended: 7,603,808)

Product Number: PLK800

Description:

The pre-grown tray provides a turnkey solution that meets or exceeds the guidelines for Green Roofs. The trays are easy to install and feature interlocking edges which prevent shifting or migration of growing media onto the roof membrane. At 24" x 24" x 4.625" deep, the pre-grown tray is appropriate for extensive and semi-intensive vegetative roof profiles. The modules are pre-grown with plants (most commonly sedum) selected by the project designer and grown off site with approximately 30%+ vegetative coverage.

Comprised of a heavy duty recycled polypropylene, the Columbia Green Technologies' Tray system is designed to offer the highest possible levels of stormwater retention. It can reduce both the amount and rate of stormwater run-off and is capable of retaining up to 70% of annual precipitation. Detailed stormwater retention calculations and hydrographs are available upon request.



Planting Options:

- Plants are grown per the project specifications, provided they are appropriate for the local climate zone and sufficient lead time has been provided. Please contact Columbia Green Technologies for more information.

LEED Information:

- Post-Consumer Recycled Content: 88%
- Manufacturing Location: Washougal, WA 98671

Declare Label for Materials Transparency:

The Declare Label is a voluntary disclosure of building material ingredients which offers Living Building Challenge and other project teams concerned about building product ingredients a guide for product specification. We are pleased to announce that our tray system is 'Red List Free' which means it doesn't contain "worst in class" materials, chemicals, and elements known to pose serious risks to human health and the greater ecosystem. www.declarepproducts.com

Wind Uplift:

- *ANSI/SPRI RP-14 Wind Design Standard for Vegetative Roof Systems* is the only Wind Uplift standard for the United States.
- Due to the interlocking design, The Planted-In-Place Tray is considered a #2 Ballast system (increased wind uplift resistance).
- Please request a copy of the ANSI/SPRI RP-14 User Guide.

COLUMBIA GREEN TECHNOLOGIES

TECHNICAL INFORMATION SHEET

System Weight:

Includes 2 lbs/S.F. (cuttings) for plant material weight

System Depth	Dry Weight	Saturated Weight
4.625" Media Depth	15 - 20 lbs./SF	25 - 30 lbs./SF

System weights vary by region due to variances in growing media weight content-your local representative for more information.

Packaging/Component Size:

Trinity Tray:	
Thickness:	100 MIL
Dimensions:	24" W. x 24"L. X 4.625"
Coverage:	4 SY
Weight:	3.6 lbs.
Packaging:	Stacked – 400 trays/pallet
Pre-Vegetated Tray:	
Typical Weight for Handling Purposes Only:	+/- 100 lbs. each

Installation:

1. Prior to installation, it is the Project Representative's responsibility to consult with a registered structural engineer to determine whether the structure is adequately reinforced to withstand the weight of a fully saturated vegetative tray.
2. Perform tray installation only after a representative from the roofing membrane manufacturer has inspected the membrane and found it to be in accordance with the membrane manufacturer's Specifications.
3. Place the vegetative trays directly on the roofing membrane or protective layer as determined by the membrane manufacturer.
4. Butt the interlocking sides, overlap the vegetative trays.
5. After all trays have been installed, irrigate plant material to ensure growth.

Storage:

- Upon delivery, move plants out of direct sun to a cool location and remove cellophane wrapping.
- Trays may be left unloaded for a maximum of 12 hours, provided they are kept in the shade.
- Water 2-3 times per week until the trays are installed on the roof.
- Store away from sources of ignition and extremely high temperatures.

Precautions:

- Confirm with a certified Structural Engineer that the structure can support the saturated weight of the vegetative roof system.
- To facilitate drainage a minimum roof slope of 1/8" in 12" min. must be provided.
- System components should not be installed when the weather is below 45 ºF (7.2 ºC) or above 95 ºF (35 ºC).
- Do not drag modules into position.
- Use caution when lifting trays.
- Check roof drains regularly to ensure there are no obstructions to impede water flow.
- Wash exposed skin prior to eating, drinking or smoking and at the end of each shift.
- Wear impermeable protective clothing, eye wear and self-contained breathing apparatus when cutting trays.

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Structure Engineer:
STRUCTURAL ENGINEERING TECHONOLOGIES P.C
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Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
DOOR LEGEND & SCHEDULE

A-700A.00

Scale: 1/2" = 1'-0"
Date: 12/1/2025 7:18:04 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

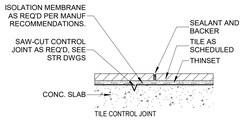
FINISH NOTES:

1. METAL EDGE SHALL BE PROVIDED ON ON SERVICE SIDE OF ALL DOORS.

2. ISOLATION MEMBRANE:
   - FOLLOW MANUF INSTRUCTIONS
   - MIN 6" COVERAGE FROM CRACK IN ANY DIRECTION
   - MIN 1-1/2x TILE SIZE
   - WHERE ANY PORTION OF A TILE SPANS A CRACK, TILE MUST REST COMPLETELY ON ISOLATION MEMBRANE

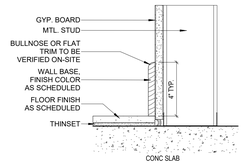
3. SEALANTS ON JOINTS MUST MATCH GROUT COLOR

TILE CONTROL JOINT

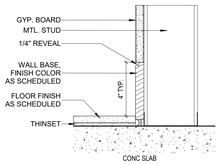


*THIS DETAIL IS NOT TO BE USED WITH BUILDING EXPANSION JOINTS. EXPANSION JOINTS MUST CARRY THRU THE TILE LAYER.

TYP. WALL BASE DETAIL

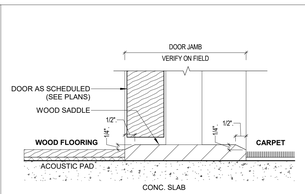


TYP. RECESSED WALL BASE DETAIL

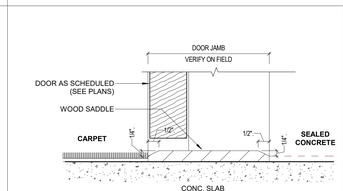


TRANSITION @ DOOR THRESHOLD

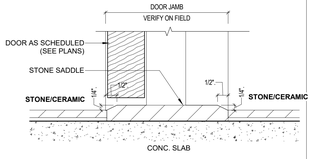
WOOD TO CARPET



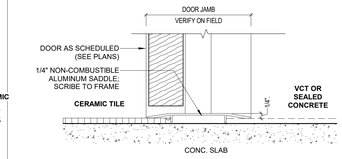
CARPET / SEALED CONCRETE



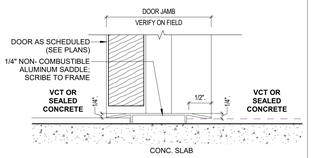
WOOD TO STONE/CERAMIC TILE



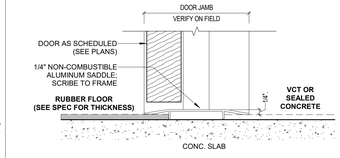
CERAMIC TILE / CARPET



TILE TO TILE



CERAMIC TILE / SEALED CONCRETE

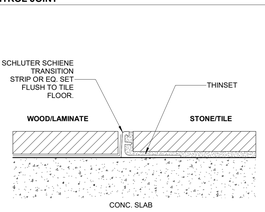


VCT TO VCT/SEALED CONCRETE

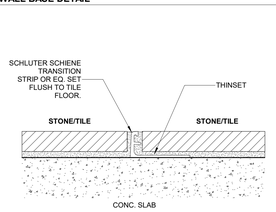
RUBBER / SEALED CONCRETE

TYPICAL TRANSITION

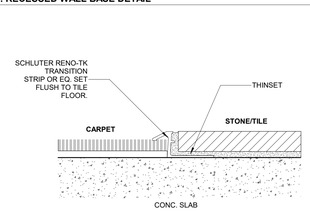
WOOD/LAMINATE TO TILE



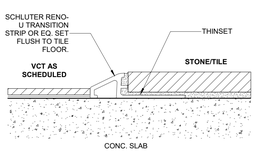
TILE TO TILE



TILE TO CARPET



TILE TO VCT



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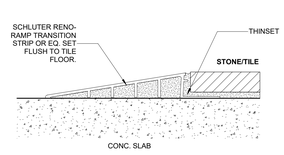

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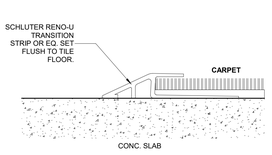
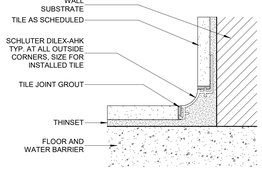


BATHROOM TILE TRIM

COVE/BASE



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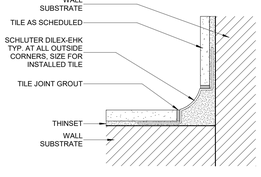

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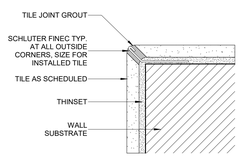
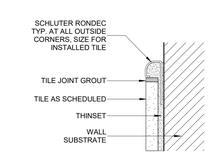


EDGE TRIM



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00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

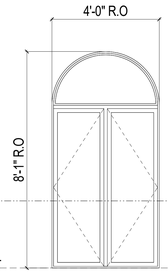
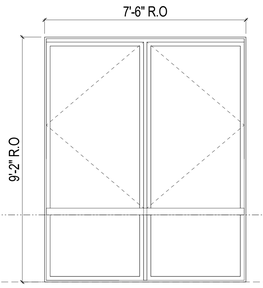
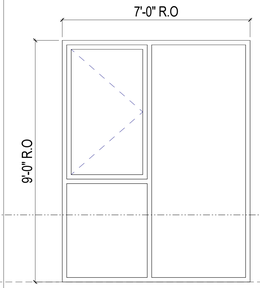
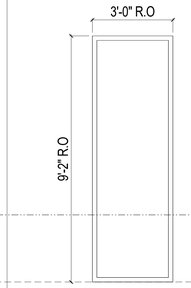
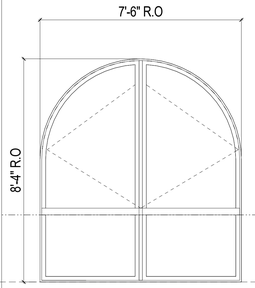
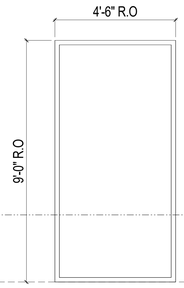
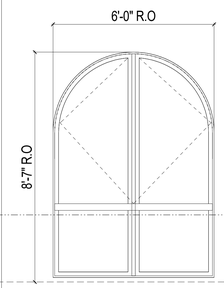
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
FLOOR AND TRANSITION DETAILS

A-701A.00

Scale:	As indicated
Date:	12/1/2025 7:18:06 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

WINDOW LEGEND

TAG	W53	W63	W69	W70	W88	W93	W94
FRONT VIEW							
GLAZING LESS THAN 30'' ABOVE FLOOR LEVEL DOES NOT CONTRIBUTE TO NATURAL LIGHT	4'-0" R.O 8'-1" R.O 2'-6" FFL	7'-6" R.O 9'-2" R.O	7'-0" R.O 9'-0" R.O	3'-0" R.O 9'-2" R.O	7'-6" R.O 8'-4" R.O	4'-6" R.O 9'-0" R.O	6'-0" R.O 8'-7" R.O

WINDOW LEGEND

TAG	W95
FRONT VIEW	
GLAZING LESS THAN 30'' ABOVE FLOOR LEVEL DOES NOT CONTRIBUTE TO NATURAL LIGHT	6'-0" R.O 9'-2" R.O 2'-6" FFL

WINDOW SCHEDULE - BUILDING A

TAG	COUNT	MANUFACTURER	MODEL	Construction Type	OPERATION	COMMENTS	GLAZING	WIDTH	HEIGHT	U-FACTOR	SHGC	AIR LEAKAGE	VT	TOTAL SF
W53	12	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	4' - 0"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	432.00 SF
W63	17	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	7' - 6"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	1147.50 SF
W69	31	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	7' - 0"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	1953.00 SF
W70	16	ZEPHYR	SUPER 82	VINYL	FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	3' - 0"	9' - 2"	.26	.33	<0.02 CFM SF	0.56	440.00 SF
W88	17	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	7' - 6"	4' - 6"	.26	.33	<0.02 CFM SF	0.56	573.75 SF
W93	75	ZEPHYR	SUPER 82	VINYL	FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	4' - 6"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	3037.50 SF
W94	3	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	6' - 0"	5' - 4"	.26	.33	<0.02 CFM SF	0.56	96.00 SF
W95	3	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	6' - 0"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	162.00 SF
														7841.75 SF

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73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
WINDOW LEGEND & SCHEDULE

A-710A.00

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Checked by:	
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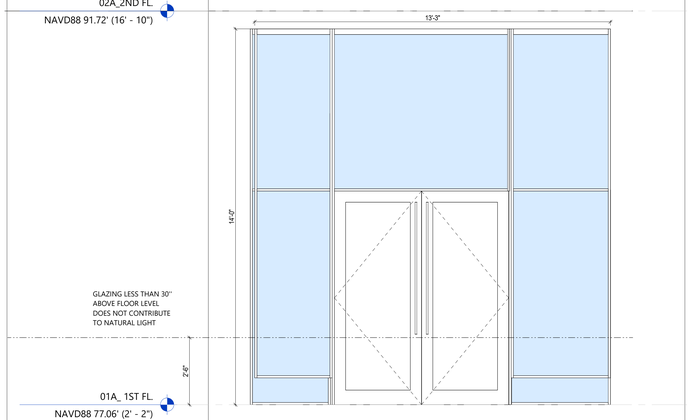
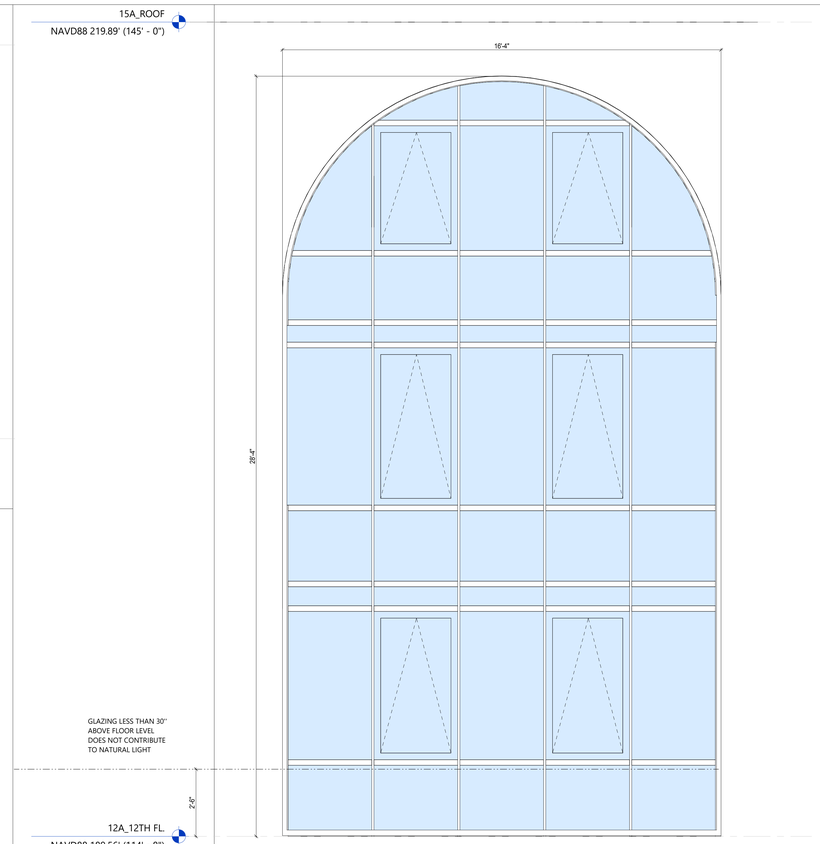


CURTAIN WALL SCHEDULE - BUILDING A				
Mark	Count	Length	Unconnected Height	Area
CW-1A	3	<varies>	<varies>	178.92 SF
CW-2A	1	16' - 4"	19' - 11 1/2"	434.10 SF
				613.01 SF



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LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
CURTAIN WALL
LEGEND & SCHEDULE

A-711A.00

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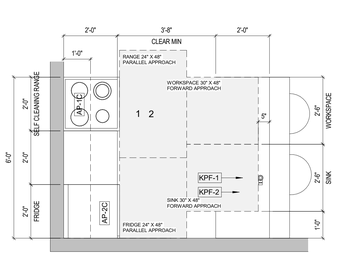
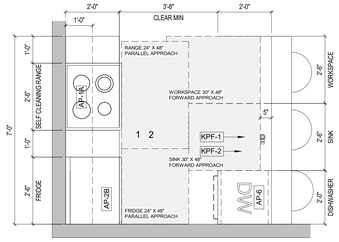


PLAN 6'-0"



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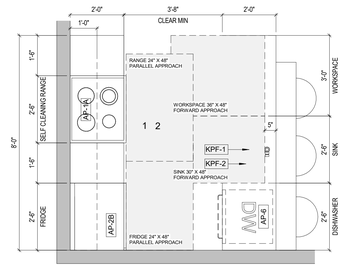
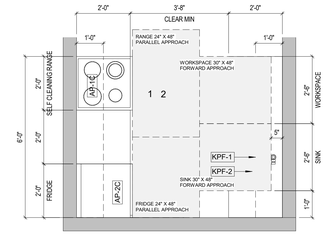


PLAN 8'-0"

U-SHAPE CLOSE



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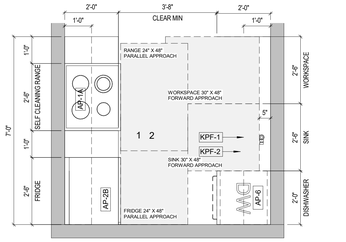

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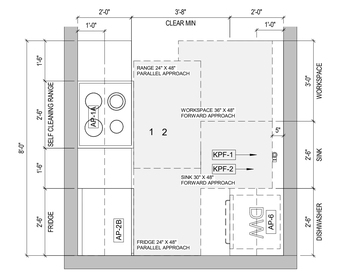
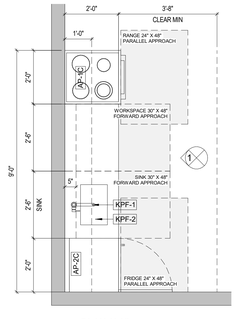


PLAN 8'-0"

STRAIGHT KITCHEN



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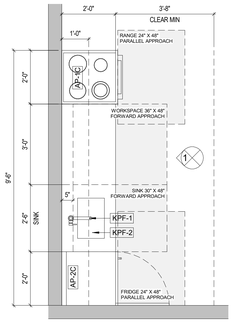
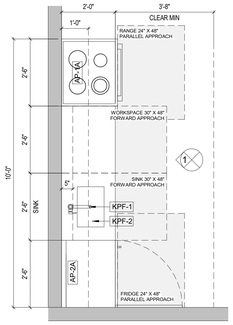


PLAN 9'-6"



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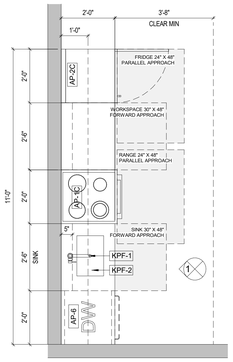
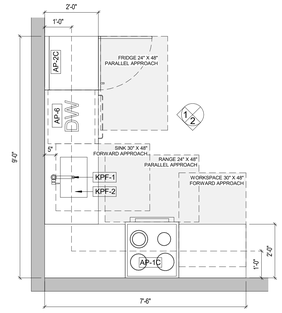
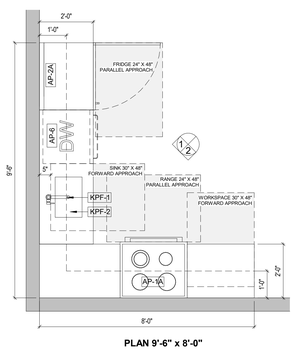


PLAN 11'-0"

L-SHAPE KITCHEN



PLAN 9'-0" x 7'-6"



PLAN 9'-6" x 8'-0"

FIXTURE & APPLIANCE SCHEDULE

PLUMBING FIXTURES & ACCESSORIES

TAG	TYPE	MANUFACTURER	MODEL	FINISH
KPF-1	KITCHEN FAUCET	BLANCO	LINUS 526375	BLK
KPF-2	KITCHEN SINK	BLANCO	PRECIS ADA SILGRANIT	BLK
PF-2	BATHROOM SINK	KOHLER	VERTICYL L K-8189-0	WHT
PF-3	ADA TOILET	TOTO	ECO ULTRAMAX MS854114EL / MS854114ELR#01	WHT
PF-4	STANDARD TUB	FINE FIXTURES	BTA104	WHT
PF-4R	ADA TUB	AMERICAN STANDARD	2973.102 / 2973.202	WHT
PF-5	SHOWER HANDLE / DIVERTER	HANSGROHE	FINORIS	BLK
PF-5R	ADA SHOWER HANDLE / DIVERTER	SYMMONS	DIA - S3508BTRM-T736-MB	BLK
PF-6	BATHROOM FAUCET	HANSGROHE	FINORIS	BLK
BF-1	TOILET PAPER HOLDER	GATCO	RECESSED T.H.	BLK
BF-1R	RECESSED TOILET PAPER HOLDER / SHELF	HANSGROHE	ADDSTORIS 41772670	BLK
BF-2	VANITY MIRROR			
BF-3	REMOVABLE IN-TUB SEAT	ASI	8358	
	ADA GRAB BARS	KOHLER	K-10540	BLK

APPLIANCES

AP-1A	30" STOVE TOP	BLOMBERG	DWS51502SS	SS
AP-1B	30" BUILT-IN OVEN	BLOMBERG	DW51600SS	SS
AP-1C	24" STOVE TOP			
AP-2A	30" FRIDGE / FREEZER	BLOMBERG	BRFB1812SSLN	SS
AP-2B	30" FRIDGE / FREEZER ADA	FRIGIDAIRE	FFHT1835VS	SS
AP-2C	24" FRIDGE / FREEZER			
AP-4	STACKABLE WASHER / DRYER UNIT	BLOMBERG	WM72200W + DV17600W	WHT
AP-5	ADA COMBINATION WASHER / DRYER UNIT	BLOMBERG	WMD24400W	WHT
AP-6	DISHWASHER			

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Brooklyn, NY 11225

SHEET TITLE
ENLARGED KITCHEN PLANS & ELEVATIONS

A-910A.00

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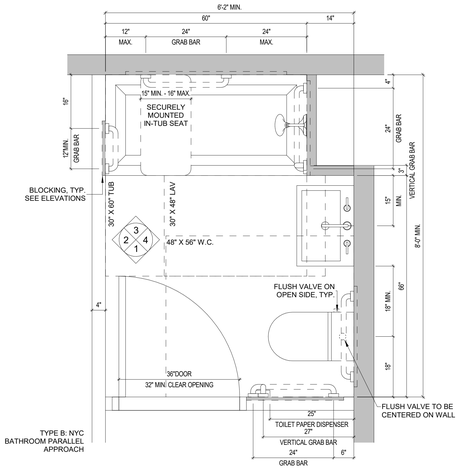
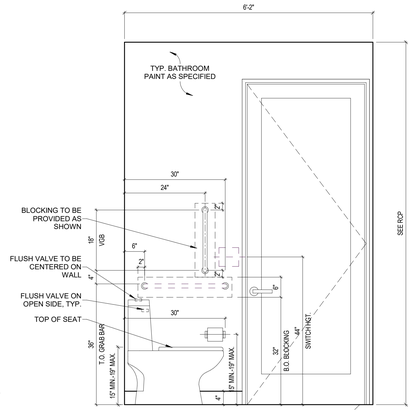
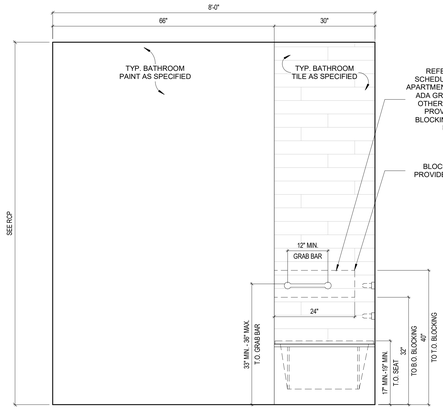


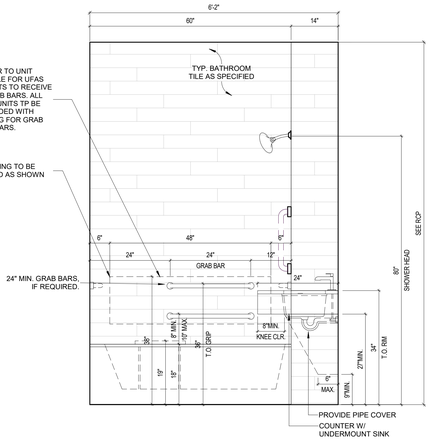
PLANS



ELEVATION 1



ELEVATION 2



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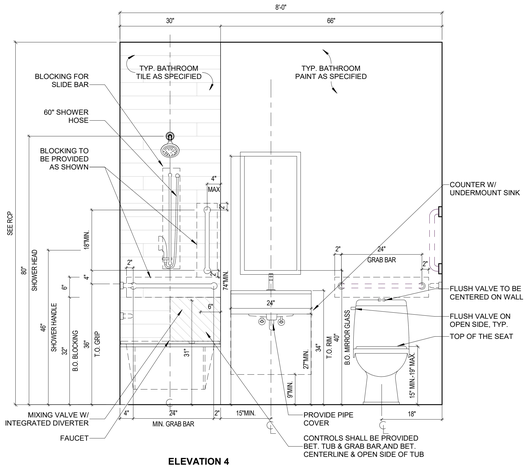

ELEVATION 4

1 BATHROOM TYPE 1A - PLAN

SCALE: 3/4" = 1'-0"

PLANS

ELEVATION 1

ELEVATION 2

ELEVATION 3

ELEVATION 4

2 BATHROOM TYPE 1B - PLAN

SCALE: 3/4" = 1'-0"

PLANS

ELEVATION 1

ELEVATION 2

ELEVATION 3

ELEVATION 4

3 BATHROOM TYPE 2 - PLAN

SCALE: 3/4" = 1'-0"

KAO-HWA LEE
ARCHITECTS P.C.

227 CATHERINE STREET
SOUTH AMBOY, NJ 08879
(609) 216 2975

CLIENT:
THE RABSKY GROUP
505 Flushing Ave
Brooklyn, NY 11205

Architect:
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227 Catherine Street
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Structure Engineer:
STRUCTURAL ENGINEERING TECHONOLOGIES P.C
40-12 28th Street
Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ENLARGED BATHROOM PLANS & ELEVATIONS

A-911A.00

Scale:	3/4" = 1'-0"
Date:	12/1/2025 7:18:16 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

54 SULLIVAN PLACE

BROOKLYN, NEW YORK 11225

PROPOSED 14 STORY MIX-USE DEVELOPMENT (RESIDENTIAL & COMMERCIAL)

BLDG B - DRAWING INDEX DOB			
DRAWING NO.	SHEET NO.	REVISION NO.	SHEET TITLE
1	T-001B	.00	TITLE SHEET
2	Z-001B	.00	ZONING ANALYSIS
3	Z-002B	.00	ZONING ANALYSIS
4	Z-003B	.00	ZONING MAPS
5	Z-004B	.00	ZONING DIAGRAMS
6	Z-005B	.00	ZONING DIAGRAMS
7	Z-010B	.00	GROSS FLOOR AREA DIAGRAMS
8	Z-011B	.00	GROSS FLOOR AREA DIAGRAMS
9	Z-020B	.00	FLOOR AREA DEDUCTIONS
10	Z-021B	.00	FLOOR AREA DEDUCTIONS
12	G-001B	.00	PROJECT SUMMARY & BUILDING CODE COMPLIANCE
13	G-004B	.00	MEANS OF EGRESS NOTES
13	G-002B	.00	GENERAL NOTES
14	G-005B	.00	ACCESSIBILITY NOTES
15	V-001B	.00	ARCHITECTURAL SURVEY
16	A-001B	.00	SUBCELLAR 2 LIFE SAFETY PLANS
17	A-002B	.00	SUBCELLAR 1 LIFE SAFETY PLANS
18	A-003B	.00	CELLAR LIFE SAFETY PLANS
19	A-004B	.00	1ST FLOOR LIFE SAFETY PLANS
20	A-005B	.00	2ND - 10TH FLOOR LIFE SAFETY PLANS
21	A-006B	.00	11TH - 14TH FLOOR LIFE SAFETY PLANS
22	A-007B	.00	ROOF LIFE SAFETY PLANS
23	A-008B	.00	SITE PLAN

BLDG B - DRAWING INDEX DOB			
DRAWING NO.	SHEET NO.	REVISION NO.	SHEET TITLE
24	A-100B	.00	PROPOSED SUB-CELLAR 02 PLAN
25	A-101B	.00	PROPOSED SUB-CELLAR 01 PLAN
26	A-102B	.00	PROPOSED CELLAR PLAN
27	A-103B	.00	PROPOSED 1ST FLOOR PLAN
28	A-104B	.00	PROPOSED 2ND FLOOR PLAN
29	A-105B	.00	PROPOSED 3RD - 10TH FLOOR PLAN
30	A-106B	.00	PROPOSED 11TH FLOOR PLAN
31	A-107B	.00	PROPOSED 12TH - 14TH FLOOR PLAN
32	A-108B	.00	PROPOSED ROOF PLAN
33	A-200B	.00	EAST & WEST ELEVATION
34	A-201B	.00	NORTH & SOUTH ELEVATION
35	A-300B	.00	BUILDING SECTIONS
36	A-404B	.00	STAIRS DETAILS
37	A-500B	.00	WALL TYPES & DETAILS
38	A-510B	.00	SECTION DETAILS
39	A-701B	.00	FLOOR AND TRANSITION DETAILS
40	A-700B	.00	DOOR LEGEND & SCHEDULE
41	A-710B	.00	WINDOW LEGEND & SCHEDULE
42	A-711B	.00	CURTAIN WALL LEGEND & SCHEDULE
43	A-910B	.00	ENLARGED KITCHEN PLANS & ELEVATIONS
44	A-911B	.00	ENLARGED BATHROOM PLANS & ELEVATIONS

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DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
TITLE SHEET

T-001B.00

Scale:
Date: 12/1/2025 7:19:43 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

ZONING ANALYSIS

ZONING ANALYSIS			
ADDRESS:	67 SOUTH 6TH ST, BROOKLYN, NY 11249		
BLOCK:	2455		
TAX LOT:	27		
ZONING DISTRICT:	C4-4D / R-8A EQUIVALENT		
ZONING MAP:	16d		
COMMUNITY DISTRICT :	BROOKLYN COMMUNITY DISTRICT 9		
INCLUSIONARY HOUSING	MANDATORY AS PER ZR APPENDIX F		
LOT AREA:	38,119.0 SF		
TRANSIT APPROVALS REQUIREMENT	NO TRANSIT APPROVAL IS REQUIRED. THE SITE IS NOT LOCATED WITHIN 200' OF A TRANSIT AUTHORITY		
APPLICABLE ZR SECTION	ITEM	PERMITTED/REQUIRED	PROPOSED
ZR 12-10	DEFINITIONS		
ZR 12-10 FLOOR AREA (c)(1))	FLOOR AREA	FLOOR SPACE WITHIN A FULLY ELECTRIFIED BUILDING OR AN ULTRA LOW ENERGY BUILDING, OF AN AMOUNT EQUIVALENT TO FIVE PERCENT OF THE FLOOR AREA LOCATED WITHIN SUCH BUILDING, AND EXCLUSIVE OF ANY FLOOR SPACE OTHERWISE EXCLUDED FROM FLOOR AREA;	PROPOSED BUILDING IS COMPYING WITH THIS PROVISION. 5% OF FLOOR AREA DEDUCTED, SEE ZONING TABLE ON Z-001
ZR 32-00	APPLICABILITY AND DEFINITIONS		
ZR 32-10	USE ALLOWANCES	IN C4 DISTRICTS, USE GROUP II, IIIB, & VI IS PERMITTED	PROPOSED USES: II(RESIDENTIAL), VI (RETAIL)
ZR 32-30	GROUND FLOOR LEVEL USE AND TRANSPARENCY REQUIREMENTS	GROUND FLOOR LEVEL USES FOR TIER B FRONTAGES ON THE PORTION OF A GROUND FLOOR LEVEL FACING A TIER B STREET FRONTAGE, WITHIN THE MINIMUM QUALIFYING DEPTH, THE UNDERLYING USE REGULATIONS ARE MODIFIED AS FOLLOWS: DWELLING UNITS SHALL NOT BE PERMITTED; USES IN GROUP III SHALL NOT BE PERMITTED; NOT BE PERMITTED; USES LISTED UNDER USE GROUP IV SHALL BE LIMITED TO THOSE LISTED UNDER PUBLIC SERVICE BUILDINGS, AND RENEWABLE ENERGY AND GREEN INFRASTRUCTURE; GUEST ROOMS OR SUITES ASSOCIATED WITH TRANSIENT ACCOMMODATIONS LISTED UNDER USE GROUP V SHALL NOT BE PERMITTED; USES LISTED UNDER USE GROUP VII SHALL BE LIMITED IN SIZE TO 5,000 SQUARE FEET PER ESTABLISHMENT; THE MAXIMUM STREET WALL WIDTH OF ANCILLARY RESIDENTIAL USES OR LOBBIES ACCESSING USES NOT PERMITTED ON THE GROUND FLOOR LEVEL SHALL BE LIMITED TO 50 PERCENT OF THE GROUND FLOOR LEVEL STREET FRONTAGES, OR 50 FEET, WHICHEVER IS GREATER; OFF-STREET PARKING SPACES OR LOADING BERTHS, SHALL NOT BE PERMITTED, EXCEPT THAT: ENTRANCES AND EXITS TO PARKING AND LOADING FACILITIES LOCATED BEYOND THE MINIMUM QUALIFYING DEPTH SHALL BE PERMITTED, SUBJECT TO ANY APPLICABLE CURB CUT REGULATIONS OF THIS SECTION, INCLUSIVE, OR THIS RESOLUTION; FOR BUILDINGS ALONG A TIER B STREET FRONTAGE, AND NO FRONTAGE ALONG ANOTHER STREET WHERE A LOADING BERTH IS PERMITTED, LOADING BERTHS WITH A MAXIMUM STREET WALL WIDTH OF 50 FEET SHALL BE PERMITTED; AND FOR BUILDINGS WITH A STREET WALL WIDTH IN EXCESS OF 100 FEET AND WITH NO FRONTAGE ALONG ANOTHER STREET WHERE PARKING SPACES ARE PERMITTED WITHIN A MINIMUM QUALIFYING DEPTH, PARKING SPACES SHALL BE PERMITTED IN THE STREET WALL PORTION IN EXCESS OF 100 FEET, PROVIDED THAT: THE MAXIMUM STREET WALL WIDTH OF SUCH PARKING SPACES DOES NOT EXCEED 50 FEET; THE FRONTAGE ALLOCATED TO SUCH PARKING SPACES SHALL BE INCLUDED IN THE MAXIMUM PERCENTAGE PERMITTED FOR ANCILLARY RESIDENTIAL USES OR LOBBIES; AND SUCH PARKING SPACES SHALL BE SCREENED IN ACCORDANCE WITH THE PROVISIONS FOR TIER A STREET FRONTAGES SET FORTH IN PARAGRAPH (A) OF SECTION 32-312. PARKING SPACES ACCESSORY TO ACCESS TRANSIT STATIONS, AS DEFINED IN SECTION 66-11, SHALL BE PERMITTED WITHOUT RESTRICTION. TRANSPARENCY REQUIREMENTS ALONG THE TIER B STREET FRONTAGE OF A GROUND FLOOR LEVEL, STREET WALLS SHALL BE GLAZED WITH TRANSPARENT MATERIALS, WHICH MAY INCLUDE SHOW WINDOWS, TRANSOM WINDOWS, OR GLAZED PORTIONS OF DOORS. SUCH TRANSPARENT MATERIALS SHALL OCCUPY AT LEAST 50 PERCENT OF THE SURFACE AREA OF SUCH GROUND FLOOR LEVEL STREET WALL BETWEEN A HEIGHT OF TWO FEET AND 12 FEET, OR THE HEIGHT OF THE GROUND FLOOR CEILING, WHICHEVER IS HIGHER, AS MEASURED FROM THE ADJOINING SIDEWALK. TRANSPARENT MATERIALS PROVIDED TO SATISFY SUCH 50 PERCENT REQUIREMENT SHALL NOT BEGIN HIGHER THAN 2 FEET, 6 INCHES, ABOVE THE LEVEL OF THE ADJOINING SIDEWALK, WITH THE EXCEPTION OF TRANSOM WINDOWS, OR PORTIONS OF WINDOWS SEPARATED BY MULLIONS OR OTHER STRUCTURAL DIVIDERS, AND SHALL HAVE A MINIMUM WIDTH OF TWO FEET. HOWEVER, SUCH TRANSPARENCY REQUIREMENTS SHALL NOT APPLY TO PORTIONS OF THE GROUND FLOOR LEVEL OCCUPIED BY ENTRANCES OR EXITS TO PARKING OR LOADING FACILITIES, TO DOORS ACCESSING EMERGENCY EGRESS STAIRWELLS AND PASSAGEWAYS, OR TO COMMUNITY FACILITY BUILDINGS.	BUILDING COMPLIES WITH THIS SECTION: NO DWELLINGS PROPOSED WITHIN 30'-0" ON THE GROUND FLOOR. MAX LOBBY WIDTH IS BELOW 50% OF STREET FRONTAGE SEE A-101 GROUND LEVEL PROVIDED WITH GLAZING OVER 50% SEE A-101
ZR 35-00	APPLICABILITY AND DEFINITIONS		
ZR 35-01	APPLICABILITY OF THIS CHAPTER	THE BULK REGULATIONS OF THIS CHAPTER APPLY TO ANY MIXED BUILDING LOCATED ON ANY ZONING LOT OR PORTION OF A ZONING LOT IN ANY COMMERCIAL DISTRICT IN WHICH SUCH BUILDING IS PERMITTED. THE BULK REGULATIONS OF THIS CHAPTER SHALL ALSO APPLY IN ANY COMMERCIAL DISTRICT WHERE THERE ARE MULTIPLE BUILDINGS ON A SINGLE ZONING LOT AND SUCH ZONING LOT CONTAINS A RESIDENTIAL USE AND EITHER A COMMERCIAL USE OR A COMMUNITY FACILITY USE. IN ADDITION, THE BULK REGULATIONS OF THIS CHAPTER, OR OF SPECIFIED SECTIONS THEREOF, ALSO APPLY IN OTHER PROVISIONS OF THIS RESOLUTION WHERE THEY ARE INCORPORATED BY CROSS-REFERENCE.	
ZR 35-10	GENERAL PROVISIONS	EXCEPT AS OTHERWISE PROVIDED IN THIS CHAPTER, THE PORTIONS OF A BUILDING USED FOR RESIDENTIAL USE ARE SUBJECT TO THE BULK REGULATIONS SET FORTH IN ARTICLE II, CHAPTER 3, AND THE PORTIONS OF A BUILDING USED FOR COMMERCIAL OR COMMUNITY FACILITY USE ARE SUBJECT TO THE BULK REGULATIONS SET FORTH IN ARTICLE III, CHAPTER 3. SPECIAL PROVISIONS APPLYING TO MIXED BUILDINGS OR ZONING LOTS WITH MULTIPLE BUILDINGS SUBJECT TO THE PROVISIONS OF THIS CHAPTER ARE SET FORTH IN SECTIONS 35-20 (APPLICABILITY OF RESIDENCE DISTRICT BULK REGULATIONS), INCLUSIVE, 35-30 (APPLICABILITY OF FLOOR AREA AND OPEN SPACE REGULATIONS), INCLUSIVE, 35-40 (APPLICABILITY OF DENSITY REGULATIONS), INCLUSIVE, 35-50 (MODIFICATION OF YARD REGULATIONS) AND 35-60 (MODIFICATION OF HEIGHT AND SETBACK REGULATIONS), INCLUSIVE.	
ZR 35-20	APPLICABILITY OF RESIDENCE DISTRICT BULK REGULATIONS		
ZR 35-21	GENERAL PROVISIONS	IN THE DISTRICTS INDICATED, THE BULK REGULATIONS SET FORTH IN ARTICLE II, CHAPTER 3 SHALL APPLY TO ALL RESIDENTIAL PORTIONS OF BUILDINGS IN ACCORDANCE WITH THE PROVISIONS AND MODIFICATIONS SET FORTH IN THE REMAINING SECTIONS OF THIS CHAPTER. THE PURPOSE OF THESE MODIFICATIONS IS TO MAKE THE REGULATIONS SET FORTH IN ARTICLE II, CHAPTER 3, APPLICABLE TO COMMERCIAL DISTRICTS.	
ZR 35-23 ZR 34-112	GENERAL PROVISIONS	IN C4-4D DISTRICTS , THE APPLICABLE BULK REGULATIONS ARE THE BULK REGULATIONS FOR THE RESIDENTIAL EQUIVALENT IS R8A	
ZR 35-30	APPLICABILITY OF FLOOR AREA AND OPEN SPACE REGULATIONS		
ZR 35-31	MAXIMUM FLOOR AREA RATIO	THE MAXIMUM FLOOR AREA RATIO PERMITTED FOR A COMMERCIAL OR COMMUNITY FACILITY USE SHALL BE AS SET FORTH IN ARTICLE III, CHAPTER 3, AND THE MAXIMUM FLOOR AREA RATIO PERMITTED FOR A RESIDENTIAL USE SHALL BE AS SET FORTH IN ARTICLE II, CHAPTER 3, EXCEPT AS SET FORTH IN SECTION 35-30. INCLUSIVE. THE TOTAL OF ALL SUCH FLOOR AREA RATIOS SHALL NOT EXCEED THE GREATEST FLOOR AREA RATIO PERMITTED FOR ANY SUCH USE ON THE ZONING LOT, EXCEPT WHERE EXPLICITLY STATED OTHERWISE. SPECIAL RULES FOR CERTAIN AREAS ARE SET FORTH IN SECTION 35-36 (SPECIAL FLOOR AREA RATIO AND RELATED BULK PROVISIONS FOR CERTAIN AREAS).	SEE ZR 23-153 AND ZR 33-121 BELOW FOR RESIDENTIAL AND COMMERCIAL FLOOR AREA REGULATIONS
ZR 33-123	FLOOR AREA RATIO	IN C4-4D DISTRICT THE COMMERCIAL & COMMUNITY FACILITY FLOOR AREA RATIO IS: 6.5 LOT AREA: 38,119 SF 6.5 X 38,119 = 247,773.50 SF	PROPOSED COMMERCIAL ZFA: 0 SF PROPOSED COMMUNIT FACILITY ZFA: 0 SF PROPOSED TOTAL COMMERCIAL/COMMUNITY ZFA: 0 SF OK
ZR 23-22	FLOOR AREA RATIO	IN R8A EQUIVALENT THE MAX RESIDENTIAL FLOOR AREA RATIO FOR QUALIFYING AFFORDABLE HOUSING IS: 7.2 LOT AREA: 38,119 SF 7.2 X 38,119 = 274,456.80 SF	PROPOSED RESIDENTIAL ZFA: 0 SF OK
ZR 35-40 ZR 23-52	MAXIMUM NUMBER OF DWELLING UNITS	MAX RESIDENTIAL FLOOR AREA: 274,456.80 / 680 = 403.61 = MAX 403 DWELLING UNITS	PROPOSED DWELLING UITS IN BUILDING A: 99 PROPOSED DWELLING UITS IN BUILDING B: 99 PROPOSED DWELLING UITS IN BUILDING C: 99 PROPOSED DWELLING UITS IN BUILDING D: 99 PROPOSED TOTAL DWELLING UNITS : 396
ZR 35-50	MODIFICATION OF YARD REGULATIONS		
ZR 35-51	MODIFICATION OF FRONT YARD REQUIREMENTS	IN C4 DISTRICT, NO FRONT YARD SHALL BE REQUIRED.	NO FRONT YARD PROVIDED
ZR 35-52	MODIFICATION OF SIDE YARD REQUIREMENTS	IN C4 DISTRICTS, NO SIDE YARD SHALL BE REQUIRED. HOWEVER, IF ANY OPEN AREA EXTENDING ALONG A SIDE LOT LINE IS PROVIDED AT ANY LEVEL, IT SHALL HAVE A MINIMUM WIDTH OF FIVE FEET	NO SIDE YARD PROVIDED
35-53	MODIFICATION OF REAR YARD REQUIREMENTS	IN C4 DISTRICTS, FOR A RESIDENTIAL PORTION OF A MIXED BUILDING, THE REQUIRED RESIDENTIAL REAR YARD SHALL BE PROVIDED AT THE FLOOR LEVEL OF THE LOWEST STORY USED FOR DWELLING UNITS OR ROOMING UNITS, WHERE ANY WINDOW OF SUCH DWELLING UNITS OR ROOMING UNITS FACES ONTO SUCH REAR YARD. IF LEVEL OF SUCH YARD IS AT OR HIGHER THAN THE FIRST STORY, DECKS, PARAPET WALLS, ROOF THICKNESS, SOLAR ENERGY SYSTEMS UP TO FOUR FEET HIGH, VEGETATED ROOFS, AND WEIRS, SHALL BE PERMITTED, PURSUANT TO SECTION 23-41 (PERMITTED OBSTRUCTIONS), INCLUSIVE.	SEE 23-343 (a) (3) FOR THE EXCEPTION
23-343 (a) (3)	REAR YARD EQUIVALENT REQUIREMENTS	NO REAR YARD EQUIVALENT REGULATIONS SHALL APPLY TO ANY ZONING LOT THAT INCLUDES A THROUGH LOT PORTION THAT IS CONTIGUOUS ON ONE SIDE TO TWO CORNER LOT PORTIONS AND SUCH ZONING LOT OCCUPIES THE ENTIRE BLOCK FRONTAGE OF A STREET	PROPOSED ZONING LOT HAS A THROUGH LOT PORTION THAT IS CONTIGUOUS ON ONE SIDE TO TWO CORNER LOT PORTIONS AND SUCH ZONING LOT OCCUPIES THE ENTIRE BLOCK FRONTAGE OF A STREET THEREFORE A REAR YARD EQUIVALENT IS NOT REQUIRED
ZR 35-60	MODIFICATION OF HEIGHT AND SETBACK REGULATIONS		
ZR 35-63	HEIGHT AND SETBACK REQUIREMENTS IN COMMERCIAL DISTRICTS WITH R6 THROUGH R12 EQUIVALENCY	C1 C2 C4 C5 C6 IN COMMERCIAL DISTRICTS MAPPED WITHIN, OR WITH A RESIDENTIAL EQUIVALENT OF R6 THROUGH R12 DISTRICTS, THE STREET WALL LOCATION OF A BUILDING SHALL BE AS SET FORTH IN SECTION 35-631, AND THE HEIGHT AND SETBACK PROVISIONS SHALL BE AS SET FORTH IN SECTION 35-632. ADDITIONAL HEIGHT AND SETBACK PROVISIONS ARE SET FORTH IN SECTION 35-633 AND SECTION 35-64. INCLUSIVE. THE HEIGHT OF ALL BUILDINGS OR OTHER STRUCTURES SHALL BE MEASURED FROM THE BASE PLANE. FOR THE PURPOSES OF THIS SECTION, WHERE BASE PLANES OF DIFFERENT ELEVATIONS APPLY TO DIFFERENT PORTIONS OF A BUILDING OR OTHER STRUCTURE, EACH SUCH PORTION OF THE BUILDING MAY BE CONSIDERED TO BE A SEPARATE BUILDING.	
ZR 35-631	STREET WALL LOCATION	C1 C2 C4 C5 C6 IN THE DISTRICTS INDICATED, THE APPLICABLE STREET WALL LOCATION PROVISIONS OF THIS SECTION SHALL APPLY. SUCH PROVISIONS SHALL APPLY TO THE PORTION OF A STREET WALL LOCATED BELOW THE MAXIMUM BASE HEIGHT AND BEFORE THE REQUIRED SETBACK AS SET FORTH IN SECTION 23-432 (HEIGHT AND SETBACK REQUIREMENTS). (B) PERCENTAGE-BASED RULES AT LEAST 70 PERCENT OF THE AGGREGATE WIDTH OF STREET WALLS SHALL BE LOCATED WITHIN EIGHT FEET OF THE STREET LINE AND SHALL EXTEND TO AT LEAST THE MINIMUM BASE HEIGHT SPECIFIED IN SECTION 23-432, OR THE HEIGHT OF THE BUILDING, WHICHEVER IS LESS. UP TO 30 PERCENT OF THE AGGREGATE WIDTH OF STREET WALLS MAY BE RECESSED BEYOND EIGHT FEET OF THE STREET LINE, PROVIDED THAT ANY SUCH RECESSES DEEPER THAN 10 FEET ALONG A WIDE STREET OR 15 FEET ALONG A NARROW STREET ARE LOCATED WITHIN AN OUTER COURT.	100% OF PROPOSED STREET WALL IS LOCATED WITHIN 8' OF THE PROPERTY LINE
ZR 35-632 ZR 23-432	HEIGHT AND SETBACK REQUIREMENTS	IN R8A EQUIVALENT DISTRICT FOR QUALIFYING AFFORDABLE HOUSING MIN. BASE HEIGHT: 60' MAX. BASE HEIGHT: 105' MAX. BUILDING HEIGHT: 145'	PROPOSED BASE HEIGHT: 105' PROPOSED BUILDING HEIGHT: 145'
ZR 36-20	REQUIRED ACCESSORY OFF-STREET PARKING SPACES FOR COMMERCIAL AND COMMUNITY FACILITY USE		
ZR 36-26	WAIVER FOR MIXED-USE DEVELOPMENTS	IN ALL DISTRICTS, AS INDICATED, THE NON-RESIDENTIAL PARKING REQUIREMENTS OF SECTION 36-20 SHALL BE WAIVED FOR USES LOCATED WITHIN BUILDINGS CONTAINING RESIDENCES ON ANY ZONING LOT (a)WITHIN THE SPECIAL MIXED USE PARKING AREA ; (1)SPECIAL MIXED USE PARKING AREAS" SHALL REFER TO SPECIAL GEOGRAPHIES WHERE UNIQUE PARKING REQUIREMENTS APPLY TO MIXED USE #BUILDINGS# .#SPECIAL MIXED USE PARKING AREAS# SHALL INCLUDE AREAS WITHIN THE BOUNDARIES SHOWN IN APPENDIX I OF THIS RESOLUTION.	THE PROPERTY FALLS UNDER APPENDIX I THEREFORE, THE PARKING IS WAIVED FOR THE COMMERCIAL
ZR 25-222	RESIDETIAL PARKING REQUIREMENTS	**IN R8A DISTRICTS, WITHIN THE OUTER TRANSIT ZONE , FOR DWELLING UNITS CREATED AS PART OF A DEVELOPMENT OR ENLARGEMENT AFTER DECEMBER 5, 2024, THE NUMBER OF REQUIRED ACCESSORY OFF-STREET PARKING SPACES SHALL BE DETERMINED BY MULTIPLYING THE NUMBER OF DWELLING UNITS BY THE APPLICABLE PARKING REQUIREMENT SET FORTH FOR THE APPLICABLE DISTRICT IN COLUMNS A OR B OF THE TABLE. HOWEVER, WHERE THE CALCULATION RESULTS IN A NUMBER OF PARKING SPACES LESS THAN OR EQUAL TO THE NUMBER IN COLUMN C, NO PARKING SPACES SHALL BE REQUIRED FOR RESIDENCES ON THE ZONING LOT.** **AS PER COLUMN A: 12% OF THE MARKET RATE UNITS REQUIRE PARKING** **BUILDING A: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **BUILDING B: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **BUILDING C: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **BUILDING D: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **TOTAL PARKING REQUIRED = 36 SPACES REQUIRED** **AS PER COLUMN B: 0% OF THE AFFORDABLE UNITS REQUIRE PARKING**	TOTAL NUMBER OF PARKING PROVIDED = 94
ZR 36-70	BICYCLE PARKING		
ZR 36-711	REQUIRED ENCLOSED BICYCLE PARKING SPACES FOR RESIDENTIAL USE	IN R8A DISTRICTS, 1 PARKING SPACE PER 2 NEW DWELLING UNITS REQUIRED BUILDING A: 99/2 = 50 PARKING SPACES REQUIRED BUILDING B: 99/2 = 50 PARKING SPACES REQUIRED BUILDING C: 99/2 = 50 PARKING SPACES REQUIRED BUILDING D: 99/2 = 50 PARKING SPACES REQUIRED	BUILDING A: 50 PARKING SPACES PROVIDED BUILDING B: 50 PARKING SPACES PROVIDED BUILDING C: 50 PARKING SPACES PROVIDED BUILDING D: 50 PARKING SPACES PROVIDED
ZR 36-711 (d)	REQUIRED ENCLOSED BICYCLE PARKING SPACES FOR #COMMERCIAL USE	FOR GENERAL RETAIL SERVICES, 1 PARKING SPACE PER 10,000 SF REQUIRED. WAIVED IF UNER 5 SPACES REQUIRED BUILDING A: 4999.69 / 10000= .12 ~ 1 BICYCLE PARKING SPACES REQUIRED	PROPOSED COMMERCIAL/COMMUNITY FACILITY BICYCLE PARKING SPACES: 0
ZR 23-00	RESIDENTIAL BULK REGULATIONS		
ZR 23-12	MINIMUM LOT AREA	MIN. LOT AREA: 1700 SF	PROPOSED LOT AREA: 38,119.0 SF
ZR 23-12	MINIMUM LOT WIDTH	MIN. LOT WIDTH: 18'-0"	PROPOSED LOT WIDTH: 200'-0"
ZR-23-362 (a)	LOT COVERAGE	THE MAXIMUM RESIDENTIAL LOT COVERAGE FOR INTERIOR LOTS OR THROUGH LOTS SHALL BE 80 PERCENT AND THE MAXIMUM RESIDENTIAL LOT COVERAGE FOR CORNER LOTS SHALL BE 100 PERCENT.	PROPOSED LOT COVERAGE ON CORNER LOT PORTION IS: 96.84% PROPOSED LOT COVERAGE ON THRUGH LOT PORTION IS: 80%
ZR 23-60	ADDITIONAL DEISGN ELEMENTS		
ZR 23-61 ZR 26-41	STREET TREES AND PLANTING	IN DISTRICTS R1 TO R12, THE FOLLOWING SHALL PROVIDE STREET TREES IN ACCORDANCE WITH SECTION 26-14 (STREET TREE PLANTING: IN ACCORDANCE WITH APPLICABILITY REQUIREMENTS OF UNDERLYING DISTRICT REGULATIONS, ONE STREET TREE, PRE-EXISTING OR NEWLY PLANTED, SHALL BE PROVIDED FOR EVERY 25 FEET OF STREET FRONTAGE OF THE ZONING LOT. FRACTIONS EQUAL TO OR GREATER THAN ONE-HALF RESULTING FROM THIS CALCULATION SHALL BE CONSIDERED TO BE ONE TREE.	TOTAL STREET FRONTAGE : 602.7' 24 TREES REQUIRED EXISTING TREES TO BE PROTECTED ON SITE: 5 PROPOSED TREE TO BE PAID INTO ON-SITE TREE FUNDS = 16 PROPOSED TREE TO BE PAID INTO OFF-SITE TREE FUNDS = 3
23-613	FRONT YARD PLANTING REQUIREMENTS	IN DISTRICTS R1 TO R12, THE AREA OF THE ZONING LOT BETWEEN THE STREET LINE AND ALL STREET WALLS OF THE BUILDING AND THEIR PROLONGATIONS SHALL BE PLANTED AT GROUND LEVEL, OR IN RAISED PLANTING BEDS THAT ARE PERMANENTLY AFFIXED TO THE GROUND, EXCEPT THAT SUCH PLANTINGS SHALL NOT BE REQUIRED AT THE ENTRANCES TO AND EXITS FROM THE BUILDING, WITHIN DRIVEWAYS ACCESSING OFF-STREET PARKING SPACES LOCATED WITHIN, TO THE SIDE, OR REAR OF SUCH BUILDING, IN ANY AREA WHERE THERE IS A PERMITTED OBSTRUCTION	PROPOSED AREA BETWEEN THE STREET LINE AND BUILDING WALL IS PROVIDED WITH PLANTING
ZR 23-62	BALCONIES	IN DISTRICTS R1 TO R12, BALCONIES MAY PROJECT INTO OR OVER ANY OPEN AREAS NOT OCCUPIED BY BUILDINGS AT THAT PARTICULAR LEVEL, PROVIDED THAT: (a) WITHIN ANY YARDS, COURTS, OR OTHER REQUIRED OPEN AREAS, SUCH BALCONY SHALL: (1) NOT PROJECT BY MORE THAN ONE THIRD OF THE DEPTH OF SUCH AREAS SPECIFIED ABOVE, OR A DISTANCE GREATER THAN SEVEN FEET, WHICHEVER IS LESS, AS MEASURED FROM THE PLANE SURFACE OF THE BUILDING WALL FROM WHICH IT PROJECTS; (2) NOT COVER MORE THAN 10 PERCENT OF ANY OPEN AREA REQUIRED PURSUANT TO SECTION 23-30, INCLUSIVE, OR ANY OUTDOOR RECREATION SPACE PROVIDED PURSUANT TO SECTION 23-63; AND (3) HAVE AN AGGREGATE WIDTH, AT THE LEVEL OF ANY STORY, NOT EXCEEDING 50 PERCENT OF THE WIDTH AT THAT LEVEL OF THE PLANE SURFACE OF THE BUILDING WALL FROM WHICH IT PROJECTS; AND (b) WITHIN ANY OPEN AREAS, WHETHER REQUIRED OR NOT, SUCH BALCONY SHALL: (1) BE UNENCLOSED EXCEPT FOR BUILDING WALLS AND PARAPETS, RAILINGS, OR SAFETY GUARDS, WHETHER APPLIED SINGLY, OR IN COMBINATION, PROVIDED THAT: (i) PARAPETS SHALL NOT EXCEED FOUR FEET IN HEIGHT; (ii) RAILINGS SHALL NOT EXCEED 4 FEET, 6 INCHES IN HEIGHT AND SHALL BE AT LEAST 50 PERCENT OPEN FOR THE PORTION THAT EXCEEDS FOUR FEET IN HEIGHT; AND (iii) SAFETY GUARDS SHALL NOT EXCEED 10 FEET IN HEIGHT AND SHALL BE AT LEAST 50 PERCENT TRANSPARENT MATERIALS FOR THE PORTION THAT EXCEEDS FOUR FEET IN HEIGHT. IN ADDITION, WHERE SUCH BALCONY HAS A ROOFED PORTION ABOVE IT, THERE SHALL BE AN OPENING THAT IS NOT LESS THAN 40 PERCENT OF THE HEIGHT BETWEEN THE BOTTOM OF THE ROOF AND THE FINISHED FLOOR LEVEL OF SUCH BALCONY. HOWEVER, SUCH BALCONIES MAY BE RECESSED INTO A BUILDING WALL UP TO A MAXIMUM DEPTH OF SIX FEET PROVIDED THAT AT LEAST 33 PERCENT OF THE PERIMETER OF SUCH BALCONY IS UNENCLOSED EXCEPT FOR A PARAPET, RAILING, OR SAFETY GUARD; AND (2) BE LOCATED AT LEAST 13 FEET ABOVE CURB LEVEL, EXCEPT THAT FOR BUILDINGS CONTAINING RESIDENCES NOT MORE THAN 35 FEET IN HEIGHT, SUCH BALCONY MAY BE LOCATED AT OR HIGHER THAN THE FLOOR LEVEL OF THE SECOND STORY PROVIDED THAT SUCH BALCONY IS LOCATED NOT LOWER THAN SEVEN FEET ABOVE CURB LEVEL OR SEVEN FEET ABOVE NATURAL GRADE, WHICHEVER IS HIGHER.	PROPOSED BALCONIES ARE IN COMPLIANCE OF SECTION 23-62 AND ARE NOT GREATER THAN 50% OF THE TOTAL WALL WIDTH. SEE SHEET A-101

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MEP Engineer:
VENTROP ECG PLLC
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Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING ANALYSIS

Z-001B.00

Scale: 12" = 1'-0"
Date: 12/1/2025 7:19:45 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

ZONING FLOOR AREA							
NAME	USE GROUP	GFA	DEDUCTIONS	TOTAL	5% ULTRA LOW EN	ZFA	FAR
BUILDING A							
COMMERCIAL							
00A_CELLAR	VI	7692.14 SF	7692.14 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01A_1ST FL. RETAIL	VI	4999.69 SF	4536.25 SF	463.44 SF	23.17 SF	440.27 SF	0.01
		12691.83 SF	12228.39 SF	463.44 SF	23.17 SF	440.27 SF	0.01
RESIDENTIAL							
00A_SUBCELLAR 2	II	7692.14 SF	7692.14 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00A_SUBCELLAR 1	II	7692.14 SF	7692.14 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01A_ 1ST FL.	II	3259.06 SF	579.85 SF	2679.20 SF	133.96 SF	2545.24 SF	0.07
02A_2ND FL.	II	6543.76 SF	3760.04 SF	2783.72 SF	139.19 SF	2644.53 SF	0.07
03A_3RD FL.	II	6543.76 SF	1102.12 SF	5441.64 SF	272.08 SF	5169.56 SF	0.14
04A_4TH FL.	II	5857.40 SF	1102.12 SF	4755.28 SF	237.76 SF	4517.52 SF	0.12
05A_5TH FL.	II	5857.40 SF	1102.12 SF	4755.28 SF	237.76 SF	4517.52 SF	0.12
06A_6TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
07A_7TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
08A_8TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
09A_9TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
10A_10TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
11A_11TH FL.	II	5489.70 SF	1055.47 SF	4434.23 SF	221.71 SF	4212.52 SF	0.11
12A_12TH FL.	II	5489.70 SF	1055.47 SF	4434.23 SF	221.71 SF	4212.52 SF	0.11
13A_13TH FL.	II	5489.70 SF	1891.02 SF	3598.68 SF	179.93 SF	3418.75 SF	0.09
14A_14TH FL.	II	5489.70 SF	1055.47 SF	4434.23 SF	221.71 SF	4212.52 SF	0.11
15A_ROOF	II	569.87 SF	569.87 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		95246.40 SF	34168.41 SF	61077.99 SF	3053.91 SF	58024.08 SF	1.52
BUILDING B							
COMMERCIAL							
00B_CELLAR	VI	11464.06 SF	11464.06 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01B_1ST FL. RETAIL	VI	10084.56 SF	4536.25 SF	5548.32 SF	277.42 SF	5270.90 SF	0.14
		21548.62 SF	16000.31 SF	5548.32 SF	277.42 SF	5270.90 SF	0.14
RESIDENTIAL							
00B_SUBCELLAR 2	II	11464.06 SF	11464.06 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00B_SUBCELLAR 1	II	11464.06 SF	11464.06 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01B_1ST FL.	II	1268.91 SF	451.78 SF	817.14 SF	40.86 SF	776.28 SF	0.02
02B_2ND FL.	II	6494.93 SF	822.24 SF	5672.69 SF	283.63 SF	5389.06 SF	0.14
03B_3RD FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
04B_4TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
05B_5TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
06B_6TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
07B_7TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
08B_8TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
09B_9TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
10B_10TH FL	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
11B_11TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
12B_12TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
13B_13TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
14B_14TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
15B_ROOF	II	692.91 SF	692.91 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		104970.45 SF	34713.13 SF	70257.35 SF	3512.85 SF	66744.50 SF	1.75
BUILDING C							
COMMERCIAL							
00C_CELLAR	VI	8957.70 SF	8957.70 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01C_1ST FL. RETAIL	VI	6555.24 SF	4536.25 SF	2019.00 SF	100.95 SF	1918.05 SF	0.05
		15512.95 SF	13493.95 SF	2019.00 SF	100.95 SF	1918.05 SF	0.05
RESIDENTIAL							
00C_SUBCELLAR 2	II	8957.70 SF	8957.70 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00C_SUBCELLAR 1	II	8957.70 SF	8957.70 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01C_1ST FL.	II	1779.77 SF	551.00 SF	1228.77 SF	61.44 SF	1167.33 SF	0.03
02C_2ND FL.	II	6387.91 SF	673.97 SF	5713.93 SF	285.70 SF	5428.23 SF	0.14
03C_3RD FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
04C_4TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
05C_5TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
06C_6TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
07C_7TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
08C_8TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
09C_9TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
10C_10TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
11C_11TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
12C_12TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
13C_13TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
14C_14TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
15C_ROOF	II	985.53 SF	985.53 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		104397.11 SF	29784.42 SF	74612.74 SF	3730.62 SF	70882.12 SF	1.86
BUILDING D							
COMMERCIAL							
00D_CELLAR	VI	7848.13 SF	7848.13 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01D_1ST FL. RETAIL	VI	6063.41 SF	4536.25 SF	1527.16 SF	76.36 SF	1450.80 SF	0.04
		13911.54 SF	12384.38 SF	1527.16 SF	76.36 SF	1450.80 SF	0.04
RESIDENTIAL							
00D_SUBCELLAR 2	II	7848.13 SF	7848.13 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00D_SUBCELLAR 1	II	7848.13 SF	7848.13 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01D_1ST FL.	II	1652.78 SF	444.95 SF	1207.84 SF	60.39 SF	1147.45 SF	0.03
02D_2ND FL.	II	6487.73 SF	851.42 SF	5636.31 SF	281.82 SF	5354.49 SF	0.14
03D_3RD FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
04D_4TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
05D_5TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
06D_6TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
07D_7TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
08D_8TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
09D_9TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
10D_10TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
11D_11TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
12D_12TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
13D_13TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
14D_14TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
15D_ROOF	II	734.87 SF	734.87 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		100596.51 SF	27916.04 SF	72680.47 SF	3634.01 SF	69046.46 SF	1.81
GRAND TOTAL		468875.42 SF	180689.03 SF	288186.47 SF	14409.29 SF	273777.18 SF	7.18

BUILDING B_ TOTAL DEDUCTION BY CODE CATEGORY	
DEDUCTION	TOTAL SF
	0.00 SF
AMENITY	172.05 SF
BULKHEAD	692.91 SF
CELLAR	34392.18 SF
CORRIDOR DEDUCTION	7788.06 SF
MECHANICAL ROOM	141.17 SF
REFUSE ROOM	455.62 SF
SHAFT	2276.71 SF
STAIRS	258.50 SF
Grand total	46177.19 SF

BUILDING B _ DEDUCTION PER ZR 12-10	
DEDUCTION	TOTAL SF
BULKHEAD	692.91 SF
CELLAR	34392.18 SF
MECHANICAL ROOM	141.17 SF
SHAFT	2276.71 SF
STAIRS	258.50 SF
Grand total	37761.47 SF

BUILDING B _ DEDUCTION PER ZR 23-23	
DEDUCTION	TOTAL SF
AMENITY	172.05 SF
CORRIDOR DEDUCTION	7788.06 SF
REFUSE ROOM	455.62 SF
Grand total	8415.72 SF

BUILDING B _ ZFA AFTER ZR 12-10 DEDUCTIONS	
RESIDENTIAL GFA	116,434.51 SF
ZR 12-10 DEDUCTIONS	37,761.47 SF
116,434.51 - 37,761.47	78,673.04 SF

LEVEL	A	B	C	D	E	F	G	H
1								
2	201	202	203	204	205	206	207	
	2-BR	1-BR	1-BR	2-BR	2-BR	2-BR	2-BR	
	719 SF	455 SF	423 SF	684 SF	875 SF	712 SF	1097 SF	
3	301	302	303	304	305	306	307	308
	2-BR	1-BR	1-BR	2-BR	2-BR	2-BR	2-BR	STUDIO
	719 SF	455 SF	426 SF	684 SF	877 SF	712 SF	735 SF	339 SF
4	401	402	403	404	405	406	407	408
	2-BR	1-BR	1-BR	2-BR	2-BR	2-BR	2-BR	STUDIO
	719 SF	455 SF	426 SF	684 SF	877 SF	712 SF	735 SF	339 SF
5	501	502	503	504	505	506	507	508
	2-BR	1-BR	1-BR	2-BR	2-BR	2-BR	2-BR	STUDIO
	719 SF	455 SF	426 SF	684 SF	877 SF	712 SF	735 SF	339 SF
6	601	602	603	604	605	606	607	608
	2-BR	1-BR	1-BR	2-BR	2-BR	2-BR	2-BR	STUDIO
	719 SF	455 SF	426 SF	684 SF	877 SF	712 SF	735 SF	339 SF
7	701	702	703	704	705	706	707	708
	2-BR	1-BR	1-BR	2-BR	2-BR	2-BR	2-BR	STUDIO
	719 SF	455 SF	426 SF	684 SF	877 SF	712 SF	735 SF	339 SF
8	801	802	803	804	805	806	807	808
	2-BR	1-BR	1-BR	2-BR	2-BR	2-BR	2-BR	STUDIO
	719 SF	455 SF	426 SF	684 SF	877 SF	712 SF	735 SF	339 SF
9	901	902	903	904	905	906	907	908
	2-BR	1-BR	1-BR	2-BR	2-BR	2-BR	2-BR	STUDIO
	719 SF	455 SF	426 SF	684 SF	877 SF	712 SF	735 SF	339 SF
10	1001	1002	1003	1004	1005	1006	1007	1008
	2-BR	1-BR	1-BR	2-BR	2-BR	2-BR	2-BR	STUDIO
	719 SF	455 SF	426 SF	684 SF	877 SF	712 SF	735 SF	339 SF
11	1101	1102	1103		1105	1106	1107	1108
	1-BR	1-BR	2-BR		2-BR	STUDIO	2-BR	STUDIO
	475 SF	479 SF	732 SF		785 SF	352 SF	737 SF	341 SF
12	1201	1202	1203		1205	1206	1207	1208
	1-BR	1-BR	2-BR		2-BR	STUDIO	2-BR	STUDIO
	475 SF	479 SF	732 SF		785 SF	352 SF	737 SF	341 SF
13	1301	1302	1303		1305	1306	1307	1308
	1-BR	1-BR	2-BR		2-BR	STUDIO	2-BR	STUDIO
	475 SF	479 SF	732 SF		785 SF	352 SF	737 SF	341 SF
14	1401	1402	1403		1405	1406	1407	1408
	1-BR	1-BR	2-BR		2-BR	STUDIO	2-BR	STUDIO
	475 SF	479 SF	732 SF		785 SF	352 SF	737 SF	341 SF

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MEP Engineer:
VENTROP ECG PLLC
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Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

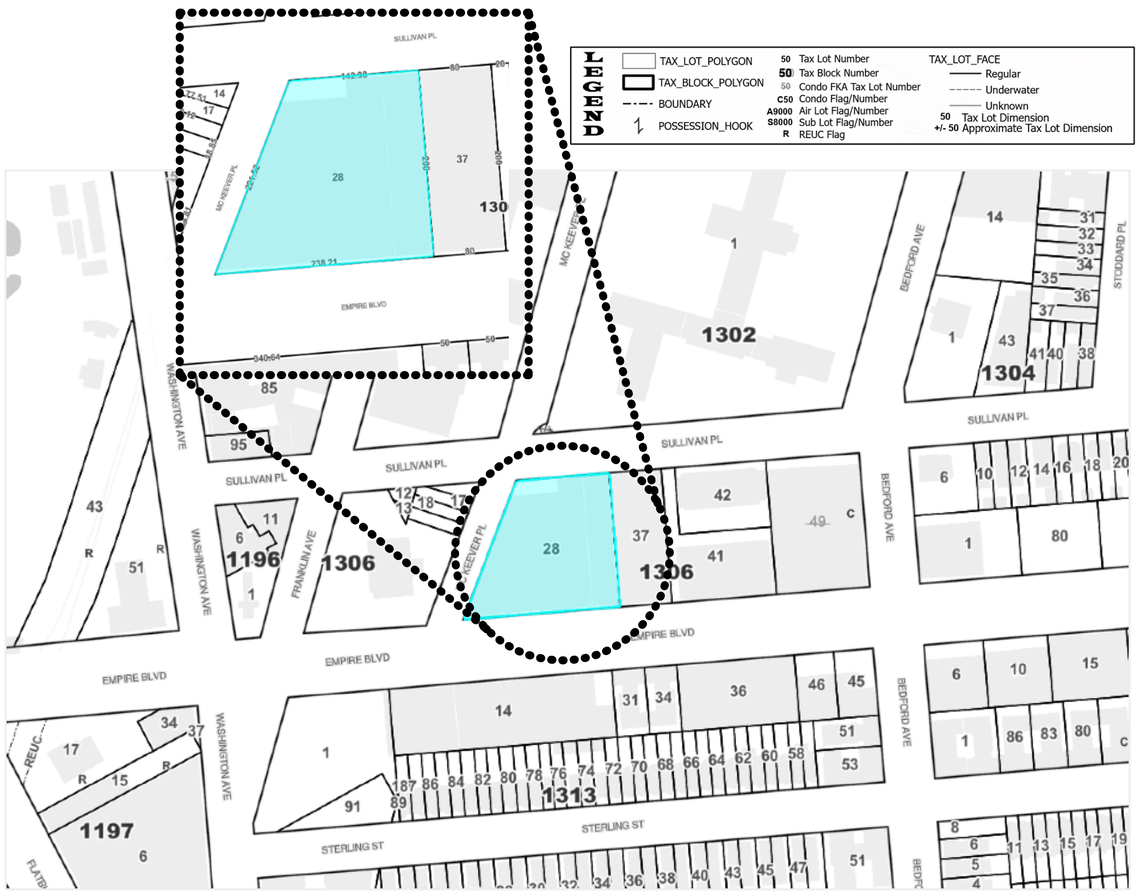
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING ANALYSIS

Z-002B.00

Scale: 12" = 1'-0"
Date: 12/1/2025 7:19:52 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 TAX MAP
N.T.S.



2 FLOOD MAP - ZONE 'X' SEPTEMBER 5, 2007
N.T.S.

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- SPECIAL FLOOD HAZARD AREAS
  - Without Base Flood Elevation (BFE) *Zone A, V, A99*
  - With BFE or Depth *Zone AE, AO, AH, VE, AR*
  - Regulatory Floodway
- OTHER AREAS OF FLOOD HAZARD
  - 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
  - Future Conditions 1% Annual Chance Flood Hazard *Zone X*
  - Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
  - Area with Flood Risk due to Levee *Zone D*
- OTHER AREAS
  - NO SCREEN Area of Minimal Flood Hazard *Zone X*
  - Effective LOMRs
  - Area of Undetermined Flood Hazard *Zone D*
- GENERAL STRUCTURES
  - Channel, Culvert, or Storm Sewer
  - Levee, Dike, or Floodwall
- OTHER FEATURES
  - 20.2 Cross Sections with 1% Annual Chance
  - 17.5 Water Surface Elevation
  - Coastal Transect
  - 513 Base Flood Elevation Line (BFE)
  - Limit of Study
  - Jurisdiction Boundary
  - Coastal Transect Baseline
  - Profile Baseline
  - Hydrographic Feature
- MAP PANELS
  - Digital Data Available
  - No Digital Data Available
  - Unmapped

N

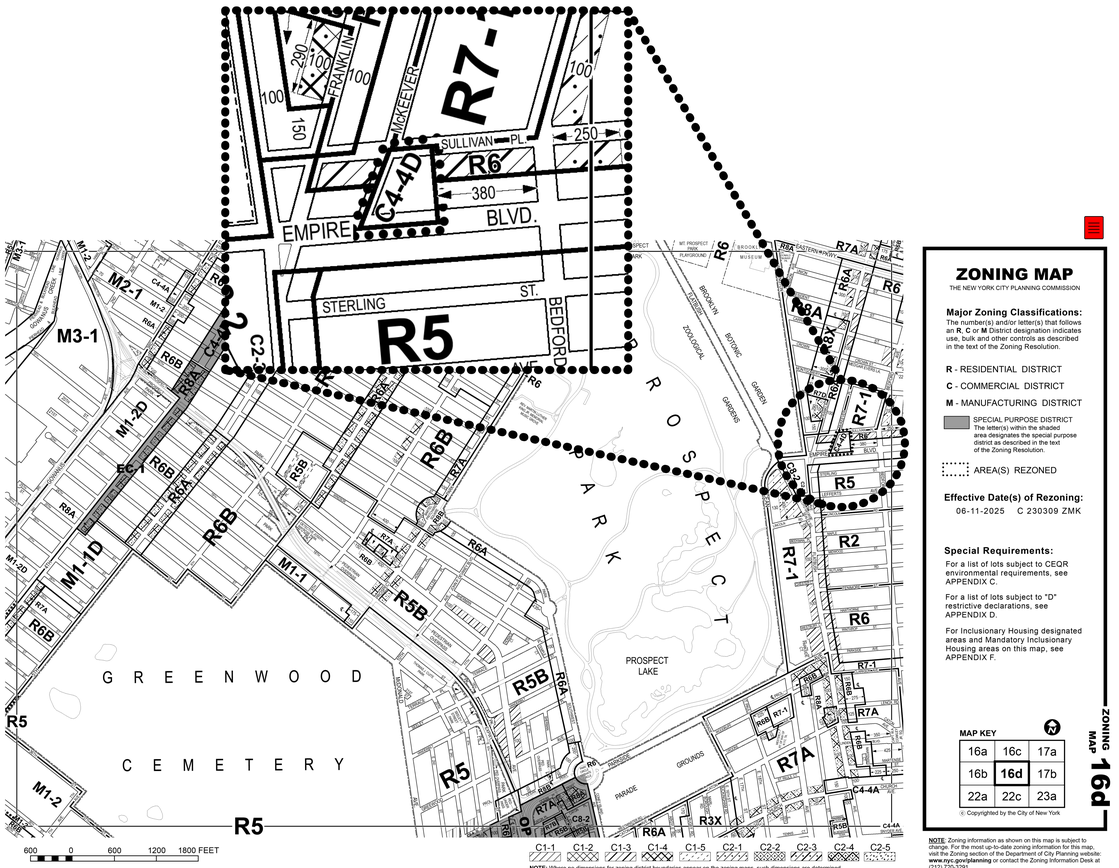
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/31/2025 at 2:40 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

3 ZONING MAP
N.T.S.



ZONING MAP

THE NEW YORK CITY PLANNING COMMISSION

Major Zoning Classifications:
The number(s) and/or letter(s) that follows an **R**, **C** or **M** District designation indicates use, bulk and other controls as described in the text of the Zoning Resolution.

R - RESIDENTIAL DISTRICT
C - COMMERCIAL DISTRICT
M - MANUFACTURING DISTRICT

SPECIAL PURPOSE DISTRICT
The letter(s) within the shaded area designates the special purpose district as described in the text of the Zoning Resolution.

AREA(S) REZONED

Effective Date(s) of Rezoning:
06-11-2025 C 230309 ZMK

Special Requirements:
For a list of lots subject to CEQR environmental requirements, see APPENDIX C.

For a list of lots subject to "D" restrictive declarations, see APPENDIX D.

For Inclusionary Housing designated areas and Mandatory Inclusionary Housing areas on this map, see APPENDIX F.

MAP KEY

16a	16c	17a
16b	**16d**	17b
22a	22c	23a

ZONING MAP 16d

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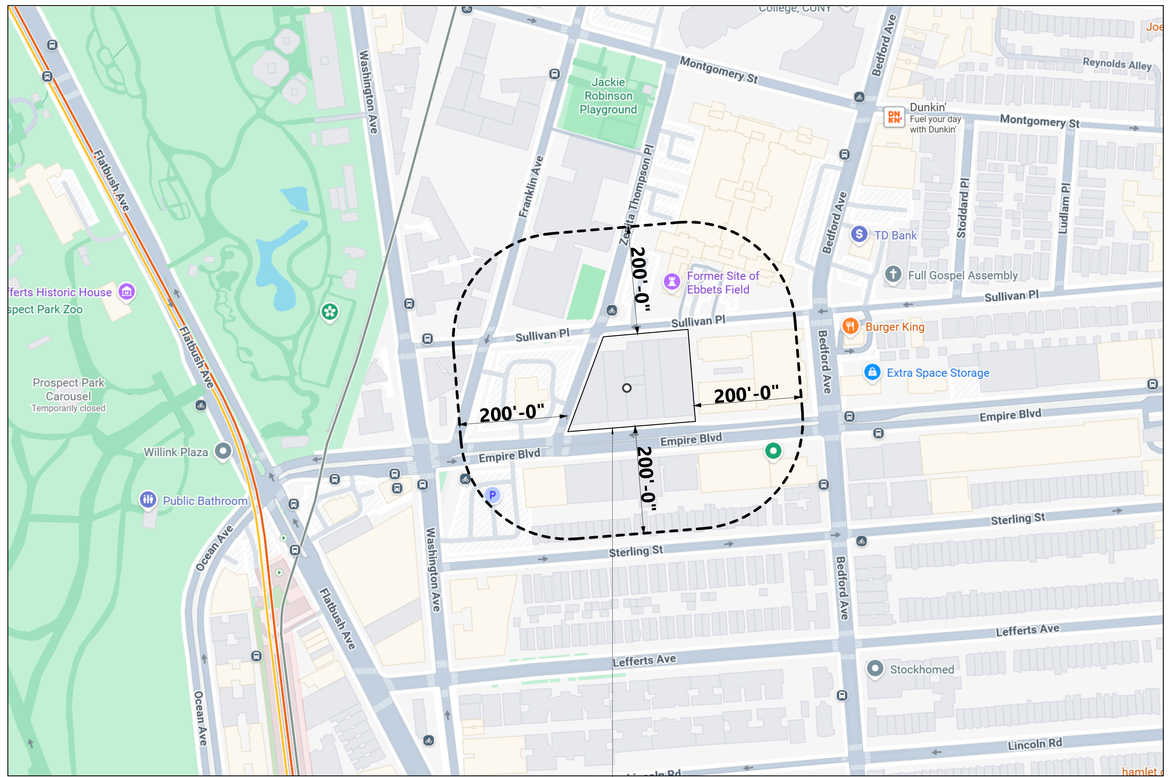
NOTE: Zoning information as shown on this map is subject to change. For the most up-to-date zoning information for this map, visit the Zoning section of the Department of City Planning website: **www.nyc.gov/planning** or contact the Zoning Information Desk at (212) 720-3291.

C1-1 C1-2 C1-3 C1-4 C1-5 C2-1 C2-2 C2-3 C2-4 C2-5

NOTE: Where no dimensions for zoning district boundaries appear on the zoning maps, such dimensions are determined in Article VII, Chapter 8 (Location of District Boundaries) of the Zoning Resolution.

TRANSIT MAP
1" = 100'-0"



SITE IS NOT LOCATED WITHIN 200' OF A TRANSIT AUTHORITY PROPOERTY

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(609) 216 2975

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Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

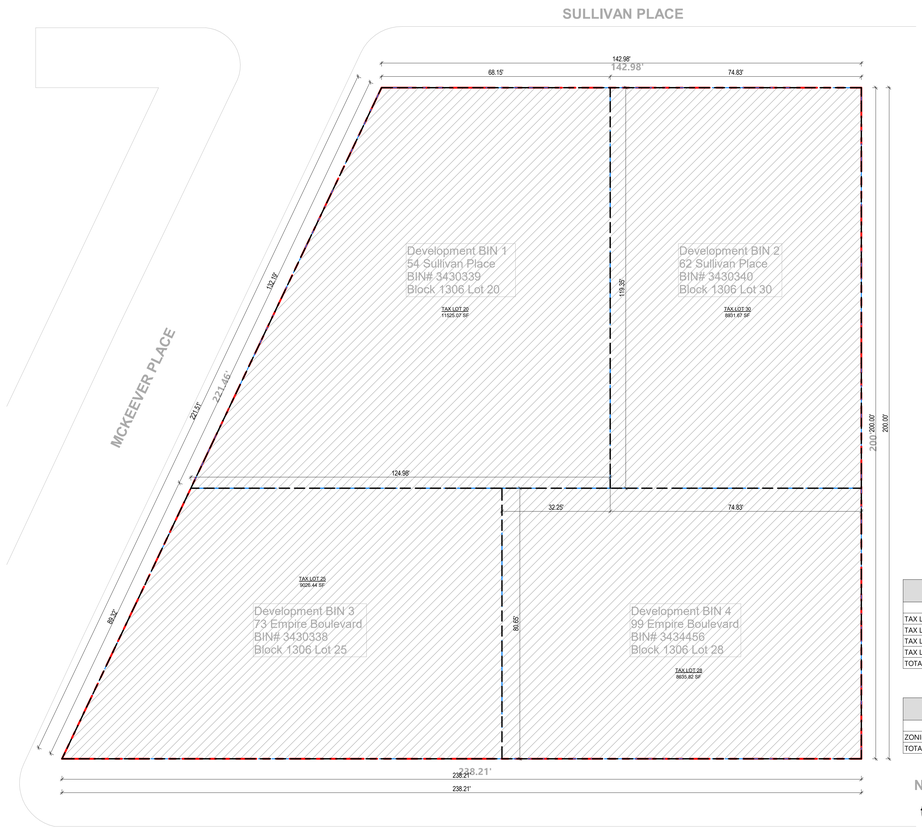
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING MAPS

Z-003B.00

Scale: 1" = 100'-0"
Date: 12/1/2025 7:19:54 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

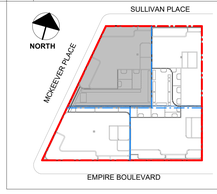
1 BLDG B - LOT AREA & BASE PLANE CALCULATION
1/16" = 1'-0"



TAX LOTS	
Name	SF
TAX LOT 20	11525.07 SF
TAX LOT 30	8931.67 SF
TAX LOT 28	8635.82 SF
TAX LOT 25	9026.44 SF
TOTAL	38119.00 SF

COMBINED LOT AREA	
Name	SF
ZONING LOT COMBINED	38119.00 SF
TOTAL	38119.00 SF

2 BLDG B - LOT COVERAGE CALCULATION
1/16" = 1'-0"

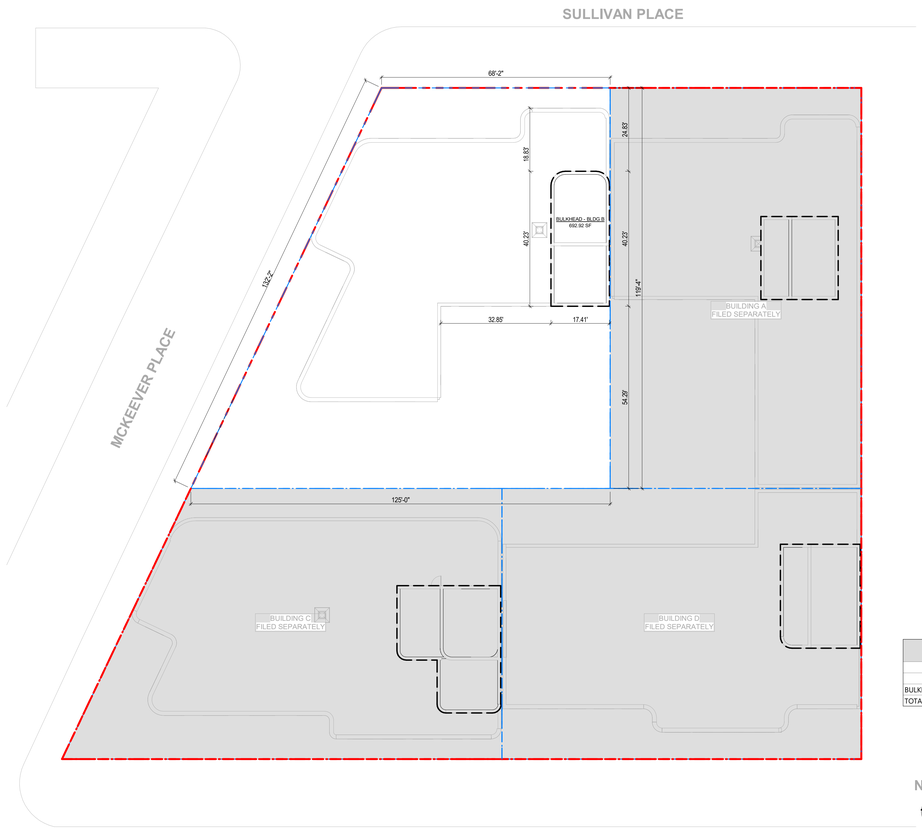


LOT COVERAGE ALLOWED WITHIN 100FT = 100%

AREA SCHEDULE (LOT COVERAGE)	
Name	Area
PORTION OF BUIDLING A - BEYOND 100FT	5395 SF
PORTION OF BUILDING C - BEYOND 100FT	423 SF
PORTION OF BUILDING D - BEYOND 100FT	6956 SF
TOTAL	12774 SF

MAXIMUM PERMITTED LOT COVERAGE: 80% x 15,967.53 = 12,774.02 SF
PROPOSED LOT COVERAGE: (12774 / 15967.53) x 100 = 79.99%

3 BLDG B - PERMITTED OBSTRUCTION CALCULATION
1/16" = 1'-0"



BLDG B - BULKHEAD AREA CALCULATION			
Name	Length	Width	Area
BULKHEAD - BLDG B	0' - 0"	0' - 0"	693 SF
TOTAL			693 SF

4 BLDG B - COURTYARD ANALYSIS DIAGRAM
1/16" = 1'-0"

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Brooklyn, NY 11225

SHEET TITLE
ZONING DIAGRAMS

Z-004B.00

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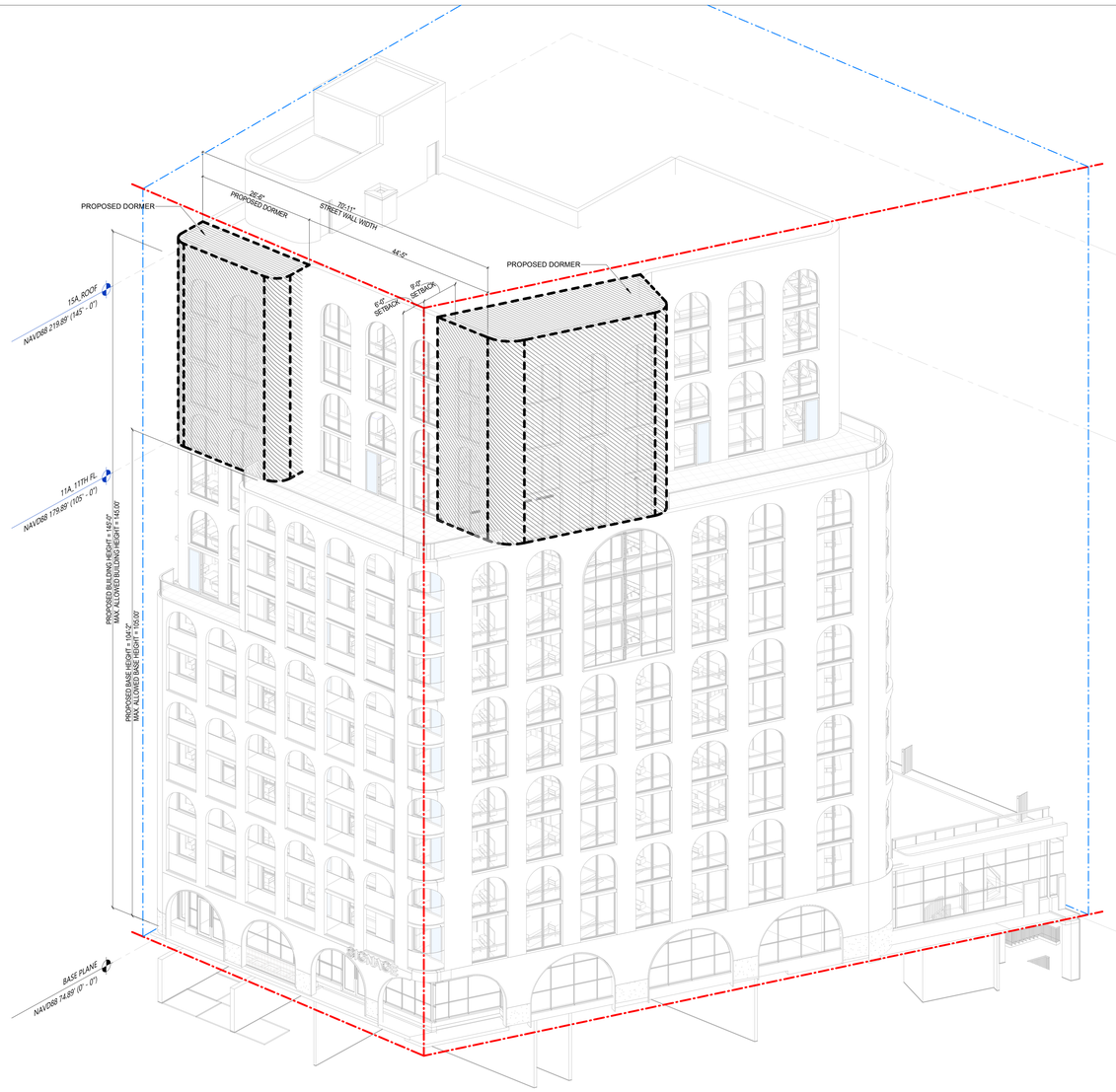
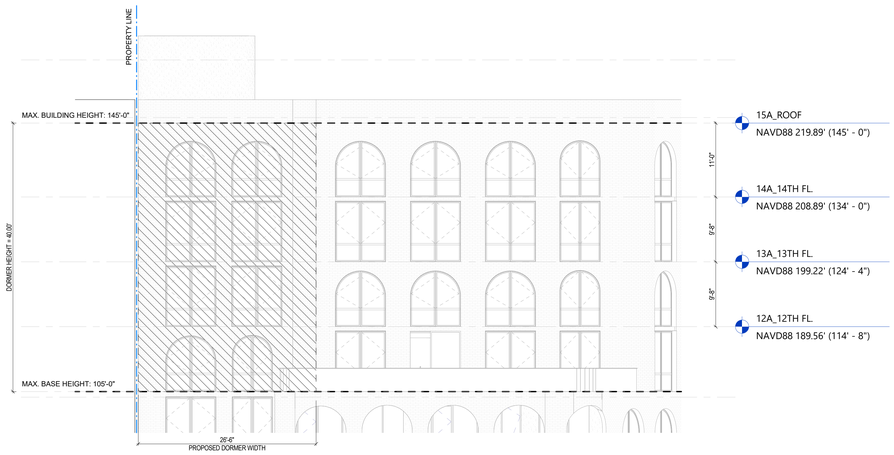
Date:	12/1/2025 7:20:09 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG B - 3D DIAGRAM



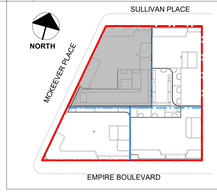
2 BLDG B - DORMER CALCULATIONS - SULLIVAN PLACE (NORTH ELEVATION)

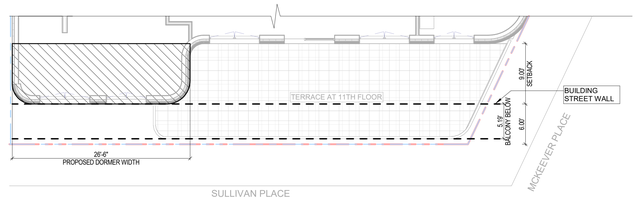
1/8" = 1'-0"



KEY PLAN

N.T.S.





SULLIVAN PLACE DORMER CALCULATION

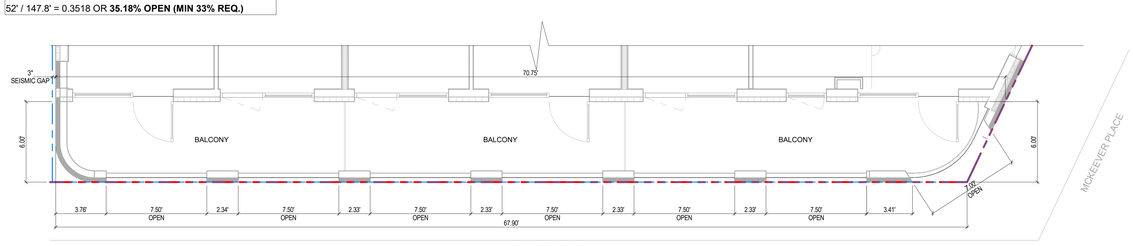
STREET WALL WIDTH = 70'-9"
PERMITTED DORMER = 70'-9" x 40% = 28'-3 5/8"
PROPOSED DORMER = 26'-6"

2.1 BLDG B - 11TH FL. - PARTIAL PLAN
1/8" = 1'-0"

3 BALCONY CALCULATIONS

BLDG B - BALCONY ENCLOSURE:
OPENINGS: 7.5' (6) + 7' = 52'
PERIMETER OF THE BALCONY: 67.9' + 67.9' + 6' + 6' = 147.8'

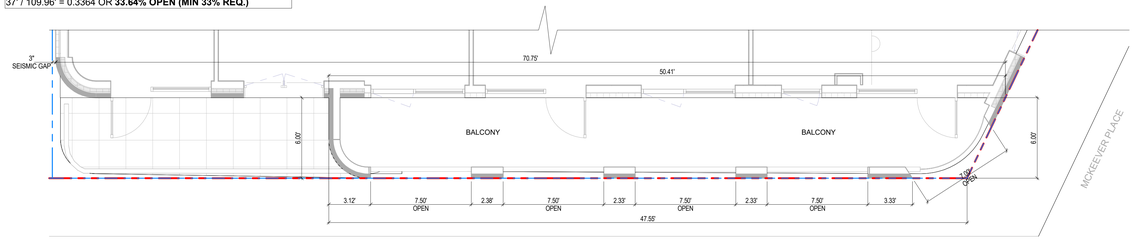
52' / 147.8' = 0.3518 OR **35.18% OPEN (MIN 33% REQ.)**



3.1 BLDG B - 3RD TO 7TH PARTIAL FLOOR PLAN
1/4" = 1'-0"

BLDG B - BALCONY ENCLOSURE:
OPENINGS: 7.5' (4) + + 7' = 37'
PERIMETER OF THE BALCONY: 47.55' + 50.41' + 6' + 6' = 109.96'

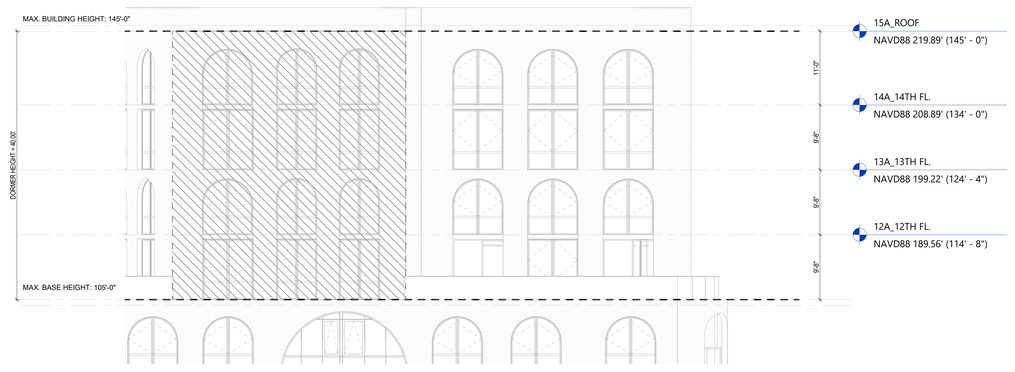
37' / 109.96' = 0.3364 OR **33.64% OPEN (MIN 33% REQ.)**

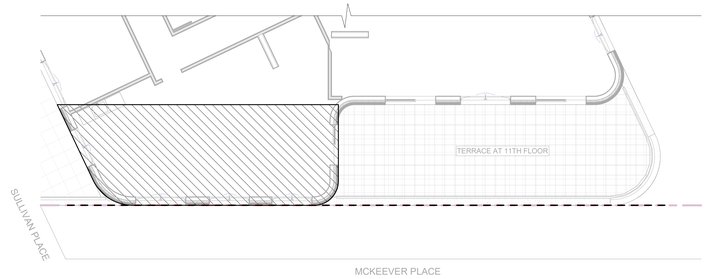


3.2 BLDG B - 8TH TO 10TH PARTIAL FLOOR PLAN
1/4" = 1'-0"

4 BLDG B - DORMER CALCULATIONS - MCKEEVER PLACE (WEST ELEVATION

1/8" = 1'-0"





SULLIVAN PLACE DORMER CALCULATION

STREET WALL WIDTH = 87'-0"
PERMITTED DORMER = 87'-0" x 40% = 34'-9 5/8"
PROPOSED DORMER = 34'-9"

4.1 BLDG B - 11TH FL. - PARTIAL PLAN
1/8" = 1'-0"

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING DIAGRAMS

Z-005B.00

Scale:	As indicated
Date:	12/1/2025 7:20:17 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG B - SUBCELLAR 2 GROSS FLOOR AREA
3/32" = 1'-0"

BLDG B - AREA - 00 SUBCELLAR 2 FLOOR	
Name	SF
BLDG B - SUB-CELLAR 2	11464.06 SF
	11464.06 SF

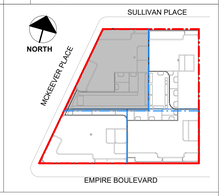
2 BLDG B - SUBCELLAR 1 GROSS FLOOR AREA
3/32" = 1'-0"

BLDG B - AREA - 00 SUBCELLAR 1 FLOOR	
Name	SF
BLDG B - SUB-CELLAR 1	11464.06 SF
	11464.06 SF

3 BLDG B - CELLAR GROSS FLOOR AREA
3/32" = 1'-0"

BLDG B - AREA - 00 CELLAR FLOOR	
Name	SF
BLDG B - CELLAR	11464.06 SF
	11464.06 SF

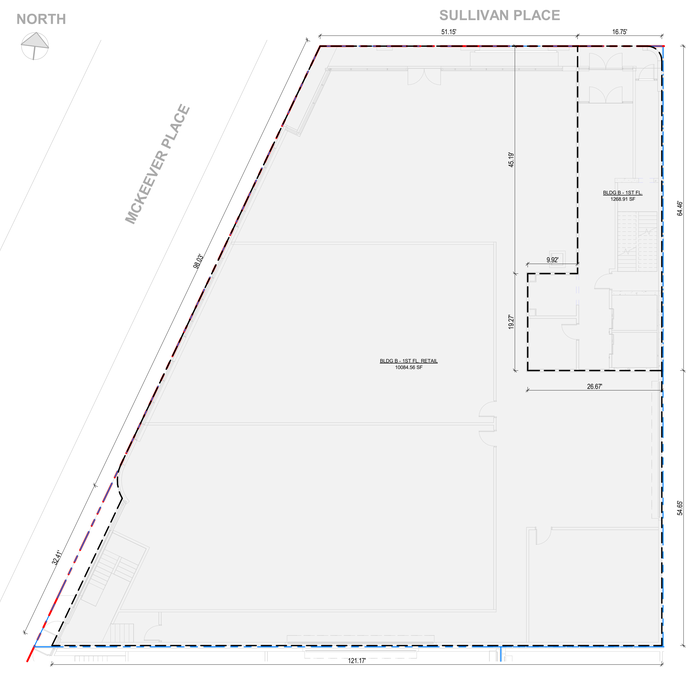
KEY PLAN
N.T.S.



4 BLDG B - 1ST FL. T.O.S LOBBY
3/32" = 1'-0"

BLDG B - AREA - 1ST FLOOR - RESIDENTIAL	
Name	SF
BLDG B - 1ST FL.	1268.91 SF
	1268.91 SF

BLDG B - AREA - 1ST FLOOR - RETAIL	
Name	SF
BLDG B - 1ST FL. RETAIL	10084.56 SF
	10084.56 SF



5 BLDG B - 2ND FL. GROSS FLOOR AREA
3/32" = 1'-0"

BLDG B - AREA - 2ND FLOOR	
Name	SF
BLDG B - 2ND FL.	6494.93 SF
	6494.93 SF

6 BLDG B - 3RD FL. GROSS FLOOR AREA
3/32" = 1'-0"

BLDG B - AREA - 3RD FLOOR	
Name	SF
BLDG B - 3RD - 10TH FL.	6488.46 SF
	6488.46 SF

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00	INITIAL SUBMISSION	12/01/2025

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DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

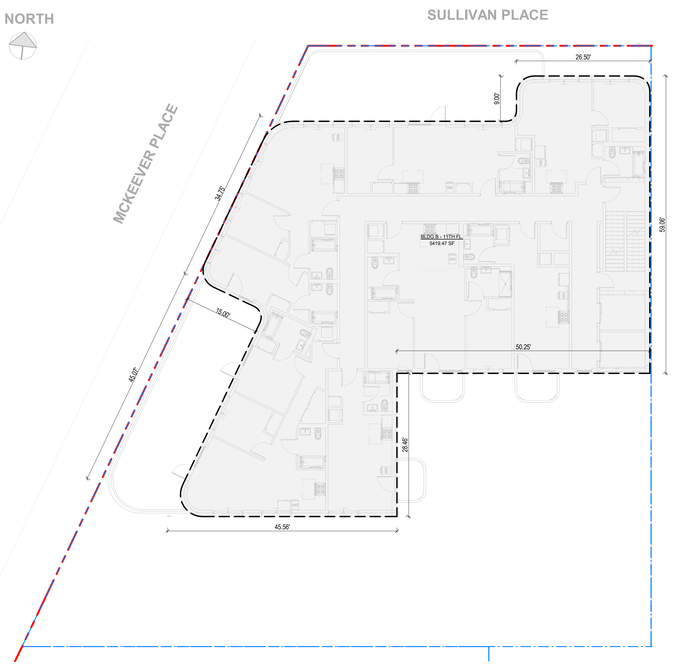
SHEET TITLE
GROSS FLOOR AREA DIAGRAMS

Z-010B.00

Scale:	As indicated
Date:	12/1/2025 7:20:35 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

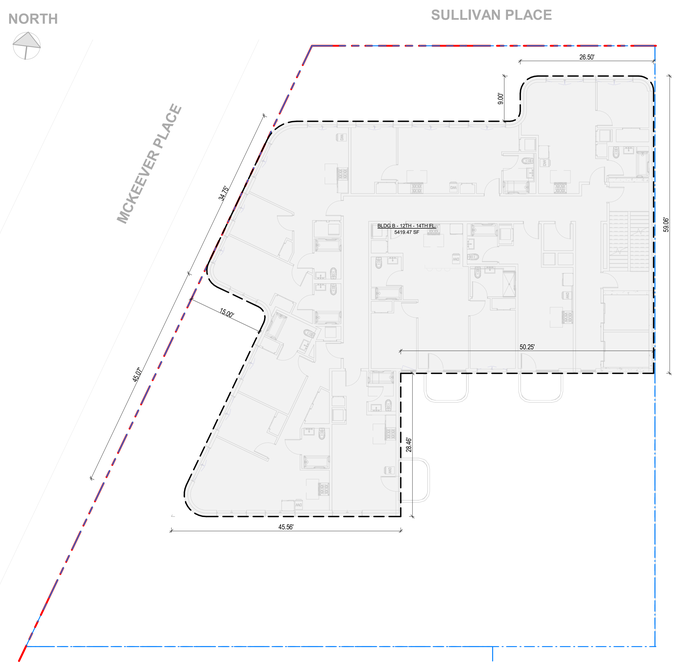
1 BLDG B - 11TH FL. GROSS FLOOR AREA DIAGRAM
3/32" = 1'-0"

BLDG B - AREA - 11TH FLOOR	
Name	SF
BLDG B - 11TH FL.	5419.47 SF
	5419.47 SF



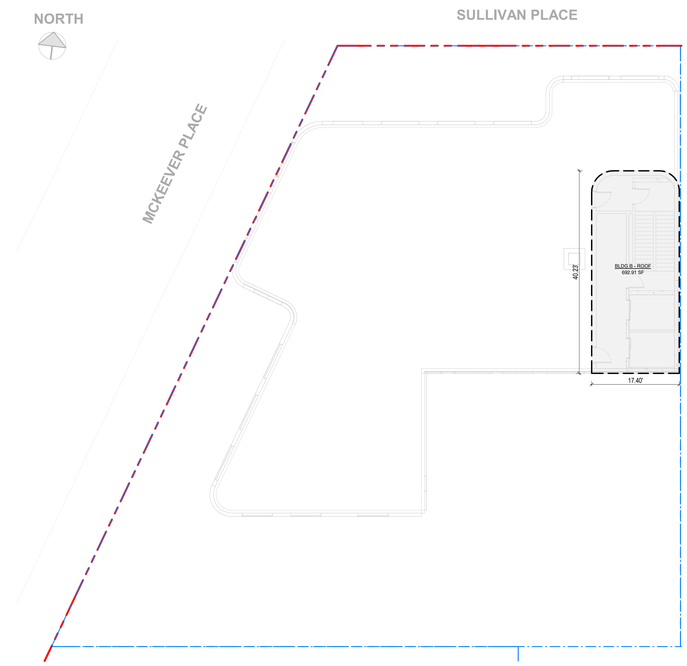
2 BLDG B - 12TH FL. GROSS FLOOR AREA DIAGRAM
3/32" = 1'-0"

BLDG B - AREA - 12TH FLOOR	
Name	SF
BLDG B - 12TH - 14TH FL.	5419.47 SF
	5419.47 SF

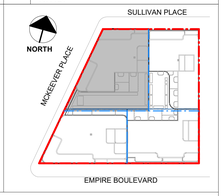


3 BLDG B - 15B_ROOF GROSS FLOOR AREA DIAGRAM
3/32" = 1'-0"

BLDG B - AREA - ROOF	
Name	SF
BLDG B - ROOF	692.91 SF
	692.91 SF



KEY PLAN
N.T.S.



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SHEET TITLE
GROSS FLOOR AREA DIAGRAMS

Z-011B.00

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Date:	12/1/2025 7:20:46 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG B - SUBCELLAR 2 FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 00_SUBCELLAR 2 -...	
DEDUCTION	TOTAL SF
CELLAR	11464.06 SF
Grand total	11464.06 SF

DEDUCTIONS LEGEND

CELLAR

2 BLDG B - SUBCELLAR 1 FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 00_SUBCELLAR 1 -...	
DEDUCTION	TOTAL SF
CELLAR	11464.06 SF
Grand total	11464.06 SF

DEDUCTIONS LEGEND

CELLAR

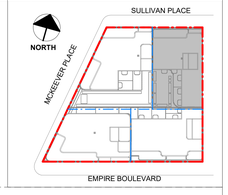
3 BLDG B - CELLAR FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 00_CELLAR - BLDG B	
DEDUCTION	TOTAL SF
CELLAR	11464.06 SF
Grand total	11464.06 SF

DEDUCTIONS LEGEND

CELLAR

KEY PLAN
N.T.S.



4 BLDG B - 1ST FLOOR DEDUCTION PLAN
3/32" = 1'-0"

DEDUCTIONS - 1ST FLOOR - BLDG B	
DEDUCTION	TOTAL SF
AMENITY	76.90 SF
AMENITY	95.15 SF
CORRIDOR DEDUCTION	114.66 SF
CORRIDOR DEDUCTION	136.35 SF
STAIRS	14.36 SF
STAIRS	14.36 SF
Grand total	451.78 SF

DEDUCTIONS LEGEND

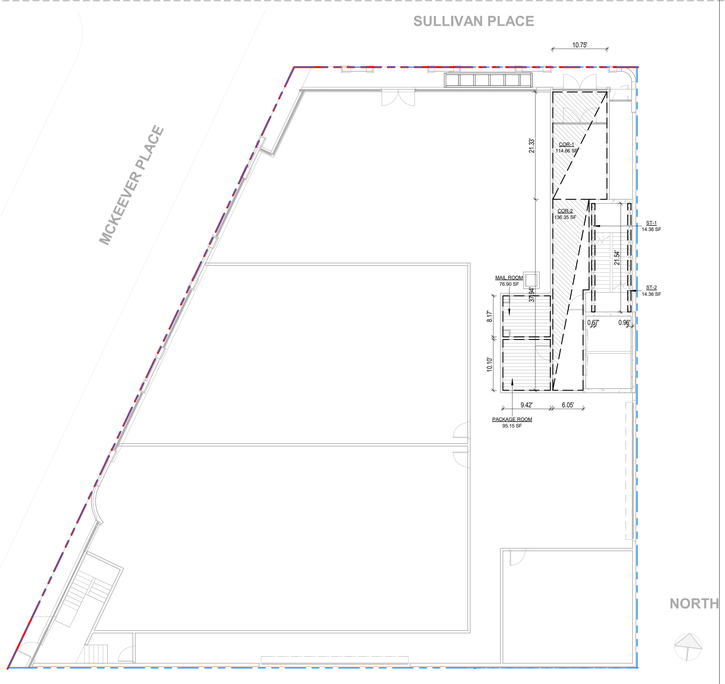
AMENITY

CORRIDOR DEDUCTION

STAIRS

50% Deduction

(b) Length of Corridor



5 BLDG B - 2ND FL. FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 2ND FLOOR - BLDG B	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	165.87 SF
CORRIDOR DEDUCTION	273.96 SF
CORRIDOR DEDUCTION	146.25 SF
REFUSE ROOM	24.00 SF
SHAFT	5.44 SF
SHAFT	7.39 SF
SHAFT	2.78 SF
SHAFT	1.69 SF

DEDUCTIONS - 2ND FLOOR - BLDG B	
DEDUCTION	TOTAL SF
SHAFT	4.58 SF
SHAFT	2.08 SF
SHAFT	10.63 SF
SHAFT	1.67 SF
SHAFT	2.08 SF
SHAFT	13.91 SF
SHAFT	7.96 SF
SHAFT	16.72 SF
SHAFT	12.17 SF
SHAFT	2.25 SF
SHAFT	2.50 SF
SHAFT	6.00 SF

DEDUCTIONS - 2ND FLOOR - BLDG B	
DEDUCTION	TOTAL SF
SHAFT	3.75 SF
SHAFT	1.74 SF
SHAFT	34.04 SF
SHAFT	16.61 SF
SHAFT	2.07 SF
SHAFT	15.02 SF
SHAFT	10.36 SF
STAIRS	14.36 SF
STAIRS	14.36 SF
Grand total	822.24 SF

DEDUCTIONS LEGEND

CORRIDOR DEDUCTION

REFUSE ROOM

SHAFT

STAIRS

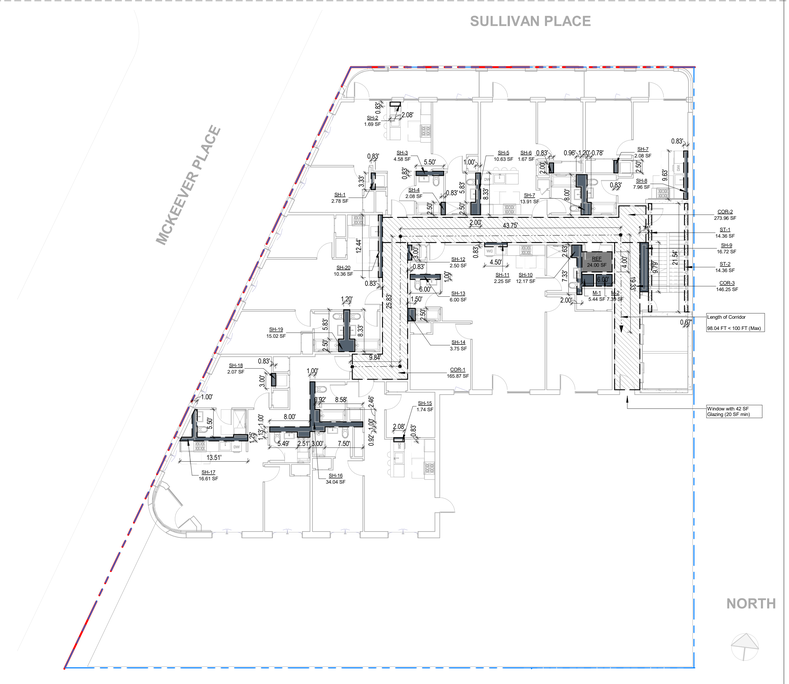
100% Deductions

a. Corridors Termination

(2) The corridor has daylighting through windows with a glazed area of at least 20 square feet, and such windows are located:

(i) Directly within the corridor;

b. Length of Corridor



6 BLDG B - 3RD - 10TH FL. FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 3RD FLOOR - BLDG B	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	165.87 SF
CORRIDOR DEDUCTION	273.96 SF
CORRIDOR DEDUCTION	146.25 SF
REFUSE ROOM	24.00 SF
SHAFT	5.44 SF
SHAFT	7.39 SF
SHAFT	2.78 SF
SHAFT	1.74 SF

DEDUCTIONS - 3RD FLOOR - BLDG B	
DEDUCTION	TOTAL SF
SHAFT	4.58 SF
SHAFT	2.08 SF
SHAFT	10.63 SF
SHAFT	1.67 SF
SHAFT	13.92 SF
SHAFT	2.08 SF
SHAFT	7.96 SF
SHAFT	16.72 SF
SHAFT	2.50 SF
SHAFT	4.17 SF
SHAFT	2.13 SF
SHAFT	23.40 SF
SHAFT	6.00 SF

DEDUCTIONS - 3RD FLOOR - BLDG B	
DEDUCTION	TOTAL SF
SHAFT	3.75 SF
SHAFT	1.74 SF
SHAFT	34.04 SF
SHAFT	16.61 SF
SHAFT	2.49 SF
SHAFT	15.02 SF
SHAFT	10.36 SF
STAIRS	14.36 SF
STAIRS	14.36 SF
Grand total	837.98 SF

DEDUCTIONS LEGEND

CORRIDOR DEDUCTION

REFUSE ROOM

SHAFT

STAIRS

100% Deductions

a. Corridors Termination

(2) The corridor has daylighting through windows with a glazed area of at least 20 square feet, and such windows are located:

(i) Directly within the corridor;

b. Length of Corridor

KAO-HWA LEE
ARCHITECTS P.C.

227 CATHERINE STREET
SOUTH AMBOY, NJ 08879
(609) 216 2975

CLIENT:
THE RABSKY GROUP
505 Flushing Ave
Brooklyn, NY 11205

Architect:
KHO-HWA LEE ARCHITECTS P.C.
227 Catherine Street
South Amboy, NJ 08879

Structure Engineer:
STRUCTURAL ENGINEERING TECHONOLOGIES P.C
40-12 28th Street
Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
FLOOR AREA DEDUCTIONS

Z-020B.00

Scale: As indicated
Date: 12/1/2025 7:20:59 PM
Drawn by:
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DOB JOB NUMBER:

1 BLDG B - 11TH FL. FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 11TH FLOOR - BLDG B	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	146.25 SF
CORRIDOR DEDUCTION	273.10 SF
CORRIDOR DEDUCTION	146.25 SF
MECHANICAL ROOM	5.44 SF
MECHANICAL ROOM	7.39 SF
REFUSE ROOM	24.00 SF

DEDUCTIONS - 11TH FLOOR - BLDG B	
DEDUCTION	TOTAL SF
SHAFT	2.27 SF
SHAFT	2.77 SF
SHAFT	3.74 SF
SHAFT	3.74 SF
SHAFT	14.54 SF
SHAFT	11.48 SF
SHAFT	16.94 SF
SHAFT	4.17 SF
SHAFT	2.13 SF

DEDUCTIONS - 11TH FLOOR - BLDG B	
DEDUCTION	TOTAL SF
SHAFT	24.08 SF
SHAFT	2.45 SF
SHAFT	6.36 SF
SHAFT	2.83 SF
SHAFT	1.25 SF
SHAFT	5.50 SF
SHAFT	3.74 SF
SHAFT	3.36 SF
SHAFT	2.40 SF
SHAFT	8.83 SF

DEDUCTIONS - 11TH FLOOR - BLDG B	
DEDUCTION	TOTAL SF
SHAFT	12.44 SF
SHAFT	6.00 SF
SHAFT	6.38 SF
STAIRS	14.36 SF
STAIRS	14.36 SF
Grand total	778.55 SF

DEDUCTIONS LEGEND

- CORRIDOR DEDUCTION
- MECHANICAL ROOM
- REFUSE ROOM
- SHAFT
- STAIRS

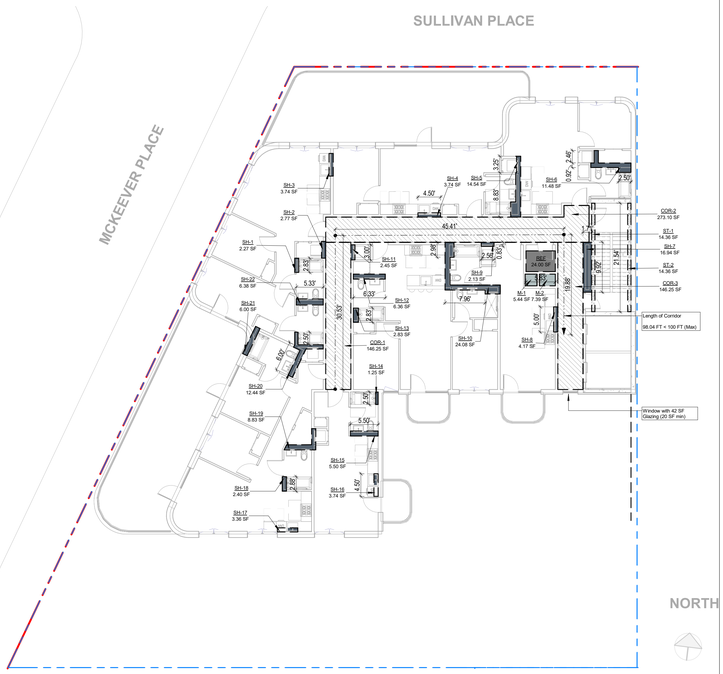
100% Deductions

a. Corridors Termination

(2) The corridor has daylighting through windows with a glazed area of at least 20 square feet, and such windows are located:

(i) Directly within the corridor;

b. Length of Corridor



2 BLDG B - 12TH - 14TH FL. FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 12TH FLOOR - BLDG B	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	146.25 SF
CORRIDOR DEDUCTION	273.10 SF
CORRIDOR DEDUCTION	146.25 SF
MECHANICAL ROOM	5.44 SF
MECHANICAL ROOM	7.39 SF
REFUSE ROOM	24.00 SF

DEDUCTIONS - 12TH FLOOR - BLDG B	
DEDUCTION	TOTAL SF
SHAFT	2.27 SF
SHAFT	2.77 SF
SHAFT	3.74 SF
SHAFT	3.74 SF
SHAFT	14.54 SF
SHAFT	11.48 SF
SHAFT	16.94 SF
SHAFT	2.13 SF

DEDUCTIONS - 12TH FLOOR - BLDG B	
DEDUCTION	TOTAL SF
SHAFT	4.17 SF
SHAFT	24.08 SF
SHAFT	2.45 SF
SHAFT	6.36 SF
SHAFT	2.83 SF
SHAFT	1.25 SF
SHAFT	5.50 SF
SHAFT	3.74 SF
SHAFT	3.36 SF

DEDUCTIONS - 12TH FLOOR - BLDG B	
DEDUCTION	TOTAL SF
SHAFT	2.40 SF
SHAFT	8.83 SF
SHAFT	12.44 SF
SHAFT	6.00 SF
SHAFT	6.38 SF
STAIRS	14.36 SF
STAIRS	14.36 SF
Grand total	778.55 SF

DEDUCTIONS LEGEND

- CORRIDOR DEDUCTION
- MECHANICAL ROOM
- REFUSE ROOM
- SHAFT
- STAIRS

100% Deductions

a. Corridors Termination

(2) The corridor has daylighting through windows with a glazed area of at least 20 square feet, and such windows are located:

(i) Directly within the corridor;

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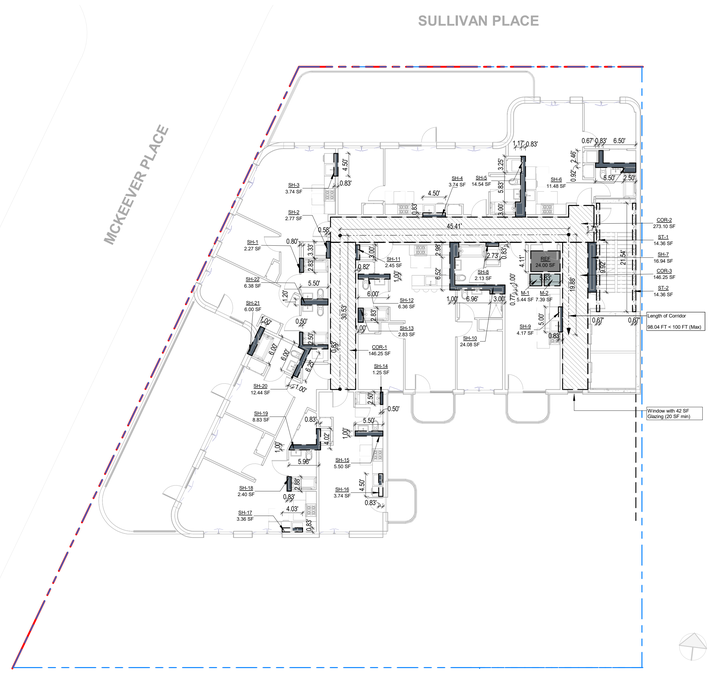
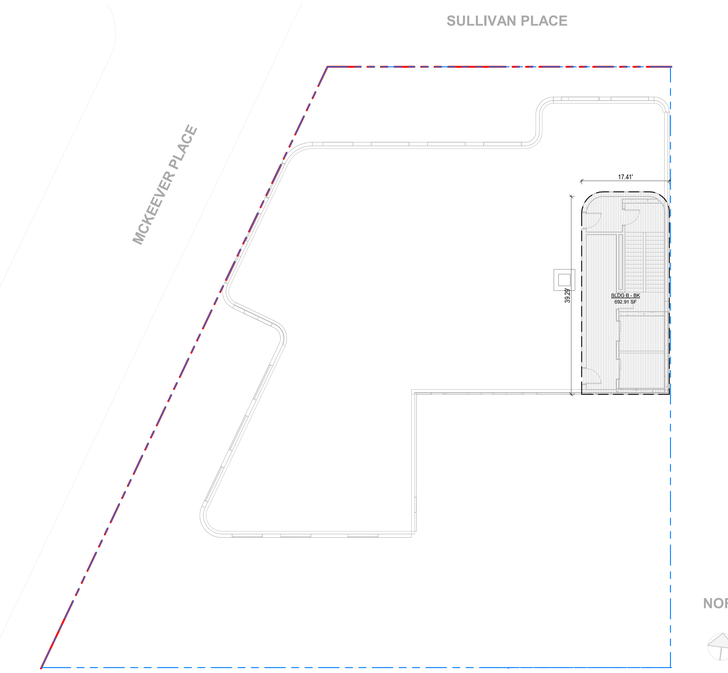


3 BLDG B - 15B_ROOF FLOOR AREA DEDUCTION
3/32" = 1'-0"

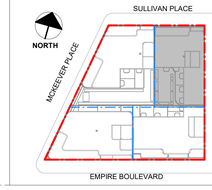
DEDUCTIONS - ROOF - BLDG B	
DEDUCTION	TOTAL SF
BULKHEAD	692.91 SF
Grand total	692.91 SF

DEDUCTIONS LEGEND

- BULKHEAD



KEY PLAN
N.T.S.



BUILDING B_ TOTAL DEDUCTION BY CODE CATEGORY	
DEDUCTION	TOTAL SF
	0.00 SF
AMENITY	172.05 SF
BULKHEAD	692.91 SF
CELLAR	34392.18 SF
CORRIDOR DEDUCTION	7788.06 SF
MECHANICAL ROOM	141.17 SF
REFUSE ROOM	455.62 SF
SHAFT	2276.71 SF
STAIRS	258.50 SF
Grand total	46177.19 SF

BUILDING B _ DEDUCTION PER ZR 12-10	
DEDUCTION	TOTAL SF
BULKHEAD	692.91 SF
CELLAR	34392.18 SF
MECHANICAL ROOM	141.17 SF
SHAFT	2276.71 SF
STAIRS	258.50 SF
Grand total	37761.47 SF

BUILDING B _ DEDUCTION PER ZR 23-23	
DEDUCTION	TOTAL SF
AMENITY	172.05 SF
CORRIDOR DEDUCTION	7788.06 SF
REFUSE ROOM	455.62 SF
Grand total	8415.72 SF

BUILDING B _ ZFA AFTER ZR 12-10 DEDUCTIONS	
RESIDENTIAL GFA	116,434.51 SF
ZR 12-10 DEDUCTONS	37,761.47 SF
116,434.51 - 37,761.47	78,673.04 SF

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Brooklyn, NY 11225

SHEET TITLE
FLOOR AREA DEDUCTIONS

Z-021B.00

Scale:	As indicated
Date:	12/1/2025 7:21:12 PM
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DOB JOB NUMBER:	

ABBREVIATIONS

A – ARCHITECTURAL
AD – ADDITION
AL – ALUMINUM
AP – ACCESS PANEL
AT – ATTIC
AV – AIR VENT
B – BUILDING
BM – BENCH MARK
BP – BUILDING PAPER
C – CONCRETE
CA – CEILING ASSEMBLY
CB – CATCH BASIN
CD – CORRIDOR DOOR
CL – CENTER LINE
CMU – CONCRETE MASONRY UNIT
CO – CLEANOUT
CP – COLUMN PIPE
CR – CORNER
CS – COLD STORAGE
CT – CERAMIC TILE
D – DOOR
DB – DOOR BUCK
DF – DIFFUSER
DG – DRAINAGE
DL – DEAD LOAD
DN – DOWNSPOUT
DP – DOWNSPOUT
DR – DRIVEWAY
DW – DOWNSPOUT
E – ELECTRICAL
EC – ELECTRICAL CABINET
ED – EMERGENCY DOOR
EL – ELEVATION
EM – EXPANSION JOINT
EN – ENTRANCE
EP – EDGE PROTECTION
ER – EMERGENCY EXIT
ES – EXIT SIGN
ET – EGRESS
EV – EXHAUST VENT
F – FIXTURE
FA – FIRE ALARM
FB – FIRE BLANKET
FC – FLOOR COVERING
FD – FLOOR DRAIN
FE – FIRE EXTINGUISHER
FF – FINISH FLOOR
FG – FIBER GLASS
FH – FIRE HOSE
FL – FINISH LINE
FM – FIRE MARSHAL
FP – FLOOR PLAN
FS – FLOOR SYSTEM
FT – FLOOR TILE
FV – FLOOR VENT
G – GLAZING
GA – GLAZING ASSEMBLY
GB – GAS BOILER
GC – GENERAL CONTRACTOR
GD – GROUND DRAIN
GF – GRADED FILL
GG – GLASS GUARD
GH – GUARDRAIL
GI – GALVANIZED IRON
GL – GLASS
GM – GUTTER
GP – GROUND PLAN
GR – GRILLE
GS – GLASS SYSTEM
GT – GUTTER
H – HVAC
HA – HEATING AIR
HB – HEAT BARRIER
HC – HEATING COIL
HD – HEAVY DUTY
HE – HEAT EXCHANGER
HF – HIGH FINISH
HG – HEAT GRID
HI – HIGH INTENSITY
HL – HEADER
HM – HEAT MAT
HP – HIGH PRESSURE
HR – HEAT RECOVERY
HS – HEAT SHIELD
HT – HIGH TEMP
I – INTERIOR
IA – INTERIOR ASSEMBLY
IB – INSULATED BOARD
IC – INTERIOR COLUMN
ID – INTERIOR DOOR
IE – INTERIOR ELEVATION
IF – INSULATED FRAME
IG – INTERIOR GLAZING
IH – INSULATION HOLDER
II – INSULATED INTERIOR
IJ – INSULATED JOINT
IL – INTERIOR LIGHTING
IM – INTERIOR METAL
IN – INTERIOR NETTING
IO – INPUT OUTLET
IP – INTERIOR PANEL
IR – INSULATED ROOF
IS – INTERIOR STAIRS
IT – INSULATED TILE
J – JUNCTION
JA – JOINT ASSEMBLY
JB – JUNCTION BOX
JC – JOINT CONNECTION
JD – JOINT DETAIL
JE – JOINT EDGE
JF – JOINT FILLER
JG – JOINT GAP
JH – JOINT HOLDER
JI – JOINT INSULATION
JJ – JOINT JAMB
JK – JOINT KIT
JL – JOINT LINE
JM – JOINT MATERIAL
JN – JOINT NAILING
JO – JOINT OPENING
JP – JOINT PANEL
JR – JOINT REPAIR
JS – JOINT SEALANT
JT – JOINT TREATMENT
K – KITCHEN
KA – KITCHEN ASSEMBLY
KB – KITCHEN CABINET
KC – KITCHEN COUNTER
KD – KITCHEN DOOR
KE – KITCHEN EQUIPMENT
KF – KITCHEN FLOOR
KG – KITCHEN GRID
KH – KITCHEN HOOD
KI – KITCHEN ISLAND
KK – KITCHEN KIT
KL – KITCHEN LAYOUT
KM – KITCHEN MONITOR
KN – KITCHEN NOOK
KO – KITCHEN OUTLET
KP – KITCHEN PANEL
KR – KITCHEN RAIL
KS – KITCHEN SINKKT – KITCHEN TILE
L – LIGHTING
LA – LIGHTING ASSEMBLY
LB – LIGHTING BRACKET
LC – LIGHTING CONTROL
LD – LIGHTING DESIGN
LE – LIGHTING ELEVATION
LF – LIGHTING FIXTURE
LG – LIGHTING GRID
LH – LIGHTING HOLDER
LI – LIGHTING INSTALLATION
LJ – LIGHTING JUNCTION
LK – LIGHTING KIT
LL – LIGHTING LAYOUT
LM – LIGHTING MOUNT
LN – LIGHTING NICHE
LO – LIGHTING OUTLET
LP – LIGHTING PANEL
LQ – LIGHTING QUALITY
LR – LIGHTING RECESS
LS – LIGHTING SWITCH
LT – LIGHTING TYPE
M – MECHANICAL
MA – MECHANICAL ASSEMBLY
MB – MECHANICAL BOX
MC – MECHANICAL CONNECTION
MD – MECHANICAL DUCT
ME – MECHANICAL EQUIPMENT
MF – MECHANICAL FITTING
MG – MECHANICAL GRID
MH – MECHANICAL HEAT
MI – MECHANICAL INSULATION
MJ – MECHANICAL JUNCTION
MK – MECHANICAL KIT
ML – MECHANICAL LAYOUT
MM – MECHANICAL MOUNT
MN – MECHANICAL NOISE
MO – MECHANICAL OUTLET
MP – MECHANICAL PANEL
MQ – MECHANICAL QUALITY
MR – MECHANICAL RECESS
MS – MECHANICAL SUPPORT
MT – MECHANICAL TYPE
N – NORTH
NA – NORTH ARROW
NB – NORTH BOUND
NC – NORTH CORNER
NE – NORTH ELEVATION
NF – NORTH FACING
NG – NORTH GRID
NH – NORTH HEADING
NI – NORTH INDEX
NJ – NORTH JUNCTION
NK – NORTH KIT
NL – NORTH LINE
NM – NORTH MARK
NN – NORTH NODE
NO – NORTH ORIENTATION
NP – NORTH PLAN
NQ – NORTH QUALITY
NR – NORTH REFERENCE
NS – NORTH SIDE
NT – NORTH TILE
O – OPENING
OA – OPENING ASSEMBLY
OB – OPENING BRACKET
OC – OPENING CONNECTION
OD – OPENING DETAIL
OE – OPENING EDGE
OF – OPENING FRAME
OG – OPENING GLASS
OH – OPENING HEIGHT
OI – OPENING INSULATION
OJ – OPENING JOINT
OK – OPENING KIT
OL – OPENING LAYOUT
OM – OPENING MATERIAL
ON – OPENING NICHE
OP – OPENING PANEL
OQ – OPENING QUALITY
OR – OPENING REVEAL
OS – OPENING SIZE
OT – OPENING TYPE
P – PLAN
PA – PLAN ASSEMBLY
PB – PLAN BLOCK
PC – PLAN CONNECTION
PD – PLAN DETAIL
PE – PLAN ELEVATION
PF – PLAN FIXTURE
PG – PLAN GRID
PH – PLAN HEIGHT
PI – PLAN INDEX
PJ – PLAN JUNCTION
PK – PLAN KIT
PL – PLAN LAYOUT
PM – PLAN MARK
PN – PLAN NODE
PO – PLAN ORIENTATION
PP – PLAN PANEL
PQ – PLAN QUALITY
PR – PLAN REFERENCE
PS – PLAN SCALE
PT – PLAN TYPE
Q – QUANTITY
QA – QUANTITY ASSEMBLY
QB – QUANTITY BLOCK
QC – QUANTITY CONTROL
QD – QUANTITY DETAIL
QE – QUANTITY ESTIMATE
QF – QUANTITY FINISH
QG – QUANTITY GRID
QH – QUANTITY HEIGHT
QI – QUANTITY INPUT
QJ – QUANTITY JUNCTION
QK – QUANTITY KIT
QL – QUANTITY LINE
QM – QUANTITY MATERIAL
QN – QUANTITY NODE
QO – QUANTITY OUTPUT
QP – QUANTITY PANEL
QR – QUANTITY REFERENCE
QS – QUANTITY SCALE
QT – QUANTITY TREATMENT
R – ROOF
RA – ROOF ASSEMBLY
RB – ROOF BEAM
RC – ROOF CONNECTION
RD – ROOF DETAIL
RE – ROOF EDGE
RF – ROOF FINISH
RG – ROOF GRID
RH – ROOF HEIGHT
RI – ROOF INSULATION
RJ – ROOF JOINT
RK – ROOF KIT
RL – ROOF LINE
RM – ROOF MATERIAL
RN – ROOF NICHE
RO – ROOF OPENING
RP – ROOF PANEL
RQ – ROOF QUALITY
RR – ROOF REVEAL
RS – ROOF SLOPE
RT – ROOF TREATMENT
S – STRUCTURAL
SA – STRUCTURAL ASSEMBLY
SB – STRUCTURAL BEAM
SC – STRUCTURAL CONNECTION
SD – STRUCTURAL DETAIL
SE – STRUCTURAL EDGE
SF – STRUCTURAL FINISH
SG – STRUCTURAL GRID
SH – STRUCTURAL HEIGHT
SI – STRUCTURAL INSULATION
SJ – STRUCTURAL JOINT
SK – STRUCTURAL KIT
SL – STRUCTURAL LINE
SM – STRUCTURAL MATERIAL
SN – STRUCTURAL NODE
SO – STRUCTURAL OPENING
SP – STRUCTURAL PANEL
SQ – STRUCTURAL QUALITY
SR – STRUCTURAL REVEAL
SS – STRUCTURAL SUPPORT
ST – STRUCTURAL TYPE
T – TILE
TA – TILE ASSEMBLY
TB – TILE BLOCK
TC – TILE CONNECTION
TD – TILE DETAIL
TE – TILE EDGE
TF – TILE FINISH
TG – TILE GRID
TH – TILE HEIGHT
TI – TILE INSULATION
TJ – TILE JOINT
TK – TILE KIT
TL – TILE LINE
TM – TILE MATERIAL
TN – TILE NICHE
TO – TILE OPENING
TP – TILE PANEL
TQ – TILE QUALITY
TR – TILE REVEAL
TS – TILE SIZE
TT – TILE TREATMENT
U – UTILITY
UA – UTILITY ASSEMBLY
UB – UTILITY BOX
UC – UTILITY CONNECTION
UD – UTILITY DETAIL
UE – UTILITY EDGE
UF – UTILITY FIXTURE
UG – UTILITY GRID
UH – UTILITY HEIGHT
UI – UTILITY INSULATION
UJ – UTILITY JOINT
UK – UTILITY KIT
UL – UTILITY LAYOUT
UM – UTILITY MATERIAL
UN – UTILITY NODE
UO – UTILITY OUTLET
UP – UTILITY PANEL
UQ – UTILITY QUALITY
UR – UTILITY REFERENCE
US – UTILITY SIZE
UT – UTILITY TYPE
V – VENTILATION
VA – VENTILATION ASSEMBLY
VB – VENTILATION BOX
VC – VENTILATION CONNECTION
VD – VENTILATION DUCT
VE – VENTILATION EQUIPMENT
VF – VENTILATION FIXTURE
VG – VENTILATION GRID
VH – VENTILATION HEIGHT
VI – VENTILATION INSULATION
VJ – VENTILATION JOINT
VK – VENTILATION KIT
VL – VENTILATION LINE
VM – VENTILATION MATERIAL
VN – VENTILATION NICHE
VO – VENTILATION OUTLET
VP – VENTILATION PANEL
VQ – VENTILATION QUALITY
VR – VENTILATION REVEAL
VS – VENTILATION SIZE
VT – VENTILATION TYPE
W – WALL
WA – WALL ASSEMBLY
WB – WALL BRACE
WC – WALL CONNECTION
WD – WALL DETAIL
WE – WALL EDGE
WF – WALL FINISH
WG – WALL GRID
WH – WALL HEIGHT
WI – WALL INSULATION
WJ – WALL JOINT
WK – WALL KIT
WL – WALL LINE
WM – WALL MATERIAL
WN – WALL NICHE
WO – WALL OPENING
WP – WALL PANEL
WQ – WALL QUALITY
WR – WALL REVEAL
WS – WALL SUPPORT
WT – WALL TYPE
X – SECTION
XA – SECTION ASSEMBLY
XB – SECTION BLOCK
XC – SECTION CONNECTION
XD – SECTION DETAIL
XE – SECTION EDGE
XF – SECTION FINISH
XG – SECTION GRID
XH – SECTION HEIGHT
XI – SECTION INSULATION
XJ – SECTION JOINT
XK – SECTION KIT
XL – SECTION LAYOUT
XM – SECTION MATERIAL
XN – SECTION NODE
XO – SECTION OPENING
XP – SECTION PANEL
XQ – SECTION QUALITY
XR – SECTION REVEAL
XS – SECTION SUPPORT
XT – SECTION TYPE
Y – YARD
YA – YARD ASSEMBLY
YB – YARD BLOCK
YC – YARD CONNECTION
YD – YARD DRAIN
YE – YARD EDGE
YF – YARD FIXTURE
YG – YARD GRID
YH – YARD HEIGHT
YI – YARD INSULATION
YJ – YARD JOINT
YK – YARD KIT
YL – YARD LAYOUT
YM – YARD MATERIAL
YN – YARD NODE
YO – YARD OPENING
YP – YARD PANEL
YQ – YARD QUALITY
YR – YARD REVEAL
YS – YARD SUPPORT
YT – YARD TYPE
Z – ZONE
ZA – ZONE ASSEMBLY
ZB – ZONE BLOCK
ZC – ZONE CONNECTION
ZD – ZONE DETAIL
ZE – ZONE EDGE
ZF – ZONE FINISH
ZG – ZONE GRID
ZH – ZONE HEIGHT
ZI – ZONE INSULATION
ZJ – ZONE JOINT
ZK – ZONE KIT
ZL – ZONE LAYOUT
ZM – ZONE MATERIAL
ZN – ZONE NODE
ZO – ZONE OPENING
ZP – ZONE PANEL
ZQ – ZONE QUALITY
ZR – ZONE REVEAL
ZS – ZONE SUPPORT
ZT – ZONE TYPE

LEGENDS AND SYMBOLS

GENERAL PLAN LEGEND

TAGS

- WALL TAG
- DOOR TAG
- WINDOW TAG
- SECTION TAG
- EXTERIOR ELEVATION TAG
- INTERIOR ELEVATION TAG
- CALLOUT TAG

WALLS, PARTITIONS & SHAFT ENCLOSURES

- CONCRETE WALL
- RATED PARTITION
- NON-RATED PARTITION
- RATED SHAFT ENCLOSURE
- EXT. BRICK WALL
- EXT. EIFS WALL
- BREEZE-BLOCK
- CMU WALL

SYMBOLS

- EXIT SIGN
- FD – FLOOR DRAIN
- RD – ROOF DRAIN
- AD – AREA DRAIN
- MV – MECHANICAL VENT
- SLAB DROP
- 0.00 – SPOT ELEVATION

HATCHES

- PLANTING AS SPECIFIED
- CONCRETE PAVERS

SPECIAL INSPECTIONS

SPECIAL INSPECTIONS CATEGORIES
TR-1 ARCHITECTURAL SPECIAL INSPECTIONS

SPECIAL INSPECTIONS	Code Section 2014 BC	Code Section 2022 BC
STRUCTURAL STEEL - WELDING	BC 1704.3.1	BC 1705.2.1
STRUCTURAL STEEL - DETAILS	BC 1704.3.2	BC 1705.2.2
STRUCTURAL STEEL - HIGH STRENGTH BOLTING	BC 1704.3.3	BC 1705.2.3
STRUCTURAL COLD - FORMED STEEL	BC 1704.3.4	BC 1705.2.6
OPEN-WEB STEEL JOISTS AND JOISTS GIRDERS	N/A	BC 1705.2.7
CONCRETE - CAST-IN-PLACE	BC 1704.4	BC 1705.3
CONCRETE - PRECAST	BC 1704.4	BC 1705.3
CONCRETE - PRESTRESSED	BC 1704.4	BC 1705.3
MASONRY	BC 1704.5	BC 1705.4
WOOD - INSTALLATION OF HIGH-LOAD DIAPHRAGMS	BC 1704.6.1	BC 1705.5.1
WOOD - INSTALLATION OF METAL-PLATE-CONNECTED TRUSSES	BC 1704.6.2	BC 1705.5.2
WOOD - INSTALLATION OF PREFABRICATED I-JOISTS	BC 1704.6.3	BC 1705.5.3
WOOD - SEISMIC RESISTANCE	N/A	BC 1705.5.5
CONSTRUCTION UTILIZING CLT OR SCL, TYPE IV	N/A	BC 1705.5.6
SUBGRADE INSPECTION	BC 1704.7.1	BC 1705.6
SUBSURFACE CONDITIONS - FILL PLACEMENT & IN-PLACE DENSITY	BC 1704.7.2 / 3	BC 1705.6
SUBSURFACE INVESTIGATIONS (BORINGS / TEST PITS)	BC 1704.7.4	BC 1705.6
DEEP FOUNDATION ELEMENTS	BC 1704.7.8	BC 1705.7
PRESTRESSED ROCK AND SOIL ANCHORS...	N/A	BC 1705.8.1
HELICAL PILES (BB # 2014-020)	BC 1704.8.5	BC 1705.9
VERTICAL MASONRY FOUNDATION ELEMENTS	BC 1704.9	BC 1705.19
WALL PANELS, CURTAIN WALLS, AND VENEERS	BC 1704.10	BC 1705.20
DESIGNATED SEISMIC SYSTEM	N/A	BC 1705.12.1
SEISMIC RESISTANCE OF ACCESS FLOORS	N/A	BC 1705.12.2
SEISMIC RESISTANCE OF PLUMBING, MECHANICAL, FUEL GAS & ELECTRICAL COMPONENTS	N/A	BC 1705.12.3
SEISMIC RESISTANCE OF STORAGE RACKS	N/A	BC 1705.12.4
SPRAYED FIRE-RESISTANT MATERIALS	BC 1704.11	BC 1705.14
MASTIC AND INTUMESCENT FIRE-RESISTANT COATINGS	BC 1704.12	BC 1705.15
EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS)	BC 1704.13	DELETED
ALTERNATIVE MATERIALS - OTCR BUILDINGS BULLETIN # _________	BC 1704.14	BC 1705.1.1
COMBUSTIBLE EXTERIOR WALL COVERINGS	N/A	BC 1705.16
SMOKE CONTROL SYSTEMS TESTING	BC 1704.15	BC 1705.18
MECHANICAL SYSTEMS	BC 1704.16	BC 1705.21
FUEL-OIL STORAGE AND FUEL-OIL PIPING SYSTEMS	BC 1704.17	BC 1705.22
HIGH-PRESSURE STEAM PIPING (WELDING)	BC 1704.18	BC 1705.23
HIGH TEMPERATURE HOT WATER PIPING (WELDING)	BC 1704.18	BC 1705.23
HIGH-PRESSURE FUEL-GAS PIPING (WELDING)	BC 1704.19	BC 1705.24
STRUCTURAL STABILITY - ALTERATIONS OF EXISTING BUILDINGS	BC 1704.20.1	BC 1705.25.1
CONSTRUCTION OPERATIONS INFLUENCING ADJACENT STRUCTURES	N/A	BC 1705.25.2
EXCAVATIONS - SHEETING, SHORING, AND BRACING...	BC 1704.20.2	BC 1705.25.3
UNDERPINNING AND ALTERNATE METHODS OF SUPPORT OF BUILDINGS AND & BC1817 ADJACENT...	N/A	BC 1705.25.4
UNDERPINNING	BC 1704.20.3 & BC 1814	DELETED
MECHANICAL DEMOLITION	BC 1704.20.4	BC 1705.25.5.1
RAISING AND MOVING OF A BUILDING	BC 1704.20.5	BC 1705.25.6
TENANT PROTECTION PLAN COMPLIANCE	N/A	BC 1705.26
SOIL PERCOLATION TEST - PRIVATE ON-SITE STORM WATER DRAINAGE DISPOSAL SYSTEMS, AND DETENTION FACILITIES	BC 1704.21.1.2	BC 1705.27.1.2
PRIVATE ON-SITE STORM WATER DRAINAGE DISPOSAL SYSTEMS, AND DETENTION FACILITIES INSTALLATION	BC 1704.21.2	BC 1705.27.2
INDIVIDUAL ON-SITE PRIVATE SEWAGE DISPOSAL SYSTEMS INSTALLATION	BC 1704.22	BC 1705.28
SPRINKLER SYSTEMS	BC 1704.23	BC 1705.29
STANDPIPE SYSTEMS	BC 1704.24	BC 1705.30
HEATING SYSTEMS	BC 1704.25	BC 1705.31
CHIMNEYS AND VENTS	BC 1704.26	BC 1705.32
FIRE-RESISTANT PENETRATIONS AND JOINTS	BC 1704.27	BC 1705.17
ALUMINUM WELDING	BC 1704.28	BC 1705.33
FLOOD ZONE COMPLIANCE (ATTACH FEMA ELEVATION / DRY FLOODPROOFING CERTIFICATE WHERE APPLICABLE)	BC 1704.29 & BC G105	BC 1705.34 & BC G107.2
LUMINOUS EGRESS PATH MARKINGS	BC 1704.30 & BC 1024.8	BC 1705.35 & BC 10.25.8
EMERGENCY AND STANDBY POWER SYSTEMS (GENERATORS)	BC 1704.31	BC 1705.36
POST-INSTALLED ANCHORS (BB#2014-018, 2014-019)	BC 1704.32	BC 1705.37
NON POTABLE WATER SYSTEMS	N/A	BC 1705.38
EXHAUST AND VENT SYSTEMS IN PLENUMS AND DUCTS	N/A	BC 1705.39
SEISMIC ISOLATION SYSTEMS	BC 1707.8	BC 1705.12.5
CONCRETE DESIGN MIX	BC 1905.3 & BC 1913.5	BC 1905.3
CONCRETE SAMPLING AND TESTING	BC 1905.6 & BC 1913.10	BC 1905.6
Progress Inspection Categories	**Code Section**	
PRELIMINARY	28-116.2.1 & BC 110.2	28-116.2.1 & BC 110.2
FOOTING AND FOUNDATION	BC 110.3.1	BC 110.3.1
LOWEST FLOOR ELEVATION	BC 110.3.2	BC 110.3.2
STRUCTURAL WOOD FRAME	BC 110.3.3	BC 110.3.3
FIRE-RESISTANCE RATED CONSTRUCTION	BC 110.3.4	BC 110.3.5
ENERGY CODE COMPLIANCE INSPECTIONS (TR8)	BC 110.3.5	BC 110.3.4
PUBLIC ASSEMBLY EMERGENCY LIGHTING	28-116.2.2	28-116.2.2
FINAL (TR1)	28-116.2.4.2 & BC 110.5	28-114 / 116 & BC 110.5

TR-8 ENERGY CODE PROGRESS INSPECTIONS

The conditional* TR8s listed below are conditional only if the job type is New Building or Alteration-CO New Building with Existing Elements to Remain, except HVAC TR8s that apply to all job types.

Progress Inspections	Table Reference in 1RCNY §5000-01(h) (1)and (2)	Work Type(s)
Air sealing and insulation — testing	(IA7), (IIA7)	GC* (Residential)
Air barrier — visual inspection	(IA6), (IIA6)	AN, SG, GC*, SL**, GR**
Air barrier continuity plan testing	(IIA8)	GC
Electrical motors	(IIC7), (IIC6)	GC, MS
Exterior lighting power	(IIC4)	SG, GC, MS
Fenestration air leakage	(IA4), (IIA4)	GC*
Fenestration and door U-factor and product ratings	(IA3), (IIA3)	GC*
Fenestration areas	(IA5), (IIA5)	GC*
Fireplaces	(IB1), (IIB1)	GC, MS
HVAC-R and service water piping design and insulation	(IB5), (IIB5)	PL, GC, MS, BE*
Insulation placement and R values	(IA2), (IIA2)	SG, GC*, FO, GR
Interior lighting power	(IC2), (IIC3)	GC, MS
Lighting controls	(IIC5)	SG, GC, MS
Lighting in dwelling units	(IIC2)	GC, MS
Maintenance information	(ID1), (IID1)	PL, GC, MS, BE, SL, GR**
Metering	(IC1), (IIC1)	PL, GC, MS
Permanent certificate	(ID2)	PL, GC* (Residential), MS, BE
Protection of exposed foundation insulation	(IA1), (IIA1)	GC, FO
Solar Ready Requirements	(ID3)	GC
Ventilation and air distribution system	(IB2)	MS* (Residential), GC
Vestibules	(IIA9)	GC

FIRE-RESISTANCE-RATED CONSTRUCTION

1. FIRE WALLS, FLOORS, BARRIERS, PARTITIONS, AND SHAFT ENCLOSURES SHALL COMPLY WITH PROVISIONS OF CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODEAND SHALL BE CONTINUOUS THROUGH ANY CONCEALED SPACE IN FLOOR OR ROOF CONSTRUCTION, UNLESS OTHERWISE EXEMPTED BY BC.
2. OPENINGS IN FIRE WALLS, FLOORS, BARRIERS, PARTITIONS, AND SHAFT ENCLOSURES TO COMPLY WITH CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODE.
3. PENETRATIONS IN FIRE WALLS, FLOORS, BARRIERS, PARTITIONS, AND SHAFT ENCLOSURES FOR PIPE SLEEVES, ELECTRIC DEVICES, ETC., SHALL BE PROVIDED WITH UL APPROVED FIRE SAFING MATERIALS TO MEET OR EXCEED THE FIRE RATING OF THE FIRE RATED CONDITION AND SHALL COMPLY WITH CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODE.
4. WHERE PIPES, WIRES, CONDUITS, DUCTS, ETC., PIERCE FIRE PROTECTION OF INDIVIDUALLY ENCASED STRUCTURAL MEMBERS, SUCH PENETRATION SHALL NOT EXCEED 2 PERCENT OF ANY ONE FACE SUCH PROTECTION AND SHALL BE CLOSED OFF WITH CLOSE FITTING METAL ESCUTCHEONS OR PLATES.
5. FIRE BLOCKING: CONCEALED SPACES WITHIN PARTITIONS, WALLS, FLOORS, ROOFS, STAIRS, FURRING PIPE SPACES, COLUMN ENCLOSURES, ETC., SHALL BE FIRE-BLOCKED AND DRAFT-STOPPED IN COMPLIANCE WITH CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODE(EXCEPT WHERE CONCEALED SPACE IS SPRINKLERED OR IS CONSTRUCTED AS A SHAFT).
6. CONDUITS IN FIRE-RATED PARTITIONS SHALL NOT EXCEED 3/4 INCH DIAMETER. OUTLETS IN FIRE RATED PARTITIONS SHALL BE BACKED UP WITH APPROVED MATERIALS TO MEET OR EXCEED THE REQUIRED FIRE RATING OF THE PARTITION.
7. SMOKE/FIRE DAMPERS OR DOORS SHALL BE PROVIDED WHERE DUCTS PENETRATE FIRE RATED WALLS OR CEILING.
8. GAS RISERS NOT PERMITTED WITHIN FIRE RATED WALLS.

NYC FIRE CODE 2022 SECTION 906 & NFPA 10 -FIRE PROTECTION EQUIPMENT

1. EXITS AND EXIT ACCESS DOORS SHALL BE MARKED BY AN APPROVED EXIT SIGN READILY VISIBLE FROM ANY DIRECTION OF EGRESS TRAVEL. THE PATH OF EGRESS TRAVEL TO EXITS AND WITHIN EXITS SHALL BE MARKED BY READILY VISIBLE EXIT SIGNS TO CLEARLY INDICATE THE DIRECTION OF EGRESS TRAVEL IN CASES WHERE THE EXIT OR THE PATH OF EGRESS TRAVEL IS NOT IMMEDIATELY VISIBLE TO THE OCCUPANTS.
2. EXIT SIGNS SHALL BE INTERNALLY LIGHTED, HAVING AN INITIAL BRIGHTNESS OF THE LETTERS OF AT LEAST 25 FOOT-LAMBERTS. LETTERS SHALL BE RED, THE BACKGROUND SHALL BE CLEAR OR WHITE. LETTERS SHALL BE BLOCK LETTERING, AT LEAST 8" HIGH WITH 3/4" STROKES. EXIT LIGHTING SHALL BE ON CIRCUITS THAT ARE SEPARATE FROM ANY OTHER CIRCUITS, TAKEN OFF AHEAD OF THE MAIN SWITCH.
3. EXIT DOORS SHALL BE READILY OPERABLE AT ALL TIMES FROM THE SIDE WHICH EGRESS IS TO BE MADE. DOORS MAY BE GIVEN A LOCKING FUNCTION IN THE DIRECTION OPPOSITE EGRESS TRAVEL TO PREVENT ACCESS FROM THE OUTDOORS AT STREET LEVEL.
4. PROVIDE EXIT SIGNS AND DIRECTION EXIT SIGNS WITH A MINIMUM 6" HIGH BY 3/4" STROKE BLOCK LETTERS ON A CONTRASTING BACKGROUND.
5. WHENEVER A SPACE IS OCCUPIED, EXIT SIGNS SHALL BE LIGHTED SO THEY ARE CLEARLY VISIBLE.
6. EXIT SIGNS SHALL BE ELECTRICALLY ILLUMINATED. TWO LAMPS SHALL BE ENERGIZED FROM SEPARATE CIRCUITS. ILLUMINATION SHALL NORMALLY BE PROVIDED BY THE PREMISES WIRING SYSTEM. IN THE EVENT OF FAILURE OF THIS SYSTEM, ILLUMINATION SHALL BE AUTOMATICALLY PROVIDED FROM AN EMERGENCY SYSTEM. EMERGENCY LIGHTING SHALL GIVE A VALUE OF ONE FOOT CANDLE AT FLOOR LEVEL. VERIFY IF ILLUMINATED SIGN ARE TO HAVE BATTERY BACKUP.
7. EXIT PATH LIGHTING SHALL BE PROVIDED FOR ANY STAIRWAY, HALLWAY, EXIT PASSAGEWAY OR EGRESS TO A PUBLIC WAY ANYTIME THE BUILDING IS OCCUPIED. EMERGENCY LIGHTING SHALL BE PROVIDED GIVING LIGHT VALUE OF ONE FOOT CANDLE AT THE FLOOR LEVEL.

FIRE DEPARTMENT NOTES

1. CONTRACTOR SHALL SUBMIT SPRINKLER PLANS AND OBTAIN APPROVAL PRIOR TO INSTALLATION.
2. CONTRACTOR SHALL SUBMIT FIRE ALARM PLANS AND OBTAIN APPROVAL PRIOR TO INSTALLATION.

SEISMIC STRUCTURAL SEPARATION CALCULATION

STRUCTURES SEPARATED FROM ADJACENT STRUCTURES:
AT LEAST 1" FOR EACH 50 FEET OF HEIGHT AND A MINIMUM OF 1".
PROPOSED BUILDING HEIGHT = 145.0'
NEW BUILDING STRUCTURE SEPARATION REQUIRED = 145.0'/50' = 2.9'
NEW BUILDING STRUCTURE SEPARATION PROPOSED = 3" > 2.9" (COMPLIES)

PROPOSED BUILDING SEISMIC EVALUATION

STRUCTURAL OCCUPANCY/RISK CATEGORY: II
SEISMIC DESIGN CATEGORY: B

GENERAL CODE COMPLIANCE NOTES

1. **CODE COMPLIANCE:** ALL WORK SHALL BE DONE AND PERFORMED ACCORDING TO THE RULES, REGULATIONS, AND REQUIREMENTS OF THE NYC BUILDING CODE.
2. **PROPERTY MAINTENANCE**: THE PROPERTY OWNER IS RESPONSIBLE FOR THE ONGOING SAFETY AND UPKEEP OF THE BUILDING AND ITS FACILITIES AS OUTLINED IN ARTICLES 301 THROUGH 304 OF THE NYC BUILDING CODE.
3. **NOTIFICATION**: PROVIDE WRITTEN NOTICE TO THE COMMISSIONER AT LEAST 24 BUT NO MORE THAN 48 HOURS BEFORE COMMENCING WORK (BC 3304.3.1). NOTIFY ADJOINING LOT OWNERS AFFECTED BY FOUNDATION, EARTHWORK, OR DEMOLITION WORK AT LEAST TEN DAYS PRIOR TO STARTING (BC 3304.3.2).
4. **LICENSED CONTRACTOR**: ALL CONSTRUCTION MUST BE PERFORMED BY A LICENSED CONTRACTOR. PERMITS MUST BE OBTAINED FROM THE APPROPRIATE NYC DEPARTMENT OF BUILDINGS BOROUGH OFFICE.
5. **INSURANCE AND PERMITS**: BEFORE STARTING WORK, THE CONTRACTOR MUST FILE ALL REQUIRED INSURANCE CERTIFICATES WITH THE DEPARTMENT OF BUILDINGS AND SECURE ALL NECESSARY PERMITS, LICENSES, AND FEES.
6. **WORK OVERSIGHT**: THE CONTRACTOR IS RESPONSIBLE FOR DIRECTING AND SUPERVISING THE CONSTRUCTION WORK, INCLUDING MANAGING METHODS, TECHNIQUES, SEQUENCES, AND COORDINATION AMONG TRADES.
7. **SITE FAMILIARIZATION**: THE CONTRACTOR MUST VISIT THE SITE TO ASSESS POTENTIAL CONSTRUCTION CHALLENGES.
8. **VERIFICATION OF CONDITIONS**: VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS ON-SITE BEFORE STARTING WORK. REPORT ANY DISCREPANCIES BETWEEN DRAWINGS AND ACTUAL CONDITIONS TO THE ARCHITECT.
9. **PUBLIC AND WORKER SAFETY**: ENSURE SAFETY FOR THE PUBLIC AND CONSTRUCTION WORKERS. PROVIDE BARRIERS, MAINTAIN CLEAR FIRE EXITS, AND BARRICADE ANY UNSAFE CONDITIONS.
10. **PROTECTION AND REPAIRS**: PROTECT EXISTING CONSTRUCTION AND EQUIPMENT. REPAIR OR REPLACE ANY DAMAGE CAUSED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.
11. **DEBRIS MANAGEMENT**: CLEAN UP CONSTRUCTION DEBRIS DAILY AND DISPOSE OF MATERIALS LEGALLY OFF-SITE. ON-SITE STORAGE OR BURIAL OF DEBRIS IS NOT PERMITTED.
12. **WORK LAYOUT**: LAYOUT WORK AND PROVIDE NECESSARY DIMENSIONS FOR OTHER TRADES (PLUMBING, ELECTRICAL, ETC.).
13. **SUBCONTRACTOR COMPLIANCE**: PLUMBING, ELECTRICAL, AND OTHER SUBCONTRACTOR WORK MUST BE PERFORMED BY LICENSED PROFESSIONALS AND MUST COMPLY WITH NYC CODES. SUBCONTRACTORS ARE RESPONSIBLE FOR ARRANGING INSPECTIONS AND OBTAINING SIGN-OFFS.
14. **DESIGN DEVIATIONS**: NO DEVIATIONS FROM DESIGN DRAWINGS ARE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE ARCHITECT.
15. **DIMENSIONAL ACCURACY**: CHECK AND VERIFY ALL DIMENSIONS, NOTES, AND WORK ON-SITE BEFORE STARTING. REPORT ANY DISCREPANCIES TO THE ARCHITECT AND RELY ONLY ON WRITTEN DIMENSIONS.
16. **UNSPECIFIED ITEMS**: IF DRAWINGS AND NOTES DO NOT ADDRESS SPECIFIC ITEMS, CONSULT THE GENERAL CONTRACTOR FOR GUIDANCE. INCLUDE A CONTINGENCY FACTOR TO ENSURE A COMPLETE SYSTEM IF NO CONSULTATION IS MADE.
17. **SITE REPAIRS**: REPAIR OR REPLACE ANY DAMAGED SIDEWALKS, CURBS, OR ROADWAYS AS DIRECTED BY RELEVANT NYC AGENCIES.
18. **PLAN APPROVAL**: ALL PLANS MUST BE REVIEWED, COMMENTED ON, AND APPROVED BY THE BUILDING DEPARTMENT AND OTHER CITY AGENCIES BEFORE CONSTRUCTION BEGINS.
19. **ARCHITECT'S ROLE**: THE ARCHITECT OF RECORD IS NOT RESPONSIBLE FOR SUPERVISING CONSTRUCTION. SITE VISITS AND REPORTS BY THE ARCHITECT ARE FOR PROGRESS DOCUMENTATION AND GENERAL CONTRACTOR USE ONLY.
20. **ADDITIONAL INSTRUCTIONS**: THE ARCHITECT MAY ISSUE FURTHER DRAWINGS, DETAILS, OR INSTRUCTIONS RELATED TO DESIGN VARIATIONS, OMISSIONS, OR SUBSTITUTIONS. THE CONTRACTOR MUST CORRECT ANY DEFECTS OR FAULTS AT THEIR OWN COST.
21. **CERTIFIED DRAWINGS**: ELEVATOR OPENINGS MUST BE CERTIFIED BY THE ELEVATOR SUBCONTRACTOR BEFORE FORMING. REQUIRED MODIFICATIONS MUST BE APPROVED BY THE ARCHITECT BEFORE PROCEEDING.
22. **CONSULTATION**: CONSULT THE ARCHITECT IF DIMENSIONS, DETAILS, OR DESIGN INTENT ARE UNCLEAR.
23. **COMPLIANCE**: ALL CONSTRUCTION MUST COMPLY WITH FEDERAL, STATE, AND LOCAL CODES, ORDINANCES, RULES, AND REGULATIONS REGARDING LABOR AND MATERIALS.
24. **CONTRACTOR ACCOUNTABILITY**: EACH CONTRACTOR IS RESPONSIBLE FOR THEIR WORK AND MUST REPORT DISCREPANCIES IN PLANS OR DETAILS TO THE ARCHITECT.
25. **MATERIAL STANDARDS**: MATERIALS, ASSEMBLIES, AND CONSTRUCTION METHODS MUST MEET NYC BUILDING CODE REQUIREMENTS.
26. **INSPECTION REPORTS**: MATERIALS AND METHODS REGULATED BY THE CODE BUT NOT LISTED MUST BE SUBJECT TO INSPECTION. SIGNED COPIES OF ALL TEST AND INSPECTION REPORTS MUST BE FILED THROUGH THE ARCHITECT WITH THE DEPARTMENT OF BUILDINGS.
27. **BORING DIAGRAM**: FILE A BORING DIAGRAM BEFORE STARTING CONSTRUCTION, AS PER BC 1802.
28. **PERMIT POSTING**: PERMITS MUST BE POSTED IN A VISIBLE LOCATION FOR PUBLIC INSPECTION THROUGHOUT THE DURATION OF THE WORK AND UNTIL THE PERMIT EXPIRES.
29. **FIRE FIGHTING EQUIPMENT**: PROVIDE FIRE FIGHTING EQUIPMENT AS REQUIRED BY THE FIRE DEPARTMENT.
30. **EXIT ACCESSIBILITY**: ENSURE ALL EXITS REMAIN ACCESSIBLE AND UNOBSTRUCTED, ARE INTERNALLY ILLUMINATED, AND ARE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
31. **EXIT ILLUMINATION**: MAINTAIN AT LEAST 2 FOOT CANDLES OF ILLUMINATION AT THE FLOOR LEVEL IN EXITS AT ALL TIMES.

SMOKE DETECTING DEVICES NOTES

1. **INSTALLATION STANDARDS**: SMOKE AND CARBON MONOXIDE DETECTORS MUST BE INSTALLED PER THE HOUSING MAINTENANCE CODE, MULTIPLE DWELLING LAW, NYC BUILDING CODE, AND NYC ELECTRICAL CODE.
2. **DETECTOR REQUIREMENTS**: EACH DWELLING UNIT MUST HAVE AN APPROVED CARBON MONOXIDE AND SMOKE DETECTOR DEVICE, POWERED DIRECTLY FROM THE BUILDING'S WIRING WITH NO SWITCHES IN THE CIRCUIT (BC 28-908.7.1.1).
3. **COMBINED DETECTORS**: COMBINED SMOKE AND CARBON MONOXIDE DETECTORS ARE ACCEPTABLE IF THEY MEET THE REQUIREMENTS OF THE ADMINISTRATIVE CODE AND APPLICABLE RULES.
4. **DETECTOR PLACEMENT**: INSTALL DETECTORS WITHIN 15 FEET OF SLEEPING ROOM ENTRANCES, WALL OR CEILING MOUNTED, AND INDICATED ON PLANS AS PER NFPA #78/80.
5. **MAINTENANCE AND TESTING**: MAINTAIN AND TEST CARBON MONOXIDE DETECTION SYSTEMS ACCORDING TO ARTICLE 103 OF CHAPTER 1 OF THE GENERAL ADMINISTRATIVE PROVISIONS OF THE 2014 NYC BC, INCLUDING SYSTEMS INTERCONNECTED WITH A FIRE ALARM OR MONITORED BY A CENTRAL STATION.

ACCESSIBILITY

BUILDINGS AND FACILITIES SHALL BE DESIGNED AND CONSTRUCTED TO BE ACCESSIBLE IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE 2022 NEW YORK CITY BUILDING CODE AND ICC/ANSI A117.1-2009 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES, UNIFORM FEDERAL ACCESSIBILITY STANDARDS FOR ACCESSIBLE DESIGN AND HUD FAIR HOUSING ACT PUBLISHED ON MARCH 6, 1991.

SAFETY DURING CONSTRUCTION

ALL CONSTRUCTION SHALL CONFORM TO THE RULES AND REGULATIONS OF THE 2022 NEW YORK CITY BUILDING CODE.

ENERGY NOTES

ALL BUILDING MECHANICAL, SERVICE WATER HEATING AND ELECTRICAL SYSTEMS AND ASSOCIATED CONTROLS SHALL BE COMMISSIONED, IN ACCORDANCE WITH SECTION C408 OF THE 2020 NYC ECC.

DATUM NOTE

UNLESS OTHERWISE NOTED, ELEVATIONS INDICATED IN THESE DRAWINGS REFER TO NAVD 88 DATUM

OTHER AGENCY REQUIREMENTS

GENERAL NOTES

1. THE BUILDING IS WITHIN 200 FT OF ANY FACILITY INFRASTRUCTURE OR PROPERTY UNDER THE JURISDICTION OF THE NEW YORK CITY TRANSIT AUTHORITY, THE METROPOLITAN TRANSPORTATION AUTHORITY OR THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY. THEREFORE, BC 3304.3.5 AND AC 28-104.10 ARE APPLICABLE.

GENERAL BUILDING DATA

ALL CONSTRUCTION SHALL CONFORM TO THE RULES AND REGULATIONS OF THE 2022 NEW YORK CITY BUILDING CODE.

ADDRESS:	54 SULLIVAN PLACE, 11225
BLOCK:	1306
TAX LOT(S):	20
ZONING LOT AREA:	38,119.00 SF
DEVELOPMENT SITE LOT AREA:	11,525.07 SF
ZONING DISTRICT:	C4-4D/R8A EQUIVALENT
ZONING MAP:	16d
NO. OF STORIES:	14 STORIES MIXED USE DEVELOPMENT (RESIDENTIAL & COMMERCIAL)
ZONING USE GROUPS:	II,VI
PRIMARY OCCUPANCY:	R-2 (MULTI-FAMILY RESIDENTIAL)
SECONDARY OCCUPANCY GROUP:	M (MERCANTILE)
PRIMARY STRUCTURAL SYSTEM:	CONCRETE (CIP)
CONSTRUCTION CLASS:	I-B
HIGH RISE BUILDING:	YES
SITE SAFETY PROJECT:	YES
FLOOD ZONE:	ZONE 'X'
LANDMARK:	NO

JOB DESCRIPTION & SCOPE OF WORK

CONSTRUCTION OF A NEW 14 STORY AFFORDABLE HOUSING BUILDING (MIH) WITH 99 UNITS, TYPE-1B CONSTRUCTION

APPLICABLE BUILDING CODE

CODE
2022 NEW YORK CITY BUILDING CODE
2022 NEW YORK CITY FIRE CODE
2022 NEW YORK CITY PLUMBING CODE
2022 NEW YORK CITY MECHANICAL CODE
2022 NEW YORK CITY FUEL GAS CODE
2022 NEW YORK CITY ENERGY CODE
2010 ADA STANDARDS
2011 NEW YORK CITY ELECTRICAL CODE
ANSI A117.1 - 2009
NYC HOUSING MAINTENANCE CODE
NYC MULTIPLE DWELLING LAW
NYC LOCAL LAW
NYC TITLE 1 RCNY
FAIR HOUSING ACT
ALL WORK IS TO COMPLY WITH CODES BELOW AND ITS APPLICBLE REFERNCE SUBCODES AND AMENDMENTS

SECTION BC 403 HIGH-RISE BUILDINGS

403.1 APPLICABILITY
HIGH-RISE BUILDINGS SHALL COMPLY WITH SECTIONS 403.2 THROUGH 403.8.

EXCEPTION: THE PROVISIONS OF SECTIONS 403.2 THROUGH 403.8 SHALL NOT APPLY TO THE FOLLOWING BUILDINGS AND STRUCTURES:

1. AIR TRAFFIC CONTROL TOWERS IN ACCORDANCE WITH SECTION 412.3.
2. BUILDINGS OCCUPIED ENTIRELY BY GROUP R-3 CLASSIFICATION.
3. OPEN PARKING GARAGES IN ACCORDANCE WITH SECTION 406.5.
4. THE PORTION OF A BUILDING CONTAINING A GROUP A-5 OCCUPANCY IN ACCORDANCE WITH SECTION 303.6.
5. SPECIAL INDUSTRIAL OCCUPANCIES IN ACCORDANCE WITH SECTION 503.1.1.
6. BUILDINGS WITH:
   6.1. A GROUP H-1 OCCUPANCY;
   6.2. A GROUP H-2 OCCUPANCY IN ACCORDANCE WITH SECTION 415.8, 415.9.2, 415.9.3 OR 426.1; OR
   6.3. A GROUP H-3 OCCUPANCY IN ACCORDANCE WITH SECTION 415.8.

403.2 CONSTRUCTION
THE CONSTRUCTION OF HIGH-RISE BUILDINGS SHALL COMPLY WITH THE PROVISIONS OF SECTIONS 403.2.1 THROUGH 403.2.4.

403.2.1 TYPES OF CONSTRUCTION
THE FOLLOWING MODIFICATIONS TO THE MINIMUM FIRE-RESISTANCE RATING OF THE BUILDING ELEMENTS IN TABLE 601 SHALL BE AS FOLLOWS:

1. HIGH RISE BUILDINGS 420 FEET (128 M) OR GREATER IN BUILDING HEIGHT SHALL BE CONSTRUCTED OF TYPE IA CONSTRUCTION.

2. FOR HIGH RISE BUILDINGS NOT GREATER THAN 420 FEET (128 M) IN BUILDING HEIGHT, AND CONSTRUCTED TO MEET THE FIRE-RESISTANCE RATING REQUIREMENTS OF TYPE IB OR IIA CONSTRUCTION, THE REQUIRED FIRE-RESISTANCE RATING OF COLUMNS SUPPORTING FLOORS SHALL BE CONSTRUCTED TO MEET TYPE IA CONSTRUCTION.

403.2.2 SEISMIC CONSIDERATIONS
FOR SEISMIC CONSIDERATIONS, SEE CHAPTER 16.

403.2.3 STRUCTURAL INTEGRITY OF INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES
FOR ALL HIGH-RISE BUILDINGS, EXIT ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES SHALL COMPLY WITH SECTIONS 403.2.3.1 THROUGH 403.2.3.4.

EXCEPTION: WHERE FIRE-RESISTANCE RATING IS NOT REQUIRED BY THIS CODE FOR THE ENCLOSURE OR PORTIONS THEREOF.

403.2.3.1 WALL ASSEMBLY
THE WALL ASSEMBLIES MAKING UP THE ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES SHALL MEET OR EXCEED SOFT BODY IMPACT CLASSIFICATION LEVEL 2 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

403.2.3.2 WALL ASSEMBLY MATERIALS
THE FACE OF THE WALL ASSEMBLIES MAKING UP THE ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES THAT ARE NOT EXPOSED TO THE INTERIOR OF THE ENCLOSURES FOR INTERIOR EXIT STAIRWAYS OR ELEVATOR HOISTWAY ENCLOSURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH ONE OF THE FOLLOWING METHODS:

1. THE WALL ASSEMBLY SHALL INCORPORATE NO FEWER THAN TWO LAYERS OF IMPACT-RESISTANT CONSTRUCTION BOARD EACH OF WHICH MEETS OR EXCEEDS HARD BODY IMPACT CLASSIFICATION LEVEL 2 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

2. THE WALL ASSEMBLY SHALL INCORPORATE NO FEWER THAN ONE LAYER OF IMPACT-RESISTANT CONSTRUCTION MATERIAL THAT MEETS OR EXCEEDS HARD BODY IMPACT CLASSIFICATION LEVEL 3 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

3. THE WALL ASSEMBLY INCORPORATES MULTIPLE LAYERS OF ANY MATERIAL, TESTED IN TANDEM, THAT MEETS OR EXCEEDS HARD BODY IMPACT CLASSIFICATION LEVEL 3 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

403.2.3.3 CONCRETE AND MASONRY WALLS
CONCRETE OR MASONRY WALLS SHALL BE DEEMED TO SATISFY THE REQUIREMENTS OF SECTIONS 403.2.3.1 AND 403.2.3.2.

403.2.3.4 OTHER WALL ASSEMBLIES
ANY OTHER WALL ASSEMBLY THAT PROVIDES IMPACT RESISTANCE EQUIVALENT TO THAT REQUIRED BY SECTIONS 403.2.3.1 AND 403.2.3.2 FOR HARD BODY IMPACT CLASSIFICATION LEVEL 3, AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M, SHALL BE PERMITTED.

403.2.4 SPRAYED FIRE-RESISTANT MATERIALS (SFRM)
THE BOND STRENGTH OF THE SFRM INSTALLED THROUGHOUT THE BUILDING SHALL BE IN ACCORDANCE WITH TABLE 403.2.4.

UP TO 420 FEET - 430 PSF
GREATER THAN 420 FEET - 1,000 PSF

FOR SI: 1 FOOT = 304.8 MM, 1 POUND PER SQUARE FOOT (PSF) = 0.0479 KW/M2.
A. ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS.

403.3 AUTOMATIC SPRINKLER SYSTEM
BUILDINGS AND STRUCTURES SHALL BE EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 AND A SECONDARY WATER SUPPLY WHERE REQUIRED BY SECTION 403.3.3.

403.3.1 NUMBER OF SPRINKLER RISERS AND SYSTEM DESIGN
EACH SPRINKLER SYSTEM ZONE IN BUILDINGS THAT ARE MORE THAN 300 FEET (91 440 MM) IN BUILDING HEIGHT SHALL BE SUPPLIED BY NO FEWER THAN TWO RISERS. EACH RISER SHALL SUPPLY SPRINKLERS ON ALTERNATE FLOORS. IF MORE THAN TWO RISERS ARE PROVIDED FOR A ZONE, SPRINKLERS ON ADJACENT FLOORS SHALL NOT BE SUPPLIED FROM THE SAME RISER.

403.3.1.1 RISER LOCATION
SPRINKLER RISERS SHALL BE PLACED IN INTERIOR EXIT STAIRWAYS AND RAMPS THAT ARE REMOTELY LOCATED IN ACCORDANCE WITH SECTION 1007.1.

403.3.2 WATER SUPPLY TO REQUIRED FIRE PUMPS
REQUIRED FIRE PUMPS SHALL BE PROVIDED WITH WATER SUPPLIES IN ACCORDANCE WITH SECTION 905.2 AND NFPA 14 AS MODIFIED BY APPENDIX Q OF THIS CODE.

403.3.3 SECONDARY ON-SITE WATER SUPPLY
A SECONDARY ON-SITE WATER SUPPLY EQUAL TO THE HYDRAULICALLY CALCULATED SPRINKLER DEMAND, INCLUDING THE HOSE STREAM REQUIREMENT, SHALL BE PROVIDED FOR HIGH-RISE BUILDINGS IN SEISMIC DESIGN CATEGORY C OR D AS DETERMINED BY THIS CODE, AND IN ANY HIGH-RISE BUILDING WITH OCCUPIED FLOORS LOCATED MORE THAN 500 FEET (152 M) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS. THE SECONDARY ON-SITE WATER SUPPLY SHALL HAVE A DURATION OF NOT LESS THAN 30 MINUTES AS DETERMINED BY THE OCCUPANCY HAZARD CLASSIFICATION IN ACCORDANCE WITH NFPA 13 AS MODIFIED BY APPENDIX Q OF THIS CODE.

403.3.4 FIRE PUMP ROOM
FIRE PUMPS SHALL BE LOCATED IN ROOMS PROTECTED IN ACCORDANCE WITH SECTION 913.2.1.

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
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SHEET TITLE
PROJECT SUMMARY & BUILDING CODE COMPLIANCE

G-001B.00

Scale: 12" = 1'-0"
Date: 12/1/2025 7:21:19 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

MEANS OF EGRESS

SECTION BC 1003 GENERAL MEANS OF EGRESS

1003.1 APPLICABILITY
THE GENERAL REQUIREMENTS SPECIFIED IN SECTIONS 1003 THROUGH 1015 SHALL APPLY TO ALL THREE ELEMENTS OF THE MEANS OF EGRESS SYSTEM, IN ADDITION TO THOSE SPECIFIC REQUIREMENTS FOR THE EXIT ACCESS, THE EXIT AND THE EXIT DISCHARGE DETAILED ELSEWHERE IN THIS CHAPTER.

1003.2 CEILING HEIGHT
THE MEANS OF EGRESS SHALL HAVE A CEILING HEIGHT OF NOT LESS THAN 7 FEET, 6 INCHES (2286 MM).
EXCEPTIONS:
1. CEILINGS THAT ARE PERMITTED TO BE LESS THAN 7 FEET, 6 INCHES (2286 MM) IN ACCORDANCE WITH SECTION 1208.2.
2. CEILINGS OF DWELLING UNITS AND SLEEPING UNITS WITHIN RESIDENTIAL OCCUPANCIES IN ACCORDANCE WITH SECTION 1208.2.
3. ALLOWABLE PROJECTIONS IN ACCORDANCE WITH SECTION 1003.3.
4. STAIR HEADROOM IN ACCORDANCE WITH SECTION 1011.3.
5. DOOR HEIGHT IN ACCORDANCE WITH SECTION 1010.1.3.
6. RAMP HEADROOM IN ACCORDANCE WITH SECTION 1012.5.2.
7. THE CLEAR HEIGHT OF FLOOR LEVELS IN VEHICULAR AND PEDESTRIAN TRAFFIC AREAS OF PUBLIC AND PRIVATE PARKING GARAGES IN ACCORDANCE WITH SECTION 406.4.1.
8. AREAS ABOVE AND BELOW MEZZANINE FLOORS IN ACCORDANCE WITH SECTION 505.2.

1003.3 PROTRUDING OBJECTS
PROTRUDING OBJECTS ON CIRCULATION PATHS SHALL COMPLY WITH THE REQUIREMENTS OF SECTIONS 1003.3.1 THROUGH 1003.3.4.

1003.3.3 HORIZONTAL PROJECTIONS
EXCEPTION: HANDRAILS ARE PERMITTED TO PROTRUDE 41/2 INCHES (114.3 MM) FROM THE WALL.

1003.4 FLOOR SURFACE
WALKING SURFACES OF THE MEANS OF EGRESS SHALL HAVE A SLIP-RESISTANT SURFACE AND BE SECURELY ATTACHED.

1003.5 ELEVATION CHANGE
WHERE CHANGES IN ELEVATION OF LESS THAN 12 INCHES (304.8 MM) EXIST IN THE MEANS OF EGRESS, SLOPED SURFACES SHALL BE USED. WHERE THE SLOPE IS GREATER THAN ONE UNIT VERTICAL IN 20 UNITS HORIZONTAL (5-PERCENT SLOPE), RAMPS COMPLYING WITH SECTION 1012 SHALL BE USED. WHERE THE DIFFERENCE IN ELEVATION IS 6 INCHES (152.4 MM) OR LESS, THE RAMP SHALL BE EQUIPPED WITH HANDRAILS OR FLOOR FINISH MATERIALS THAT CONTRAST WITH ADJACENT FLOOR FINISH MATERIALS.
EXCEPTIONS: AT LOCATIONS THAT ARE NOT REQUIRED TO BE ACCESSIBLE BY CHAPTER 11:
1. A SINGLE STEP WITH A MAXIMUM RISER HEIGHT OF 7 INCHES (177.8 MM) IS PERMITTED FOR BUILDINGS WITH OCCUPANCIES IN GROUPS F, H, R-2, R-3, S AND U AT EXTERIOR DOORS.
2. A STEP WITH A SINGLE RISER OR A STAIR WITH TWO RISERS AND A TREAD IS PERMITTED WHERE THE RISERS AND TREADS COMPLY WITH SECTION 1011.5, THE MINIMUM DEPTH OF THE TREAD IS 13 INCHES (330 MM) AND NOT LESS THAN ONE HANDRAIL COMPLYING WITH SECTION 1014 IS PROVIDED WITHIN 30 INCHES (762 MM) OF THE CENTERLINE OF THE NORMAL PATH OF EGRESS TRAVEL ON THE STEP OR STAIR.
3. A STEP IS PERMITTED IN AISLES SERVING SEATING THAT HAS A DIFFERENCE IN ELEVATION LESS THAN 12 INCHES (304.8 MM) PROVIDED THAT THE RISERS AND TREADS COMPLY WITH SECTION 1029.13 AND THE AISLE IS PROVIDED WITH A HANDRAIL COMPLYING WITH SECTION 1029.15.
4. THROUGHOUT A STORY IN A GROUP I-2 OCCUPANCY, ANY CHANGE IN ELEVATION IN PORTIONS OF THE MEANS OF EGRESS THAT SERVE NONAMBULATORY PERSONS SHALL BE BY MEANS OF A RAMP OR SLOPED WALKWAY.

1003.6 MEANS OF EGRESS CONTINUITY
THE PATH OF EGRESS TRAVEL ALONG A MEANS OF EGRESS SHALL NOT BE INTERRUPTED BY A BUILDING ELEMENT OTHER THAN A MEANS OF EGRESS COMPONENT AS SPECIFIED IN THIS CHAPTER. OBSTRUCTIONS SHALL NOT BE PLACED IN THE MINIMUM WIDTH OR REQUIRED CAPACITY OF A MEANS OF EGRESS COMPONENT EXCEPT PROJECTIONS PERMITTED BY THIS CHAPTER. THE MINIMUM WIDTH OR REQUIRED CAPACITY OF A MEANS OF EGRESS SYSTEM SHALL NOT BE DIMINISHED ALONG THE PATH OF EGRESS TRAVEL.

1003.7 ELEVATORS, ESCALATORS AND MOVING WALKS
ELEVATORS, ESCALATORS AND MOVING WALKS SHALL NOT BE USED AS A COMPONENT OF A REQUIRED MEANS OF EGRESS FROM ANY OTHER PART OF THE BUILDING.

SECTION BC 1004 OCCUPANT LOAD

1004.1 DESIGN OCCUPANT LOAD
IN DETERMINING MEANS OF EGRESS REQUIREMENTS, THE NUMBER OF OCCUPANTS FOR WHOM MEANS OF EGRESS FACILITIES SHALL BE PROVIDED SHALL BE ESTABLISHED BY THE LARGEST NUMBER COMPUTED IN ACCORDANCE WITH SECTION 1004.1.3, UNLESS OTHERWISE PERMITTED BY SECTION 1004.1.3.1, 1004.1.3.2 OR 1004.2.

TABLE 1004.1.3 MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR
ACCESSORY STORAGE AREAS, MECHANICAL EQUIPMENT ROOM	300 GROSS
AGRICULTURAL BUILDING	300 GROSS
AIRCRAFT HANGARS	500 GROSS
ASSEMBLY	
GAMING FLOORS (KENO, SLOTS, ETC.)	11 GROSS
EXHIBIT GALLERY AND MUSEUM	30 NET
ASSEMBLY WITH FIXED SEATS	SEE SECTION 1004.3
ASSEMBLY WITHOUT FIXED SEATS	
CONCENTRATED (CHAIRS ONLY—NOT FIXED)	7 NET
DANCE FLOOR	5 NET
DANCE FLOOR (BALLROOM)	10 NET
STANDING SPACE	5 NET
UNCONCENTRATED (TABLES AND CHAIRS)	15 NET
BOWLING CENTERS, ALLOW 5 PERSONS FOR EACH LANE INCLUDING 15 FEET OF RUNWAY, AND FOR ADDITIONAL AREAS	7 NET
BUSINESS AREAS, INCLUDING ACCESSORY AREAS ON TERRACES AND ROOFTOPS	100 GROSSb, d
COURTROOMS — OTHER THAN FIXED SEATING AREAS	40 NET
DAY CARE:	
AGE UNDER 6 MONTHS	50 NET
AGE 6 MONTHS — 2 YEARS	40 NET
AGE 2 YEARS — 6 YEARS	30 NET
AGE ABOVE 6 YEARS	50 NET
DORMITORIES	50 GROSS
EDUCATIONAL	
CLASSROOM AREA	20 NET
SHOPS AND OTHER VOCATIONAL ROOM AREAS	50 NET
KINDERGARTEN, AND PRE-KINDERGARTEN	30 NET
EXERCISE ROOMS	50 GROSS
GYMNASIUMS	15 NET
GROUP H-5 FABRICATION AND MANUFACTURING AREAS	200 GROSS
INDUSTRIAL AREAS	100 GROSS
INSTITUTIONAL AREAS	
INPATIENT TREATMENT AREAS	240 GROSS
OUTPATIENT AREAS	100 GROSS
SLEEPING AREAS	120 GROSS
KITCHENS, COMMERCIAL	200 GROSS
LIBRARY	
READING ROOMS	50 NET
STACK AREA	100 GROSS
LOCKER ROOMS	50 GROSS
MALL BUILDINGS - COVERED AND OPEN	SEE SECTION 402.8.2
MERCANTILE	
AREAS ON OTHER FLOORS	60 GROSS
BASEMENT AND GRADE FLOOR AREAS	30 GROSS
STORAGE, STOCK, SHIPPING AREAS	300 GROSS
PARKING GARAGES	200 GROSS
PASSENGER TERMINAL	
BAGGAGE CLAIM	20 GROSS
BAGGAGE HANDLING	300 GROSS
CONCOURSE	100 GROSS
PASSENGER TERMINAL OR PLATFORM	1.5 X C*
WAITING AREA (STANDING)	15 GROSS
WAITING AREAS (SEATED)	5 NET
RESIDENTIAL	
WITHIN DWELLING UNITS	200 GROSS
ROOFTOP AND TERRACE ACCESSORY TO GROUPS R-2 AND R-3	200 GROSSb, c, d
INDOOR RESIDENTIAL AMENITY SPACES ACCESSORY TO GROUP R-2 (CONCENTRATED)	15 NET
INDOOR RESIDENTIAL AMENITY SPACES ACCESSORY TO GROUP R-2 (UNCONCENTRATED)	50 NET
SKATING RINKS, SWIMMING POOLS	
RINK AND POOL	50 GROSS
DECKS	15 GROSS
STAGES AND PLATFORMS	15 NET FOR PERFORMING AREA AND 50 NET REMAINING AREA
WAREHOUSES	500 GROSS

Assembly Code

C*-CAPACITY OF ALL PASSENGER VEHICLES THAT CAN BE UNLOADED SIMULTANEOUSLY.
FOR SI: 1 SQUARE FOOT = 0.0929 M2, 1 FOOT = 304.8 MM.*

a. FLOOR AREA IN SQUARE FEET PER OCCUPANT.
b. FOR THE PURPOSES OF OCCUPANT LOAD CALCULATION, PERMANENT FIXTURES AND AMENITIES SUCH AS SHRUBS, DECORATIVE POOLS, NON-WALKABLE PAVING SURFACES, ETC. MAY BE DEDUCTED FROM THE TOTAL FLOOR AREA.
c. A ROOFTOP OR TERRACE IN GROUP R-2 OR R-3 OCCUPANCIES THAT IS PROVIDED FOR THE INCIDENTAL, RECREATIONAL USE BY THE RESIDENTIAL TENANTS RESIDING IN THE SAME RESIDENTIAL BUILDING.
d. WHERE THE MAXIMUM OCCUPANT LOAD OF THE ROOFTOP OR TERRACE EXCEEDS 74 PERSONS BASED ON OCCUPANT LOAD CALCULATIONS, A PLACE OF ASSEMBLY CERTIFICATE OF OPERATION IS REQUIRED PURSUANT TO SECTION 28-117.1 OF THE ADMINISTRATIVE CODE AND ITEM 1 OF SECTION 303.7 OF THIS CODE.
e. TO BE USED ONLY WHEN THE OCCUPANT LOAD FOR THE FUNCTION OF THE SPACE IS NOT LISTED ELSEWHERE IN TABLE 1004.1.3.

SECTION BC 1005 MEANS OF EGRESS SIZING

1005.1 GENERAL
ALL PORTIONS OF THE MEANS OF EGRESS SYSTEM SHALL BE SIZED IN ACCORDANCE WITH THIS SECTION.
1005.2 MINIMUM WIDTH BASED ON COMPONENT
THE MINIMUM WIDTH, IN INCHES (MM), OF ANY MEANS OF EGRESS COMPONENTS SHALL BE NOT LESS THAN THAT SPECIFIED FOR SUCH COMPONENT, ELSEWHERE IN THIS CODE.
1005.3 REQUIRED CAPACITY BASED ON OCCUPANT LOAD
THE REQUIRED CAPACITY, IN INCHES (MM), OF THE MEANS OF EGRESS FOR ANY ROOM, AREA, SPACE OR STORY SHALL BE NOT LESS THAN THAT DETERMINED IN ACCORDANCE WITH SECTIONS 1005.3.1 AND 1005.3.2.
1005.3.1 STAIRWAYS
THE CAPACITY, IN INCHES, OF MEANS OF EGRESS STAIRWAYS SHALL BE CALCULATED BY MULTIPLYING THE OCCUPANT LOAD SERVED BY SUCH STAIRWAYS BY A MEANS OF EGRESS CAPACITY FACTOR OF 0.3 INCH (7.6 MM) PER OCCUPANT. WHERE STAIRWAYS SERVE MORE THAN ONE STORY, ONLY THE OCCUPANT LOAD OF EACH STORY CONSIDERED INDIVIDUALLY SHALL BE USED IN CALCULATING THE REQUIRED CAPACITY OF THE STAIRWAYS SERVING THAT STORY.
EXCEPTIONS:
1. FACILITIES WITH SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO USE THE CAPACITY FACTORS IN TABLE 1029.6.2 INDICATED FOR STEPPED AISLES FOR EXIT ACCESS OR EXIT STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS PROVIDED WITH A SMOKE CONTROL SYSTEM COMPLYING WITH SECTION 909.
2. FACILITIES WITH OUTDOOR SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO THE CAPACITY FACTORS IN SECTION 1029.6.3 INDICATED FOR STEPPED AISLES FOR EXIT ACCESS OR EXIT STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS OPEN TO THE OUTDOORS.
1005.3.2 OTHER EGRESS COMPONENTS
THE CAPACITY, IN INCHES, OF MEANS OF EGRESS COMPONENTS OTHER THAN STAIRWAYS SHALL BE CALCULATED BY MULTIPLYING THE OCCUPANT LOAD SERVED BY SUCH COMPONENT BY A MEANS OF EGRESS CAPACITY FACTOR OF 0.2 INCH (5.1 MM) PER OCCUPANT.
EXCEPTIONS:
1. FACILITIES WITH SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO USE THE CAPACITY FACTORS IN TABLE 1029.6.2 INDICATED FOR LEVEL OR RAMPED AISLES FOR MEANS OF EGRESS COMPONENTS OTHER THAN STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS PROVIDED WITH A SMOKE CONTROL SYSTEM COMPLYING WITH SECTION 909.
2. FACILITIES WITH OUTDOOR SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO THE CAPACITY FACTORS IN SECTION 1029.6.3 INDICATED FOR LEVEL OR RAMPED AISLES FOR MEANS OF EGRESS COMPONENTS OTHER THAN STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS OPEN TO THE OUTDOORS.

1005.4 CONTINUITY
THE MINIMUM WIDTH OR REQUIRED CAPACITY OF THE MEANS OF EGRESS REQUIRED FROM ANY STORY OF A BUILDING SHALL NOT BE REDUCED ALONG THE PATH OF EGRESS TRAVEL UNTIL ARRIVAL AT THE PUBLIC WAY.

1005.5 DISTRIBUTION OF MINIMUM WIDTH AND REQUIRED CAPACITY
WHERE MORE THAN ONE EXIT, OR ACCESS TO MORE THAN ONE EXIT, IS REQUIRED, THE MEANS OF EGRESS SHALL BE CONFIGURED SUCH THAT THE LOSS OF ANY ONE EXIT, OR ACCESS TO ONE EXIT, SHALL NOT REDUCE THE AVAILABLE CAPACITY OR WIDTH TO LESS THAN 50 PERCENT OF THE REQUIRED CAPACITY OR WIDTH.

1005.6 EGRESS CONVERGENCE
WHERE THE MEANS OF EGRESS FROM STORIES ABOVE AND BELOW CONVERGE AT AN INTERMEDIATE LEVEL, THE CAPACITY OF THE MEANS OF EGRESS FROM THE POINT OF CONVERGENCE SHALL BE NOT LESS THAN THE LARGEST MINIMUM WIDTH OR THE SUM OF THE REQUIRED CAPACITIES FOR THE STAIRWAYS OR RAMPS SERVING THE TWO ADJACENT STORIES, WHICHEVER IS LARGER.

1005.7 ENCROACHMENT
ENCROACHMENTS INTO THE REQUIRED MEANS OF EGRESS WIDTH SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THIS SECTION.

1005.7.1 DOORS
DOORS, WHEN FULLY OPENED, SHALL NOT REDUCE THE REQUIRED WIDTH BY MORE THAN 7 INCHES (177.8 MM). DOORS IN ANY POSITION SHALL NOT REDUCE THE REQUIRED WIDTH BY MORE THAN ONE-HALF.
EXCEPTIONS:
1. SURFACE-MOUNTED LATCH RELEASE HARDWARE SHALL BE EXEMPT FROM INCLUSION IN THE 7-INCH (177.8 MM) MAXIMUM ENCROACHMENT WHERE BOTH OF THE FOLLOWING CONDITIONS EXIST:
   1. THE HARDWARE IS MOUNTED TO THE SIDE OF THE DOOR FACING AWAY FROM THE ADJACENT WALL WHERE THE DOOR IS IN THE OPEN POSITION.
   2. THE HARDWARE IS MOUNTED NOT LESS THAN 34 INCHES (865 MM) NOR MORE THAN 48 INCHES (1220 MM) ABOVE THE FINISHED FLOOR.
2. THE RESTRICTIONS ON DOOR SWING SHALL NOT APPLY TO DOORS WITHIN INDIVIDUAL DWELLING UNITS AND SLEEPING UNITS OF GROUP R-2 OCCUPANCIES AND WITHIN INDIVIDUAL DWELLING UNITS OF GROUP R-3 OCCUPANCIES.

1005.7.2 OTHER PROJECTIONS
HANDRAIL PROJECTIONS SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1014.8. OTHER NONSTRUCTURAL PROJECTIONS SUCH AS TRIM AND SIMILAR DECORATIVE FEATURES SHALL BE PERMITTED TO PROJECT INTO THE REQUIRED WIDTH NOT MORE THAN 11/2 INCHES (38.1 MM) ON EACH SIDE.
EXCEPTION: PROJECTIONS ARE PERMITTED IN CORRIDORS WITHIN GROUP I-2 IN ACCORDANCE WITH SECTION 407.4.3.

1005.7.3 PROTRUDING OBJECTS
PROTRUDING OBJECTS SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF SECTION 1003.3.

SECTION BC 1006 NUMBER OF EXITS AND EXIT ACCESS DOORWAYS

1006.2 EGRESS FROM SPACES
ROOMS, AREAS OR SPACES, INCLUDING MEZZANINES, WITHIN A STORY OR BASEMENT SHALL BE PROVIDED WITH THE NUMBER OF EXITS OR ACCESS TO EXITS IN ACCORDANCE WITH THIS SECTION.

SECTION BC 1006 NUMBER OF EXITS AND EXIT ACCESS DOORWAYS

1006.2 EGRESS FROM SPACES
ROOMS, AREAS OR SPACES, INCLUDING MEZZANINES, WITHIN A STORY OR BASEMENT SHALL BE PROVIDED WITH THE NUMBER OF EXITS OR ACCESS TO EXITS IN ACCORDANCE WITH THIS SECTION.

TABLE 1006.2.1 SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Sprinkler System (feet)		With Sprinkler System (feet)
		Occupant Load		
		OL ≤ 30	OL > 30	
Ac, Ef, M	74	76	75	75a
B	74	100	75	100a
F	49	75	75	100a
H-1, H-2, H-3	3	NP	NP	25b
H-4b, H-5b, I-1, I-3, I-4	10	NP	NP	75a
I-2d	See Section 407	NP	NP	75a
R-1	20	NP	NP	75a
R-2	20g	NP	NP	125a
S	29	100	75e	100a
U	74	100	75	75a

Assembly Code

FOR SI: 1 FOOT = 304.8 MM.
NP = NOT PERMITTED.

a. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2. SEE SECTION 903 FOR OCCUPANCIES WHERE AUTOMATIC SPRINKLER SYSTEMS ARE PERMITTED IN ACCORDANCE WITH SECTION 903.3.1.2.
b. GROUP H OCCUPANCIES EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.2.5.
c. FOR A ROOM OR SPACE USED FOR ASSEMBLY PURPOSES HAVING FIXED SEATING, SEE SECTION 1029.8.
d. FOR THE TRAVEL DISTANCE LIMITATIONS IN GROUP I-2, SEE SECTION 407.4.
e. THE LENGTH OF COMMON PATH OF EGRESS TRAVEL DISTANCE IN A GROUP S-2 OPEN PARKING GARAGE SHALL BE NOT MORE THAN 100 FEET (30 480 MM).
f. DAY CARE MAXIMUM OCCUPANT LOAD IS 10.
g. ROOMS, AREAS, OR SPACES THAT ARE ACCESSORY TO A GROUP R-2 OCCUPANCY MAY HAVE A MAXIMUM OCCUPANT LOAD OF 49.

1006.3.1 EGRESS BASED ON OCCUPANT LOAD
EACH STORY OR OCCUPIED ROOF DESIGNED FOR HUMAN OCCUPANCY OR USE SHALL HAVE THE MINIMUM NUMBER OF EXITS, OR ACCESS TO EXITS, AS SPECIFIED IN TABLE 1006.3.1. A SINGLE EXIT OR ACCESS TO A SINGLE EXIT SHALL BE PERMITTED IN ACCORDANCE WITH SECTION 1006.3.2. THE REQUIRED NUMBER OF EXITS, OR EXIT ACCESS STAIRWAYS OR RAMPS PROVIDING ACCESS TO EXITS, FROM ANY SUCH STORY OR OCCUPIED ROOF SHALL BE MAINTAINED UNTIL ARRIVAL AT THE EXIT DISCHARGE OR A PUBLIC WAY.

TABLE 1006.3.1
MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS PER STORY

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

Assembly Code

1006.3.2 SINGLE EXITS
A SINGLE EXIT OR ACCESS TO A SINGLE EXIT SHALL BE PERMITTED FROM ANY STORY OR OCCUPIED ROOF DESIGNED FOR HUMAN OCCUPANCY OR USE WHERE ONE OF THE FOLLOWING CONDITIONS EXISTS:
1. THE OCCUPANT LOAD, NUMBER OF DWELLING UNITS AND EXIT ACCESS TRAVEL DISTANCE DO NOT EXCEED THE VALUES IN TABLE 1006.3.2.
2. ROOMS, AREAS AND SPACES COMPLYING WITH SECTION 1006.2.1 WITH EXITS THAT DISCHARGE DIRECTLY TO THE EXTERIOR AT THE LEVEL OF EXIT DISCHARGE ARE PERMITTED TO HAVE ONE EXIT OR ACCESS TO A SINGLE EXIT.
3. OPEN OR ENCLOSED PARKING GARAGES WHERE VEHICLES ARE MECHANICALLY PARKED SHALL BE PERMITTED TO HAVE ONE EXIT PROVIDED SUCH EXIT SHALL NOT BE A VEHICLE RAMP.
4. GROUP R-3 OCCUPANCIES SHALL BE PERMITTED TO HAVE ONE EXIT OR ACCESS TO A SINGLE EXIT.
5. INDIVIDUAL SINGLE-STORY OR MULTISTORY DWELLING UNITS SHALL BE PERMITTED TO HAVE A SINGLE EXIT OR ACCESS TO A SINGLE EXIT FROM THE DWELLING UNIT PROVIDED THAT BOTH OF THE FOLLOWING CRITERIA ARE MET:
   1. THE DWELLING UNIT COMPLIES WITH SECTION 1006.2.1 AS A SPACE WITH ONE MEANS OF EGRESS.
   2. EITHER THE EXIT FROM THE DWELLING UNIT DISCHARGES DIRECTLY TO THE EXTERIOR AT THE LEVEL OF EXIT DISCHARGE, OR THE EXIT ACCESS OUTSIDE THE DWELLING UNIT'S ENTRANCE DOOR PROVIDES ACCESS TO NOT LESS THAN TWO APPROVED INDEPENDENT EXITS.
6. BUILDINGS OF OCCUPANCY GROUP R-2 WHERE ALL OF THE FOLLOWING CONDITIONS ARE MET:
   1. THE BUILDING DOES NOT EXCEED FOUR STORIES;
   2. THE BUILDING CONTAINS NOT MORE THAN THREE DWELLING UNITS PER STORY;
   3. THE BUILDING IS OF CONSTRUCTION TYPE I OR II;
   4. THE BUILDING DOES NOT EXCEED 2,500 SQUARE FEET (232.3 M2) PER STORY;
   5. EACH DWELLING UNIT HAS AT LEAST ONE WINDOW FACING THE STREET, OR FACING A LAWFUL YARD WITH OPEN, UNOBSTRUCTED, AND DIRECT ACCESS TO THE STREET. SUCH YARD OR DIRECT ACCESS SHALL BE A MINIMUM WIDTH EQUAL TO 25 PERCENT OF THE VERTICAL DISTANCE FROM THE WINDOWSILL OF THE HIGHEST OPERABLE WINDOW, FACING SUCH YARD OR DIRECT ACCESS, TO THE GRADE OF SUCH YARD OR DIRECT ACCESS DIRECTLY BELOW SUCH WINDOW, BUT SHALL IN NO CASE BE LESS THAN 36 INCHES (914.4 MM) WIDE;
   6. THE STAIRWAY EXTENDS TO THE ROOF SURFACE THROUGH A STAIRWAY BULKHEAD COMPLYING WITH SECTION 1509.2, PROVIDED THE ROOF HAS A SLOPE NOT STEEPER THAN 20 DEGREES (0.35 RAD), OR THE STAIRWAY IS CONSTRUCTED AGAINST THE STREET WALL, WITH ONE WINDOW FACING THE STREET AT EACH LANDING AND ACCESS TO THE ROOF IS PROVIDED VIA A SCUTTLE WITH A STATIONARY, NONCOMBUSTIBLE ACCESS LADDER;
   7. THE STAIRWAY IS ENCLOSED IN 2-HOUR FIRE-RATED WALLS WITH ALL EXIT DOORS LEADING INTO THE STAIRWAY HAVING AT LEAST 11/2-HOUR FIRE RATING; AND
   8. THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.2.
7. BUILDINGS OF OCCUPANCY GROUP R-2 OF CONSTRUCTION TYPE I OR II NOT EXCEEDING SIX STORIES AND NOT EXCEEDING 2,000 SQUARE FEET (185.8 M2) PER STORY.

TABLE 1006.3.2
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT

STORY	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER FLOOR	MAXIMUM TRAVEL DISTANCE (feet)
FIRST STORY ABOVE GRADE PLANE OR CELLAR	A, Bb, Ec, Fb, M, U, Sb	49	75
	H-2, H-3	3	25
	H-4, H-5, I, Re	10	75
	Sa	29	100
SECOND STORY ABOVE GRADE PLANE	B, F, M, Sa	29	75
	R-2d,e	NA	50
THIRD STORY ABOVE GRADE PLANE	R-2d,e	NA	50

Assembly Code

FOR SI: 1 FOOT = 304.8 MM.
NP = NOT PERMITTED.
NA = NOT APPLICABLE.

a. FOR THE REQUIRED NUMBER OF EXITS FOR OPEN OR ENCLOSED PARKING GARAGES, SEE SECTION 1006.3.2, ITEM 3.
b. GROUP B, F AND S OCCUPANCIES IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 SHALL HAVE A MAXIMUM TRAVEL DISTANCE OF 100 FEET.
c. DAY CARE OCCUPANCIES SHALL HAVE A MAXIMUM OCCUPANT LOAD OF 10.
d. MAXIMUM FOUR DWELLING UNITS PER FLOOR.
e. BUILDINGS CLASSIFIED AS OCCUPANCY GROUP R-2 EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2 AND PROVIDED WITH EMERGENCY ESCAPE AND RESCUE OPENINGS IN ACCORDANCE WITH SECTION 1030.
f. LIMITED TO THE CELLAR CLOSEST TO GRADE PLANE.

1006.3.2.1 MIXED OCCUPANCIES
WHERE ONE EXIT, OR EXIT ACCESS STAIRWAY OR RAMP PROVIDING ACCESS TO EXITS AT OTHER STORIES, IS PERMITTED TO SERVE INDIVIDUAL STORIES, MIXED OCCUPANCIES SHALL BE PERMITTED TO BE SERVED BY SINGLE EXITS PROVIDED EACH INDIVIDUAL OCCUPANCY COMPLIES WITH THE APPLICABLE REQUIREMENTS OF TABLE 1006.3.2 FOR THAT OCCUPANCY. WHERE APPLICABLE, CUMULATIVE OCCUPANT LOADS FROM ADJACENT OCCUPANCIES SHALL BE CONSIDERED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1004.1. IN EACH STORY OF A MIXED OCCUPANCY BUILDING, THE MAXIMUM NUMBER OF OCCUPANTS SERVED BY A SINGLE EXIT SHALL BE SUCH THAT THE SUM OF THE RATIOS OF THE CALCULATED NUMBER OF OCCUPANTS OF THE SPACE DIVIDED BY THE ALLOWABLE NUMBER OF OCCUPANTS INDICATED IN TABLE 1006.3.2 FOR EACH OCCUPANCY DOES NOT EXCEED ONE. WHERE DWELLING UNITS ARE LOCATED ON A STORY WITH OTHER OCCUPANCIES, THE ACTUAL NUMBER OF DWELLING UNITS DIVIDED BY FOUR PLUS THE RATIO FROM THE OTHER OCCUPANCY DOES NOT EXCEED ONE.

1006.4 OPEN OR ENCLOSED PARKING GARAGES
OPEN OR ENCLOSED PARKING GARAGES SHALL NOT HAVE LESS THAN TWO EXITS FROM EACH PARKING TIER. AN UNENCLOSED VEHICLE RAMP CONSTRUCTED IN ACCORDANCE WITH SECTION 1012.1 MAY SERVE AS ONE OF THE REQUIRED EXITS WHEN PROVIDED WITH PEDESTRIAN FACILITIES ALONG THE RAMP. SUCH RAMPS SERVING AS PART OF A NONASSESSABLE MEANS OF EGRESS IN OPEN OR ENCLOSED PARKING GARAGES THREE STORIES OR LESS IN HEIGHT AND SERVING NOT MORE THAN ONE LEVEL BELOW GRADE IS PERMITTED TO COMPLY WITH SECTION 1012.2, EXCEPTION 2.
EXCEPTION: ONE EXIT SHALL BE PERMITTED IN PARKING GARAGES COMPLYING WITH ITEM 3 OF SECTION 1006.3.2.

SECTION BC 1007 EXIT AND EXIT ACCESS DOORWAY CONFIGURATION

1007.1 GENERAL
EXITS, EXIT ACCESS DOORWAYS, AND EXIT ACCESS STAIRWAYS AND RAMPS SERVING SPACES, INCLUDING INDIVIDUAL BUILDING STORIES, SHALL BE SEPARATED IN ACCORDANCE WITH THE PROVISIONS OF THIS SECTION.

1007.1.1 TWO EXITS OR EXIT ACCESS DOORWAYS
ASSEMBLY
WHERE TWO EXITS, EXIT ACCESS DOORWAYS, EXIT ACCESS STAIRWAYS OR RAMPS, OR ANY COMBINATION THEREOF, ARE REQUIRED FROM ANY PORTION OF THE EXIT ACCESS, THEY SHALL BE PLACED A DISTANCE APART EQUAL TO NOT LESS THAN ONE-HALF OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE BUILDING OR AREA TO BE SERVED MEASURED IN A STRAIGHT LINE BETWEEN THEM. STAIRS SHARING ANY COMMON WALL, FLOOR, CEILING, SCISSOR STAIR ASSEMBLY, OR OTHER ENCLOSURE SHALL BE COUNTED AS ONE EXIT STAIRWAY.

EXCEPTIONS:
1. CORRIDOR MEASUREMENTS. WHERE INTERIOR EXIT STAIRWAYS OR RAMPS ARE INTERCONNECTED BY A 1-HOUR FIRE-RESISTANCE-RATED CORRIDOR CONFORMING TO THE REQUIREMENTS OF SECTION 1020, THE REQUIRED EXIT SEPARATION SHALL BE MEASURED ALONG THE SHORTEST DIRECT LINE OF TRAVEL WITHIN THE CORRIDOR.
2. REMOTE LOCATION IN SPRINKLERED BUILDINGS. WHERE A BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2, THE SEPARATION DISTANCE SHALL BE NOT LESS THAN ONE-THIRD OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE AREA SERVED.
3. GROUP R-2 OCCUPANCIES. IN GROUP R-2 OCCUPANCIES, WHERE STAIRS ARE ENCLOSED IN WALLS HAVING AT LEAST A 2-HOUR FIRE RESISTANCE RATING AND CONSTRUCTED OF MASONRY OR MASONRY EQUIVALENT IN ACCORDANCE WITH DEPARTMENT RULES:
   A. THE EXIT DOORS TO SUCH STAIRS SHALL BE PLACED A DISTANCE APART EQUAL TO NO LESS THAN 15 FEET (4572 MM); AND
   B. SUCH STAIRS SHALL BE PERMITTED TO SHARE COMMON WALLS, FLOORS, CEILINGS OR SCISSOR STAIRS ASSEMBLIES OR OTHER ENCLOSURES PROVIDED THAT THE CONSTRUCTION SEPARATING THE STAIRS IS ALSO OF AT LEAST A 2-HOUR FIRE-RESISTANCE RATING AND CONSTRUCTED OF MASONRY OR MASONRY EQUIVALENT IN ACCORDANCE WITH DEPARTMENT RULES.
   C. THE EXIT DOORS TO SUCH STAIRS SHALL BE PLACED A DISTANCE APART EQUAL TO NO LESS THAN 15 FEET (4572 MM); AND
   D. SUCH STAIRS SHALL BE PERMITTED TO SHARE COMMON WALLS, FLOORS, CEILINGS OR SCISSOR STAIRS ASSEMBLIES.

1007.1.1.1 MEASUREMENT POINT
THE SEPARATION DISTANCE REQUIRED IN SECTION 1007.1.1 SHALL BE MEASURED IN ACCORDANCE WITH THE FOLLOWING:
1. THE SEPARATION DISTANCE TO EXIT OR EXIT ACCESS DOORWAYS SHALL BE MEASURED TO THE CENTER POINT OF THE REQUIRED DOORWAY.
2. THE SEPARATION DISTANCE TO EXIT ACCESS STAIRWAYS SHALL BE MEASURED TO THE CENTER POINT OF THE CLOSEST RISER.
3. THE SEPARATION DISTANCE TO EXIT ACCESS RAMPS SHALL BE MEASURED TO THE CENTER POINT OF THE START OF THE RAMP RUN.

1007.1.2 THREE OR MORE EXITS OR EXIT ACCESS DOORWAYS
WHERE ACCESS TO THREE OR MORE EXITS IS REQUIRED, NOT LESS THAN TWO EXIT OR EXIT ACCESS DOORWAYS SHALL BE ARRANGED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1007.1.1. ADDITIONAL REQUIRED EXIT OR EXIT ACCESS DOORWAYS SHALL BE ARRANGED A REASONABLE DISTANCE APART SO THAT IF ONE BECOMES BLOCKED, THE OTHERS WILL BE AVAILABLE.

1007.1.3 REMOTENESS OF EXIT ACCESS STAIRWAYS OR RAMPS
WHERE TWO EXIT ACCESS STAIRWAYS OR RAMPS PROVIDE THE REQUIRED MEANS OF EGRESS TO EXITS AT ANOTHER STORY, THE REQUIRED SEPARATION DISTANCE SHALL BE MAINTAINED FOR ALL PORTIONS OF SUCH EXIT ACCESS STAIRWAYS OR RAMPS..

SECTION BC 1016 EXIT ACCESS

1016.1 GENERAL
THE EXIT ACCESS SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF SECTIONS 1003 THROUGH 1015. EXIT ACCESS ARRANGEMENT SHALL COMPLY WITH SECTIONS 1016 THROUGH 1021.
1016.2 EGRESS THROUGH INTERVENING SPACES
EGRESS THROUGH INTERVENING SPACES SHALL COMPLY WITH THIS SECTION.
1. EXIT ACCESS THROUGH AN ENCLOSED ELEVATOR LOBBY IS PERMITTED. ACCESS TO NOT LESS THAN ONE OF THE REQUIRED EXITS SHALL BE PROVIDED WITHOUT TRAVEL THROUGH THE ENCLOSED ELEVATOR LOBBIES REQUIRED BY SECTION 3006. WHERE THE PATH OF EXIT ACCESS TRAVEL PASSES THROUGH AN ENCLOSED ELEVATOR LOBBY, THE LEVEL OF PROTECTION REQUIRED FOR THE ENCLOSED ELEVATOR LOBBY IS NOT REQUIRED TO BE EXTENDED TO THE EXIT UNLESS DIRECT ACCESS TO AN EXIT IS REQUIRED BY OTHER SECTIONS OF THIS CODE.
2. EGRESS FROM A ROOM OR SPACE SHALL NOT PASS THROUGH ADJOINING OR INTERVENING ROOMS OR AREAS, EXCEPT WHERE SUCH ADJOINING ROOMS OR AREAS AND THE AREA SERVED ARE ACCESSORY TO ONE OR THE OTHER, ARE NOT A GROUP H OCCUPANCY AND PROVIDE A DISCERNIBLE PATH OF EGRESS TRAVEL TO AN EXIT.
   EXCEPTION: MEANS OF EGRESS ARE NOT PROHIBITED THROUGH ADJOINING OR INTERVENING ROOMS OR SPACES IN A GROUP H, S OR F OCCUPANCY WHERE THE ADJOINING OR INTERVENING ROOMS OR SPACES ARE THE SAME OR A LESSER HAZARD OCCUPANCY GROUP.
3. AN EXIT ACCESS SHALL NOT PASS THROUGH A ROOM THAT CAN BE LOCKED TO PREVENT EGRESS.
4. MEANS OF EGRESS FROM DWELLING UNITS OR SLEEPING AREAS SHALL NOT LEAD THROUGH OTHER SLEEPING AREAS, TOILET ROOMS OR BATHROOMS.
5. EGRESS SHALL NOT PASS THROUGH KITCHENS, STORAGE ROOMS, CLOSETS OR SPACES USED FOR SIMILAR PURPOSES.
   EXCEPTIONS:
6. MEANS OF EGRESS ARE NOT PROHIBITED THROUGH A KITCHEN AREA SERVING ADJOINING ROOMS CONSTITUTING PART OF THE SAME DWELLING UNIT OR SLEEPING UNIT.
7. MEANS OF EGRESS ARE NOT PROHIBITED THROUGH STOCKROOMS IN GROUP M WHERE ALL OF THE FOLLOWING ARE MET:
   1. THE STOCK IS OF THE SAME HAZARD CLASSIFICATION AS THAT FOUND IN THE MAIN RETAIL AREA.
   2. NOT MORE THAN 50 PERCENT OF THE EXIT ACCESS IS THROUGH THE STOCKROOM.
   3. THE STOCKROOM IS NOT SUBJECT TO LOCKING FROM THE EGRESS SIDE.
   4. THERE IS A DEMARCATED, MINIMUM 44-INCH (1117.6 MM) WIDE AISLE DEFINED BY FULL- OR PARTIAL-HEIGHT FIXED WALLS OR SIMILAR CONSTRUCTION THAT WILL MAINTAIN THE REQUIRED WIDTH AND LEAD DIRECTLY FROM THE RETAIL AREA TO THE EXIT WITHOUT OBSTRUCTIONS.

1016.2.1 MULTIPLE TENANTS
WHERE MORE THAN ONE TENANT OCCUPIES ANY ONE FLOOR OF A BUILDING OR STRUCTURE, EACH TENANT SPACE, DWELLING UNIT AND SLEEPING UNIT SHALL BE PROVIDED WITH ACCESS TO THE REQUIRED EXITS WITHOUT PASSING THROUGH ADJACENT TENANT SPACES, DWELLING UNITS AND SLEEPING UNITS.
EXCEPTION: THE MEANS OF EGRESS FROM A SMALLER TENANT SPACE SHALL NOT BE PROHIBITED FROM PASSING THROUGH A LARGER ADJOINING TENANT SPACE WHERE THE FOLLOWING CONDITIONS ARE MET:
1. SUCH ROOMS OR SPACES OF THE SMALLER TENANT OCCUPY LESS THAN 10 PERCENT OF THE AREA OF THE LARGER TENANT SPACE THROUGH WHICH THEY PASS;
2. THE LARGER TENANT IS A GROUP M OCCUPANCY AND THE SMALLER TENANT SPACE IS OF THE SAME OR SIMILAR OCCUPANCY GROUP;
3. A DISCERNIBLE PATH OF EGRESS TRAVEL IS PROVIDED FROM THE SMALLER TENANT SPACE TO AN EXIT;
4. THE MEANS OF EGRESS INTO THE ADJOINING SPACE IS NOT SUBJECT TO LOCKING FROM THE EGRESS SIDE OF THE SMALLER TENANT SPACE; AND
5. THE SMALLER TENANT SPACE SERVES THE SAME OCCUPANTS, CUSTOMERS, OR PATRONS AS THE LARGER TENANT SPACE.

1016.3 INTERVENING PUBLIC HALL IN GROUP R-2 OCCUPANCIES
BUILDINGS IN OCCUPANCY GROUP R-2 SHALL COMPLY WITH THE INTERVENING PUBLIC HALL REQUIREMENTS IN ACCORDANCE WITH SECTIONS 1016.3.1 AND 1016.3.2.
1016.3.1 GROUP R-2 NONHIGH-RISE OCCUPANCIES
IN BUILDINGS IN OCCUPANCY GROUP R-2 NOT SUBJECT TO SECTION 403, A DOOR FROM A DWELLING UNIT SHALL OPEN INTO AN INTERVENING PUBLIC HALL. SUCH PUBLIC HALL SHALL BE CONSTRUCTED AS A PUBLIC CORRIDOR IN ACCORDANCE WITH SECTION 1020. OPENING PROTECTIVES IN ACCORDANCE WITH EXCEPTION 3 OF SECTION 707.6 SHALL NOT BE PERMITTED.
EXCEPTIONS:
1. NO INTERVENING PUBLIC HALL SHALL BE REQUIRED FOR ANY OF THE FOLLOWING:
2. A BUILDING THAT IS BOTH THREE STORIES OR LESS IN HEIGHT, AND CONTAINS TWO OR FEWER DWELLING UNITS PER STORY; OR
3. A BUILDING THAT COMPLIES WITH ITEM 6 OF SECTION 1006.3.2.
4. NO INTERVENING PUBLIC HALL SHALL BE REQUIRED WHERE THE DOORS OPENING TO THE APARTMENTS ARE SMOKE AND DRAFT CONTROLLED DOORS COMPLYING WITH UL 1784 WITHOUT ARTIFICIAL BOTTOM SEALS, IN ACCORDANCE WITH SECTIONS 716.5 AND 716.5.7.3 OF THIS CODE, AND THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1 OF THIS CODE. THIS EXCEPTION SHALL NOT APPLY TO ANY BUILDING THAT COMPLIES WITH ITEM 7 OF SECTION 1006.3.2 OF THIS CODE WHERE THERE IS MORE THAN ONE APARTMENT PER STORY.

1016.3.2 GROUP R-2 HIGH-RISE OCCUPANCIES
IN HIGH-RISE BUILDINGS IN OCCUPANCY GROUP R-2, ALL DOORS FROM A DWELLING UNIT SHALL OPEN INTO AN INTERVENING PUBLIC HALL. SUCH PUBLIC HALL SHALL BE CONSTRUCTED AS A PUBLIC CORRIDOR IN ACCORDANCE WITH SECTION 1020. OPENING PROTECTIVES IN ACCORDANCE WITH EXCEPTION 3 OF SECTION 707.6 SHALL NOT BE PERMITTED. SUCH PUBLIC HALL SHALL PROVIDE ACCESS TO AT LEAST TWO EXITS.
EXCEPTION: WHERE THE ONLY DWELLING UNITS ON A STORY OF A BUILDING ARE THE UPPER STORIES OF MULTISTORY (DUPLEX) DWELLING UNITS;
1. ANY PUBLIC HALLS SHALL BE PERMITTED TO PROVIDE ACCESS TO ONLY ONE EXIT; OR
2. NO SUCH PUBLIC HALL SHALL BE REQUIRED WHERE SMOKE AND DRAFT CONTROLLED DOORS COMPLYING WITH UL 1784 WITHOUT ARTIFICIAL BOTTOM SEALS, IN ACCORDANCE WITH SECTIONS 716.5 AND 716.5.7.3 OF THIS CODE, ARE PROVIDED. THIS EXCEPTION SHALL NOT BE CONSTRUED TO EFFECT, ALTER, OR CHANGE ANY REQUIREMENT OF THIS CODE TO PROVIDE TWO MEANS OF EGRESS FROM EACH APARTMENT ON EACH STORY.

SECTION BC 1017 EXIT ACCESS TRAVEL DISTANCE

1017.1 GENERAL
TRAVEL DISTANCE WITHIN THE EXIT ACCESS PORTION OF THE MEANS OF EGRESS SYSTEM SHALL BE IN ACCORDANCE WITH THIS SECTION.

1017.2 LIMITATIONS
EXIT ACCESS TRAVEL DISTANCE SHALL NOT EXCEED THE VALUES GIVEN IN TABLE 1017.2.

TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCEa

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A	See Section 1029.7	
E, F-1, M, R, S-1	150	200b
B	200	300c
F-2, S-2, U	200	250c
H-1	Not Permitted	75d
H-2	Not Permitted	100d
H-3	Not Permitted	150d
H-4	Not Permitted	175d
H-5	Not Permitted	200c
I-1, I-2, I-3, I-4	Not Permitted	200c

FOR SI: 1 FOOT = 304.8 MM. Assembly Code

a. SEE THE FOLLOWING SECTIONS FOR MODIFICATIONS TO EXIT ACCESS TRAVEL DISTANCE REQUIREMENTS:
   SECTION 402.8: FOR THE DISTANCE LIMITATION IN MALLS.
   SECTION 404.9: FOR THE DISTANCE LIMITATION THROUGH AN ATRIUM SPACE.
   SECTION 407.4: FOR THE DISTANCE LIMITATION IN GROUP I-2.
   SECTIONS 408.6.1 AND 408.8.1: FOR THE DISTANCE LIMITATIONS IN GROUP I-3.
   SECTION 411.4: FOR THE DISTANCE LIMITATION IN SPECIAL AMUSEMENT BUILDINGS.
   SECTION 412.7: FOR THE DISTANCE LIMITATIONS IN AIRCRAFT MANUFACTURING FACILITIES.
   SECTION 407.4.2: FOR THE DISTANCE LIMITATION IN GROUP I-2 HOSPITAL SUITES.
   SECTION 1006.2.2.2: FOR THE DISTANCE LIMITATION IN REFRIGERATION MACHINERY ROOMS.
   SECTION 1006.2.2.3: FOR THE DISTANCE LIMITATION IN REFRIGERATED ROOMS AND SPACES.
   SECTION 1006.3.2: FOR BUILDINGS WITH ONE EXIT.
   SECTION 1029.7: FOR INCREASED LIMITATION IN ASSEMBLY SEATING.
   SECTION 3103.4: FOR TEMPORARY STRUCTURES.
   SECTION 3104.9: FOR PEDESTRIAN WALKWAYS.
b. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2. SEE SECTION 903 FOR OCCUPANCIES WHERE SPRINKLER SYSTEMS ARE PERMITTED IN ACCORDANCE WITH SECTION 903.3.1.2.
c. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1.
   GROUP H OCCUPANCIES EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.2.5.1.

1017.2.1 EXTERIOR EGRESS BALCONY INCREASE
EXIT ACCESS TRAVEL DISTANCES SPECIFIED IN TABLE 1017.2 SHALL BE INCREASED UP TO AN ADDITIONAL 100 FEET (30 480 MM) PROVIDED THE LAST PORTION OF THE EXIT ACCESS LEADING TO THE EXIT OCCURS ON AN EXTERIOR EGRESS BALCONY CONSTRUCTED IN ACCORDANCE WITH SECTION 1021. THE LENGTH OF SUCH BALCONY SHALL BE NOT LESS THAN THE AMOUNT OF THE INCREASE TAKEN.

1017.3 MEASUREMENT
EXIT ACCESS TRAVEL DISTANCE SHALL BE MEASURED FROM THE MOST REMOTE POINT WITHIN A STORY ALONG THE NATURAL AND UNOBSTRUCTED PATH OF HORIZONTAL AND VERTICAL EGRESS TRAVEL TO THE ENTRANCE TO AN EXIT.
EXCEPTIONS:
1. IN OPEN PARKING GARAGES, EXIT ACCESS TRAVEL DISTANCE IS PERMITTED TO BE MEASURED TO THE CLOSEST RISER OF AN EXIT ACCESS STAIRWAY OR THE CLOSEST SLOPE OF AN EXIT ACCESS RAMP.
2. IN BUILDINGS OF GROUP A-5 WITH OPEN-AIR SEATING SERVED BY EXIT ACCESS STAIRWAYS AND RAMPS, EXIT ACCESS TRAVEL DISTANCE IS PERMITTED TO BE MEASURED TO THE CLOSEST RISER OF AN EXIT ACCESS STAIRWAY OR THE CLOSEST SLOPE OF AN EXIT ACCESS RAMP.
3. EXIT ACCESS TRAVEL DISTANCE IN ASSEMBLY OCCUPANCIES SHALL BE MEASURED IN ACCORDANCE WITH SECTION 1029.

1017.3.1 EXIT ACCESS STAIRWAYS AND RAMPS
TRAVEL DISTANCE ON EXIT ACCESS STAIRWAYS OR RAMPS SHALL BE INCLUDED IN THE EXIT ACCESS TRAVEL DISTANCE MEASUREMENT. THE MEASUREMENT ALONG STAIRWAYS SHALL BE MADE ON A PLANE PARALLEL AND TANGENT TO THE STAIR TREAD NOSINGS IN THE CENTER OF THE STAIR AND LANDINGS. THE MEASUREMENT ALONG RAMPS SHALL BE MADE ON THE WALKING SURFACE IN THE CENTER OF THE RAMP AND LANDINGS.

SECTION BC 1018 AISLES

1018.1 GENERAL
AISLES AND AISLE ACCESSWAYS SERVING AS A PORTION OF THE EXIT ACCESS IN THE MEANS OF EGRESS SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION. AISLES OR AISLE ACCESSWAYS SHALL BE PROVIDED FROM ALL OCCUPIED PORTIONS OF THE EXIT ACCESS THAT CONTAIN SEATS, TABLES, FURNISHINGS, DISPLAYS AND SIMILAR FIXTURES OR EQUIPMENT. THE MINIMUM WIDTH OR REQUIRED CAPACITY OF AISLES SHALL BE UNOBSTRUCTED.
EXCEPTION: ENCROACHMENTS COMPLYING WITH SECTION 1005.7.
1018.2 AISLES IN ASSEMBLY SPACES
AISLES AND AISLE ACCESSWAYS SERVING A ROOM OR SPACE USED FOR ASSEMBLY PURPOSES SHALL COMPLY WITH SECTION 1029.

1018.3 AISLES IN GROUPS B AND M
IN GROUP B AND M OCCUPANCIES, THE MINIMUM CLEAR AISLE WIDTH SHALL BE DETERMINED BY SECTION 1005 FOR THE OCCUPANT LOAD SERVED, BUT SHALL BE NOT LESS THAN 36 INCHES (914.4 MM).
EXCEPTION: NONPUBLIC AISLES SERVING LESS THAN 50 PEOPLE AND NOT REQUIRED TO BE ACCESSIBLE BY CHAPTER 11 NEED NOT EXCEED 28 INCHES (711.2 MM) IN WIDTH.

1018.4 AISLE ACCESSWAYS IN GROUP M
AN AISLE ACCESSWAY SHALL BE PROVIDED ON NOT LESS THAN ONE SIDE OF EACH ELEMENT WITHIN THE MERCHANDISE PAD. THE MINIMUM CLEAR WIDTH FOR AN AISLE ACCESSWAY NOT REQUIRED TO BE ACCESSIBLE SHALL BE 30 INCHES (762 MM). THE REQUIRED CLEAR WIDTH OF THE AISLE ACCESSWAY SHALL BE MEASURED PERPENDICULAR TO THE ELEMENTS AND MERCHANDISE WITHIN THE MERCHANDISE PAD. THE 30-INCH (762 MM) MINIMUM CLEAR WIDTH SHALL BE MAINTAINED TO PROVIDE A PATH TO AN ADJACENT AISLE OR AISLE ACCESSWAY. THE COMMON PATH OF EGRESS TRAVEL SHALL NOT EXCEED 30 FEET (9144 MM) FROM ANY POINT IN THE MERCHANDISE PAD.
EXCEPTION: FOR AREAS SERVING NOT MORE THAN 50 OCCUPANTS, THE COMMON PATH OF EGRESS TRAVEL SHALL NOT EXCEED 75 FEET (22 860 MM).

SECTION BC 1019 EXIT ACCESS STAIRWAYS AND RAMPS

1019.1 GENERAL
EXIT ACCESS STAIRWAYS AND RAMPS SERVING AS AN EXIT ACCESS COMPONENT IN A MEANS OF EGRESS SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION. THE NUMBER OF STORIES CONNECTED BY EXIT ACCESS STAIRWAYS AND RAMPS SHALL INCLUDE BASEMENTS, BUT NOT MEZZANINES.

1019.2 ALL OCCUPANCIES
EXIT ACCESS STAIRWAYS AND RAMPS THAT SERVE FLOOR LEVELS WITHIN A SINGLE STORY ARE NOT REQUIRED TO BE ENCLOSED.

1019.3 OCCUPANCIES OTHER THAN GROUPS H, I-2 AND I-3
IN OTHER THAN GROUP H, I-2 AND I-3 OCCUPANCIES, EXIT ACCESS STAIRWAYS OR RAMPS SHALL BE ENCLOSED WITH A SHAFT ENCLOSURE CONSTRUCTED IN ACCORDANCE WITH SECTION 713.
EXCEPTION: IN OTHER THAN GROUP H, I-2 AND I-3 OCCUPANCIES, EXIT ACCESS STAIRWAYS OR RAMPS THAT COMPLY WITH ONE OF THE FOLLOWING CONDITIONS NEED NOT BE ENCLOSED:
1. A MAXIMUM OF 50 PERCENT OF THE EXIT ACCESS STAIRWAYS AND RAMPS THAT SERVE ONLY TWO CONSECUTIVE STORIES NEED NOT BE ENCLOSED, PROVIDED EACH SUCH INTERCONNECTED STORY HAS ACCESS TO THE MINIMUM NUMBER OF APPROVED INDEPENDENT EXITS AS REQUIRED BY SECTION 1006, AND IN NO CASE BE LESS THAN TWO MEANS OF EGRESS. SUCH INTERCONNECTED STORIES SHALL NOT BE OPEN TO OTHER STORIES. UNENCLOSED EXIT ACCESS STAIRWAYS AND RAMPS SHALL BE REMOTELY LOCATED IN ACCORDANCE WITH SECTION 1007.
2. IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, EXIT ACCESS STAIRWAYS AND RAMPS THAT SERVE BETWEEN ONLY THE FIRST AND SECOND STORIES ABOVE GRADE, PROVIDED THE FIRST AND SECOND STORIES HAVE ACCESS TO THE MINIMUM NUMBER OF APPROVED INDEPENDENT EXITS AS REQUIRED BY SECTION 1006, AND IN NO CASE BE LESS THAN TWO MEANS OF EGRESS. SUCH INTERCONNECTED STORIES SHALL NOT BE OPEN TO OTHER STORIES. UNENCLOSED EXIT ACCESS STAIRWAYS AND RAMPS SHALL BE REMOTELY LOCATED IN ACCORDANCE WITH SECTION 1007.
3. IN GROUP R-1, R-2 OR R-3 OCCUPANCIES THAT ARE FULLY SPRINKLERED IN ACCORDANCE WITH SECTION 903.3.1.1, 903.3.1.2 OR 903.3.1.3, EXIT ACCESS STAIRWAYS AND RAMPS CONNECTING FOUR STORIES OR LESS AND CONTAINED WITHIN AN INDIVIDUAL RESIDENTIAL DWELLING UNIT.
4. EXIT ACCESS STAIRWAYS AND RAMPS IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, WHERE THE AREA OF THE VERTICAL OPENING BETWEEN STORIES DOES NOT EXCEED TWICE THE HORIZONTAL PROJECTED AREA OF THE STAIRWAY OR RAMP AND THE OPENING IS PROTECTED BY A DRAFT CURTAIN AND CLOSELY SPACED SPRINKLERS IN ACCORDANCE WITH NFPA 13 AS MODIFIED BY APPENDIX Q. IN OTHER THAN GROUP B AND M OCCUPANCIES, THIS PROVISION IS LIMITED TO OPENINGS THAT DO NOT CONNECT MORE THAN FOUR STORIES.
5. EXIT ACCESS STAIRWAYS AND RAMPS WITHIN AN ATRIUM COMPLYING WITH THE PROVISIONS OF SECTION 404.
6. EXIT ACCESS STAIRWAYS AND RAMPS IN OPEN PARKING GARAGES THAT SERVE ONLY THE PARKING GARAGE.
7. EXIT ACCESS STAIRWAYS AND RAMPS SERVING OPEN-AIR SEATING IN BUILDINGS OF GROUP A-5, WHERE ALL PORTIONS OF THE MEANS OF EGRESS ARE ESSENTIALLY OPEN TO THE OUTSIDE.
8. EXIT ACCESS STAIRWAYS AND RAMPS SERVING THE BALCONY, GALLERY OR PRESS BOX AND THE MAIN ASSEMBLY FLOOR IN OCCUPANCIES SUCH AS THEATERS, PLACES OF RELIGIOUS WORSHIP, AUDITORIUMS AND SPORTS FACILITIES.
1019.4 GROUP I-2 AND I-3 OCCUPANCIES
IN GROUP I-2 AND I-3 OCCUPANCIES, FLOOR OPENINGS BETWEEN STORIES CONTAINING EXIT ACCESS STAIRWAYS OR RAMPS ARE REQUIRED TO BE ENCLOSED WITH A SHAFT ENCLOSURE CONSTRUCTED IN ACCORDANCE WITH SECTION 713.
EXCEPTION: IN GROUP I-3 OCCUPANCIES, EXIT ACCESS STAIRWAYS OR RAMPS CONSTRUCTED IN ACCORDANCE WITH SECTION 408 ARE NOT REQUIRED TO BE ENCLOSED.

SECTION BC 1020 CORRIDORS

1020.1 CONSTRUCTION
CORRIDORS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THIS SECTION. INTERIOR CORRIDOR WALLS REQUIRED TO BE FIRE-RESISTANCE RATED SHALL COMPLY WITH SECTION 708 FOR FIRE PARTITIONS. PUBLIC CORRIDOR WALLS SHALL COMPLY WITH SECTION 707 FOR FIRE BARRIERS.

1020.1.1 INTERIOR CORRIDORS
INTERIOR CORRIDORS SHALL BE FIRE-RESISTANCE RATED IN ACCORDANCE WITH TABLE 1020.1.1.
EXCEPTIONS:
1. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS IN AN OCCUPANCY IN GROUP E WHERE EACH ROOM THAT IS USED FOR INSTRUCTION HAS NOT LESS THAN ONE DOOR OPENING DIRECTLY TO THE EXTERIOR AND ROOMS FOR ASSEMBLY PURPOSES HAVE NOT LESS THAN ONE-HALF OF THE REQUIRED MEANS OF EGRESS DOORS OPENING DIRECTLY TO THE EXTERIOR. EXTERIOR DOORS SPECIFIED IN THIS EXCEPTION ARE REQUIRED TO BE AT GROUND LEVEL.
2. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS CONTAINED WITHIN A DWELLING UNIT OR SLEEPING UNIT IN AN OCCUPANCY IN GROUP R.
3. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS IN OPEN PARKING GARAGES.
4. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS IN AN OCCUPANCY IN GROUP B THAT IS A SPACE REQUIRING ONLY A SINGLE MEANS OF EGRESS COMPLYING WITH SECTION 1006.2.
5. CORRIDORS ADJACENT TO THE EXTERIOR WALLS OF BUILDINGS SHALL BE PERMITTED TO HAVE UNPROTECTED OPENINGS ON UNRATED EXTERIOR WALLS WHERE UNRATED WALLS ARE PERMITTED BY TABLE 602 AND UNPROTECTED OPENINGS ARE PERMITTED BY TABLE 705.8.
6.

TABLE 1020.1.1
INTERIOR CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY INTERIOR CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		WITHOUT SPRINKLER SYSTEM	WITH SPRINKLER SYSTEMc
H-1, H-2, H-3	ALL	NOT PERMITTED	1
H-4, H-5	GREATER THAN 30	NOT PERMITTED	1
A, B, E, F, M, S, U	GREATER THAN 30	1	0
R	GREATER THAN 10	1d	0
I-2a, I-4	ALL	NOT PERMITTED	0
I-1, I-3	ALL	NOT PERMITTED	1b

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a. FOR REQUIREMENTS FOR OCCUPANCIES IN GROUP I-2, SEE SECTIONS 407.2 AND 407.3.
b. FOR A REDUCTION IN THE FIRE-RESISTANCE RATING FOR OCCUPANCIES IN GROUP I-3, SEE SECTION 408.8.
c. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2 WHERE ALLOWED.
d. INTERIOR CORRIDORS WITHIN DWELLING OR SLEEPING UNITS IN GROUP R OCCUPANCIES PURSUANT TO SECTION 1020.1.1, EXCEPTION 2 SHALL NOT REQUIRE FIRE-RESISTANCE RATING.

1020.1.2 PUBLIC CORRIDORS
PUBLIC CORRIDORS SHALL BE FIRE-RESISTANCE RATED IN ACCORDANCE WITH TABLE 1020.1.2.

TABLE 1020.1.2
PUBLIC CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	REQUIRED FIRE-RESISTANCE RATING (hours)
H-1, H-2, H-3	2
H-4, H-5	1
A, E, F, M, S, U	1
B	1a
R (Noncombustible)	1c
R (Combustible)	2b
I-1, I-2, I-3, I-4	1

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a. PUBLIC CORRIDORS NEED NOT BE FIRE RATED IN HIGH-RISE BUILDINGS IN OCCUPANCY GROUP B EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, WHERE SUCH BUILDING IS PROVIDED WITH SMOKEPROOF ENCLOSURES IN STAIRWAYS IN ACCORDANCE WITH SECTION 403.5.4.
b. PUBLIC CORRIDORS IN BUILDINGS NOT EXCEEDING TWO STORIES IN HEIGHT, OR THAT ARE THREE STORIES IN HEIGHT AND OCCUPIED BY NOT MORE THAN ONE FAMILY ON EACH STORY, MAY BE CONSTRUCTED WITH 1-HOUR FIRE-RESISTANCE RATING.
c. CORRIDORS SERVING ACCESSORY ROOMS OR SPACES IN GROUP R-2 OCCUPANCIES PURSUANT TO SECTION 1004.1.1.2.3 SHALL BE CONSTRUCTED WITH FIRE BARRIERS WITH 1-HOUR FIRE-RESISTANCE RATING, AND 2-HOUR FIRE-RESISTANCE RATING WHERE THE DEAD-END DISTANCE EXCEEDS 40 FEET (12 192 MM) IN LENGTH.

1020.2 WIDTH AND CAPACITY
THE REQUIRED CAPACITY OF CORRIDORS SHALL BE DETERMINED AS SPECIFIED IN SECTION 1005, BUT THE MINIMUM WIDTH SHALL BE NOT LESS THAN THAT SPECIFIED IN TABLE 1020.2.
EXCEPTION: IN GROUP I-2 OCCUPANCIES, CORRIDORS ARE NOT REQUIRED TO HAVE A CLEAR WIDTH OF 96 INCHES (2438.4 MM) IN AREAS WHERE THERE WILL NOT BE STRETCHER OR BED MOVEMENT FOR ACCESS TO CARE OR AS PART OF THE DEFEND-IN-PLACE STRATEGY.

TABLE 1020.2
MINIMUM CORRIDOR WIDTH

OCCUPANCY	MINIMUM WIDTH (inches)
ANY FACILITIES NOT LISTED BELOW	44
ACCESS TO AND UTILIZATION OF MECHANICAL, PLUMBING OR ELECTRICAL SYSTEMS OR EQUIPMENT	24
WITH AN OCCUPANT LOAD OF 50 OR LESS, EXCEPT AS OTHERWISE REQUIRED BY CHAPTER 11	36
WITHIN A DWELLING UNIT, IN OCCUPANCY GROUPS I-1 AND R-1, EXCEPT AS OTHERWISE REQUIRED BY SECTION 1107	36
WITHIN A DWELLING UNIT, IN OCCUPANCY GROUPS R-2 AND R-3, EXCEPT AS OTHERWISE REQUIRED BY SECTION 1107	30
IN GROUP E SERVING CLASSROOMS	66
IN CORRIDORS AND AREAS SERVING STRETCHER TRAFFIC IN OCCUPANCIES WHERE PATIENTS RECEIVE OUTPATIENT MEDICAL CARE THAT CAUSES THE PATIENTS TO BE INCAPABLE OF SELF-PRESERVATION	72
GROUP I-2 IN AREAS WHERE REQUIRED FOR BED MOVEMENT	96

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1020.3 OBSTRUCTION
THE MINIMUM WIDTH OR REQUIRED CAPACITY OF CORRIDORS SHALL BE UNOBSTRUCTED.
EXCEPTION: ENCROACHMENTS COMPLYING WITH SECTION 1005.7.

1020.4 DEAD ENDS
WHERE MORE THAN ONE EXIT OR EXIT ACCESS DOORWAY IS REQUIRED, THE EXIT ACCESS SHALL BE ARRANGED SUCH THAT THERE ARE NO DEAD ENDS IN CORRIDORS MORE THAN 20 FEET (6096 MM) IN LENGTH.
EXCEPTIONS:
1. IN OCCUPANCIES IN GROUP I-3 OF CONDITION 2, 3 OR 4, THE DEAD END IN A CORRIDOR SHALL NOT EXCEED 50 FEET (15 240 MM).
2. IN OCCUPANCIES IN GROUPS B, E, F, I-1, M, R-1, S AND U, WHERE THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, THE LENGTH OF THE DEAD-END CORRIDORS SHALL NOT EXCEED 50 FEET (15 240 MM).
3. DEAD-END LENGTH NOT EXCEEDING 2.5 TIMES THE LEAST WIDTH OF THE DEAD-END CORRIDOR.
4. IN OCCUPANCIES IN GROUP R-2, THE DEAD END IN A CORRIDOR SHALL NOT EXCEED 40 FEET (12 192 MM). HOWEVER, WHERE THE CORRIDORS ARE COMPLETELY ENCLOSED IN CONSTRUCTION HAVING A 2-HOUR FIRE-RESISTANCE RATING WITH ALL DOORS OPENING INTO THE CORRIDOR BEING SELF-CLOSING AND HAVING A FIRE-RESISTANCE RATING OF 11/2 HOURS, THE LENGTH OF DEAD-END CORRIDOR SHALL NOT EXCEED 80 FEET (24 384 MM).

SECTION BC 1022 EXITS

1022.1 GENERAL
EXITS SHALL COMPLY WITH SECTIONS 1022 THROUGH 1027 AND THE APPLICABLE REQUIREMENTS OF SECTIONS 1003 THROUGH 1015. AN EXIT SHALL NOT BE USED FOR ANY PURPOSE THAT INTERFERES WITH ITS FUNCTION AS A MEANS OF EGRESS. ONCE A GIVEN LEVEL OF EXIT PROTECTION IS ACHIEVED, SUCH LEVEL OF PROTECTION SHALL NOT BE REDUCED UNTIL ARRIVAL AT THE EXIT DISCHARGE. EXITS SHALL BE CONTINUOUS FROM THE POINT OF ENTRY INTO THE EXIT TO THE EXIT DISCHARGE.
EXCEPTION: INTERIOR EXIT STAIRWAYS WITH DOORS THAT ARE AUTOMATIC-CLOSING BY SMOKE DETECTION PURSUANT TO THE EXCEPTION SET FORTH IN SECTION 713.7 MAY BE USED FOR TRAVEL BETWEEN FLOORS AND THIS USE SHALL NOT BE DEEMED TO INTERFERE WITH FUNCTION AS A MEANS OF EGRESS.

1022.2 EXTERIOR EXIT DOORS
BUILDINGS OR STRUCTURES USED FOR HUMAN OCCUPANCY SHALL HAVE NOT LESS THAN ONE EXTERIOR DOOR THAT MEETS THE REQUIREMENTS OF SECTION 1010.1.1.

1022.2.1 DETAILED REQUIREMENTS
EXTERIOR EXIT DOORS SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF SECTION 1010.1.

1022.2.2 ARRANGEMENT
EXTERIOR EXIT DOORS SHALL LEAD DIRECTLY TO THE EXIT DISCHARGE OR THE PUBLIC WAY.

SECTION BC 1023 INTERIOR EXIT STAIRWAYS AND RAMPS

1023.1 GENERAL
INTERIOR EXIT STAIRWAYS AND RAMPS SERVING AS AN EXIT COMPONENT IN A MEANS OF EGRESS SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION. INTERIOR EXIT STAIRWAYS AND RAMPS SHALL BE ENCLOSED AND LEAD DIRECTLY TO THE EXTERIOR OF THE BUILDING OR SHALL BE EXTENDED TO THE EXTERIOR OF THE BUILDING WITH AN EXIT PASSAGEWAY CONFORMING TO THE REQUIREMENTS OF SECTION 1024, EXCEPT AS PERMITTED IN SECTION 1028.1. AN INTERIOR EXIT STAIRWAY OR RAMP SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN AS A MEANS OF EGRESS AND A CIRCULATION PATH.

1023.2 CONSTRUCTION
ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND RAMPS SHALL BE CONSTRUCTED AS FIRE BARRIERS IN ACCORDANCE WITH SECTION 707 OR HORIZONTAL ASSEMBLIES CONSTRUCTED IN ACCORDANCE WITH SECTION 711, OR BOTH. INTERIOR EXIT STAIRWAY AND RAMP ENCLOSURES SHALL HAVE A FIRE-RESISTANCE RATING OF NOT LESS THAN 2 HOURS WHERE CONNECTING FOUR STORIES OR MORE AND NOT LESS THAN 1 HOUR WHERE CONNECTING LESS THAN FOUR STORIES. THE NUMBER OF STORIES CONNECTED BY THE INTERIOR EXIT STAIRWAYS OR RAMPS SHALL INCLUDE ANY BASEMENTS, BUT NOT ANY MEZZANINES. INTERIOR EXIT STAIRWAYS AND RAMPS SHALL HAVE A FIRE-RESISTANCE RATING NOT LESS THAN THE FLOOR ASSEMBLY PENETRATED, BUT NEED NOT EXCEED 2 HOURS. IN GROUP R-1 AND R-2 OCCUPANCIES, WHERE INTERIOR EXIT STAIRWAYS AND RAMPS ARE REQUIRED TO HAVE A FIRE-RESISTANCE RATING OF 2 HOURS, SUCH ENCLOSURES SHALL BE CONSTRUCTED OF MASONRY OR MASONRY EQUIVALENT. WALL ASSEMBLIES CONSTITUTING MASONRY EQUIVALENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH DEPARTMENT RULES.
EXCEPTIONS:
1. INTERIOR EXIT STAIRWAYS AND RAMPS IN GROUP I-3 OCCUPANCIES IN ACCORDANCE WITH THE PROVISIONS OF SECTION 408.3.8.
2. INTERIOR EXIT STAIRWAYS WITHIN AN ATRIUM ENCLOSED IN ACCORDANCE WITH SECTION 404.6.

1023.3 TERMINATION
INTERIOR EXIT STAIRWAYS AND RAMPS SHALL TERMINATE AT AN EXIT DISCHARGE OR A PUBLIC WAY.
EXCEPTION: A COMBINATION OF INTERIOR EXIT STAIRWAYS, INTERIOR EXIT RAMPS AND EXIT PASSAGEWAYS, CONSTRUCTED IN ACCORDANCE WITH SECTIONS 1023.2, 1023.3.1 AND 1024, RESPECTIVELY, AND FORMING A CONTINUOUS PROTECTED ENCLOSURE, SHALL BE PERMITTED TO EXTEND AN INTERIOR EXIT STAIRWAY OR RAMP TO THE EXIT DISCHARGE OR A PUBLIC WAY.

1023.3.1 EXTENSION
WHERE INTERIOR EXIT STAIRWAYS AND RAMPS ARE EXTENDED TO AN EXIT DISCHARGE OR A PUBLIC WAY BY AN EXIT PASSAGEWAY, THE INTERIOR EXIT STAIRWAY AND RAMP SHALL BE SEPARATED FROM THE EXIT PASSAGEWAY BY A FIRE BARRIER CONSTRUCTED IN ACCORDANCE WITH SECTION 707 OR A HORIZONTAL ASSEMBLY CONSTRUCTED IN ACCORDANCE WITH SECTION 711, OR BOTH. THE FIRE-RESISTANCE RATING SHALL BE NOT LESS THAN THAT REQUIRED FOR THE INTERIOR EXIT STAIRWAY AND RAMP. A FIRE DOOR ASSEMBLY COMPLYING WITH SECTION 716.5 SHALL BE INSTALLED IN THE FIRE BARRIER TO PROVIDE A MEANS OF EGRESS FROM THE INTERIOR EXIT STAIRWAY AND RAMP TO THE EXIT PASSAGEWAY. OPENINGS IN THE FIRE BARRIER OTHER THAN THE FIRE DOOR ASSEMBLY ARE PROHIBITED. PENETRATIONS OF THE FIRE BARRIER ARE PROHIBITED.
EXCEPTIONS:
1. PENETRATIONS OF THE FIRE BARRIER IN ACCORDANCE WITH SECTION 1023.5 SHALL BE PERMITTED.
2. SEPARATION BETWEEN AN INTERIOR EXIT STAIRWAY OR RAMP AND THE EXIT PASSAGEWAY EXTENSION SHALL NOT BE REQUIRED WHERE THERE ARE NO OPENINGS INTO THE EXIT PASSAGEWAY EXTENSION.

1023.4 OPENINGS
INTERIOR EXIT STAIRWAY AND RAMP OPENING PROTECTIVES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 716. OPENINGS IN INTERIOR EXIT STAIRWAYS AND RAMPS OTHER THAN UNPROTECTED EXTERIOR OPENINGS SHALL BE LIMITED TO THOSE NECESSARY FOR EXIT ACCESS TO THE ENCLOSURE FROM NORMALLY OCCUPIED SPACES AND FOR EGRESS FROM THE ENCLOSURE. ELEVATORS SHALL NOT OPEN INTO INTERIOR EXIT STAIRWAYS AND RAMPS.

1023.5 PENETRATIONS
PENETRATIONS INTO OR THROUGH INTERIOR EXIT STAIRWAYS AND RAMPS ARE PROHIBITED EXCEPT FOR EQUIPMENT AND DUCTWORK NECESSARY FOR INDEPENDENT VENTILATION OR PRESSURIZATION, HYDRONIC PIPING AND RELATED HEATING EQUIPMENT LIMITED TO SERVING THE INTERIOR EXIT STAIRWAY OR RAMP IN WHICH SUCH PIPING AND EQUIPMENT IS LOCATED, SPRINKLER PIPING, STANDPIPES, ELECTRICAL RACEWAY FOR FIRE DEPARTMENT COMMUNICATION SYSTEMS AND ELECTRICAL RACEWAY SERVING THE INTERIOR EXIT STAIRWAY AND RAMP AND TERMINATING AT A STEEL BOX NOT EXCEEDING 16 SQUARE INCHES (0.010 M2). SUCH PENETRATIONS SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 714. THERE SHALL NOT BE PENETRATIONS OR COMMUNICATION OPENINGS, WHETHER PROTECTED OR NOT, BETWEEN ADJACENT INTERIOR EXIT STAIRWAYS AND RAMPS.
EXCEPTION: MEMBRANE PENETRATIONS SHALL BE PERMITTED ON THE OUTSIDE OF THE INTERIOR EXIT STAIRWAY AND RAMP. SUCH PENETRATIONS SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 714.3.2.

1023.6 VENTILATION
EQUIPMENT AND DUCTWORK FOR INTERIOR EXIT STAIRWAY AND RAMP VENTILATION AS PERMITTED BY SECTION 1023.5 SHALL COMPLY WITH ONE OF THE FOLLOWING ITEMS:
1. SUCH EQUIPMENT AND DUCTWORK SHALL BE LOCATED EXTERIOR TO THE BUILDING AND SHALL BE DIRECTLY CONNECTED TO THE INTERIOR EXIT STAIRWAY AND RAMP BY DUCTWORK ENCLOSED IN CONSTRUCTION AS REQUIRED FOR SHAFTS.
2. WHERE SUCH EQUIPMENT AND DUCTWORK IS LOCATED WITHIN THE INTERIOR EXIT STAIRWAY AND RAMP, THE INTAKE AIR SHALL BE TAKEN DIRECTLY FROM THE OUTDOORS AND THE EXHAUST AIR SHALL BE DISCHARGED DIRECTLY TO THE OUTDOORS, OR SUCH AIR SHALL BE CONVEYED THROUGH DUCTS ENCLOSED IN CONSTRUCTION AS REQUIRED FOR SHAFTS.
3. WHERE LOCATED WITHIN THE BUILDING, SUCH EQUIPMENT AND DUCTWORK SHALL BE SEPARATED FROM THE REMAINDER OF THE BUILDING, INCLUDING OTHER MECHANICAL EQUIPMENT, WITH CONSTRUCTION AS REQUIRED FOR SHAFTS.
   IN EACH CASE, OPENINGS INTO THE FIRE-RESISTANCE-RATED CONSTRUCTION SHALL BE LIMITED TO THOSE NEEDED FOR MAINTENANCE AND OPERATION AND SHALL BE PROTECTED BY OPENING PROTECTIVES IN ACCORDANCE WITH SECTION 716 FOR SHAFT ENCLOSURES. THE INTERIOR EXIT STAIRWAY AND RAMP VENTILATION SYSTEMS SHALL BE INDEPENDENT OF OTHER BUILDING VENTILATION SYSTEMS.

1023.7 INTERIOR EXIT STAIRWAY AND RAMP EXTERIOR WALLS
EXTERIOR WALLS OF THE INTERIOR EXIT STAIRWAY OR RAMP SHALL COMPLY WITH THE REQUIREMENTS OF SECTION 705 FOR EXTERIOR WALLS. WHERE NONRATED WALLS OR UNPROTECTED OPENINGS ENCLOSE THE EXTERIOR OF THE STAIRWAY OR RAMPS AND THE WALLS OR OPENINGS ARE EXPOSED BY OTHER PARTS OF THE BUILDING AT AN ANGLE OF LESS THAN 180 DEGREES (3.14 RAD), THE BUILDING EXTERIOR WALLS WITHIN 10 FEET (3048 MM) HORIZONTALLY OF A NONRATED WALL OR UNPROTECTED OPENING SHALL HAVE A FIRE-RESISTANCE RATING OF NOT LESS THAN 1 HOUR. OPENINGS WITHIN SUCH EXTERIOR WALLS SHALL BE PROTECTED BY OPENING PROTECTIVES HAVING A FIRE PROTECTION RATING OF NOT LESS THAN 3/4 HOUR. THIS CONSTRUCTION SHALL EXTEND VERTICALLY FROM THE GROUND TO A POINT 10 FEET (3048 MM) ABOVE THE TOPMOST LANDING OF THE STAIRWAY OR RAMP, OR TO THE ROOF LINE, WHICHEVER IS LOWER.

1023.8 DISCHARGE IDENTIFICATION
AN INTERIOR EXIT STAIRWAY AND RAMP SHALL NOT CONTINUE BELOW ITS LEVEL OF EXIT DISCHARGE UNLESS AN APPROVED BARRIER IS PROVIDED AT THE LEVEL OF EXIT DISCHARGE TO PREVENT PERSONS FROM UNINTENTIONALLY CONTINUING INTO LEVELS BELOW. DIRECTIONAL EXIT SIGNS SHALL BE PROVIDED AS SPECIFIED IN SECTION 1013. AN APPROVED BARRIER SHALL CONSIST OF PARTITIONS, DOORS, OR GATES SEPARATING THE PORTION OF THE INTERIOR EXIT STAIRWAY ABOVE GRADE FROM THE PORTION BELOW GRADE. WHERE DOORS OR GATES ARE PROVIDED AS APPROVED BARRIERS, SUCH DOORS OR GATES SHALL BE SELF-CLOSING, OPENING IN THE DIRECTION OF EXIT TRAVEL FROM THE FLOORS BELOW GRADE, AND PROVIDED WITH LANDINGS IN ACCORDANCE WITH SECTIONS 1010.1.5 AND 1010.1.6.
EXCEPTIONS:
1. SUCH BARRIER SEPARATING THE ABOVE-GRADE PORTION OF THE INTERIOR EXIT STAIRWAYS AND RAMPS FROM THE PORTION BELOW GRADE SHALL NOT BE REQUIRED IN GROUP E AND R-3 OCCUPANCIES.
2. SUCH BARRIER SEPARATING THE ABOVE-GRADE PORTION OF THE INTERIOR EXIT STAIRWAYS AND RAMPS FROM THE PORTION BELOW GRADE SHALL NOT BE REQUIRED WHERE THE STAIRWAY OR RAMP DESIGN IS INTENDED TO CONTINUE THE PATH OF EGRESS THROUGH A BELOW GRADE LEVEL.

1023.9 STAIRWAY IDENTIFICATION AND FLOOR LEVEL SIGNS
SIGNS IDENTIFYING STAIRWAYS SHALL COMPLY WITH SECTION 1023.9.1. SIGNS IDENTIFYING FLOOR LEVELS SHALL COMPLY WITH SECTIONS 1023.9.2 THROUGH 1023.9.5.

1023.9.1 STAIRWAY IDENTIFICATION SIGNS
A STAIRWAY IDENTIFICATION SIGN INDICATING EACH STAIR BY ALPHABETIC LETTER SHALL BE POSTED ON BOTH SIDES OF EACH STAIR DOOR. THE ALPHABETIC LETTERS DESIGNATING THE IDENTIFICATION OF THE INTERIOR EXIT STAIRWAY AND RAMP SHALL BE NOT LESS THAN 3 INCHES (76.2 MM) IN HEIGHT. SUCH SIGN SHALL COMPLY WITH ITEMS 2, 5 AND 6 OF SECTION 1023.9.4.

1023.9.2 FLOOR IDENTIFICATION SIGNS
A FLOOR IDENTIFICATION SIGN SHALL BE PROVIDED AT EACH FLOOR LANDING IN AN INTERIOR EXIT STAIRWAY AND RAMP CONNECTING MORE THAN THREE STORIES. SUCH SIGN SHALL DESIGNATE:
- THE FLOOR LEVEL;
- THE TERMINUS OF THE TOP AND BOTTOM OF THE INTERIOR EXIT STAIRWAY AND RAMP;
- THE IDENTIFICATION OF THE INTERIOR EXIT STAIRWAY AND RAMP;
- THE STORY OF THE EXIT DISCHARGE; AND
- THE AVAILABILITY OF ROOF ACCESS FROM THE INTERIOR EXIT STAIRWAY AND RAMP FOR THE FIRE DEPARTMENT.

1023.9.3 ACCESSIBLE FLOOR LEVEL IDENTIFICATION SIGNS
FLOOR LEVEL IDENTIFICATION SIGNS IN VISUAL CHARACTERS, RAISED CHARACTERS AND BRAILLE COMPLYING WITH ICC A117.1 SHALL BE LOCATED AT EACH FLOOR LEVEL LANDING ADJACENT TO THE DOOR ON THE STAIR SIDE.

1023.9.4 SIGNAGE REQUIREMENTS
FLOOR IDENTIFICATION SIGNS REQUIRED BY SECTION 1023.9.2 SHALL COMPLY WITH ALL OF THE FOLLOWING REQUIREMENTS:
1. THE SIGNS SHALL BE A MINIMUM SIZE OF 18 INCHES (457.2 MM) BY 12 INCHES (304.8 MM).
2. THE TOP OF THE SIGNS SHALL BE LOCATED 5 FEET (1524 MM) ABOVE THE FLOOR LANDING IN A POSITION THAT IS READILY VISIBLE WHEN THE DOORS ARE IN THE OPEN AND CLOSED POSITIONS.
3. THE NUMBER DESIGNATING THE FLOOR LEVEL SHALL BE NOT LESS THAN 5 INCHES (127 MM) IN HEIGHT AND LOCATED IN THE CENTER OF THE SIGN.
4. OTHER LETTERING AND NUMBERS SHALL BE NOT LESS THAN 1 INCH (25.4 MM) IN HEIGHT.
5. CHARACTERS AND THEIR BACKGROUND SHALL HAVE A NONGLARE FINISH. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND, WITH EITHER LIGHT CHARACTERS ON A DARK BACKGROUND OR DARK CHARACTERS ON A LIGHT BACKGROUND.
6. WHERE SIGNS REQUIRED BY SECTION 1023.9 ARE INSTALLED IN THE INTERIOR EXIT STAIRWAYS AND RAMPS OF BUILDINGS SUBJECT TO SECTION 1025, THE SIGNS SHALL BE MADE OF THE SAME LUMINOUS MATERIALS AS REQUIRED BY SECTION 1025.4.

1023.9.5 DIRECTIONS TO OPENABLE DOORS
WHERE DOORS SERVING INTERIOR EXIT STAIRWAYS ARE LOCKED ON THE STAIR SIDE, SIGNAGE SHALL BE POSTED IN COMPLIANCE WITH SECTIONS 1031.4.1, 1031.4.2 AND 1031.4.3.

1023.10 ELEVATOR LOBBY IDENTIFICATION SIGNS
AT LANDINGS IN INTERIOR EXIT STAIRWAYS WHERE TWO OR MORE DOORS LEAD TO THE FLOOR LEVEL, ANY DOOR WITH DIRECT ACCESS TO AN ENCLOSED ELEVATOR LOBBY SHALL BE IDENTIFIED BY SIGNAGE LOCATED ON THE DOOR OR DIRECTLY ADJACENT TO THE DOOR STATING "ELEVATOR LOBBY." SIGNAGE SHALL BE IN ACCORDANCE WITH SECTION 1023.9.4, ITEMS 4, 5 AND 6.
1023.11 SMOKEPROOF ENCLOSURES AND PRESSURIZATION ALTERNATIVE
IN BUILDINGS REQUIRED TO COMPLY WITH SECTION 403 OR 405, EACH OF THE INTERIOR EXIT STAIRWAYS AND RAMPS SERVING A STORY WITH A FLOOR SURFACE LOCATED MORE THAN 75 FEET (22 860 MM) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS OR MORE THAN 30 FEET (9144 MM) BELOW THE FINISHED FLOOR OF A LEVEL OF EXIT DISCHARGE SERVING SUCH STORIES SHALL BE PROTECTED BY A SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE IN ACCORDANCE WITH SECTION 909.20.

1023.11.1 TERMINATION AND EXTENSION
A SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE SHALL TERMINATE AT AN EXIT DISCHARGE OR A PUBLIC WAY. THE SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE SHALL BE PERMITTED TO BE EXTENDED BY AN EXIT PASSAGEWAY IN ACCORDANCE WITH SECTION 1023.3. THE EXIT PASSAGEWAY SHALL BE WITHOUT OPENINGS OTHER THAN THE FIRE DOOR ASSEMBLY REQUIRED BY SECTION 1023.3.1 AND THOSE NECESSARY FOR EGRESS FROM THE EXIT PASSAGEWAY. THE EXIT PASSAGEWAY SHALL BE SEPARATED FROM THE REMAINDER OF THE BUILDING BY 2-HOUR FIRE BARRIERS CONSTRUCTED IN ACCORDANCE WITH SECTION 707 OR HORIZONTAL ASSEMBLIES CONSTRUCTED IN ACCORDANCE WITH SECTION 711, OR BOTH.
EXCEPTIONS:
1. OPENINGS IN THE EXIT PASSAGEWAY SERVING A SMOKEPROOF ENCLOSURE ARE PERMITTED WHERE THE EXIT PASSAGEWAY IS PROTECTED AND PRESSURIZED IN THE SAME MANNER AS THE SMOKEPROOF ENCLOSURE, AND OPENINGS ARE PROTECTED AS REQUIRED FOR ACCESS FROM OTHER FLOORS.
2. OPENINGS IN THE EXIT PASSAGEWAY SERVING A PRESSURIZATION ALTERNATIVE ARE PERMITTED WHERE THE EXIT PASSAGEWAY IS PROTECTED AND PRESSURIZED IN THE SAME MANNER AS THE PRESSURIZATION ALTERNATIVE.
3. THE FIRE BARRIER SEPARATING THE SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE FROM THE EXIT PASSAGEWAY IS NOT REQUIRED, PROVIDED THE EXIT PASSAGEWAY IS PROTECTED AND PRESSURIZED IN THE SAME MANNER AS THE SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE.
4. A SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE SHALL BE PERMITTED TO EGRESS THROUGH AREAS ON THE LEVEL OF EXIT DISCHARGE OR VESTIBULES AS PERMITTED BY SECTION 1028.
1023.11.2 ENCLOSURE ACCESS
ACCESS TO THE STAIRWAY OR RAMP WITHIN A SMOKEPROOF ENCLOSURE SHALL BE BY WAY OF A VESTIBULE OR AN OPEN EXTERIOR BALCONY.
EXCEPTION: ACCESS IS NOT REQUIRED BY WAY OF A VESTIBULE OR EXTERIOR BALCONY FOR STAIRWAYS AND RAMPS USING THE PRESSURIZATION ALTERNATIVE COMPLYING WITH SECTION 909.20.5.

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SIGNATURE & SEAL

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SHEET TITLE
MEANS OF EGRESS NOTES

G-004B.00

Scale:
Date: 12/1/2025 7:21:31 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

403.4 EMERGENCY SYSTEMS
THE DETECTION, ALARM AND EMERGENCY SYSTEMS OF HIGH-RISE BUILDINGS SHALL COMPLY WITH SECTIONS 403.4.1 THROUGH 403.4.8.

403.4.1 SMOKE DETECTION
SMOKE DETECTION SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 907.2.13.1.

403.4.2 FIRE ALARMS SYSTEMS
A FIRE ALARM SYSTEM SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 907.2.13.

403.4.3 STANDPIPE SYSTEM
A HIGH-RISE BUILDING SHALL BE EQUIPPED WITH A STANDPIPE SYSTEM AS REQUIRED BY SECTION 905.3.

403.4.4 EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM
AN EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 907.5.2.2.

403.4.5 EMERGENCY RESPONDER RADIO COVERAGE
EMERGENCY RESPONDER RADIO COVERAGE SHALL BE PROVIDED IN ACCORDANCE WITH THE NEW YORK CITY FIRE CODE AND SECTION 907.2.13.2 OF THIS CODE.

403.4.6 FIRE COMMAND
A FIRE COMMAND CENTER COMPLYING WITH SECTION 911 SHALL BE PROVIDED IN A LOCATION APPROVED BY THE FIRE DEPARTMENT.

403.4.7 POST-FIRE SMOKE PURGE
A POST-FIRE SMOKE PURGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 917.

403.4.8 STANDBY AND EMERGENCY POWER
A STANDBY POWER SYSTEM COMPLYING WITH SECTION 2702 AND SECTION 3003 SHALL BE PROVIDED FOR THE STANDBY POWER LOADS SPECIFIED IN SECTION 403.4.8.3. AN EMERGENCY POWER SYSTEM COMPLYING WITH SECTION 2702 SHALL BE PROVIDED FOR THE EMERGENCY POWER LOADS SPECIFIED IN SECTION 403.4.8.4.

403.4.8.1 EQUIPMENT ROOM
IF THE STANDBY OR EMERGENCY POWER SYSTEM INCLUDES A GENERATOR SET INSIDE A BUILDING, THE SYSTEM SHALL BE LOCATED IN A SEPARATE ROOM IN ACCORDANCE WITH SECTION 2702.1.2.2.

403.4.8.2 FUEL LINE PIPING PROTECTION
FUEL LINES SUPPLYING A GENERATOR SET INSIDE A BUILDING SHALL COMPLY WITH SECTION 1305.9 OF THE NEW YORK CITY MECHANICAL CODE.

403.4.8.3 STANDBY POWER SYSTEMS
A STANDBY POWER SYSTEM COMPLYING WITH SECTION 2702 SHALL BE PROVIDED FOR STANDBY POWER LOADS SPECIFIED IN SECTIONS 403.4.8.3.1 AND 403.4.8.3.2. FUEL SOURCES FOR GENERATORS SHALL BE IN ACCORDANCE WITH SECTION 2702.1.1.

403.4.8.3.1 STANDBY POWER LOADS IN OCCUPANCIES OTHER THAN GROUP R-2
IN BUILDINGS OF ANY OCCUPANCY GROUP OTHER THAN GROUP R-2, THE FOLLOWING ARE CLASSIFIED AS STANDBY POWER LOADS:
1. POWER AND LIGHTING FOR FIRE COMMAND CENTER REQUIRED BY SECTION 403.4.6;
2. VENTILATION AND AUTOMATIC FIRE DETECTION EQUIPMENT FOR SMOKEPROOF ENCLOSURES;
3. ELEVATORS, IN ACCORDANCE WITH SECTION 3003; AND
4. STAIR PRESSURIZATION SYSTEMS WHEN PROVIDED.

403.4.8.3.2 STANDBY POWER LOADS IN GROUP R-2 OCCUPANCIES
GROUP R-2 OCCUPANCIES IN BUILDINGS GREATER THAN 125 FEET (38 100 MM) IN HEIGHT SHALL BE REQUIRED TO PROVIDE A STANDBY POWER SYSTEM TO SUPPORT THE FOLLOWING LOADS:
1. POWER AND LIGHTING FOR FIRE COMMAND CENTER REQUIRED BY SECTION 403.4.6;
2. VENTILATION AND AUTOMATIC FIRE DETECTION EQUIPMENT FOR SMOKEPROOF ENCLOSURES;
3. AT LEAST ONE ELEVATOR SERVING ALL FLOORS, OR ONE ELEVATOR PER BANK WHERE DIFFERENT BANKS SERVE DIFFERENT PORTIONS OF THE BUILDING; AND
4. STAIR PRESSURIZATION SYSTEMS WHEN PROVIDED.

403.4.8.4 EMERGENCY POWER SYSTEMS
AN EMERGENCY POWER SYSTEM COMPLYING WITH SECTION 2702 SHALL BE PROVIDED FOR EMERGENCY POWER LOADS SPECIFIED IN SECTIONS 403.4.8.4.1 AND 403.4.8.4.3. FUEL SOURCES FOR GENERATORS SHALL BE IN ACCORDANCE WITH SECTION 2702.1.1.

403.4.8.4.1 EMERGENCY POWER LOADS IN OCCUPANCIES OTHER THAN GROUP R-2
IN BUILDINGS OF ANY OCCUPANCY GROUP OTHER THAN GROUP R-2, THE FOLLOWING ARE CLASSIFIED AS EMERGENCY POWER LOADS:
1. EXIT SIGNS AND MEANS OF EGRESS ILLUMINATION REQUIRED BY CHAPTER 10;
2. ELEVATOR CAR LIGHTING;
3. EMERGENCY VOICE/ALARM COMMUNICATIONS SYSTEMS, INCLUDING FIRE DEPARTMENT IN-BUILDING AUXILIARY RADIO COMMUNICATION SYSTEMS (ARCS);
4. AUTOMATIC FIRE DETECTION SYSTEMS;
5. FIRE ALARM SYSTEMS; AND
6. ELECTRICALLY POWERED FIRE PUMPS, INCLUDING MANUAL FIRE PUMPS, AUTOMATIC FIRE PUMPS, AND SPRINKLER BOOSTER PUMPS.

403.4.8.4.2 EMERGENCY POWER LOADS IN GROUP R-2 OCCUPANCIES
GROUP R-2 OCCUPANCIES IN BUILDINGS GREATER THAN 125 FEET (38 100 MM) IN HEIGHT SHALL BE REQUIRED TO PROVIDE AN EMERGENCY POWER SYSTEM TO SUPPORT THE FOLLOWING LOADS:
1. EXIT SIGNS AND MEANS OF EGRESS ILLUMINATION REQUIRED BY CHAPTER 10;
2. EMERGENCY VOICE COMMUNICATIONS SYSTEMS, INCLUDING FIRE DEPARTMENT IN-BUILDING AUXILIARY RADIO COMMUNICATION SYSTEMS (ARCS); AND
3. ELECTRICALLY POWERED FIRE PUMPS, UNLESS ELECTRICAL POWER TO THE MOTOR IS TAKEN AHEAD OF THE MAIN FROM THE STREET SIDE OF THE HOUSE SERVICE SWITCH.

403.4.8.4.3 EMERGENCY POWER LOADS IN GROUP R-2 OCCUPANCIES 125 FEET OR LESS IN HEIGHT
GROUP R-2 OCCUPANCIES IN BUILDINGS 125 FEET (38 100 MM) OR LESS IN HEIGHT SHALL BE REQUIRED TO PROVIDE AN EMERGENCY POWER SYSTEM TO SUPPORT THE FOLLOWING LOADS:
1. EMERGENCY VOICE COMMUNICATIONS SYSTEMS IN BUILDINGS CONTAINING GROUP R-2 OCCUPANCIES IN ACCORDANCE WITH SECTION 907.5.2.2 OF THIS CODE, OR WHERE OTHERWISE PROVIDED. BATTERIES IN ACCORDANCE WITH THE NEW YORK CITY ELECTRICAL CODE ARE PERMITTED TO SERVE AS THE SECONDARY POWER SUPPLY FOR SUCH SYSTEMS.
2. FIRE DEPARTMENT IN-BUILDING AUXILIARY RADIO COMMUNICATION SYSTEMS (ARCS) IN BUILDINGS CONTAINING GROUP R-2 OCCUPANCIES IN ACCORDANCE WITH SECTION 916.3 OF THIS CODE, OR WHERE OTHERWISE PROVIDED. BATTERIES IN ACCORDANCE WITH THE NEW YORK CITY ELECTRICAL CODE ARE PERMITTED TO SERVE AS THE SECONDARY POWER SUPPLY FOR SUCH SYSTEMS.

403.5 MEANS OF EGRESS AND EVACUATION
THE MEANS OF EGRESS IN HIGH-RISE BUILDINGS SHALL COMPLY WITH SECTIONS 403.5.1 THROUGH 403.5.6.

403.5.1 REMOTENESS OF INTERIOR EXIT STAIRWAYS
REQUIRED INTERIOR EXIT STAIRWAYS SHALL BE SEPARATED BY A DISTANCE NOT LESS THAN 30 FEET (9144 MM) OR NOT LESS THAN 1/4 OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE BUILDING OR AREA TO BE SERVED, WHICHEVER IS LESS. THE DISTANCE SHALL BE MEASURED IN A STRAIGHT LINE BETWEEN THE NEAREST POINTS OF THE ENCLOSURE SURROUNDING THE INTERIOR EXIT STAIRWAYS. IN BUILDINGS WITH THREE OR MORE INTERIOR EXIT STAIRWAYS, NO FEWER THAN TWO OF THE INTERIOR EXIT STAIRWAYS SHALL COMPLY WITH THIS SECTION. STAIRS SHARING ANY COMMON WALL, FLOORS, CEILINGS, SCISSOR STAIR ASSEMBLIES, OR OTHER ENCLOSURES SHALL BE COUNTED AS ONE INTERIOR EXIT STAIRWAY.

EXCEPTION: GROUP R-2 OCCUPANCIES.

403.5.2 ADDITIONAL EXIT STAIRWAY
FOR BUILDINGS OTHER THAN GROUP R-2 THAT ARE MORE THAN 420 FEET (128 M) IN BUILDING HEIGHT, ONE ADDITIONAL EXIT STAIRWAY MEETING THE REQUIREMENTS OF SECTIONS 1011 AND 1023 SHALL BE PROVIDED IN ADDITION TO THE MINIMUM NUMBER OF EXITS REQUIRED BY SECTION 1006.3. THE TOTAL WIDTH OF ANY COMBINATION OF REMAINING EXIT STAIRWAYS WITH ONE EXIT STAIRWAY REMOVED SHALL NOT BE LESS THAN THE TOTAL WIDTH REQUIRED BY SECTION 1005.1. STAIRS SHARING ANY COMMON WALL, FLOORS, CEILINGS, SCISSOR STAIR ASSEMBLIES, OR OTHER ENCLOSURES SHALL NOT BE CONSIDERED THE ADDITIONAL EXIT STAIRWAY REQUIRED BY THIS SECTION.

EXCEPTIONS: AN ADDITIONAL EXIT STAIRWAY SHALL NOT BE REQUIRED TO BE INSTALLED IN ANY OF THE FOLLOWING INSTANCES:
1. IN BUILDINGS WHERE ALL PASSENGER ELEVATORS FOR GENERAL PUBLIC USE AND ALL OTHER ELEVATORS USED FOR OCCUPANT SELF-EVACUATION COMPLY WITH SECTIONS 3008.1 THROUGH 3008.11;
2. IN BUILDINGS WHERE ALL OF THE FOLLOWING CONDITIONS ARE MET:
2.1 THE COMMISSIONER HAS APPROVED A TIMED EGRESS ANALYSIS ESTABLISHING THE EGRESS TIME IT WOULD TAKE FOR A FULL BUILDING EVACUATION, UTILIZING THE STAIRS REQUIRED BY SECTION 1006 AND THE ADDITIONAL STAIR THAT WOULD HAVE BEEN REQUIRED PURSUANT TO SECTION 403.5.2;
2.2 THE COMMISSIONER HAS APPROVED A TIMED EGRESS ANALYSIS ESTABLISHING THE EGRESS TIME IT WOULD TAKE FOR A FULL BUILDING EVACUATION, UTILIZING THE COMBINATION OF THE STAIRS REQUIRED BY SECTION 1006 AND ELEVATORS USED FOR OCCUPANT SELF-EVACUATION AS FOLLOWS:
2.2.1 SUCH ANALYSIS NEED ONLY UTILIZE A NUMBER OF DESIGNATED ELEVATORS DESIGNED FOR OCCUPANT SELF-EVACUATION NECESSARY TO DEMONSTRATE AN EVACUATION TIME THAT IS LESS THAN THE TIME ESTABLISHED IN EXCEPTION 2.1; AND
2.2.2 EVERY BANK OF PASSENGER ELEVATORS FOR GENERAL PUBLIC USE SHALL BE SERVED BY AT LEAST ONE SUCH DESIGNATED ELEVATOR;
2.3 ALL ELEVATORS IN THE BUILDING THAT EITHER ARE PASSENGER ELEVATORS FOR GENERAL PUBLIC USE OR ARE USED FOR OCCUPANT SELF-EVACUATION SHALL COMPLY WITH SECTIONS 3008.1 THROUGH 3008.11. HOWEVER, THE STANDBY POWER GENERATING EQUIPMENT REQUIRED BY SECTION 3008.9 NEED ONLY BE SIZED TO SATISFY THE LOADS REQUIRED TO SIMULTANEOUSLY OPERATE THOSE ELEVATORS IDENTIFIED IN THE TIMED EGRESS ANALYSIS DESCRIBED IN EXCEPTION 2.2.

THE MINIMUM NUMBER OF EXITS REQUIRED BY SECTION 1006 ARE ALL AT LEAST 25 PERCENT WIDER THAN THE EXIT WIDTH REQUIRED BY CHAPTER 10. THE INCREASE IN THE STAIR WIDTH SHALL NOT BE UTILIZED IN THE TIMED EGRESS ANALYSES REQUIRED BY EXCEPTIONS 2.1 AND 2.2.

403.5.3 STAIRWAY DOOR OPERATION
OORS OPENING INTO INTERIOR STAIR ENCLOSURES SHALL NOT BE LOCKED FROM EITHER SIDE. HOWEVER, A DOOR LOCKED FROM THE STAIR SIDE MAY BE PERMITTED PROVIDED THAT SUCH DOOR IS EQUIPPED WITH AN AUTOMATIC FAIL SAFE SYSTEM FOR OPENING IN THE EVENT OF THE ACTIVATION OF ANY AUTOMATIC FIRE DETECTION SYSTEM, OR WHEN ANY ELEVATOR RECALL IS ACTIVATED, OR WHEN ANY SIGNAL IS RECEIVED FROM THE FIRE COMMAND CENTER. SUCH DOOR SHALL BE DEEMED AS OPENABLE FROM THE STAIR SIDE. STAIR REENTRY SIGNS SHALL BE POSTED THROUGHOUT THE STAIRWAY INDICATING THAT REENTRY IS PROVIDED ONLY DURING FIRE EMERGENCIES. SUCH SIGNS SHALL BE IN ACCORDANCE WITH SECTION 1031.4.2.

EXCEPTION: IN SCHOOLS CLASSIFIED AS GROUP E OCCUPANCIES THAT REQUIRE "LOCKDOWN DRILLS" AS PER SECTION 807 OF THE NEW YORK STATE EDUCATION LAW, STAIRWAY EGRESS DOORS FROM OCCUPIED SPACES ARE PERMITTED TO BE LOCKED FROM THE SIDE OPPOSITE THE EGRESS SIDE FOR THE DURATION OF THE LOCKDOWN DRILL, PROVIDED THEY ARE OPENABLE FROM THE OCCUPIED SIDE FOR EGRESS AND ARE UNLOCKED UPON DIRECTIONS FROM THE SCHOOL ADMINISTRATIVE PERSONNEL FOLLOWING THE COMPLETION OF THE LOCKDOWN DRILL.

403.5.3.1 STAIRWAY COMMUNICATION SYSTEM
A TELEPHONE OR OTHER TWO-WAY VOICE‡ COMMUNICATIONS SYSTEM CONNECTED TO AN APPROVED CONSTANTLY ATTENDED STATION SHALL BE PROVIDED AT NOT LESS THAN EVERY FIFTH FLOOR IN EACH STAIRWAY WHERE THE DOORS TO THE STAIRWAY ARE LOCKED IN ACCORDANCE WITH SECTION 403.5.3.

403.5.4 SMOKEPROOF ENCLOSURES
EVERY REQUIRED INTERIOR EXIT STAIRWAY SERVING FLOORS MORE THAN 75 FEET (22 860 MM) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS SHALL COMPLY WITH SECTIONS 909.20 AND 1023.11.

EXCEPTION: SMOKEPROOF ENCLOSURES ARE NOT REQUIRED IN OCCUPANCY GROUP R-2 UNLESS PROVIDED PURSUANT TO EXCEPTION 2 OF SECTION 917.1..

403.5.5 LUMINOUS EGRESS PATH MARKINGS
LUMINOUS EGRESS PATH MARKINGS SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 1025 AND APPENDIX S.

EXCEPTION: EGRESS PATHS SERVING GROUP R-2.

403.5.6 EMERGENCY ESCAPE AND RESCUE
EMERGENCY ESCAPE AND RESCUE OPENINGS SPECIFIED IN SECTION 1030 ARE NOT REQUIRED

403.6 ELEVATORS
ELEVATOR INSTALLATION AND OPERATION IN HIGH-RISE BUILDINGS SHALL COMPLY WITH CHAPTER 30 AND SECTIONS 403.6.1 AND 403.6.2.

403.6.1 FIRE SERVICE ACCESS ELEVATOR
IN BUILDINGS WITH AN OCCUPIED FLOOR MORE THAN 120 FEET (36 576 MM) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS, A MINIMUM OF ONE FIRE SERVICE ACCESS ELEVATOR SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 3007

403.6.2 OCCUPANT EVACUATION ELEVATORS
WHERE INSTALLED IN ACCORDANCE WITH SECTION 3008, PASSENGER ELEVATORS FOR GENERAL PUBLIC USE SHALL BE PERMITTED TO BE USED FOR OCCUPANT SELF-EVACUATION.

403.6.3 ELEVATOR LOBBIES
ELEVATOR LOBBIES SHALL BE PROVIDED IN ACCORDANCE WITH SECTIONS 3006.1.1 AND 3006.1.2.

403.7 OUTDOOR AIR INTAKES
FOR HIGH-RISE BUILDINGS, OUTDOOR AIR INTAKES SERVING SPACES ABOVE THE SECOND STORY AND SERVING SPACES GREATER THAN 10,000 SQUARE FEET (929 M2) OF FLOOR AREA SHALL BE LOCATED IN ACCORDANCE WITH SECTION 401.5 OF THE NEW YORK CITY MECHANICAL CODE.

EXCEPTION: GROUP R-2 OCCUPANCY.

403.8 OPEN WEB STEEL JOISTS
THE USE OF OPEN WEB STEEL JOISTS SHALL BE PROHIBITED IN HIGH-RISE BUILDINGS UNTIL THE COMMISSIONER PROMULGATES RULES ESTABLISHING MINIMUM ACCEPTABLE FIREPROOFING METHODS.

TABLE 504.3a

ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION									
	SEE FOOTNOTES	TYPE I		TYPE II		TYPE III		TYPE IVi	TYPE V	
		A	Bi	A	B	A	B	HT	A	B
A-1	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-2	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-3	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-4	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-5	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
B	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
E	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
F-1	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
F-2	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
H-1	S	UL	160	65	55	65	55	65	50	NP
H-2f	S	UL	160	65	55	65	55	65	50	40
H-3f	S	UL	160	65	55	65	55	65	50	40
H-4	S	UL	180	85	75	85	75	85	70	60
H-5	S	UL	160	65	55	65	55	65	50	40
I-1	S13D	60	60	60	NP	60	55	60	NP	NP
	S13R	60	60	60	NP	60	55	60	NP	NP
	S	UL	420	85	NP	85	75	85	NP	NP
I-2	S	UL	180	85	55	65	55	65	50	NP
I-3	S	UL	180	85	75	85	75	85	70	NP
I-4	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
M	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
R-1	S13R	60	60	60	NP	60	NP	60	NP	NP
	S	UL	420	85	NP	85	NP	85	NP	NP
R-2	S13R	60	60	60	NP	60	60	60	NP	NP
	S	UL	420	85	NP	85	75	85	NP	NP
R-3	NSb,c	UL	160	65	55	65	55	65	50g,h	40g
	S13D	60	60	60	60	60	55	60	50g,h	40g
	S13R	60	60	60	60	60	60	60	60g,h	60g
	S	UL	420	85	75	85	75	85	70g,h	60g
S-1	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
S-2d,e	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
Ue	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60

NOT PERMITTED IN FIRE DISTRICT	NOT PERMITTED IN FIRE DISTRICT WITHOUT SPRINKLERS

X = Number of stories in nonsprinklered 1- & 2-family buildings shall be limited by Section 903.2.8

Note: UL = Unlimited; NP = Not permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See the following sections for general exceptions to Table 504.4:
1. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
2. Section 506.3, Allowable area increase due to frontage.
3. Section 507, Unlimited area building.
b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
c. The NS value is only for use in buildings not required by this code to be equipped throughout with an automatic sprinkler system.
d. For open parking structures, see Section 406.5.
e. For private garages, see Section 406.3.
f. See Section 415.8 for limitations.
g. See Exception 9 of Section D105.1 for allowances of Type VA and VB construction for R-3 occupancies.
h. See Exception 12 of Section D105.1 for allowances of Type VA construction and height limitations for R-3 occupancies in Lower Density Growth Management Areas.
i. Type IV construction utilizing cross-laminated timber or structural composite lumber shall be sprinklered where required by Section 903.2.13.

TABLE 504.3
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
S-2 d,a	NS b,c	UL	160	65	55	65	55	65	50	40

GENERAL BUILDING HEIGHTS AND AREAS; SEPARATION OF OCCUPANCIES

U e	S	UL	420	85	75	85	75	85	70	60
	NS b,c	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60

= Not permitted in Fire District   = Not permitted in Fire District without sprinklers

For SI: 1 foot 304.8 mm.
Note: UL-Unlimited; NP-Not permitted; NS-Buildings not equipped throughout with an automatic sprinkler system; S-Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R - Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.
a. See the following sections for general exceptions to Table 504.3:
1. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
2. Section 506.3, Allowable area increase due to frontage.
3. Section 507, Unlimited area building
b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
c. The NS value is only for use in buildings not required by this code to be equipped throughout with an automatic sprinkler system.
d. For open parking structures, see Section 406.5.
e. For private garages, see Section 406.3.
f. See Section 415.8 for limitations.
g. See Exception 9 of Section D105.1 for allowances of Type VA and VB construction for R-3 occupancies.
h. See Exception 12 of Section D105.1 for allowances of Type VA construction and height limitations for R-3 occupancies in Lower Density Growth Management Areas.
i. See Section 403.2.1 for additional requirements for high-rise buildings.
j. Type IV construction utilizing cross-laminated timber or structural composite lumber shall be sprinklered where required by Section 903.2.13.

19. TABLE 508.4 OF 2022 NYC BC CHAPTER 5 GENERAL BUILDING HEIGHTS AND AREAS; SEPARATION OF OCCUPANCIES, SECTION BC 508 MIXED USE AND OCCUPANCY.

TABLE 508
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

Occupancy	A, E		I-1, I-3, 1-4		I-2		Rª		F-2, S-2ᵇ, U		B		F-1		M		S-1		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A, E	N	N	1	2	2	NP	1	2	N	1	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
I-1, I-3, 1-4	--	--	N	N	2	NP	1	NP	1	2	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
I-2	--	--	--	--	N	N	2	NP	2	NP	2	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
Rª	--	--	--	--	--	--	N	N	1ᶜ	2ᶜ	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2ᵇ, U	--	--	--	--	--	--	--	--	N	N	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
B	--	--	--	--	--	--	--	--	--	--	N	N	2	3	1	2	2	3	NP	NP	2	3	1	2	1	NP
F-1	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	2	3	NP	NP	2	3	1	2	1	NP
M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	NP	NP	2	3	1	2	1	NP
S-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	NP	NP	2	3	1	2	1	NP
H-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	NP	NP	NP	NP	NP	NP
H-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	1	NP	1	NP
H-3, H-4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1ᵈ	NP	1	NP
H-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement
NP = Not permitted
a. See Section 420
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.1.4.
d. Separation is not required between occupancies of the same classification.

MULTIPLE DWELLING LAW

GENERAL PROVISIONS

1. LIGHTING AND VENTILATION OF ROOMS SHALL BE AS PER SECTION 30, MDL.
2. SIZE OF ROOMS SHALL BE AS PER SECTION 31, MDL.
3. ALCOVES SHALL BE AS PER SECTION 32, MDL.
4. COOKING SPACES (KITCHENS & KITCHENETTES) SHALL BE AS PER SECTION 33, MDL.
5. BUILDING ENTRANCE DOORS AND LIGHTS SHALL BE AS PER SECTION 35, MDL.
6. MAIL RECEPTACLES SHALL BE AS PER SECTION 57, MDL.
7. ALL INCOMBUSTIBLE MATERIALS SHALL BE AS PER SECTION 58, MDL.
8. PARAPETS AND GUARD RAILINGS SHALL BE AS PER SECTION 62, MDL.
9. SUB-CURB USES SHALL BE AS PER SECTION 63, MDL.
10. LIGHTING, GAS METERS, GAS AND OIL APPLIANCES SHALL BE AS PER SECTION 64, MDL.
11. BOILER ROOMS SHALL BE AS PER SECTION 65, MDL.
12. WATER-CLOSET AND BATH ACCOMMODATIONS SHALL BE AS PER SECTION 76, MDL.
13. PLUMBING AND DRAINAGE SHALL BE AS PER SECTION 77, MDL.
14. REPAIRS SHALL BE MADE AS PER SECTION 78, MDL.
15. HEAT SHALL BE PROVIDED AS PER SECTION 79, MDL.
16. CLEANLINESS SHALL BE AS PER SECTION 80, MDL.
17. RECEPTACLES FOR WASTE MATTER SHALL BE AS PER SECTION 81, MDL.
18. PRIVACY SHALL BE AS PER SECTION 82, MDL.
19. JANITORIAL SERVICES SHALL BE AS PER SECTION 83, MDL.
20. CONSTRUCTION STANDARDS FOR THE CONTROL OF NOISE SHALL BE AS ER SECTION 84, MDL.

TABLE 508.4

REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

OCCUPANCY	A, E		I-1a, I-3, I-4		I-2		Ra		F-2, S-2b, U		Be		F-1		M		S-1		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A, E	N	N	1	2	2	NP	1	2	Nf	1f	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
I-1a, I-3, I-4	--	--	N	N	2	NP	1	NP	1	2	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
I-2	--	--	--	--	N	N	2	NP	2	NP	2	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
Ra	--	--	--	--	--	--	N	N	1c	2c	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2b, U	--	--	--	--	--	--	--	--	N	N	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
Be	--	--	--	--	--	--	--	--	--	--	N	N	2	3	1	2	2	3	NP	NP	2	3	1	2	1	NP
F-1	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	2	3	NP	NP	2	3	1	2	1	NP
M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	NP	NP	2	3	1	2	1	NP
S-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	NP	NP	2	3	1	2	1	NP
H-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	NP	NP	NP	NP	NP	NP
H-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	1	NP	1	NP
H-3, H-4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1d	NP	1	NP
H-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.
a. See Section 420.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.3.4.
d. Separation is not required between occupancies of the same classification.
e. See Section 422.2 for ambulatory care facilities.
f. A commercial kitchen in Group F-2 that does not comply with Section 508.1, Exception 5 shall be separated from adjoining dining spaces with 1-hour fire separation where the dining spaces are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, and separated with 2-hour fire separation where the dining spaces is not equipped throughout with an automatic sprinkler system.

OCCUPANCY FIRE-RESISTANCE RATINGS NOTES

20. TABLE 601 OF 2022 NYC BC CHAPTER 6 TYPES OF CONSTRUCTION, SECTION BC 601 GENERAL.

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame (see section 202)	3^a	$2^{a,j}$	1^j	0	1	0	HT	1	0
Bearing walls Exterior	3	2	1	0	2	2	2	1	0
Interior	3^a	2^a	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions Exterior			See Table 602						
Nonbearing walls and partitions Interior	0	0	0	0	0	0	See Section 602.4.6.	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	$1^{1/2b,c}$	$1^{b,c}$	$1^{b,c}$	0^c	$1^{b,c}$	0	HT	$1^{b,c}$	0

For SI: 1 foot = 304.8 mm.
a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
b. 1. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members within any portion of the roof, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant- treated wood members shall be allowed to be used for such unprotected members.
2. Except in Group F occupancies subject to regulation under Sections 264(1) and 264(2) of the New York State Labor Law, and in Group I-1, R-1, and R-2 occupancies, in Types I and II construction, fire-retardant-treated wood shall be allowed in buildings including girders and trusses as part of the roof construction when the building is:
i. Type II construction of any height; or
ii. Type I construction two stories or less; or when over two stories, the vertical distance from the upper floor to the roof is 20 feet or more. c. Except in Group F occupancies subject to regulation under Sections 264(1) and 264(2) of the New York State Labor Law, and in Group I-1, R-1 and R-2 occupancies, heavy timber shall be allowed where a 1- hour or less fire-resistance rating is required.
d. Not less than the fire-resistance rating required by other sections of this code.
e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
f. Not less than the fire-resistance rating as referenced in Section 704.10.
g. See note g of Table 602.
h. See Section 711.2.4 for additional requirements.
i. Type V construction is not permitted inside fire districts except as provided for in Section D105.1 of Appendix D.
j. See Section 403.2.1 for additional requirements for high-rise buildings and fire-resistance rating of columns in such buildings.

21. TABLE 602 OF 2022 NYC BC CHAPTER 6 TYPES OF CONSTRUCTION, SECTION BC 602 CONSTRUCTION CLASSIFICATION.

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H f	OCCUPANCY GROUP F-1, M, S-1 g,l	OCCUPANCY GROUP A, B, E, F-2, I, R, S-2, U b
a e g h j				
X<5°	All	3	2	1
5 < x < 10	IA	3	2	1
	Others	2	1	1
10 ≤ X < 30	IA,IB	2	1	1^d
	IIB,VB	1	0	0
	Others	1	1	1^d
X>30	All	0	0	0

For SI: 1 foot 304.8 mm.
a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
b. Group U when used as accessory to Group R-3 shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet or more for free standing private garages in compliance with Section 406.1, and when the separation distance is 3 feet or more for other freestanding Group U buildings. For free standing private garages where the fire separation distance is less than 5 feet, refer to Section 406.3.4 for required fire-resistance rating for exterior walls.
c. See Section 706.1.1 for party walls.
d. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
e. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
f. For special requirements for Group H occupancies, see Section 415.6.
g. Inside the fire district, exterior load-bearing walls of Type II buildings shall have a fire-resistance rating not less than prescribed below:
X<5 2 hours
5 < x <10 2 hours
10 <X<30 1 hour
X230 As per Table 602.

h. Inside the fire district, exterior nonload-bearing walls of Type II buildings shall have a fire-resistance rating not less than prescribed below: X<5 As per Table 602
5≤ X ≤10 As per Table 602
10<X<30 X230 1 hour
X>30 As per Table 602.
i. For special requirements for Group S aircraft hangars, see Section 412.4.1.
j. Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.

TABLE 601

FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE Vi	
	A	B	A	B	A	B	HT	A	B
Primary structural framef (see Section 202)	3a	2a, j	1j	0	1	0	HT	1	0
Bearing walls									
Exteriore,f,g	3	2	1	0	2	2	2	1	0
Interior	3a	2a	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions									
Exterior			See Table 602						
Nonbearing walls and partitions Interiord	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor constructionh and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	11/2b,c	1b,c	1b,c	0c	1b,c	0	HT	1b,c	0

FOR SI: 1 FOOT = 304.8 MM.
A. ROOF SUPPORTS: FIRE-RESISTANCE RATINGS OF PRIMARY STRUCTURAL FRAME AND BEARING WALLS ARE PERMITTED TO BE REDUCED BY 1 HOUR WHERE SUPPORTING A ROOF ONLY.
B. 1.EXCEPT IN GROUP F-1, H, M AND S-1 OCCUPANCIES, FIRE PROTECTION OF STRUCTURAL MEMBERS IN ROOF CONSTRUCTION SHALL NOT BE REQUIRED, INCLUDING PROTECTION OF PRIMARY STRUCTURAL FRAME MEMBERS WITHIN ANY PORTION OF THE ROOF, ROOF FRAMING AND DECKING WHERE EVERY PART OF THE ROOF CONSTRUCTION IS 20 FEET OR MORE ABOVE ANY FLOOR IMMEDIATELY BELOW. FIRE-RETARDANT- TREATED WOOD MEMBERS SHALL BE ALLOWED TO BE USED FOR SUCH UNPROTECTED MEMBERS.
2. EXCEPT IN GROUP F OCCUPANCIES SUBJECT TO REGULATION UNDER SECTIONS 264(1) AND 264(2) OF THE NEW YORK STATE LABOR LAW, AND IN GROUP I-1, R-1, AND R-2 OCCUPANCIES, IN TYPES I AND II CONSTRUCTION, FIRE-RETARDANT—TREATED WOOD SHALL BE ALLOWED IN BUILDINGS INCLUDING GIRDERS AND TRUSSES AS PART OF THE ROOF CONSTRUCTION WHEN THE BUILDING IS:
i.TYPE II CONSTRUCTION OF ANY HEIGHT; OR
ii. TYPE I CONSTRUCTION TWO STORIES OR LESS; OR WHEN OVER TWO STORIES, THE VERTICAL DISTANCE FROM THE UPPER FLOOR TO THE ROOF IS 20 FEET OR MORE.
C. EXCEPT IN GROUP F OCCUPANCIES SUBJECT TO REGULATION UNDER SECTIONS 264(1) AND 264(2) OF THE NEW YORK STATE LABOR LAW, AND IN GROUP I-1, R-1 AND R-2 OCCUPANCIES, HEAVY TIMBER SHALL BE ALLOWED WHERE A 1-HOUR OR LESS FIRE-RESISTANCE RATING IS REQUIRED.
D. NOT LESS THAN THE FIRE-RESISTANCE RATING REQUIRED BY OTHER SECTIONS OF THIS CODE.
E. NOT LESS THAN THE FIRE-RESISTANCE RATING BASED ON FIRE SEPARATION DISTANCE (SEE TABLE 602).
F. NOT LESS THAN THE FIRE-RESISTANCE RATING AS REFERENCED IN SECTION 704.10.
G. SEE NOTE G OF TABLE 602.
H. SEE SECTION 711.2.4 FOR ADDITIONAL REQUIREMENTS.
I. TYPE V CONSTRUCTION IS NOT PERMITTED INSIDE FIRE DISTRICTS EXCEPT AS PROVIDED FOR IN SECTION D105.1 OF APPENDIX D.
J. SEE SECTION 403.2.1 FOR ADDITIONAL REQUIREMENTS FOR HIGH-RISE BUILDINGS AND FIRE-RESISTANCE RATING OF COLUMNS IN SUCH BUILDINGS.FOR SI: 1 FOOT = 304.8 MM.

HOUSING MAINTENANCE CODE

1. OWNER SHALL FILE REGISTRATION STATEMENT AS PER §27–2097 HMC.
2. OWNER SHALL PROVIDE A SIGN IDENTIFYING OWNER, MANAGEMENT AND SUPERINTENDENT AS PER § 27–2104 HMC.
3. FLOOR SIGNS SHALL BE PLACED AND MAINTAINED ON EACH FLOOR LEVEL AS PER §27–2048 HMC.
4. ALL APARTMENT ENTRANCE DOORS SHALL BE A MINIMUM 3/4 HOUR RATED, SELF CLOSING WITH PEEPHOLES AS PER §27–2041 HMC AND LOCKS AS PER §27–2043 HMC.
5. MIRRORS IN ELEVATORS SHALL BE AS PER §27–2042 HMC.
6. THE BUILDING'S HEATING AND HOT WATER SUPPLY SHALL COMPLY WITH §27–2028 THROUGH § 27–2033 HMC.
7. LIGHTING SHALL BE PROVIDED AS PER §27–2037 THROUGH §27–2040 AND C26-605AC, C26-1203AC AND SECTION 26-35 MDL.
8. RECEPTACLES AND COLLECTION FOR WASTE MATTER SHALL BE PROVIDED AS PER §27–2021 AND §27–2022 HMC.
9. U.S. MAIL SERVICE SHALL BE PROVIDED AS PER §27–2047 HMC.
10. THE BUILDING STREET NUMBER SHALL BE DISPLAYED AS §27–2049 HMC.
11. JANITORIAL SERVICES SHALL BE PROVIDED AS PER §27–2053 AND §27–2054 HMC.
12. OWNER SHALL PAINT ALL PUBLIC PARTS OF A MULTIPLE DWELLING AS PER §27–2013 HMC.
13. INTERIOR OF DWELLING UNITS SHALL BE CLEANED §27–2012 HMC
14. DUTIES OF OWNER SHALL BE AS PER §27–2005 HMC.
15. DUTIES OF TENANTS SHALL BE AS PER §27–2006 AND §27–2007 HMC.
16. OWNER'S RIGHT OF ACCESS SHALL BE AS PER §27–2008 HMC.
17. NOTICE AND REPORTING OF BEDBUG INFESTATION SHALL BE AS PER §27–2018
18. WATER SHALL BE SUPPLIED AS PER §27–2024 AND §27–2025 HMC.
19. THE PLUMBING AND DRAINAGE SYSTEM SHALL BE MAINTAINED AS PER §27–2026 HMC.
20. DRAINAGE OF ROOFS AND COURT YARDS SHALL BE AS PER §27–2027 HMC.
21. NATURAL LIGHT AND VENTILATION SHALL BE PROVIDED AS PER §27–2057 HMC FOR MULTIPLE DWELLINGS.
22. SANITARY FACILITIES IN MULTIPLE DWELLINGS AND LIGHT AND VENTILATION FOR TOILET COMPARTMENTS SHALL BE AS PER §27–2064, §27–2065, §27–2066 AND §27–2067 HMC.
23. KITCHENS AND KITCHENETTES SHALL BE PROVIDED WITH PROPER FACILITIES, EQUIPMENT, LIGHTING, VENTILATION AND FIRE PROTECTION AS PER §27–2070, §27–2071, AND §27–2072 HMC.
24. MINIMUM ROOM SIZES SHALL BE AS PER §27–2074 AND MAXIMUM OCCUPANCY SHALL BE AS PER §27–2075 HMC.

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) NOTES

1. EIFS SHALL BE CONSTRUCTED SUCH THAT IT MEETS THE PERFORMANCE CHARACTERISTICS REQUIRED IN ASTM E 2568.
2. THE UNDERLYING STRUCTURAL FRAMING AND SUBSTRATE SHALL BE DESIGNED AND CONSTRUCTED TO RESIST LOADS AS REQUIRED BY NUC B 2014, CHAPTER 16.
3. EIFS SHALL BE DESIGNED AND CONSTRUCTED TO RESIST WIND AND RAIN IN ACCORDANCE WITH THIS THE MANUFACTURER'S APPLICATION INSTRUCTIONS.
4. EIFS WITH DRAINAGE SHALL HAVE AN AVERAGE MINIMUM DRAINAGE EFFICIENCY OF 90 PERCENT WHEN TESTED IN ACCORDANCE WITH REQUIREMENTS OF ASTM E 2273.
5. EIFS WITH DRAINAGE SHALL HAVE A WATER-RESISTIVE BARRIER COMPLYING WITH SECTION 1404.2 OR ASTM E 2570.
6. INSTALLATION OF EIFS AND EIFS WITH DRAINAGE SHALL BE IN ACCORDANCE WITH THE EIFS MANUFACTURER'S INSTRUCTIONS.
7. EIFS INSTALLATION SPECIAL INSPECTIONS SHALL COMPLY WITH THE PROVISIONS OF NYC BC 2014, CHAPTER 17.

SMOKE DETECTING DEVICES NOTES

1. SMOKE DETECTING DEVICES SHALL CONFORM TO THE 2014 NYC BC SECTION BC 907 FIRE ALARM AND DETECTION SYSTEMS. SYSTEMS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH NFPA 72 AS MODIFIED IN APPENDIX Q AND THE NEW YORK CITY ELECTRICAL CODE.
2. SMOKE DETECTORS WITHIN DWELLING UNITS ARE REQUIRED IN THE FOLLOWING AREAS AS PER SECTION 907.2.8.3: IN SLEEPING AREAS AND IN EVERY ROOM IN THE PATH OF THE MEANS OF EGRESS FROM THE SLEEPING AREA TO THE DOOR LEADING FROM THE DWELLING UNIT.
3. AS PER SECTION 907.2.11.2, REQUIRED SMOKE ALARMS SHALL RECEIVE THEIR PRIMARY POWER FROM A DEDICATED BRANCH CIRCUIT OR THE UNSWITCHED PORTION OF A BRANCH CIRCUIT ALSO USED FOR POWER AND LIGHTING, AND SHALL BE EQUIPPED WITH A BATTERY BACKUP. SMOKE ALARMS SHALL EMIT A SIGNAL WHEN THE BATTERIES ARE LOW. WIRING SHALL BE PERMANENT AND WITHOUT A DISCONNECTING SWITCH OTHER THAN AS REQUIRED FOR OVER- CURRENT PROTECTION. EXCEPTION: SMOKE ALARMS WITH INTEGRAL STROBES SHALL NOT REQUIRE BATTERY BACKUP PROVIDED THAT THE SMOKE ALARMS ARE CONNECTED TO AN EMERGENCY ELECTRICAL SOURCE.
4. ACCESSIBLE AUDIBLE AND VISIBLE ALARMS AND NOTIFICATION APPLIANCES SHALL BE INSTALLED IN ACCORDANCE WITH ICC/ANSI A117.1.
5. AS PER SECTION 901.2, FIRE PROTECTION SYSTEMS SHALL BE INSTALLED, REPAIRED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE 2014 NYC BC AND THE NEW YORK CITY FIRE CODE.
6. AS PER SECTION 901.5 ACCEPTANCE TESTS, FIRE PROTECTION SYSTEMS SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2014 NYC BC AND THE NEW YORK CITY FIRE CODE.

CARBON MONOXIDE DETECTING DEVICES NOTES

1. CARBON MONOXIDE ALARMS AND DETECTORS SHALL CONFORM TO THE 2014 NYC BC SECTION BC 908.7.
2. CARBON MONOXIDE ALARMS OR DETECTORS WITHIN DWELLING UNITS ARE REQUIRED IN THE FOLLOWING AREAS AS PER SECTION 908.7.1.1: OUTSIDE ANY ROOM USED FOR SLEEPING PURPOSES, WITHIN 15 FEET OF THE ENTRANCE TO SUCH ROOM AND IN ANY ROOM USED FOR SLEEPING PURPOSES.
3. AS PER SECTION 908.7.1.1.2, CARBON MONOXIDE ALARMS OR DETECTORS SHALL COMPLY WITH THE POWER SOURCE, INTERCONNECTION, AND ACCEPTANCE TESTING REQUIREMENTS AS REQUIRED FOR SMOKE ALARMS IN ACCORDANCE WITH SECTIONS 907.2.11.2 THROUGH 907.2.11.3.
4. AS PER SECTION 908.7.4 INSTALLATION, CARBON MONOXIDE ALARMS AND DETECTORS SHALL BE LISTED IN ACCORDANCE WITH UL 2034 AND UL 2075.
5. ACCESSIBLE AUDIBLE AND VISIBLE ALARMS AND NOTIFICATION APPLIANCES SHALL BE INSTALLED IN ACCORDANCE WITH ICC/ANSI A117.1.
6. THE MAINTENANCE OF CARBON MONOXIDE DETECTION AND ALARM SYSTEMS AND THE INSTALLATION AND TESTING OF CARBON MONOXIDE DETECTING DEVICES THAT ARE INTERCONNECTED WITH A FIRE ALARM SYSTEM OR MONITORED BY A CENTRAL STATION SHALL BE ENFORCED AS PER ARTICLE 103 OF CHAPTER 1 OF THE GENERAL ADMINISTRATIVE PROVISIONS OF THE 2014 NYC BC.

ROOF ASSEMBLY REFLECTANCE NOTES

1. ROOF COVERING REFLECTANCE SHALL BE PROVIDED AS PER NYC BC 2014, SECTION 1504.9.
2. ROOF COVERINGS ON ROOFS OR SETBACKS WITH SLOPE EQUAL TO OR LESS THAN TWO UNITS VERTICAL IN 12 UNITS HORIZONTAL (17 PERCENT) SHALL HAVE:

A. A MINIMUM INITIAL SOLAR REFLECTANCE OF 0.7 IN ACCORDANCE WITH ASTM C 1549 OR ASTM E 1918, AND A MINIMUM THERMAL EMITTANCE OF 0.75 AS DETERMINED IN ACCORDANCE WITH ASTM C 1371 OR ASTM E 408; OR

B. A MINIMUM SRI OF 78 AS DETERMINED IN ACCORDANCE WITH ASTM E 1980. EXCEPTIONS:

a. TERRACES ON SETBACKS COMPRISING LESS THAN 25 PERCENT OF THE AREA OF THE LARGEST FLOOR PLATE IN THE BUILDING.

b. ANY PORTION OF A ROOF COVERED BY A GREEN ROOF SYSTEM, INCLUDING SUCH A SYSTEM WITH AGRICULTURAL PLANTINGS, IN COMPLIANCE WITH SECTION 1507.16.

c. ANY PORTION OF A ROOF USED AS OUTDOOR RECREATION SPACE BY THE OCCUPANTS OF THE BUILDING THAT IS LANDSCAPED COVERED BY WOOD DECKING OR COVERED WITH A WALKING SURFACE OR OTHER PROTECTIVE SURFACE, PROVIDED THAT SUCH WALKING SURFACE OR PROTECTIVE SURFACE HAS A MINIMUM INITIAL SOLAR REFLECTANCE OF 0.3 AS DETERMINED IN ACCORDANCE WITH ASTM C 1549 OR ASTM E 1918.

d. ANY PORTION OF A ROOF THAT IS UNDER MECHANICAL EQUIPMENT, FLUSH MOUNTED SOLAR PANELS LYING DIRECTLY ON THE ROOF SURFACE, DUCKBOARDING, DECKING, PLATFORM, ROOF TANK, COOLING TOWER OR ANY OTHER ROOFTOP STRUCTURE OR EQUIPMENT EXEMPTED BY RULE BY THE COMMISSIONER.

e. ANY ROOF OR PORTION OF A ROOF COMPOSED OF GLASS, METAL, CLAY OR CONCRETE TILE OR PLASTIC/RUBBER INTENDED TO SIMULATE CLAY OR CONCRETE TILE, WOOD, OR SLATE.

f. ANY PORTION OF A ROOF USED BY A SCHOOL OR DAYCARE CENTER AS A PLAYGROUND FOR CHILDREN

g. ANY ROOF, IF THE AMOUNT OF ROOFTOP SPACE N

WIND LOADS NOTES

1. BUILDINGS, STRUCTURES AND PARTS THEREOF SHALL BE DESIGNED TO WITHSTAND THE MINIMUM WIND LOADS PRESCRIBED IN THE 2014 NYC BC, CHAPTER 16 STRUCTURAL DESIGN, SECTION BC 1609 WIND LOADS. DECREASES IN WIND LOADS SHALL NOT BE MADE FOR THE EFFECT OF SHIELDING BY OTHER STRUCTURES.
2. AS PER SECTION 1609.1.1 DETERMINATION OF WIND LOADS, WIND LOADS ON EVERY BUILDING OR STRUCTURE SHALL BE DETERMINED IN ACCORDANCE WITH CHAPTER 6 OF ASCE 7, WITH THE BASIC WIND SPEED AND THE EXPOSURE CATEGORY DETERMINED IN ACCORDANCE WITH SECTIONS 1609.3 THROUGH 1609.4. WIND LOADS MAY ALSO BE DETERMINED USING PROVISIONS OF THE ALTERNATE METHODS DESCRIBED IN SECTION 1609.6. WIND S HALL BE ASSUMED TO COME FROM ANY HORIZONTAL DIRECTION AND WIND PRESSURES SHALL BE ASSUMED TO ACT NORMAL TO THE SURFACE CONSIDERED.

MECHANICAL SYSTEMS NOTES

1. MECHANICAL APPLIANCES, EQUIPMENT AND SYSTEMS SHALL BE CONSTRUCTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW YORK CITY MECHANICAL CODE AND THE NEW YORK CITY FUEL GAS CODE. MASONRY CHIMNEYS, FIREPLACES AND BARBECUES SHALL COMPLY WITH THE NYC 2014 MECHANICAL CODE AND NYC BC 2014, CHAPTER 21 MASONRY.
2. ALL BATHROOM AND TOILET ROOMS IN DWELLING UNITS TO HAVE MECHANICAL EXHAUST SYSTEM OF MIN. 50 CFM WHEN DESIGNED TO OPERATE INTERMITTENTLY AND MIN. OF 25 CFM WHEN DESIGNED TO OPERATE CONTINUOUSLY DURING NORMAL HOURS OF USE.
3. PUBLIC TOILETS SHALL BE VENTILATED WITH MECHANICAL EXHAUST SYSTEM OF 50/70 CFM RATES PER WATER CLOSET OR URINAL. THE HIGHER RATE SHALL BE PROVIDED WHERE PERIODS OF HEAVY USE ARE EXPECTED TO OCCUR, SUCH AS TOILETS IN THEATERS, SCHOOLS AND SPORTS FACILITIES. THE LOWER RATE SHALL BE PERMITTED WHERE PERIODS OF HEAVY USE ARE NOT EXPECTED.
4. IN DWELLING UNITS, WHEN KITCHEN REQUIRED TO HAVE MECHANICAL EXHAUST SYSTEM AND ALL KITCHENETTES TO BE PROVIDED WITH MIN. OF 100 CFM WHEN DESIGNED TO OPERATE INTERMITTENTLY AND MIN. OF 25 CFM WHEN DESIGNED TO OPERATE CONTINUOUSLY DURING NORMAL HOURS OF USE.
5. DUCT RISERS TO BE FIRE PROTECTED WITH TWO (2) HOUR FIRE RATED CONSTRUCTION ON ALL SIDES.
6. WHERE DUCTS PASS THROUGH FLOOR, FLOOR OPENINGS TO BE CUT TIGHT TO DUCT, AND REMAINING GAP BETWEEN DUCT AND FLOOR CONSTRUCTION TO BE FILLED WITH MINERAL WOOL OR EQUAL.
7. WHEN EACH BATHROOM AND KITCHEN TO BE EQUIPPED WITH ITS OWN INDEPENDENT EXHAUST BLOWER BACKDRAFT DAMPER TO BE PROVIDED OR AS PER MECHANICAL DOCUMENTS.
8. EACH BATHROOM AND KITCHEN/KITCHENETTE OUTLET TO BE EQUIPPED WITH APPROVED FIRE DAMPER WHEN REQUIRED.
9. MINIMUM FRESH AIR INTAKE (F.A.I.) WITH APPROVED FIRE DAMPER TO BE PROVIDED FOR BOILER ROOM AS PER MECHANICAL DOCUMENTS.
10. BATHROOMS CONTAINING BATHTUBS, SHOWERS, SPAS AND SIMILAR BATHING FIXTURES IN OTHER THAN R AND I-1 OCCUPANCIES SHALL BE MECHANICALLY VENTILATED IN ACCORDANCE WITH THE NYC 2014 MECHANICAL CODE, WHETHER OR NOT THEY ARE ALSO PROVIDED WITH NATURAL VENTILATION.
11. AIR INTAKE OPENING LOCATIONS SHALL COMPLY WITH THE FOLLOWING:

· INTAKE OPENINGS SHALL BE LOCATED A MINIMUM OF 10 FEET FROM LOT LINES OR BUILDINGS ON THE SAME LOT.

· FOR BUILDINGS ON LOTS MEASURING LESS THAN 20 FEET IN WIDTH, INTAKE OPENINGS SHALL BE LOCATED AT THE CENTERLINE BETWEEN LOT LINES. WHERE OPENINGS FRONT ON A STREET OR PUBLIC WAY, THE DISTANCE SHALL BE MEASURED TO THE CENTERLINE OF THE STREET OR PUBLIC WAY.

· OUTDOOR INTAKES FOR HIGH-RISE OFFICE BUILDINGS HAVING OCCUPIED FLOORS LOCATED MORE THAN 75 FEET ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS SERVING SPACES ABOVE THE SECOND STORY AND SERVING SPACES GREATER THAN 10,000 SQUARE FEET OF FLOOR AREA SHALL BE LOCATED AT LEAST 20 FEET ABOVE GROUND LEVEL, AT LEAST 30 FEET FROM EXHAUST OUTLETS AND OTHER EXHAUST DISCHARGES, AND AT LEAST 20 FEET FROM AREAS THAT MAY COLLECT VEHICULAR EXHAUST, SUCH AS OFF STREET LOADING BAYS.

· MECHANICAL AND GRAVITY OUTDOOR AIR INTAKE OPENINGS SHALL BE LOCATED NOT LESS THAN 10 FEET HORIZONTALLY FROM ANY HAZARDOUS OR NOXIOUS CONTAMINANT SOURCE.

· INTAKE OPENINGS ON STRUCTURES IN FLOOD HAZARD AREAS SHALL COMPLY WITH APPENDIX G OF THE NYC BC 2014.

· EXCEPTION: GROUP R-3 OCCUPANCIES ARE NOT REQUIRED TO COMPLY WITH ABOVE.

10. AIR INTAKE OPENINGS THAT TERMINATE OUTDOORS SHALL BE PROTECTED WITH CORROSION-RESISTANT SCREENS, LOUVERS OR GRILLES. OPENINGS IN LOUVERS, GRILLES AND SCREENS SHALL BE SIZED IN ACCORDANCE WITH TABLE 401.5, NYC 2014 MECHANICAL CODE AND SHALL BE PROTECTED AGAINST LOCAL WEATHER CONDITIONS. OUTDOOR AIR INTAKE OPENINGS LOCATED IN EXTERIOR WALLS SHALL MEET THE PROVISIONS FOR EXTERIOR WALL OPENING PROTECTIVES IN ACCORDANCE WITH THE NYC BC 2014.
11. FOR HIGH-RISE BUILDINGS, OUTDOOR AIR INTAKES SERVING SPACES ABOVE THE SECOND STORY AND SERVING SPACES GREATER THAN 10,000 SQUARE FEET OF FLOOR AREA SHALL BE LOCATED IN ACCORDANCE WITH SECTION 401.5 OF THE NYC 2014 MECHANICAL CODE. EXCEPTION: GROUP R-2 OCCUPANCY.
12. ENCLOSED PARKING GARAGES. MECHANICAL VENTILATION SYSTEMS FOR ENCLOSED PARKING GARAGES SHALL BE PERMITTED TO OPERATE INTERMITTENTLY WHERE THE SYSTEM IS ARRANGED TO OPERATE AUTOMATICALLY UPON DETECTION OF A CONCENTRATION OF CARBON MONOXIDE.

PLUMBING SYSTEMS NOTES

1. THE 2014 NEW YORK CITY PLUMBING CODE SHALL GOVERN THE ERECTION, INSTALLATION, ALTERATION, REPAIR, RELOCATION, REPLACEMENT, ADDITION TO, USE OR MAINTENANCE OF PLUMBING SYSTEMS. PLUMBING SYSTEMS AND EQUIPMENT SHALL BE CONSTRUCTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW YORK CITY PLUMBING CODE.
2. ALL MATERIALS, FIXTURES, AND APPLIANCES SHALL COMPLY WITH CHAPTER 3 GENERAL REGULATIONS, SECTION PC 303 MATERIALS .
3. ALL GAS-FIRED EQUIPMENT AND ACCESSORY EQUIPMENT SHALL COMPLY WITH THE 2014 NYC MECHANICAL CODE AND THE 2014 NYC FUEL GAS CODE.
4. PLUMBING CONTRACTOR TO EXAMINE PROPOSED LAYOUT WITH REGARD TO EXISTING FIELD CONDITIONS, AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BETWEEN ASSUMED FIELD CONDITIONS AND THOSE ENCOUNTERED DURING CONSTRUCTION. PLUMBING CONTRACTOR SHALL INFORM ARCHITECT OF ANY REVISIONS TO PLAN WHICH SHALL BE NECESSARY (BASED ON CONDITIONS UNCOVERED IN THE FIELD), IN ORDER TO INSTALL ALL FIXTURES, EQUIPMENT AND PIPING IN STRICT ACCORDANCE WITH REQUIREMENTS OF THE 2014 NYC BC, THE 2014 NYC PLUMBING CODE, AND/OR AS PER DESIGNS SHOWN IN THE CONTRACT DOCUMENTS.
5. PLUMBING CONTRACTOR SHALL ARRANGE AND OBTAIN INSPECTIONS AND REQUIRED SIGN-OFFS AS PER SECTION PC 107 INSPECTION AND TESTING, SECTION 107.5 SIGN-OFF OF COMPLETED WORK. REFER TO ARTICLE 116 OF CHAPTER 28 OF THE ADMINISTRATIVE CODE.

DIMENSIONING NOTES

1. ALL WALLS ARE ORTHOGONAL TO THE PROPERTY LINES UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL BE KNOWLEDGEABLE OF WHICH PROPERTY LINE DETERMINES THE ORIENTATION OF EACH WALL, AND SHALL NOTIFY THE ARCHITECT OF ANY CONDITIONS REQUIRING CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
2. PARTITIONS ARE DIMENSIONED TO THE FURNISHED FACE OF THE WALL UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS SHALL HAVE PREFERENCE OVER SCALE. DO NOT SCALE THE DRAWINGS.
4. ALL DIMENSIONS OF EXISTING CONDITIONS ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD BEFORE PROCEEDING WITH THE WORK. THE ARCHITECT SHALL BE NOTIFIED OF ANY CORRECTIONS.
5. WHEN UNDIMENSIONED PARTITIONS APPEAR IN CONJUNCTION WITH DOOR OPENINGS, THE DOOR WIDTH AND DOOR FRAME DETAILS DETERMINE THE LOCATION OF THE ADJACENT WALLS AND FRAMES.
6. ALL ACCESSIBLE DIMENSIONS TO BE PROVIDED TO FINISH WALL, CEILING AND FLOORS.

PARTITION NOTES

1. DEFLECTION FOR ALL PARTITIONS SHALL NOT EXCEED 1/240TH OF THE SPAN MAXIMUM FOR TYPICAL GYPSUM PARTITIONS, OR 1/360 FOR WOOD-CLAD PARTITIONS OR STONE-CLAD PARTITION SYSTEMS.
2. WATER RESISTANT DRYWALL (FOR THE FULL HEIGHT OF THE PARTITION CONSTRUCTION) SHALL BE USED IN TOILETS, SHOWERS, SERVICE ROOMS, ETC. USE STANDARD GYPSUM BOARD FOR CEILING CONSTRUCTION.
3. PENETRATIONS: COORDINATE WITH MECHANICAL CONTRACTOR FOR OPENINGS REQUIRED FOR RETURN AIR IN FULL HEIGHT PARTITIONS.
4. PROVIDE LATERAL BRACING TO STRUCTURE ABOVE FINISHED CEILINGS FOR PARTITIONS EXCEEDING UNSUPPORTED HEIGHTS INDICATED ON DRAWINGS.
5. PROVIDE HORIZONTAL CONTROL JOINTS AT 12'-0' O.C. IN THE VERTICAL DIRECTION UNLESS NOTED OTHERWISE.
6. PROVIDE CONTROL JOINTS IN GYPSUM WALLBOARD CONSTRUCTION SUCH THAT PARTITION OR FURRING RUNS DO NOT EXCEED 30' AND CEILING DIMENSIONS DO NOT EXCEED 50' IN EITHER DIRECTION WITH PERIMETER RELIEF OR 30' WITHOUT PERIMETER RELIEF.
7. PROVIDE VERTICAL CONTROL JOINTS WITH SEALANT IN MASONRY WALLS AS SHOWN ON DRAWINGS, WITH MAXIMUM SPACING OF 25'-0'.
8. COMPLETELY SEAL WITH ACOUSTICAL SEALANT HEADS, BASES, AND ENDS, PLUS ALL PENETRATIONS (INCLUDING BUT NOT LIMITED TO MECHANICAL, ELECTRICAL, AND PLUMBING WORK).
9. PROVIDE SOUND BLANKETS AS INDICATED.

FINISHES & DETAILS NOTES - NYC BC 2014, CHAPTER 8

1. AS PER SECTION BC 803.1.1.2 INTERIOR FLAME SPREAD INDEX REQUIREMENTS BASED ON OCCUPANCY GROUP, INTERIOR WALL AND CEILING FINISH SHALL HAVE A FLAME SPREAD INDEX NOT GREATER THAN THAT FOR THE CLASSIFICATION RATING SPECIFIED IN TABLE 803.1 'INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY' FOR THE GROUP AND LOCATION DESIGNATED.
2. AS PER SECTION BC 803.1.1.3 INTERIOR SMOKE DEVELOPED INDEX REQUIREMENTS BASED ON OCCUPANCY GROUP, EXCEPT WHERE PERMITTED FOR INTERIOR TRIM IN SECTION 806.5, ACCEPTABLE SMOKE-DEVELOPED INDICES SHALL RANGE FROM 0-450 WITH THE FOLLOWING RESTRICTIONS:

EXITS, CORRIDORS .... 25 OR LESS
OCCUPANCY GROUP I .... 50 OR LESS
ROOMS IN WHICH THE NET FLOOR AREA PER OCCUPANT IS 10 SQUARE FEET OR LESS .... 100 OR LESS

3. WHERE INTERIOR FINISH MATERIALS ARE APPLIED ON WALLS, CEILINGS OR STRUCTURAL ELEMENTS REQUIRED TO HAVE A F FIRE-RESISTANCE RATING OR TO BE OF NONCOMBUSTIBLE CONSTRUCTION, THEY SHALL COMPLY WITH THE PROVISIONS OF SECTION BC 803.3.
4. AS PER SECTION BC 803.5 TOXICITY, INTERIOR WALL OR CEILING FINISHES, OTHER THAN TEXTILES, UPON EXPOSURE TO FIRE, SHALL NOT PRODUCE PRODUCTS OF DECOMPOSITION OR COMBUSTION THAT ARE MORE TOXIC IN POINT OF CONCENTRATION THAN THOSE GIVEN OFF BY WOOD OR PAPER WHEN DECOMPOSING OR BURNING UNDER COMPARABLE CONDITIONS AS TESTED IN ACCORDANCE WITH NFPA 269.
5. COMBUSTIBLE FLOORING MATERIALS ARE PERMITTED AS PER SECTION BC 805 COMBUSTIBLE FLOORING MATERIALS IN TYPES I AND II CONSTRUCTION.
6. THERMAL AND ACOUSTICAL INSULATION SHALL COMPLY WITH SECTION BC 807.
7. ACOUSTICAL CEILING SYSTEMS SHALL COMPLY WITH SECTION BC 808.
8. COMBUSTIBLE MATERIALS USED FOR MILLWORK, DOORS, AND TRIM ARE PERMITTED AS PER THE 2014 NYC BC CHAPTER 6 TYPES OF CONSTRUCTION, SECTION BC 603 COMBUSTIBLE MATERIAL IN TYPE I AND II CONSTRUCTION.
9. ALL GLASS FOR INTERIOR USE IN BOTH VERTICAL AND SLOPED APPLICATIONS SHALL COMPLY WITH THE NYC BC 2014, CHAPTER 24 GLASS AND GLAZING.
10. FLOORS AND WALL BASE FINISH MATERIALS IN TOILET, BATHING AND SHOWER ROOM FLOOR FINISH MATERIALS SHALL HAVE A SMOOTH, HARD, NONABSORBENT SURFACE. THE INTERSECTIONS OF SUCH FLOORS WITH WALLS SHALL HAVE A SMOOTH, HARD, NONABSORBENT VERTICAL BASE THAT EXTENDS UPWARD ONTO THE WALLS AT LEAST 4 INCHES. EXCEPTION: OCCUPANCY CLASSES I-1, R-1 AND R-2 SHALL HAVE A VERTICAL BASE THAT EXTENDS UPWARD ONTO WALLS AT LEAST 6 INCHES.

SEISMIC/EARTHQUAKE NOTES

1. THE PROPOSED BUILDING HAS BEEN DESIGNED IN COMPLIANCE WITH THE NEW YORK CITY SEISMIC CODE: LOCAL LAW 17/95.
2. EVERY STRUCTURE, AND PORTION THEREOF, INCLUDING NONSTRUCTURAL COMPONENTS THAT ARE PERMANENTLY ATTACHED TO STRUCTURES AND THEIR SUPPORTS AND ATTACHMENTS, SHALL BE DESIGNED AND CONSTRUCTED TO RESIST THE EFFECTS OF EARTHQUAKE MOTIONS IN ACCORDANCE WITH THE 2014 NYC BC, CHAPTER 16 STRUCTURAL DESIGN, SECTION BC 1613 EARTHQUAKE LOADS, AND ASCE 7-10 (2010 EDITION), EXCLUDING CHAPTER 14 AND APPENDIX 11A. THE SEISMIC DESIGN CATEGORY FOR A STRUCTURE SHALL BE DETERMINED IN ACCORDANCE WITH EITHER SECTION 1613 OR ASCE 7-10 (2010 EDITION).
3. THE PROPOSED BUILDING HAS BEEN DESIGNED WITH STRUCTURAL SEPARATIONS AS PER 2014 NYC BC 1613.7. ALL STRUCTURES SHALL BE SEPARATED FROM ADJACENT STRUCTURES. WHEN A STRUCTURE ADJOINS A PROPERTY LINE NOT COMMON TO A PUBLIC WAY (TYPICALLY SIDE OR REAR LOT LINES), THAT STRUCTURE SHALL ALSO BE SET BACK FROM THE PROPERTY LINE BY AT LEAST 1 INCH FOR EACH 50 FEET OF HEIGHT AND A MINIMUM OF 1 INCH FOR STRUCTURES WITH HEIGHTS LESS THAN 50 FEET. FOR STRUCTURES IN SEISMIC DESIGN CATEGORY D, REFER TO ASCE 7-10 FOR ADDITIONAL REQUIREMENTS.
4. FOR STRUCTURES ADJACENT TO EXISTING UN REINFORCED MASONRY BEARING WALL STRUCTURES, THE STRUCTURAL SEPARATION SHALL BE FILLED WITH A MATERIAL WITH A MINIMUM COMPRESSIVE STRENGTH OF 25 PSI AND A MAXIMUM COMPRESSIVE STRENGTH OF 100 PSI. ADDITIONALLY, WHEN THE ADJACENT WALL IS A PARTY WALL, THE PARTY WALL SHALL BE MADE SECURE BY THE PARTY RESPONSIBLE FOR THE NEW CONSTRUCTION AS PER CHAPTER 33.
5. THE INFILL MATERIAL SHALL BE COVERED ON ALL SIDES AND SHALL MEET THE APPROPRIATE PROVISIONS OF CHAPTER 26. THE COVERING MUST BE OF ADEQUATE STRENGTH TO RESIST THE WIND LOADS FOR CLADDING AS SPECIFIED IN CHAPTER 16 AND SHALL CONFORM TO ALL APPLICABLE PROVISIONS IN CHAPTER 14.
6. WHEN A BUILDING SEPARATION WIDER THAN 5 INCHES IS CREATED PURSUANT TO SECTION 1613.7, SUCH SEPARATION, AT THE ROOF LEVEL OF THE PROPOSED NEW BUILDING, OR AT THE ROOF LEVEL OF AN EXISTING ADJOINING BUILDING WHERE IF THAT BUILDING IS LOWER THAN THE PROPOSED NEW BUILDING, SHALL HAVE A HORIZONTAL COVER/CLOSURE THAT CONFORMS WITH THE FOLLOWING:

a. THE COVER/CLOSURE MATERIAL SHALL BE NON COMBUSTIBLE; AND
EXCEPTION: THE COVER/CLOSURE MATERIAL USED SHALL BE PERMITTED TO BE COMBUSTIBLE MATERIAL IN ACCORDANCE WITH SECTION 1509.9 IF ALL THE MATERIAL ON THE APPROPRIATE ROOF CONFORMS TO THE LIMITATIONS THEREIN, THERE ARE NO MASONRY OPENINGS IN EITHER WALL ABUTTING THE BUILDING SEPARATION, AND BOTH BUILDINGS ARE NON COMBUSTIBLE.

b. THE COVER/CLOSURE SHALL BE CAPABLE OF WITHSTANDING THE ROOF LIVE LOAD OF 30 PSF SECURELY FASTENED TO THE NEW BUILDING, AND BE OF A TYPE THAT WOULD BE CAPABLE OF PREVENTING UNAUTHORIZED OR ACCIDENTAL ACCESS TO THE SPACE.

7. SEISMIC DESIGN REQUIREMENTS FOR MASONRY STRUCTURES AND COMPONENTS SHALL COMPLY WITH THE REQUIREMENTS IN SECTION 1.17 OF TMS 402/ACI 530/ASCE 5 DEPENDING ON THE STRUCTURE'S SEISMIC DESIGN CATEGORY AS DETERMINED IN SECTION 1613 OF THIS CODE.

OTHER AGENCY REQUIREMENTS

508.1- EACH PORTION OF A BUILDING SHALL BE INDIVIDUALLY CLASSIFIED IN ACCORDANCE WITH § 302.1.
EXCEPTIONS:
• OCCUPANCIES SEPARATED IN ACCORDANCE WITH SECTION 510.
• WHERE IDENTIFIED IN TABLE 509, ROOMS OR SPACES SHALL BE TREATED AS INCIDENTAL USES.
• WHERE NOT IDENTIFIED IN TABLE 509, MECHANICAL AND/OR ELECTRICAL EQUIPMENT ROOMS SHALL BE PERMITTED TO BE CLASSIFIED AS THE OCCUPANCY WITHIN WHICH THEY ARE LOCATED, OR AT THE OPTION OF THE APPLICANT, CLASSIFIED AS GROUP F-2 OCCUPANCY IN ACCORDANCE WITH SECTION 306.3.

508.3-NONSEPARATED OCCUPANCIES
PROPOSED MIXED USE BUILDING COMPLIES WITH ALL PROVISIONS OF 508.3

508.3.1 OCCUPANCY CLASSIFICATION.
NONSEPARATED OCCUPANCIES SHALL BE INDIVIDUALLY CLASSIFIED IN ACCORDANCE WITH SECTION 302.1. THE REQUIREMENTS OF THIS CODE SHALL APPLY TO EACH PORTION OF THE BUILDING BASED ON THE OCCUPANCY CLASSIFICATION OF THAT SPACE. IN ADDITION, THE MOST RESTRICTIVE PROVISIONS OF CHAPTER 9 WHICH APPLY TO THE NONSEPARATED OCCUPANCIES SHALL APPLY TO THE TOTAL NONSEPARATED OCCUPANCY AREA. WHERE NONSEPARATED OCCUPANCIES OCCUR IN A HIGH-RISE BUILDING, THE MOST RESTRICTIVE REQUIREMENTS OF SECTION 403 WHICH APPLY TO THE NONSEPARATED OCCUPANCIES SHALL APPLY THROUGHOUT THE HIGH-RISE BUILDING.

508.3.2 ALLOWABLE BUILDING AREA AND HEIGHT.
THE ALLOWABLE BUILDING AREA AND HEIGHT OF THE BUILDING OR PORTION THEREOF SHALL BE BASED ON THE MOST RESTRICTIVE ALLOWANCES FOR THE OCCUPANCY GROUPS UNDER CONSIDERATION FOR THE TYPE OF CONSTRUCTION OF THE BUILDING IN ACCORDANCE WITH SECTION 503.1.
[PROPOSED BUILDING COMPLIES - PROPOSED USES ARE UNLIMITED IN HEIGHT AND AREA AS PER § 503.1]

508.3.3 SEPARATION.
NO SEPARATION IS REQUIRED BETWEEN NONSEPARATED OCCUPANCIES.

EXCEPTIONS:
1. GROUP H-2, H-3, H-4 AND H-5 OCCUPANCIES SHALL BE SEPARATED FROM ALL OTHER OCCUPANCIES IN ACCORDANCE WITH SECTION 508.4.
2. SEPARATED TENANCIES IN ACCORDANCE WITH SECTION 510.10.
3. KITCHENS SHALL BE SEPARATED IN ACCORDANCE WITH SECTION 508.4.4.

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
GENERAL NOTES

G-002B.00

Scale:	As indicated
Date:	12/1/2025 7:21:34 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

ACCESSIBILITY NOTES:

1. ALL MEASUREMENTS TO BE VERIFIED ON FIELD BY GC.
2. ALL SECTIONS IN DIAGRAMS REFERENCE THE ANSI A117.1 2009 WITH NYC MODIFICATIONS U.N.O.

NYC 2022 BUILDING CODE CHAPTER 11 - ACCESSIBILITY NOTES:

1101.3 CHAPTER 11 APPLIES TO ALTERATIONS, INCLUDING MINOR ALTERATIONS BUT EXCLUDING ORDINARY REPAIRS, AND CHANGES OF USE OR OCCUPANCY TO PRIOR CODE BUILDINGS, PORTIONS OF SUCH BUILDINGS, AND SPACES WITHIN SUCH BUILDINGS. THIS SECTION SHALL NOT IMPOSE A REQUIREMENT FOR GREATER ACCESSIBILITY THAN THAT WHICH WOULD BE REQUIRED FOR NEW CONSTRUCTION, NOR SHALL IT REDUCE OR HAVE THE EFFECT OF REDUCING ACCESSIBILITY.

1103.1 ALL SITES, BUILDINGS, STRUCTURES, FACILITIES, ELEMENTS AND SPACES, TEMPORARY OR PERMANENT, SHALL BE ACCESSIBLE TO INDIVIDUALS WITH DISABILITIES.

1104.5 ACCESSIBLE ROUTES SHALL COINCIDE WITH OR BE LOCATED IN THE SAME AREA AS A GENERAL CIRCULATION PATH. WHERE THE CIRCULATION PATH IS INTERIOR, THE ACCESSIBLE ROUTE SHALL ALSO BE INTERIOR. WHERE ONLY ONE ACCESSIBLE ROUTE IS PROVIDED, THE ACCESSIBLE ROUTE SHALL NOT PASS THROUGH KITCHENS, STORAGE ROOMS, RESTROOMS, CLOSETS OR SIMILAR SPACES.

1105.1 IN ADDITION TO ACCESSIBLE ENTRANCES REQUIRED BY § 1105.1.1 THROUGH 1105.1.8, ALL PUBLIC ENTRANCES SHALL BE ACCESSIBLE.

1105.1.7 DOORS AND DOORWAYSAT ENTRANCE(S) TO ACCESSIBLE UNITS AND TYPE B+NYC UNITS, INCLUDING HARDWARE, SHALL COMPLY WITH § 404 OF ICC A117.1. DOORS AND DOORWAYS, INCLUDING HARDWARE, AT ENTRANCE(S) TO TYPE B UNITS SHALL COMPLY WITH § 1003.5 OF ICC A117.1.

1106.1 WHERE PARKING IS PROVIDED, 5% OF THE TOTAL NUMBER OF PARKING SPACES PROVIDED FOR A FACILITY, BUT NOT LESS THAN ONE PARKING SPACE, SHALL BE ACCESSIBLE PARKING SPACES. VAN-ACCESSIBLE PARKING SPACES SHALL BE PROVIDED IN ACCORDANCE WITH 1106.5. ACCESSIBLE PARKING SPACES SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH § 502 OF ICC A117.1.

1106.6 ACCESSIBLE PARKING SPACES SHALL BE LOCATED ON THE SHORTEST ACCESSIBLE ROUTE OF TRAVEL FROM ADJACENT PARKING TO AN ACCESSIBLE BUILDING ENTRANCE.

1106.7 PASSENGER LOADING ZONES.PASSENGER LOADING ZONES SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH ICC A117.1 INCLUDING § 503.

1106.8.1 WHERE VEHICLE CHARGING STATIONS ARE PROVIDED FOR COMMON USE, AT LEAST FIVE PERCENT OF THE TOTAL NUMBER OF ELECTRICAL VEHICLE CHARGING STATIONS PER FACILITY, BUT NOT LESS THAN ONE FOR EACH TYPE OF ELECTRIC VEHICLE CHARGING STATION, SHALL BE ACCESSIBLE.

1107.2 DWELLING UNITS AND SLEEPING UNITS WHICH ARE REQUIRED TO BE ACCESSIBLE UNITS, TYPE B+NYC UNITS, OR TYPE B UNITS SHALL COMPLY WITH CHAPTER 10 OF ICC A117.1.

1107.2.2.5 LAVATORIES SHALL COMPLY WITH § 606 OF ICC A117.1.

1107.2.2.6 MIRRORS ABOVE LAVATORIES SHALL HAVE THE BOTTOM EDGE OF THE REFLECTING SURFACE 40" (1016 MM) MAX. ABOVE THE FLOOR OR GROUND. MEDICINE CABINETS, IF PROVIDED, MUST INCLUDE A STORAGE SHELF NO HIGHER THAN 44 " (1117.6 MM) ABOVE THE FLOOR.

1107.2.2.7.1 THE WATER CLOSET SHALL BE POSITIONED WITH A WALL TO THE REAR AND TO ONE SIDE. THE CENTERLINE OF THE WATER CLOSET SHALL BE 18" (457.2 MM) FROM THE SIDE WALL.

1107.2.2.7.2 CLEARANCE AROUND THE WATER CLOSET SHALL COMPLY WITH SECTIONS 1107.2.2.7.2.1 THROUGH 1107.2.2.7.2.3.

1107.2.2.7.3 GRAB BARS FOR WATER CLOSETS SHALL COMPLY § 609 OF ICC A117.1 AND 1107.2.2.7.3.1 THROUGH 1107.2.2.7.3.2.

1107.2.3 WHERE KITCHENS AND KITCHENETTES ARE PROVIDED IN ATYPE B+NYC DWELLING UNIT OR SLEEPING UNIT, THE PRIMARY KITCHEN OR KITCHENETTE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE KITCHEN REQUIREMENTS OF § 1003.12 AND 1003.3.2 OF ICC A117.1.

1107.2.8 WHERE WASHING MACHINES OR CLOTHES DRYERS ARE PROVIDED WITHIN A TYPE B+NYC DWELLING UNIT OR SLEEPING UNIT, SUCH EQUIPMENT SHALL COMPLY WITH § 611 OF ICC A117.1 AND SHALL BE FRONT LOADING.

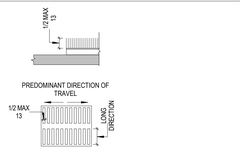
1107.3 ROOMS AND SPACES AVAILABLE TO THE GENERAL PUBLIC OR AVAILABLE FOR COMMONUSE BY RESIDENTS AND SERVINGACCESSIBLE UNITS, TYPE B+NYCUNITS ORTYPE B UNITS SHALL BE ACCESSIBLE.

1107.4 AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ACCESSIBLE BUILDING OR FACILITY ENTRANCES WITH THE REQUIRED ACCESSIBLE ENTRANCE(S) OF EACH ACCESSIBLE UNIT, TYPE B+NYC UNIT,AND TYPE B UNIT WITHIN THE BUILDING OR FACILITY AND WITH THOSE EXTERIOR AND INTERIOR SPACES AND FACILITIES THAT SERVE THE UNITS.

1111.1 REQUIRED ACCESSIBLE ELEMENTS SHALL BE IDENTIFIED BY THE DYNAMIC ACCESSIBILITY SYMBOL AT THE FOLLOWING LOCATIONS:

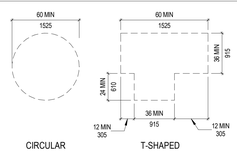
- ACCESSIBLE PARKING SPACES REQUIRED PER 1106.1 AND 1106.2.
- ACCESSIBLE PASSENGER LOADING ZONES.
- ACCESSIBLE ROOMS WHERE MULTIPLE SINGLE-OCCUPANT TOILET ROOMS OR BATHING ROOMS ARE CLUSTERED AT A SINGLE LOCATION.
- ACCESSIBLE ENTRANCES WHERE NOT ALL ENTRANCES ARE ACCESSIBLE.
- ACCESSIBLE CHECK-OUT AISLES WHERE NOT ALL AISLES ARE ACCESSIBLE.
- FAMILYOR ASSISTED-USE TOILET AND BATHING ROOMS.
- ACCESSIBLE DRESSING, FITTING AND LOCKER ROOMS WHERE NOT ALL SUCH ROOMS ARE ACCESSIBLE.
- ACCESSIBLE AREAS OF RESCUE ASSISTANCE.
- EXTERIOR AREAS FOR ASSISTED RESCUE.
- REFUSE DISPOSAL AND REFUSE STORAGE ROOMS.

302 FLOOR SURFACES



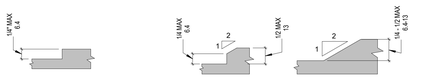
EXPOSED CARPET EDGES MUST BE FASTENED TO THE FLOOR AND PROVIDED WITH A FINISH TRIM COMPLYING W/ § 303.

304 TURNING SPACE



CIRCULAR T-SHAPED

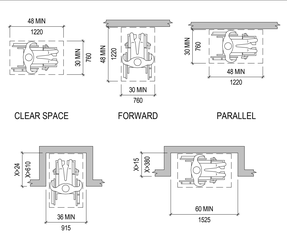
303 CHANGES IN LEVEL



VERTICAL CHANGES IN LEVEL BEVELED CHANGES IN LEVEL

CHANGES IN LEVEL GREATER THAN 1/2" (13mm) SHALL BE CONSIDERED RAMPS COMPLYING W/ § 405 & 406

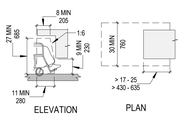
305 CLEAR FLOOR SPACE



CLEAR SPACE FORWARD PARALLEL

ALCOVE FORWARD ALCOVE PARALLEL

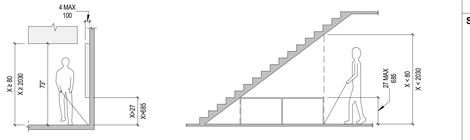
306 KNEE & TOE CLEARANCE



ELEVATION PLAN

ANY ADDITIONAL TOE CLEARANCE GREATER THAN 6" ABOVE THE MINIMUM 9" SHALL NOT BE CONSIDERED TOE CLEARANCE PER § 306.2.4

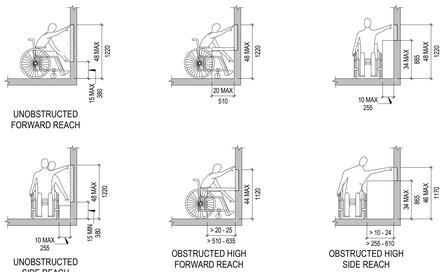
307 PROTRUDING OBJECTS



LIMITS OF PROTRUDING OBJECTS REDUCED VERTICAL CLEARANCE

EXCEPTIONS: HANDRAILS CAN PROTRUDE 4-1/2" (115mm) MAX. INTO CIRCULATION PATHS PER § 307.2. DOOR CLOSERS AND DOOR STOPS SHALL BE PERMITTED TO BE 78" (1980mm) A.F.F. PER § 307.4.

308 REACH RANGES



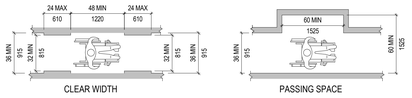
UNOBSTRUCTED FORWARD REACH

UNOBSTRUCTED SIDE REACH OBSTRUCTED HIGH FORWARD REACH OBSTRUCTED HIGH SIDE REACH

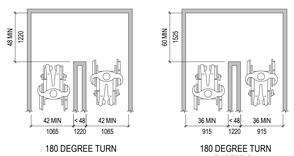
EXCEPTIONS: EXISTING ELEMENTS THAT ARE NOT ALTERED SHALL BE PERMITTED AT 54" (1370mm) A.F.F. ON SIDE REACH PER § 308.3.1. FOR WASHING MACHINES AND CLOTHES DRYERS OBSTRUCTION HEIGHT SHALL BE PERMITTED AT 36" (915mm) A.F.F. PER § 308.3.2.

402/3 ACCESSIBLE ROUTES & WALKING SURFACES

ACCESSIBLE ROUTES CONSIST OF WALKING SURFACES WITH A MAX. SLOPE OF 1:20, DOORS/DOORWAYS, RAMPS, CURB RAMPS, ELEVATORS AND PLATFORM LIFTS. CROSS SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 1:48 PER § 402.

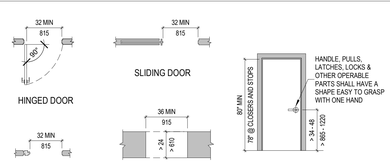


CLEAR WIDTH PASSING SPACE

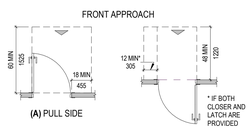


180 DEGREE TURN 180 DEGREE TURN EXCEPTION

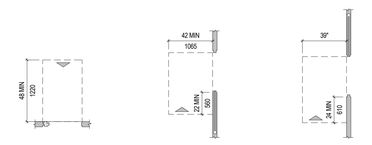
404 DOORS AND DOORWAYS



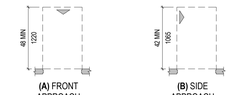
MANUAL SWING DOORS CLEARANCES



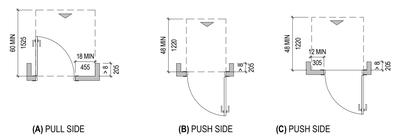
SLIDING AND FOLDING DOORS CLEARANCES



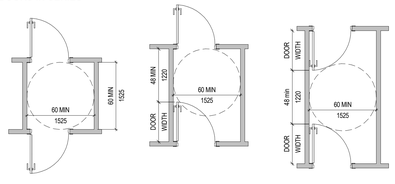
DOORWAYS CLEARANCE



RECESSED DOORS

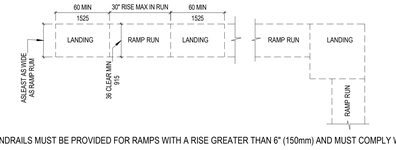


TWO DOORS IN SERIES



405 RAMPS

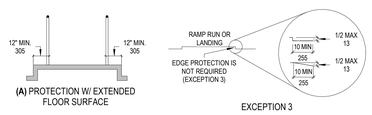
RAMPS SHOULD HAVE A SLOPE GREATER THAN 1:20 BUT NOT STEEPER THAN 1:12. CROSS SLOPE SHALL NOT BE STEEPER THAN 1:48 PER § 405. EXCEPTIONS: IN EXISTING BUILDINGS, RAMPS WITH A STEEPER SLOPE SHALL BE PERMITTED DUE TO SPACE LIMITATIONS BUT NOT STEEPER THAN 1:8. PER § 405.2.



HANDRAILS MUST BE PROVIDED FOR RAMPS WITH A RISE GREATER THAN 6" (150mm) AND MUST COMPLY WITH § 505.

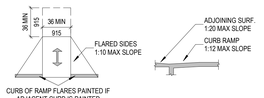
EDGE PROTECTION

PER § 405.9 EDGE PROTECTION MUST BE PROVIDED ON EACH SIDE OF RAMP RUNS AND LANDINGS. EXCEPTIONS: EDGE PROTECTIONS NOT REQUIRED ON 1) CURB RAMPS WITH FLARES AND W/OUT HANDRAILS 2) RAMP LANDINGS SERVING A RUN OR STAIRWAY 3) SIDES OF RAMPS HAVING A VERTICAL DROP OFF OF 1/2" (13mm) MAX WITHIN 10" (255mm) OUTSIDE MINIMUM LANDING AREA 4) RAMP AISLES PROVIDING ACCESS TO SEATS OF AISLE WAYS.



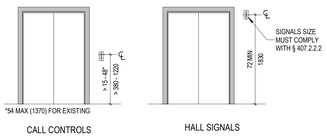
406 CURB RAMPS

DETECTABLE WARNINGS SHALL BE PROVIDED FOR CURB RAMPS COMPLYING WITH § 406.13 AND 705



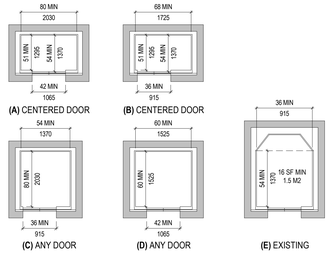
407 ELEVATORS

ELEVATORS SHALL BE PROVIDED FOR BUILDINGS WITH 5 STORIES OR MORE IN HEIGHT PER NYC BC § 3002.4 AND ONE MUST ACCOMMODATE AN AMBULANCE STRETCHER PER NYC BC § 3003.3. ALL ELEVATORS SHALL COMPLY WITH § 407 OF ANSI A117.1 2009 AND ASME A17.1/CSA B44. ELEVATORS CONTROLS SHALL HAVE A CLEAR FLOOR SPACE COMPLYING WITH § 305. EXISTING ELEVATORS SHALL NOT COMPLY WITH MINIMUM HEIGHTS OF § 407.2.2.2. AUDIBLE SIGNALS SHALL BE PROVIDED AND COMPLYING WITH § 407.2.2.3



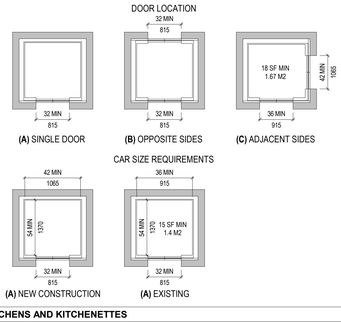
CAR REQUIREMENTS

IF OTHER ELEVATORS ARE PROVIDED BESIDES THE ELEVATOR-IN-READINESS MUST COMPLY WITH § 407.4



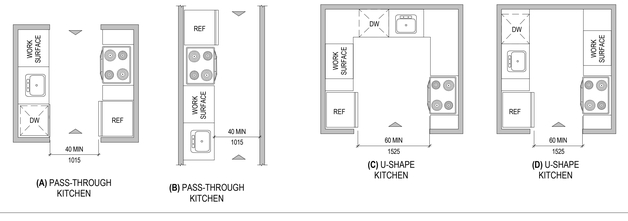
408 LIMITED-USE/LIMITED-APPLICATION ELEVATORS

ALL LIMITED-USE ELEVATORS SHALL COMPLY WITH § 408 OF ANSI A117.1 2009 AND ASME A17.1/CSA B44.



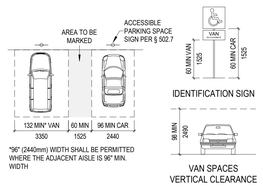
804 KITCHENS AND KITCHENETTES

PER § 804.25 EXCEPTION: SPACES THAT DO NOT PROVIDE COOKTOP OR CONVENTIONAL RANGE SHALL NOT REQUIRE TO COMPLY PROVIDED A 40" MIN DISTANCE BETWEEN OPPOSING CABINETS, COUNTERTOPS OR WALLS

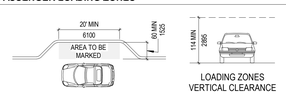


502 PARKING SPACES

PER § 502.5 PARKING SPACES SURFACES SHALL NOT HAVE A SLOPE STEEPER 1:48.

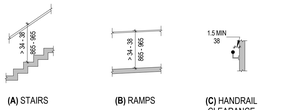


503 PASSENGER LOADING ZONES



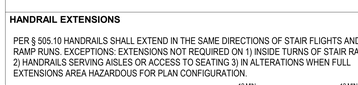
505 HANDRAILS

PER § 505 HANDRAILS SHALL BE PROVIDED ON BOTH SIDES OF STAIRS AND RAMPS. HANDRAILS SHALL BE CONTINUOUS WITHIN THE FULL LENGTH OF EACH STAIR FLIGHT AND RAMP RUN.



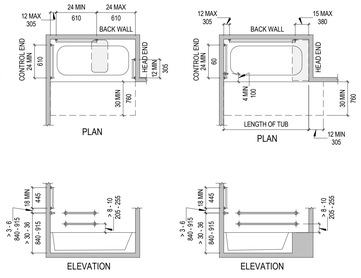
HANDRAIL EXTENSIONS

PER § 505.10 HANDRAILS SHALL EXTEND IN THE SAME DIRECTIONS OF STAIR FLIGHTS AND RAMP RUNS. EXCEPTIONS: EXTENSIONS NOT REQUIRED ON 1) INSIDE TURNS OF STAIR RAMPS 2) HANDRAILS SERVING AISLES OR ACCESS TO SEATING 3) IN ALTERATIONS WHEN FULL EXTENSIONS AREA HAZARDOUS FOR PLAN CONFIGURATION.



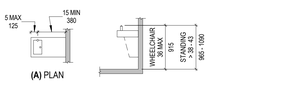
607 BATHTUBS

GRAB BARS SHALL BE PROVIDED PER § 607.4. EXCEPTIONS: GRAB BARS SHALL NOT BE PROVIDED ON SINGLE OCCUPANT RESTROOMS ACCESSED THROUGH PRIVATE OFFICE NOT FOR COMMON/PUBLIC USE. L-SHAPED CONTINUOUS GRAB BAR SHALL BE PERMITTED ON CONTROL END WALL WITH EQUIVALENT DIMENSIONS PER § 607.4 W/ PERMANENT SEAT.



602 DRINKING FOUNTAINS

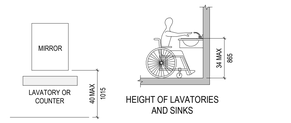
DRINKING FOUNTAINS MUST HAVE A CLEAR SPACE AND CLEARANCES PER § 305.



603 TOILET AND BATHING ROOMS

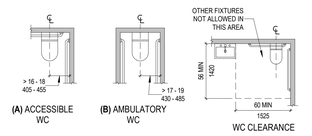
DOORS SHALL NOT SWING INTO CLEARANCE FOR ANY FIXTURE PER § 603.2.2. EXCEPTIONS: DOOR SWING SHALL BE PERMITTED ON FIXTURES CLEARANCES ON 1) SINGLE OCCUPANT TOILET OR BATHING ROOMS 2) INDIVIDUAL USE ROOMS WHERE CLEAR FLOOR SPACE IS PROVIDED BEYOND DOOR SWING.

CLEAR FLOOR SPACE COMPLYING W/ § 305.3 (FORWARD APPROACH) SHALL BE PROVIDED AND KNEE AND TOE CLEARANCE SHALL BE PROVIDED PER § 306. EXCEPTIONS: 1) PARALLEL APPROACH SHALL BE PERMITTED FOR KITCHEN SINKS WHEN TOP RANGE IS NOT PROVIDED 2) KNEE AND TOE CLEARANCE SHALL NOT BE PROVIDED FOR SINGLE OCCUPANT TOILETS 3) KNEE AND TOE REQUIREMENTS ARE NOT REQUIRED TO FOR MORE THAN ONE BOWL IN MULTIBOWL SINKS.

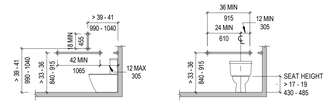


604 WATER CLOSERS AND TOILET COMPARTMENTS

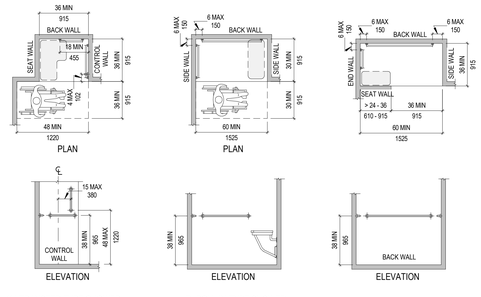
PER § 604.3.2 THE WATER CLOSET CLEARANCE CAN OVERLAP W/ GRAB BARS, PAPER DISPENSERS, SANITARY NAPKINS RECEPTACLES, COAT HOOKS, SHELVES AND OTHER FIXTURES CLEARANCES.



GRAB BARS SHALL COMPLY SHALL BE PROVIDED IN REAR AND SIDE WALLS CLOSEST TO THE WATER CLOSET PER § 604.5. EXCEPTIONS: GRAB BARS SHALL NOT BE PROVIDED ON 1) SINGLE OCCUPANT RESTROOMS ACCESSED THROUGH PRIVATE OFFICE NOT FOR COMMON/PUBLIC USE 2) DETENTION OR CORRECTION FACILITIES.

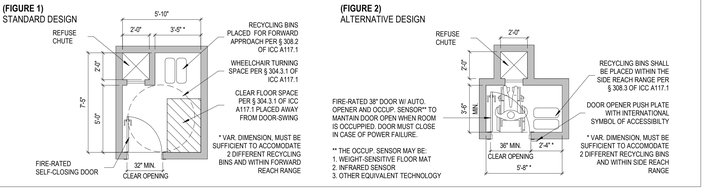


608 SHOWER COMPARTMENTS



BUILDINGS BULLETIN 2019-001 - ACCESSIBLE REFUSE ROOM

STANDARD DESIGN. IN MULTIPLE DWELLINGS, REFUSE DISPOSAL, RECYCLABLE, AND STORAGE ROOMS INTENDED FOR THE GENERAL COMMON-USE SHALL COMPLY WITH BULLETIN 2019-001. EACH ROOM MUST COMPLY W/ ICC A117.11, INCLUDING BUT NOT LIMITED TO, § 304 (TURNING SPACE), § 305 (CLEAR FLOOR SPACE), § 309 (OPERABLE PARTS) AND § 404 (DOORS AND DOORWAYS). THE REFUSE AND RECYCLABLE STORAGE ROOM DOOR MAY SWING INTO THE ROOM PROVIDED THAT A CLEAR FLOOR SPACE NOT LESS THAN 30" BY 48" IS PROVIDED WITHIN THE ROOM BEYOND THE ARC OF THE DOOR SWING. SEE FIGURE 1. **ALTERNATIVE DESIGN.** AN ALTERNATIVE DESIGN IS PERMITTED PROVIDED THAT THE CONDITIONS ARE MET PER FIGURE 2.



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Structure Engineer:
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Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ACCESSIBILITY NOTES

G-005B.00

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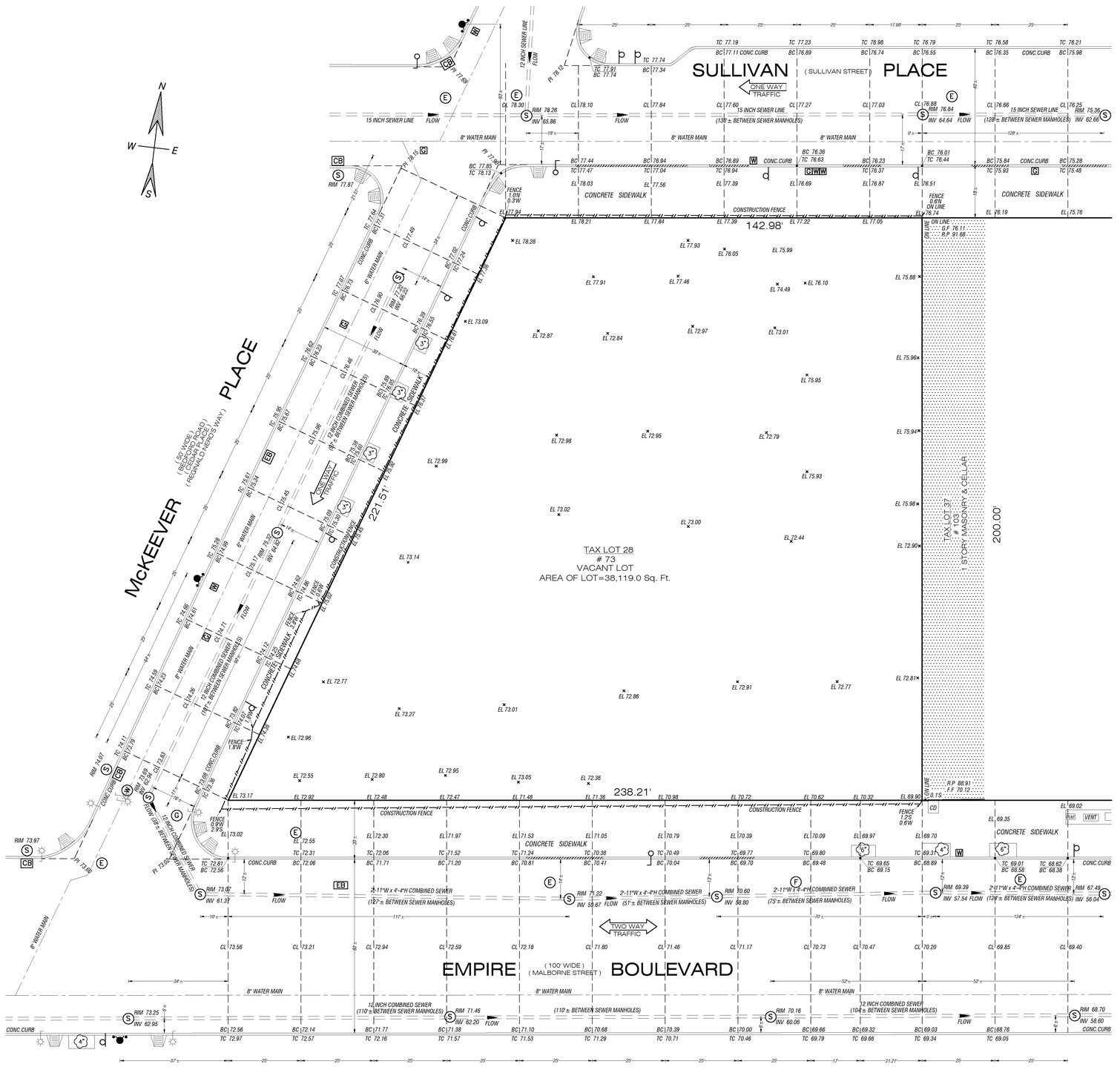
Date: 12/1/2025 7:21:36 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

JOB # CM 5022 ADDRESS: 73 EMPIRE BOULEVARD



SCALE: 1 INCH = 25 FEET

GENERAL NOTES:

1. This survey was prepared only for the party (parties) and purpose indicated hereon.
2. Property corner monuments or markers were (not) placed as part of this survey.
3. Certifications on this survey map signify that the map was prepared in accordance with the current existing Code of Practice for Land Surveys adopted by the New York State Association of Professional Land Surveyors, Inc. Said certifications are limited to the party (parties) for whom the survey is prepared and are not transferable.
4. The location and nature of underground structures, internal walls and improvements or encroachments not visible to the surveyor are not covered under this certification.
5. Easements of record are only guaranteed if an Abstract of Title is furnished to the surveyor.
6. This is to certify that there are no streams nor natural water courses on the property except as shown on this survey.
7. Elevations refer to NAVD 1988 datum.

CAPTION	ARCHITECTURAL SURVEY				
DATE	REVISIONS				
10-20-2025	ARCHITECTURAL SURVEY UPDATE				
07-02-2025	ARCHITECTURAL SURVEY				
	DATE	BY		DATE	BY
SURVEYED	07-02-2025	V.B,V.J,P.J	DRAWN	07-05-2025	V.B

LEGEND

F.F	FIRST FLOOR ELEVATION
R.P	ROOF PARAPET ELEVATION
G.F	GARAGE FLOOR ELEVATION
TC	TOP OF CURB
BC	BOTTOM OF CURB
CL	CENTERLINE
EL	SPOT ELEVATION
INV	INVERT ELEVATION
CD	CELLAR DOOR
CONC.	CONCRETE
G	GAS MANHOLE
W	WATER MANHOLE
E	ELECTRIC MANHOLE
S	SEWER MANHOLE
F	FIRE DEPARTMENT MANHOLE
W	WATER VALVE
G	GAS VALVE
CB	CATCH BASIN
EB	ELECTRIC BOX
	TRAFFIC LIGHT
	LIGHT POLE
	STREET SIGN
	HYDRANT
	CHAIN LINK FENCE
	CONSTRUCTION FENCE
	DROP CURB
	PEDESTRIAN RAMP
30"	TREE & SIZE

VINCENT TEUTONICO, L.S.
NEW YORK LICENSE 050307

MAP OF SURVEY OF PROPERTY

BOROUGH AND COUNTY OF BROOKLYN
CITY AND STATE OF NEW YORK
TAX MAP: BLOCK 1306, LOT 28

STATEWIDE LAND SURVEYING P.C.

16 FLAGG PLACE
STATEN ISLAND
NY 10304
TEL: 718-751-6871
email: citymapping@yahoo.com

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No.	Description	Date
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SIGNATURE & SEAL

DOB SCAN STICKER:

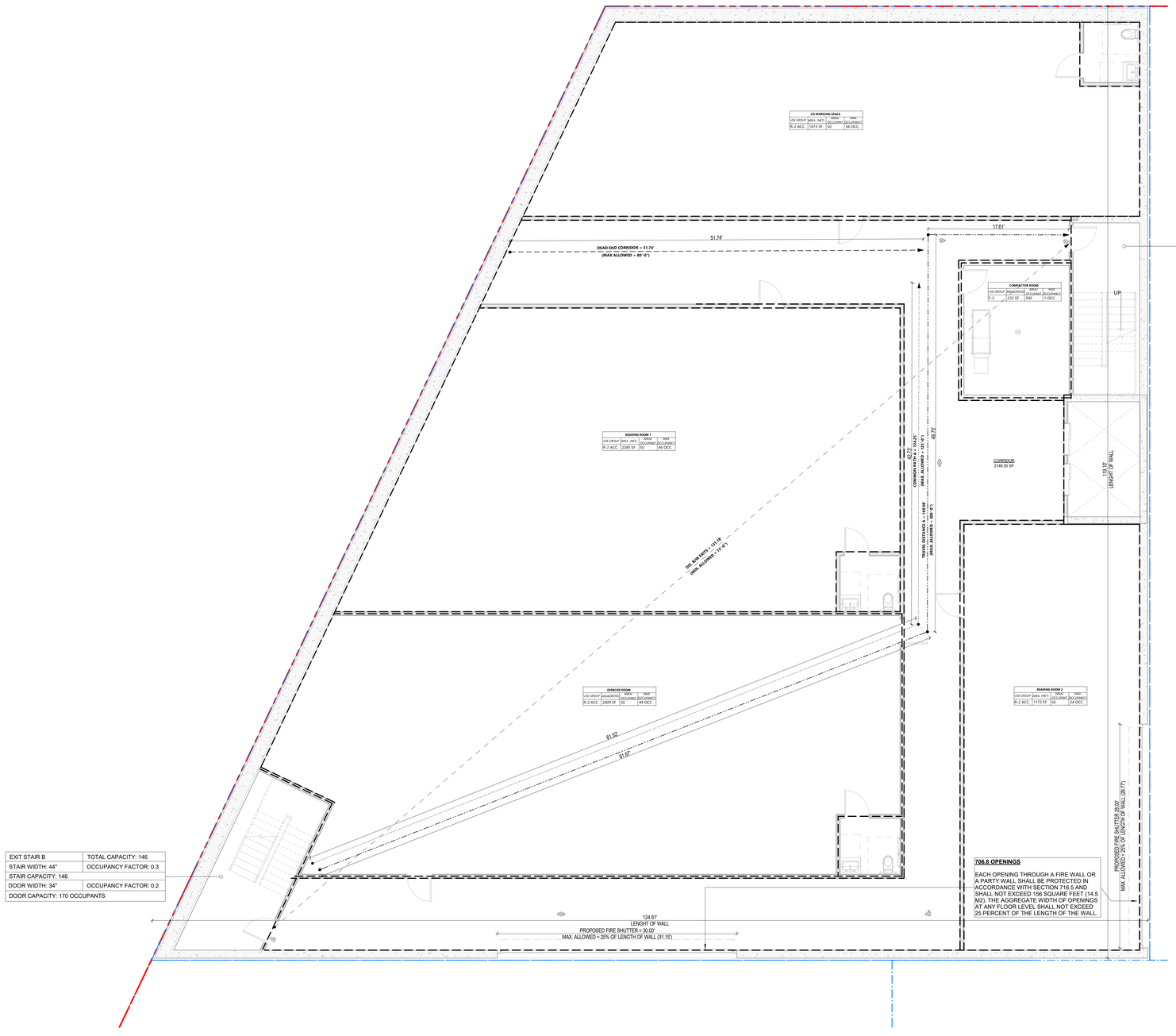
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ARCHITECTURAL SURVEY

V-001B.00

Scale:
Date: 12/1/2025 7:21:37 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 BLDG B - SUBCELLAR 2 LIFE SAFETY PLAN
3/16" = 1'-0"



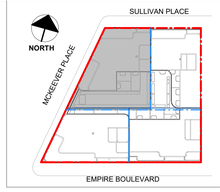
EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

706.8 OPENINGS

EACH OPENING THROUGH A FIRE WALL OR A PARTY WALL SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 716.5 AND SHALL NOT EXCEED 156 SQUARE FEET (14.5 M2). THE AGGREGATE WIDTH OF OPENINGS AT ANY FLOOR LEVEL SHALL NOT EXCEED 25 PERCENT OF THE LENGTH OF THE WALL.

KEY PLAN
N.T.S.



SUB-CELLAR 2 EGRESS DOORS - BLDG B

Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	77	15.4	36"
EGRESS DOOR B	0.2	77	15.4	36"

SUB-CELLAR 2 EGRESS STAIRS - BLDG B

Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	77	23.1	44"
EGRESS STAIR B	0.3	77	23.1	44"

SUB-CELLAR 2 TRAVEL DISTANCE - BLDG B

Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	124' - 3"
DEAD END			
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	51' - 9"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2 ACC.	MIN. ALLOWED = 15'-0"	131' - 2"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	149' - 0"

SUB-CELLAR 2 OCCUPANT LOAD - BLDG B

Name	Area	# of Occupants
CO WORKING SPACE	1673 SF	34
EXERCISE ROOM	2409 SF	49
READING ROOM 1	2285 SF	46
READING ROOM 2	1172 SF	24
	7539 SF	153
COMPACTOR ROOM	232 SF	1
	232 SF	1
TOTAL	7771 SF	154

SUB-CELLAR 2 CORRIDOR CAPACITY - BLDG B

Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	154	30.8	60"

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SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

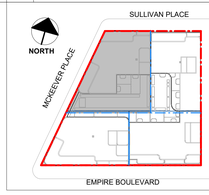
SHEET TITLE
SUBCELLAR 2 LIFE SAFETY PLANS

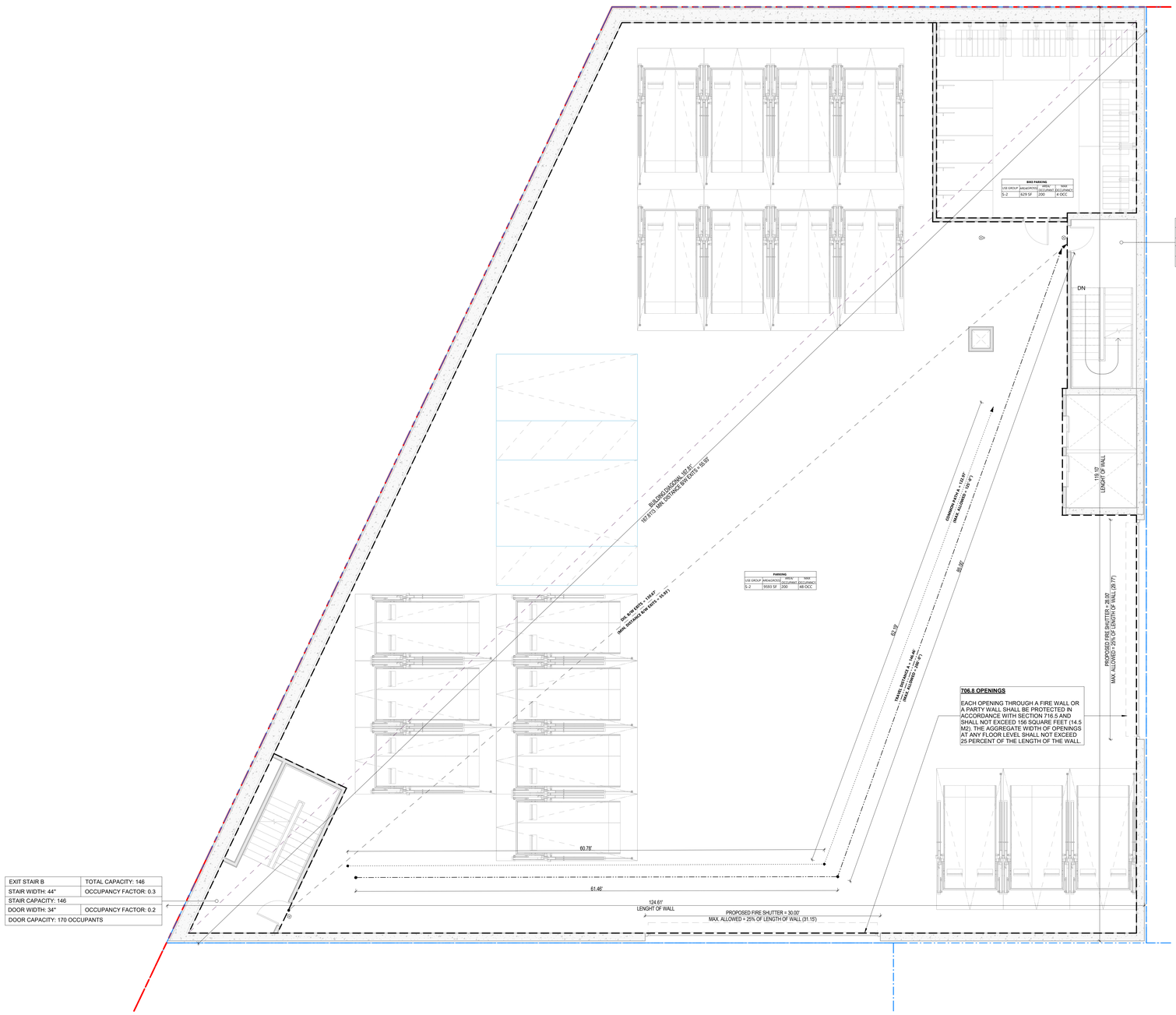
A-001B.00

Scale:	As indicated
Date:	12/1/2025 7:21:45 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 | BLDG B - SUBCELLAR 1 LIFE SAFETY PLAN
3/16" = 1'-0"

KEY PLAN
N.T.S.





SUB-CELLAR 1 EGRESS STAIRS - BLDG B				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	26	7.8	44"
EGRESS STAIR B	0.3	26	7.8	44"

SUB-CELLAR 1 EGRESS DOORS - BLDG B				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	26	5.2	36"
EGRESS DOOR B	0.2	26	5.2	36"

SUB-CELLAR 1 CORRIDOR CAPACITY - BLDG B				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width

SUB-CELLAR 1 TRAVEL DISTANCE - BLDG B			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	S-2	MAX. ALLOWED = 125'-0"	123' - 0"
DIS. B/W EXITS			
DIS. B/W EXITS	S-2	MIN. DISTANCE B/W EXITS = 55.93'	130' - 8"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	S-2	MAX. ALLOWED = 200'-0"	146' - 5"

SUB-CELLAR 1 OCCUPANT LOAD - BLDG B		
Name	Area	# of Occupants
BIKE PARKING	629 SF	4
PARKING	9593 SF	48
	10222 SF	52
TOTAL	10222 SF	52

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SOUTH AMBOY, NJ 08879
(609) 216 2975

CLIENT:
THE RABSKY GROUP
505 Flushing Ave
Brooklyn, NY 11205

Architect:
KHO-HWA LEE ARCHITECTS P.C.
227 Catherine Street
South Amboy, NJ 08879

Structure Engineer:
STRUCTURAL ENGINEERING TECHONOLOGIES P.C
40-12 28th Street
Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

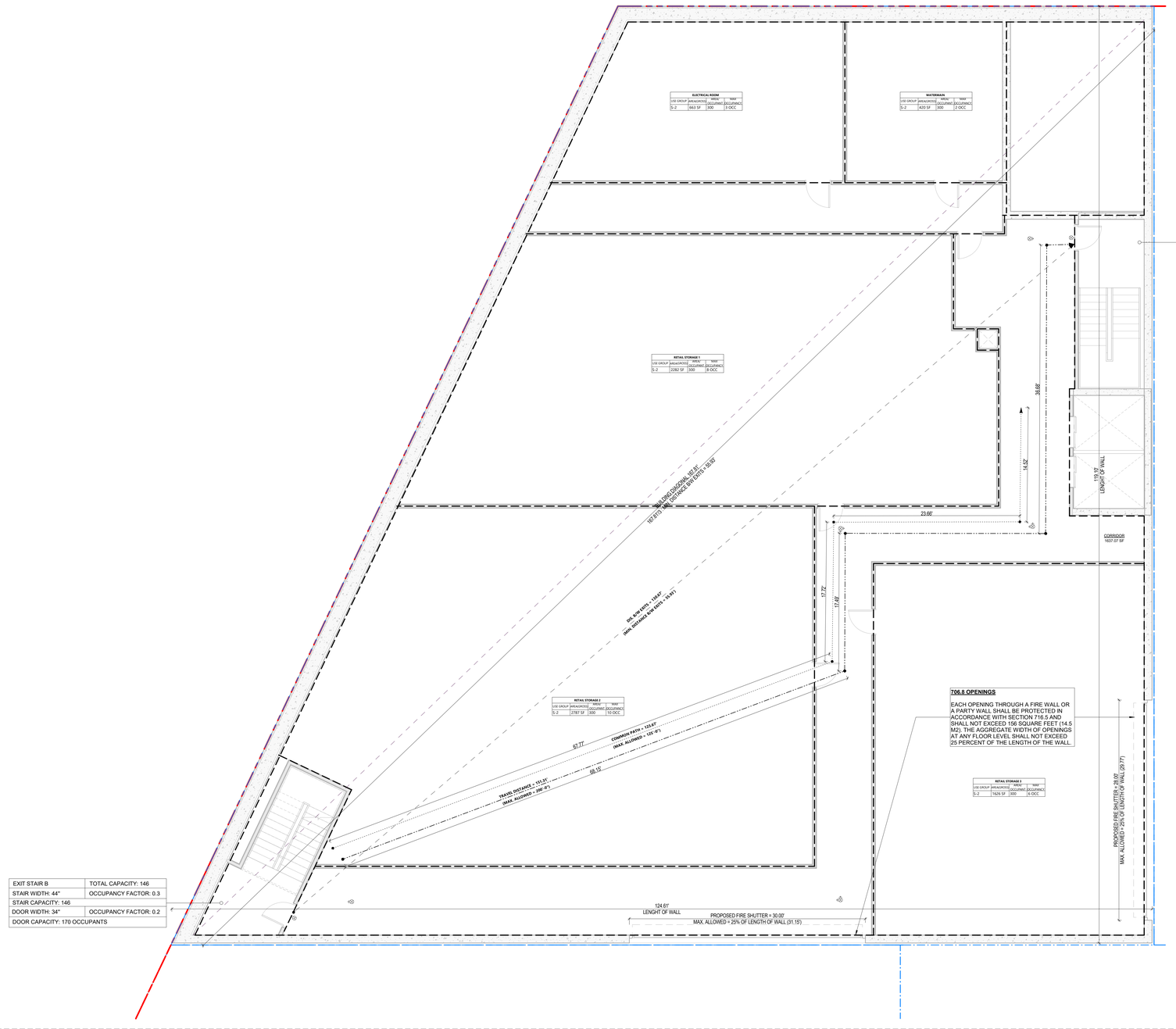
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
SUBCELLAR 1 LIFE SAFETY PLANS

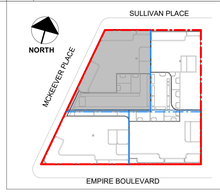
A-002B.00

Scale:	As indicated
Date:	12/1/2025 7:21:52 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG B - CELLAR LIFE SAFETY PLAN
3/16" = 1'-0"



KEY PLAN
N.T.S.



CELLAR EGRESS STAIRS- BLDG B				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	26	7.8	44"
EGRESS STAIR B	0.3	26	7.8	44"

CELLAR EGRESS DOORS - BLDG B				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	15	3	36"
EGRESS DOOR B	0.2	14	2.8	36"

CELLAR CORRIDOR CAPACITY - BLDG B				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	29	5.8	60"

CELLAR TRAVEL DISTANCE - BLDG B			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH	M	MAX. ALLOWED = 125'-0"	123' - 8"
DIS. B/W EXITS			
DIS. B/W EXITS	S-2	MIN. DISTANCE B/W EXITS = 55.93'	130' - 8"
TRAVEL DISTANCE			
TRAVEL DISTANCE	M	MAX. ALLOWED = 200'-0"	151' - 4"

CELLAR OCCUPANT LOAD - BLDG B		
Name	Area	# of Occupants
RETAIL STORAGE 1	2282 SF	8
RETAIL STORAGE 2	2787 SF	10
RETAIL STORAGE 3	1626 SF	6
	6695 SF	24
ELECTRICAL ROOM	663 SF	3
WATERMAIN	420 SF	2
	1083 SF	5
TOTAL	7777 SF	29

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Brooklyn, NY 11225

SHEET TITLE
CELLAR LIFE SAFETY PLANS

A-003B.00

Scale:	As indicated
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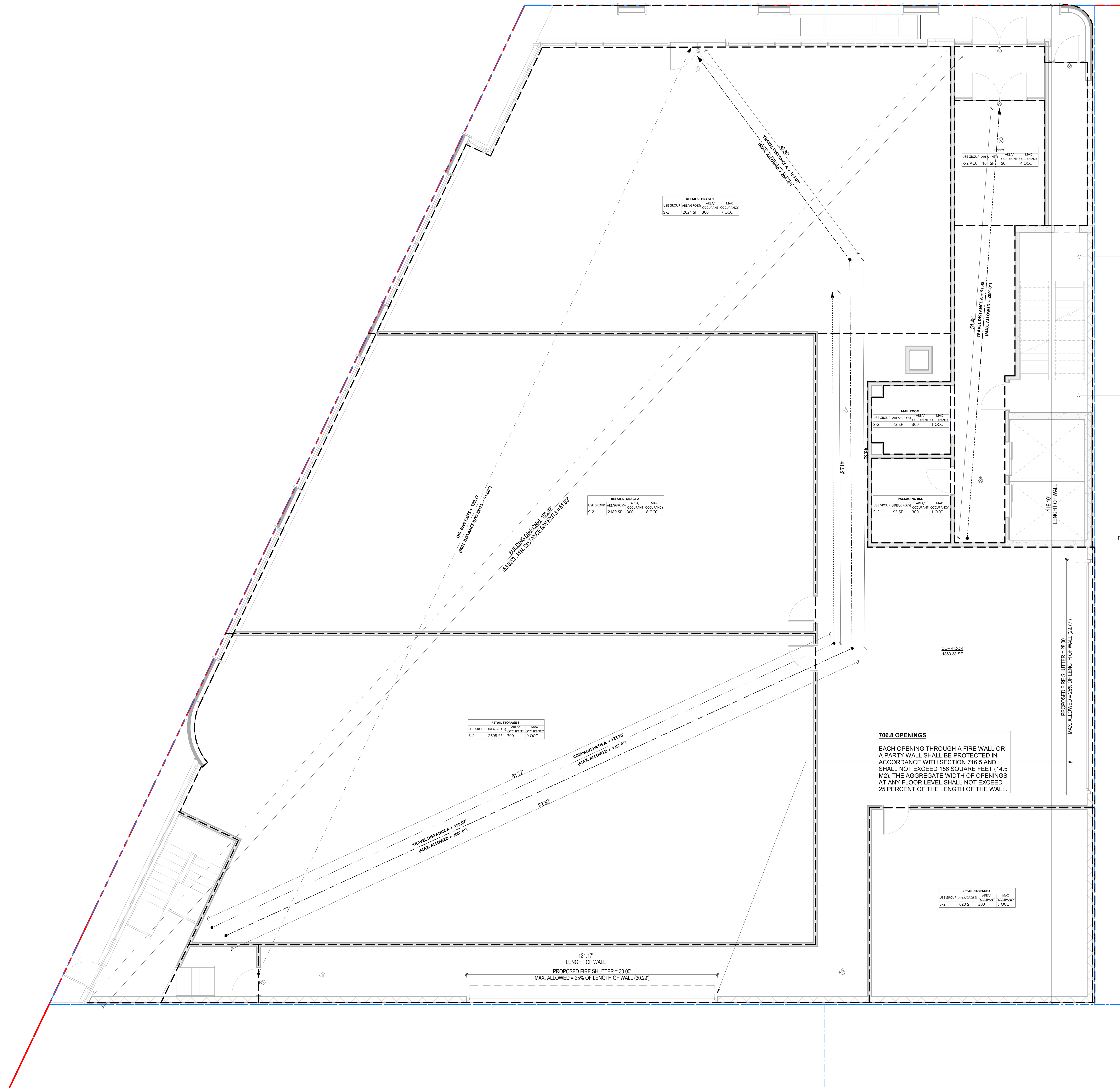
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

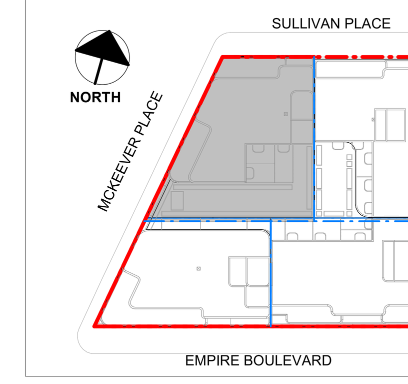
1 BLDG B - 1ST FL. T.O.S LOBBY LIFE SAFETY PLAN
3/16" = 1'-0"



EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

KEY PLAN
N.T.S.



1ST FLOOR EGRESS STAIRS - BLDG B

Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	16	4.8	44"
EGRESS STAIR B	0.3	17	5.1	44"

1ST FLOOR EGRESS DOORS - BLDG B LOBBY

Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	10	2	37"
EGRESS DOOR B	0.2	10	2	78"
EGRESS DOOR C	0.2	11	2.2	78"

1ST FLOOR CORRIDOR CAPACITY - BLDG B

Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	33	6.6	60"

1ST FLOOR TRAVEL DISTANCE - BLDG B

Name	Occupancy Group	Required Distance	Proposed Distance

1ST FLOOR OCCUPANT LOAD - BLDG B

Name	Area	# of Occupants
RETAIL STORAGE 1	2024 SF	7
RETAIL STORAGE 2	2189 SF	8
RETAIL STORAGE 3	2698 SF	9
RETAIL STORAGE 4	620 SF	3
	7531 SF	27
LOBBY	161 SF	4
MAIL ROOM	73 SF	1
PACKAGING RM.	95 SF	1
	329 SF	6
TOTAL	7860 SF	33

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SHEET TITLE
1ST FLOOR LIFE SAFETY PLANS

A-004B.00

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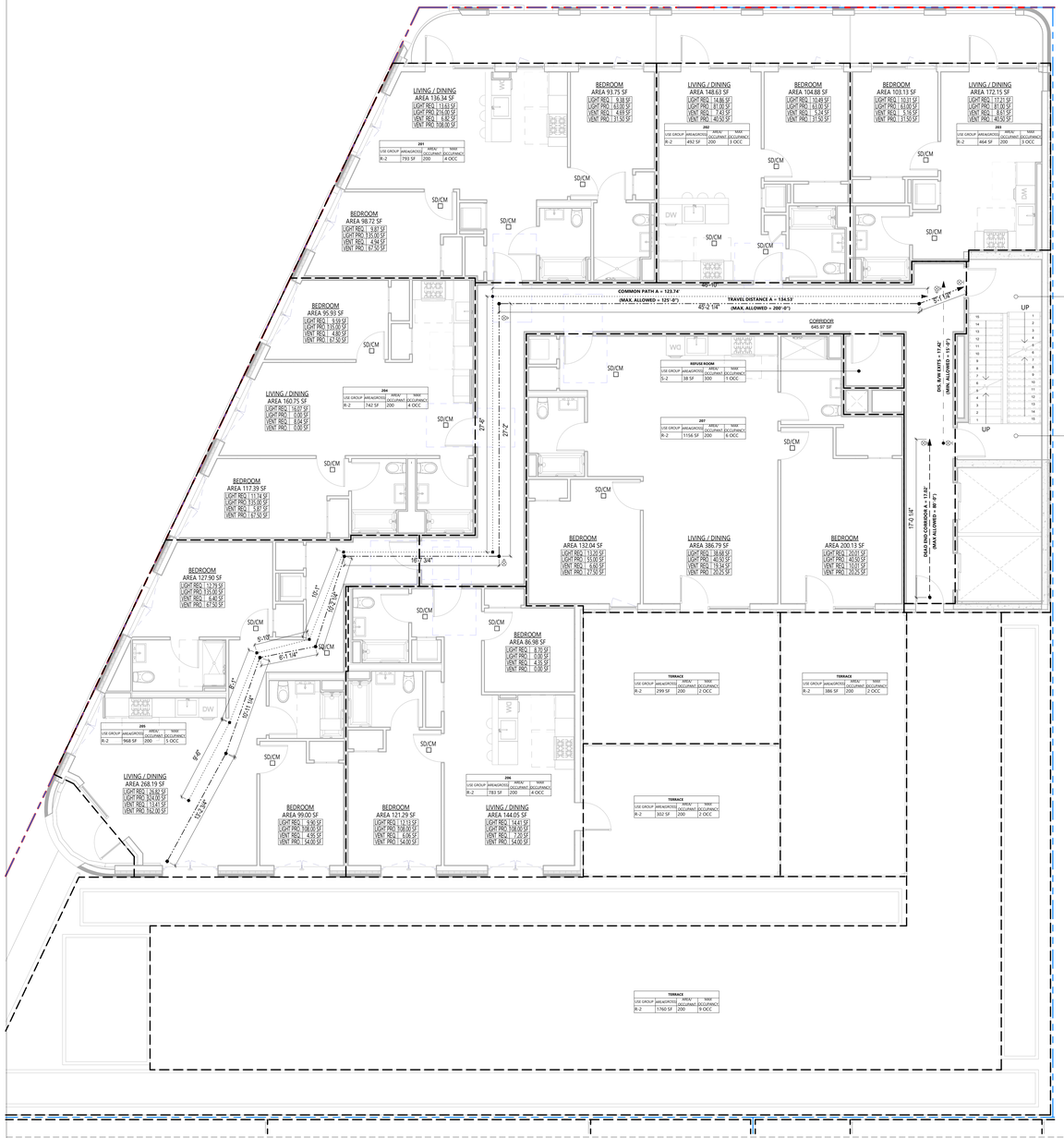
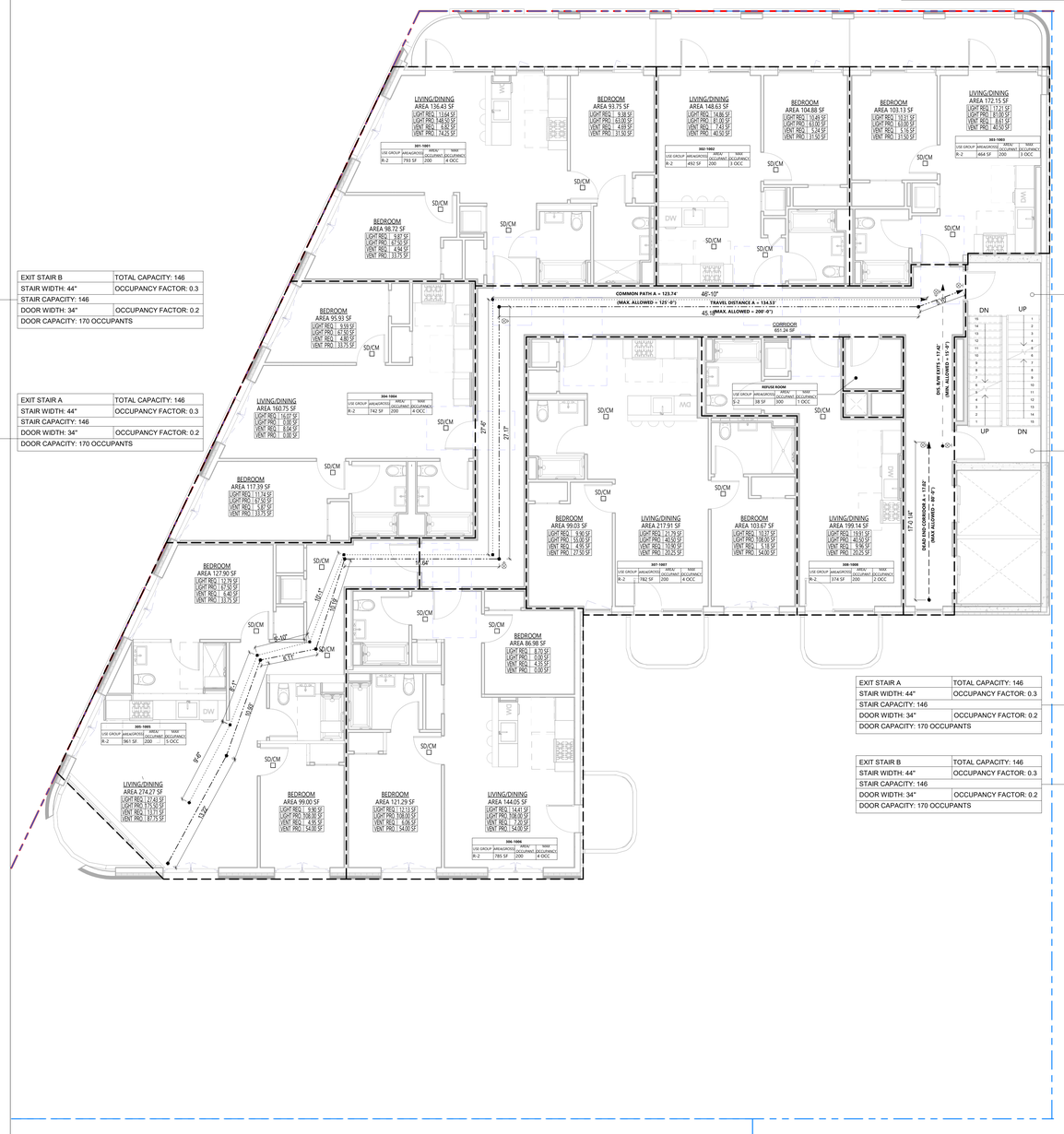
1 2ND FL. - 10TH FL.
3/16" = 1'-0"



2 BLDG B - 3RD FL. LIFE SAFETY PLAN
3/16" = 1'-0"



EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
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DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
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DOOR CAPACITY: 170 OCCUPANTS	

KEY PLAN
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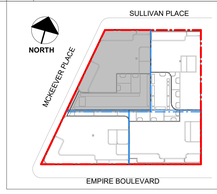

2ND FLOOR EGRESS STAIRS - BLDG B

Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	22	6.6	44"
EGRESS STAIR B	0.3	22	6.6	44"

2ND FLOOR EGRESS DOORS - BLDG B

Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	22	4.4	36"
EGRESS DOOR B	0.2	22	4.4	36"

2ND FLOOR CORRIDOR CAPACITY - BLDG B

Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	44	8.8	60"

2ND FLOOR TRAVEL DISTANCE - BLDG B

Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	123' - 9"
DEAD END			
DEAD END CORRIDOR A	R-2	MAX ALLOWED = 80'-0"	17' - 0"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	17' - 5"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	134' - 6"

2ND FLOOR OCCUPANT LOAD - BLDG B

Name	Area	# of Occupants
201	793 SF	4
202	492 SF	3
203	464 SF	3
204	742 SF	4
205	968 SF	5
206	783 SF	4
207	1156 SF	6
TERRACE	1760 SF	9
TERRACE	302 SF	2
TERRACE	299 SF	2
TERRACE	386 SF	2
	8145 SF	44
REFUSE ROOM	38 SF	1
	38 SF	1
TOTAL	8183 SF	45

BLDG B - 2ND FL.-10TH FL. -LIGHT AND AIR CALCULATION

Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
02B_2ND FL.					
201	BEDROOM	9.375	63.00 SF	4.6875	31.50 SF
201	LIVING / DINING	13.633892	216.00 SF	6.816946	108.00 SF
201	BEDROOM	9.872243	135.00 SF	4.936122	67.50 SF
202	BEDROOM	10.487985	63.00 SF	5.243992	31.50 SF
202	LIVING / DINING	14.863065	81.00 SF	7.431532	40.50 SF
203	LIVING / DINING	17.214822	81.00 SF	8.607411	40.50 SF
203	BEDROOM	10.3125	63.00 SF	5.15625	31.50 SF
204	BEDROOM	9.592728	135.00 SF	4.796364	67.50 SF
204	LIVING / DINING	16.074839	0.00 SF	8.037419	0.00 SF
204	BEDROOM	11.738806	135.00 SF	5.869403	67.50 SF
205	BEDROOM	12.790313	135.00 SF	6.395156	67.50 SF
205	BEDROOM	9.9	108.00 SF	4.95	54.00 SF
205	LIVING / DINING	26.819184	324.00 SF	13.409592	162.00 SF
206	BEDROOM	12.128828	108.00 SF	6.064414	54.00 SF
206	BEDROOM	8.69776	0.00 SF	4.34888	0.00 SF
206	LIVING / DINING	14.405061	108.00 SF	7.202531	54.00 SF
207	BEDROOM	13.203996	55.00 SF	6.601998	27.50 SF
207	LIVING / DINING	38.679068	40.50 SF	19.339534	20.25 SF
207	BEDROOM	20.012793	40.50 SF	10.006397	20.25 SF

3RD FLOOR EGRESS STAIRS - BLDG B

Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	15	4.5	44"
EGRESS STAIR B	0.3	15	4.5	44"

3RD FLOOR EGRESS DOORS - BLDG B

Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	15	3	36"
EGRESS DOOR B	0.2	15	3	36"

3RD FLOOR CORRIDOR CAPACITY - BLDG B

Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	30	6	60"

3RD FLOOR TRAVEL DISTANCE - BLDG B

Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	123' - 9"
DEAD END			
DEAD END CORRIDOR A	R-2	MAX ALLOWED = 80'-0"	17' - 0"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	17' - 5"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	134' - 6"

3RD FLOOR OCCUPANT LOAD - BLDG B

Name	Area	# of Occupants
301-1001	793 SF	4
302-1002	492 SF	3
303-1003	464 SF	3
304-1004	742 SF	4
305-1005	961 SF	5
306-1006	785 SF	4
307-1007	782 SF	4
308-1008	374 SF	2
	5393 SF	29
REFUSE ROOM	38 SF	1
	38 SF	1
TOTAL	5431 SF	30

BLDG B - 3RD FL.-10TH FL. -LIGHT AND AIR CALCULATION

Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
03B_3RD FL.					
308-1009	LIVING/DINING	17.214822	81.00 SF	8.607411	40.50 SF
308-1010	BEDROOM	10.3125	63.00 SF	5.15625	31.50 SF
308-1011	BEDROOM	10.487985	63.00 SF	5.243992	31.50 SF
308-1012	LIVING/DINING	14.863065	81.00 SF	7.431532	40.50 SF
308-1013	BEDROOM	9.375	63.00 SF	4.6875	31.50 SF
308-1014	LIVING/DINING	13.642941	148.50 SF	6.82147	74.25 SF
308-1015	BEDROOM	9.872243	67.50 SF	4.936122	33.75 SF
308-1016	BEDROOM	9.592728	67.50 SF	4.796364	33.75 SF
308-1017	LIVING/DINING	16.074839	0.00 SF	8.037419	0.00 SF
308-1018	BEDROOM	11.738806	67.50 SF	5.869403	33.75 SF
308-1019	BEDROOM	12.790313	67.50 SF	6.395156	33.75 SF
308-1020	LIVING/DINING	27.427418	175.50 SF	13.713709	87.75 SF
308-1021	BEDROOM	9.9	108.00 SF	4.95	54.00 SF
308-1022	BEDROOM	12.128828	108.00 SF	6.064414	54.00 SF
308-1023	LIVING/DINING	14.405061	108.00 SF	7.202531	54.00 SF
308-1024	BEDROOM	8.69776	0.00 SF	4.34888	0.00 SF
308-1025	BEDROOM	9.902997	55.00 SF	4.951499	27.50 SF
308-1026	LIVING/DINING	21.79088	40.50 SF	10.89544	20.25 SF
308-1027	BEDROOM	10.366667	108.00 SF	5.183333	54.00 SF
308-1028	LIVING/DINING	19.914089	40.50 SF	9.957044	20.25 SF

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SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
2ND - 10TH FLOOR LIFE SAFETY PLANS

A-005B.00

Scale:	As indicated
Date:	12/1/2025 7:22:23 PM
Drawn by:	
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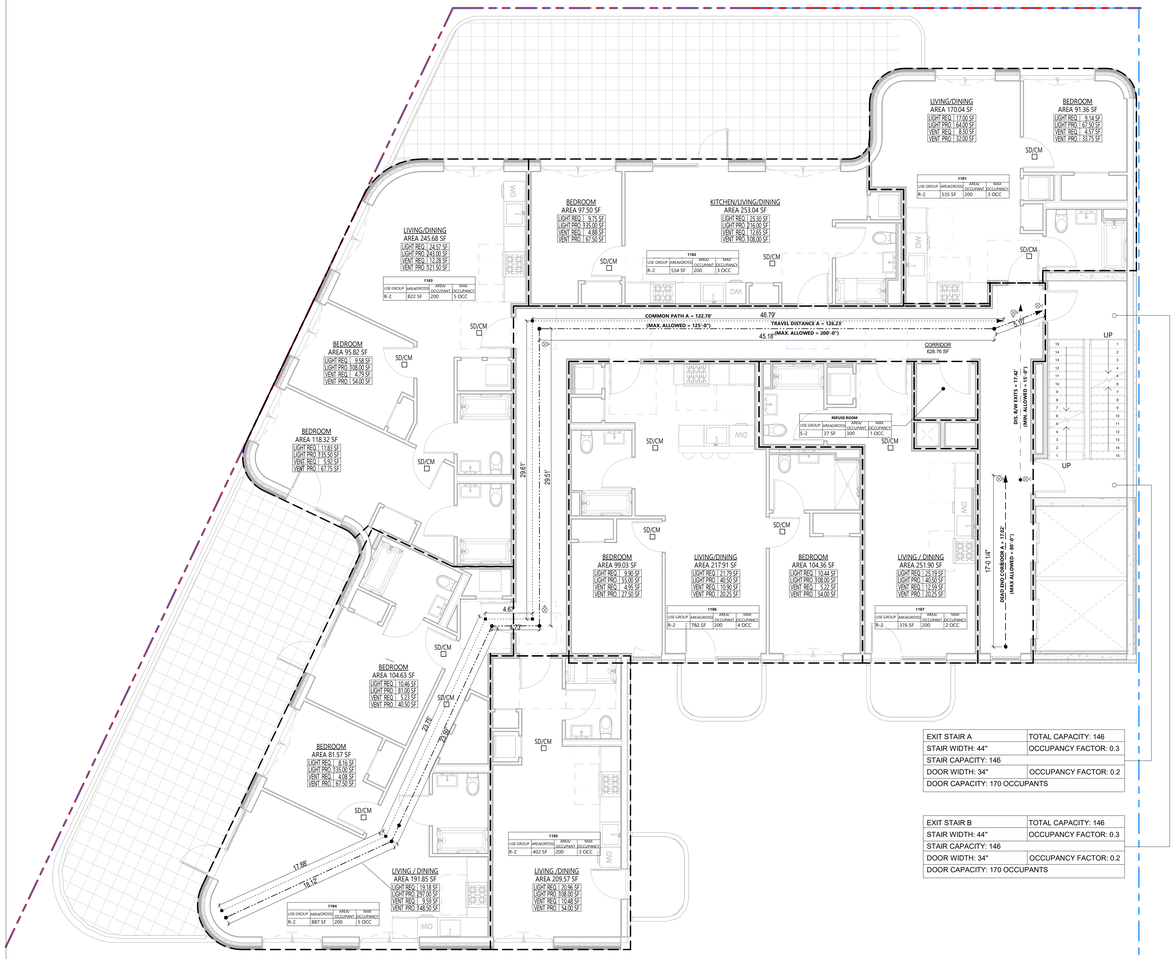
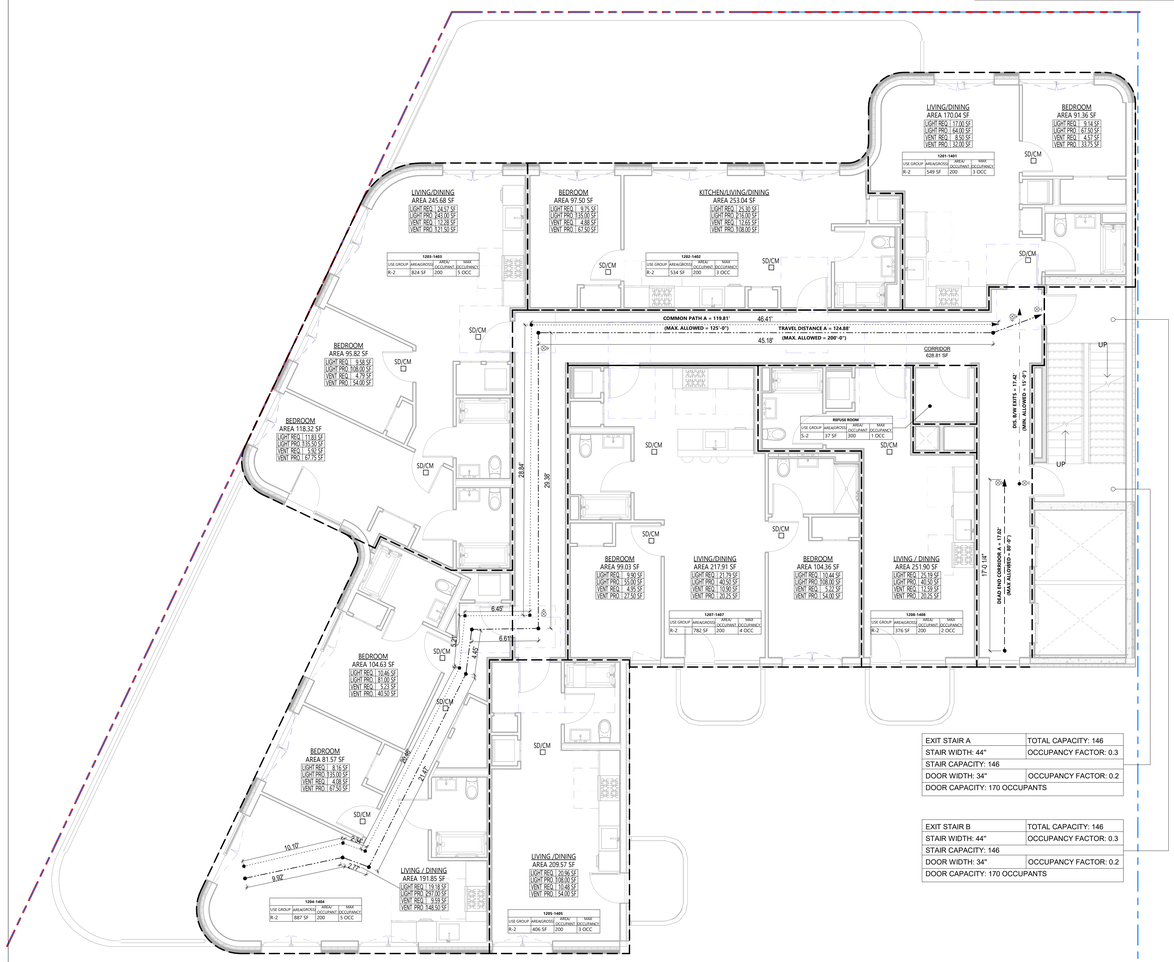
1 BLDG B - 11TH FL. LIFE SAFETY PLAN
3/16" = 1'-0"



EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

2 BLDG B - 12TH FL. LIFE SAFETY PLAN
3/16" = 1'-0"



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STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
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KEY PLAN
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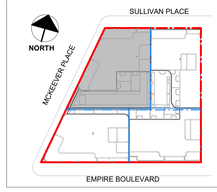

11TH FLOOR EGRESS STAIRS- BLDG B				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	13	3.9	44"
EGRESS STAIR B	0.3	13	3.9	44"

11TH FLOOR EGRESS DOORS - BLDG B				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	13	2.6	36"
EGRESS DOOR B	0.2	13	2.6	36"

11TH FLOOR CORRIDOR CAPACITY - BLDG B				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	26	5.2	60"

11TH FLOOR TRAVEL DISTANCE - BLDG B			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	122' - 8"
DEAD END			
DEAD END CORRIDOR A	R-2	MAX.ALLOWED = 80'-0"	17' - 0"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	17' - 5"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	126' - 3"

11TH FLOOR OCCUPANT LOAD - BLDG B		
Name	Area	# of Occupants
1101	535 SF	3
1102	534 SF	3
1103	822 SF	5
1104	887 SF	5
1105	402 SF	3
1106	782 SF	4
1107	376 SF	2
	4338 SF	25
REFUSE ROOM	37 SF	1
	37 SF	1
TOTAL	4375 SF	26

BLDG B - 11TH FL.-14TH FL. -LIGHT AND AIR CALCULATION					
Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
11B_11TH FL.					
1101	LIVING/DINING	17.003996	64.00 SF	8.501998	32.00 SF
1101	BEDROOM	9.135579	67.50 SF	4.56779	33.75 SF
1102	KITCHEN/LIVING/DINING	25.303513	216.00 SF	12.651756	108.00 SF
1102	BEDROOM	9.75	135.00 SF	4.875	67.50 SF
1103	LIVING/DINING	24.567789	243.00 SF	12.283895	121.50 SF
1103	BEDROOM	9.582273	108.00 SF	4.791137	54.00 SF
1103	BEDROOM	11.832225	135.50 SF	5.916112	67.75 SF
1104	BEDROOM	10.462783	81.00 SF	5.231391	40.50 SF
1104	LIVING / DINING	19.184945	297.00 SF	9.592472	148.50 SF
1104	BEDROOM	8.156826	135.00 SF	4.078413	67.50 SF
1105	LIVING /DINING	20.956552	108.00 SF	10.478276	54.00 SF
1106	BEDROOM	9.902997	55.00 SF	4.951499	27.50 SF
1106	LIVING/DINING	21.79088	40.50 SF	10.89544	20.25 SF
1106	BEDROOM	10.436111	108.00 SF	5.218056	54.00 SF
1107	LIVING / DINING	25.189921	40.50 SF	12.59496	20.25 SF

12TH FLOOR EGRESS STAIRS- BLDG B				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	13	3.9	44"
EGRESS STAIR B	0.3	13	3.9	44"

12TH FLOOR EGRESS DOORS - BLDG B				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	13	2.6	36"
EGRESS DOOR B	0.2	13	2.6	36"

12TH FLOOR CORRIDOR CAPACITY - BLDG B				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	26	5.2	60"

12TH FLOOR TRAVEL DISTANCE - BLDG B			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	119' - 10"
DEAD END			
DEAD END CORRIDOR A	R-2	MAX.ALLOWED = 80'-0"	17' - 0"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	17' - 5"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	124' - 11"

12TH FLOOR OCCUPANT LOAD - BLDG B		
Name	Area	# of Occupants
1201-1401	549 SF	3
1202-1402	534 SF	3
1203-1403	824 SF	5
1204-1404	887 SF	5
1205-1405	406 SF	3
1207-1407	782 SF	4
1208-1408	376 SF	2
	4358 SF	25
REFUSE ROOM	37 SF	1
	37 SF	1
TOTAL	4395 SF	26

BLDG B - 11TH FL.-14TH FL. -LIGHT AND AIR CALCULATION					
Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
11B_11TH FL.					
1101	LIVING/DINING	17.003996	64.00 SF	8.501998	32.00 SF
1101	BEDROOM	9.135579	67.50 SF	4.56779	33.75 SF
1102	KITCHEN/LIVING/DINING	25.303513	216.00 SF	12.651756	108.00 SF
1102	BEDROOM	9.75	135.00 SF	4.875	67.50 SF
1103	LIVING/DINING	24.567789	243.00 SF	12.283895	121.50 SF
1103	BEDROOM	9.582273	108.00 SF	4.791137	54.00 SF
1103	BEDROOM	11.832225	135.50 SF	5.916112	67.75 SF
1104	BEDROOM	10.462783	81.00 SF	5.231391	40.50 SF
1104	LIVING / DINING	19.184945	297.00 SF	9.592472	148.50 SF
1104	BEDROOM	8.156826	135.00 SF	4.078413	67.50 SF
1105	LIVING /DINING	20.956552	108.00 SF	10.478276	54.00 SF
1106	BEDROOM	9.902997	55.00 SF	4.951499	27.50 SF
1106	LIVING/DINING	21.79088	40.50 SF	10.89544	20.25 SF
1106	BEDROOM	10.436111	108.00 SF	5.218056	54.00 SF
1107	LIVING / DINING	25.189921	40.50 SF	12.59496	20.25 SF

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

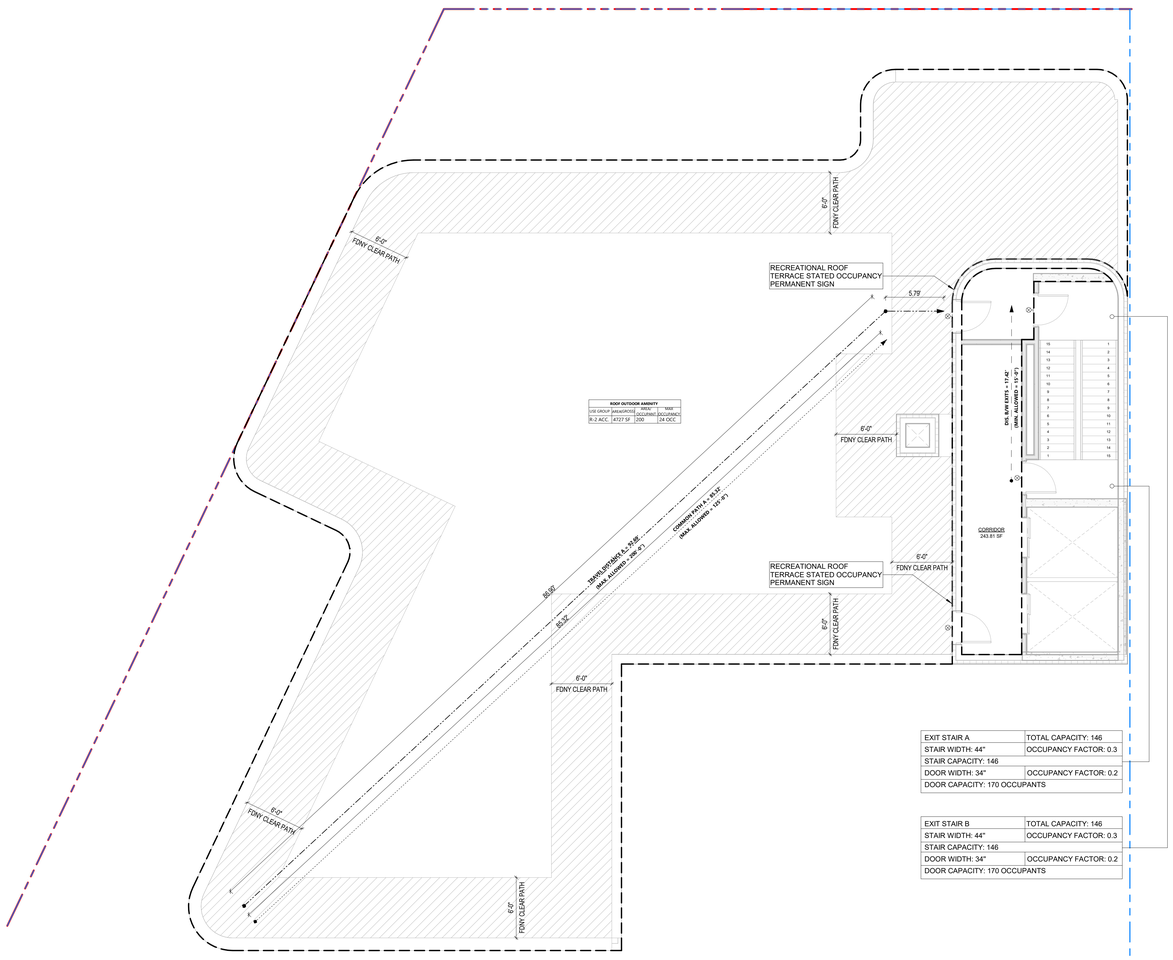
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
11TH - 14TH FLOOR
LIFE SAFETY PLANS

A-006B.00

Scale:	As indicated
Date:	12/1/2025 7:22:39 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG B - 15B_ROOF LIFE SAFETY PLAN
3/16" = 1'-0"



EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

ROOF EGRESS STAIRS- BLDG B

Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	12	3.6	44"
EGRESS STAIR B	0.3	12	3.6	44"

ROOF EGRESS DOORS - BLDG B

Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	12	2.4	36"
EGRESS DOOR B	0.2	12	2.4	36"

ROOF CORRIDOR CAPACITY - BLDG B

Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	24	4.8	60"

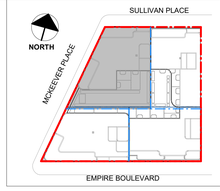
ROOF OCCUPANT LOAD - BLDG B

Name	Area	# of Occupants
ROOF OUTDOOR AMENITY	4727 SF	24
	4727 SF	24
TOTAL	4727 SF	24

ROOF TRAVEL DISTANCE - BLDG B

Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	85' - 4"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	17' - 5"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	92' - 8"

KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

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DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

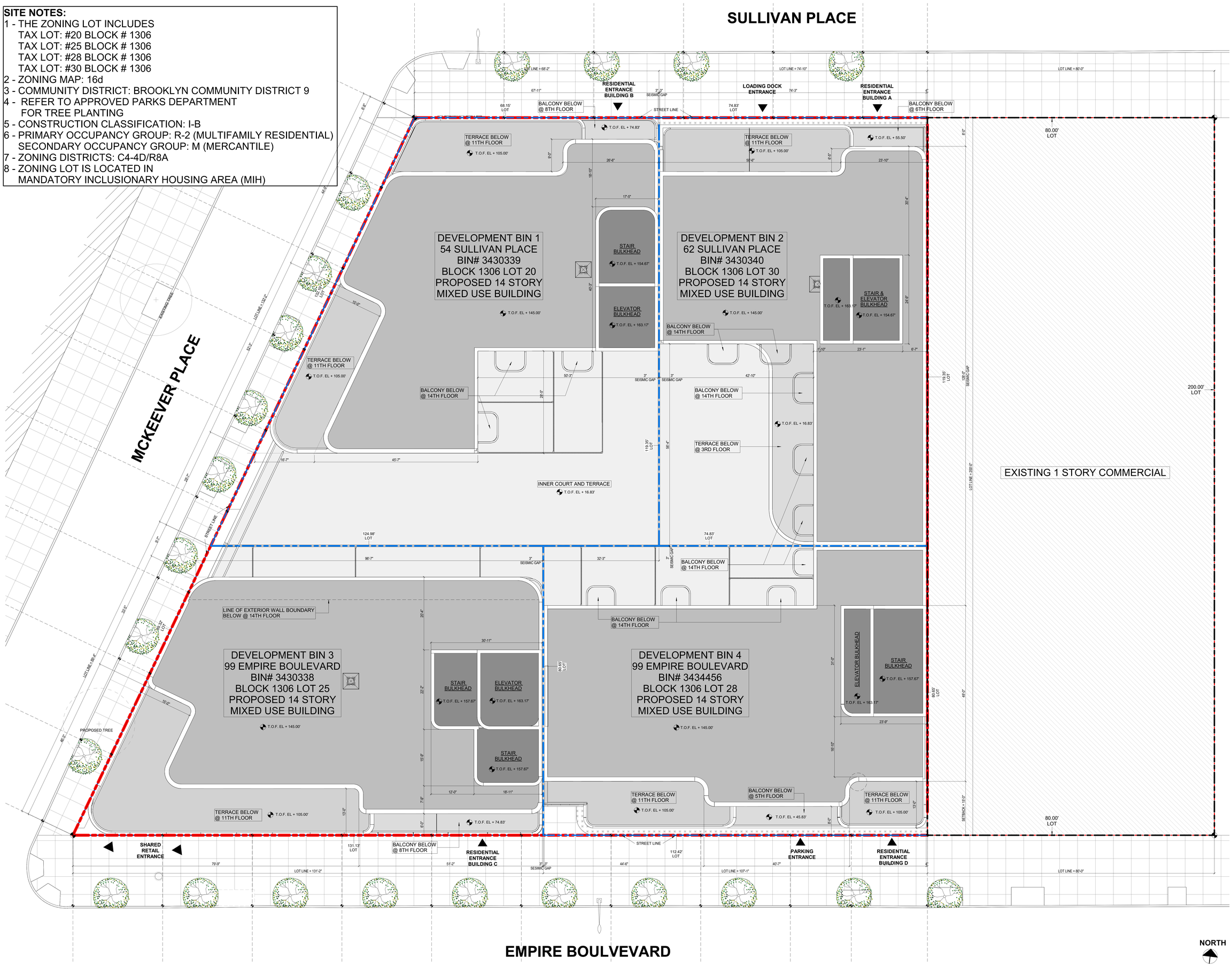
SHEET TITLE
ROOF LIFE SAFETY PLANS

A-007B.00

Scale: As indicated
Date: 12/1/2025 7:22:46 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 | SITE PLAN - Dependent 1
1/8" = 1'-0"

SITE NOTES:
1 - THE ZONING LOT INCLUDES
TAX LOT: #20 BLOCK # 1306
TAX LOT: #25 BLOCK # 1306
TAX LOT: #28 BLOCK # 1306
TAX LOT: #30 BLOCK # 1306
2 - ZONING MAP: 16d
3 - COMMUNITY DISTRICT: BROOKLYN COMMUNITY DISTRICT 9
4 - REFER TO APPROVED PARKS DEPARTMENT FOR TREE PLANTING
5 - CONSTRUCTION CLASSIFICATION: I-B
6 - PRIMARY OCCUPANCY GROUP: R-2 (MULTIFAMILY RESIDENTIAL)
SECONDARY OCCUPANCY GROUP: M (MERCANTILE)
7 - ZONING DISTRICTS: C4-4D/R8A
8 - ZONING LOT IS LOCATED IN MANDATORY INCLUSIONARY HOUSING AREA (MIH)



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

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DOB SCAN STICKER:

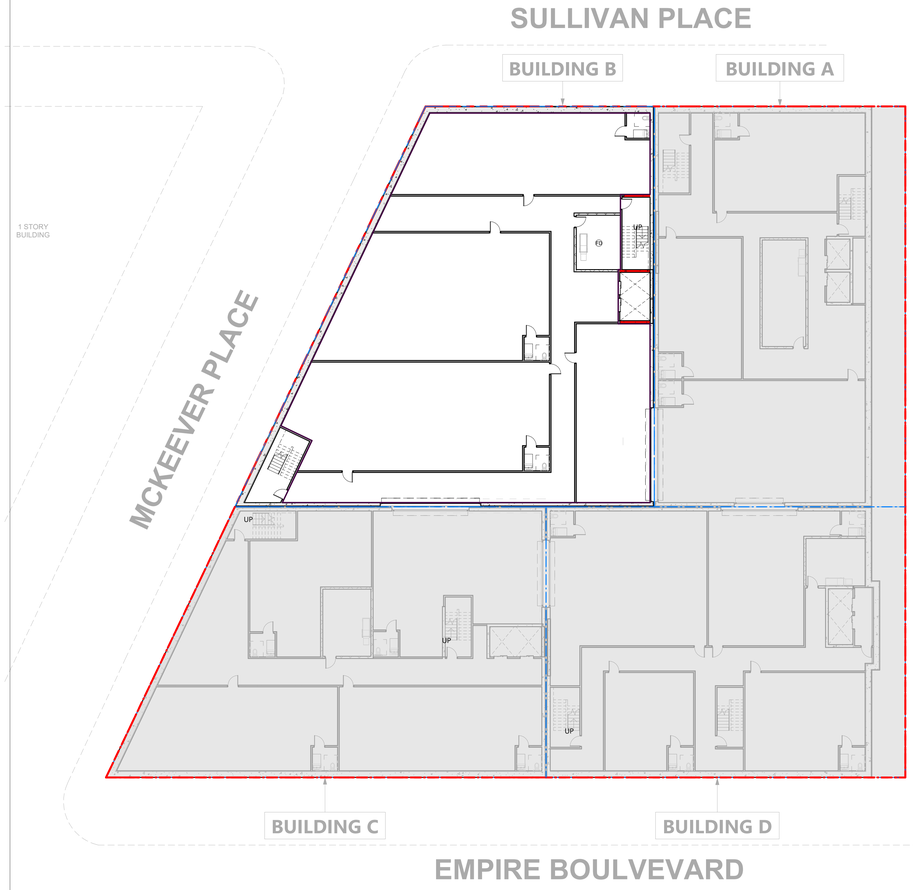
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
SITE PLAN

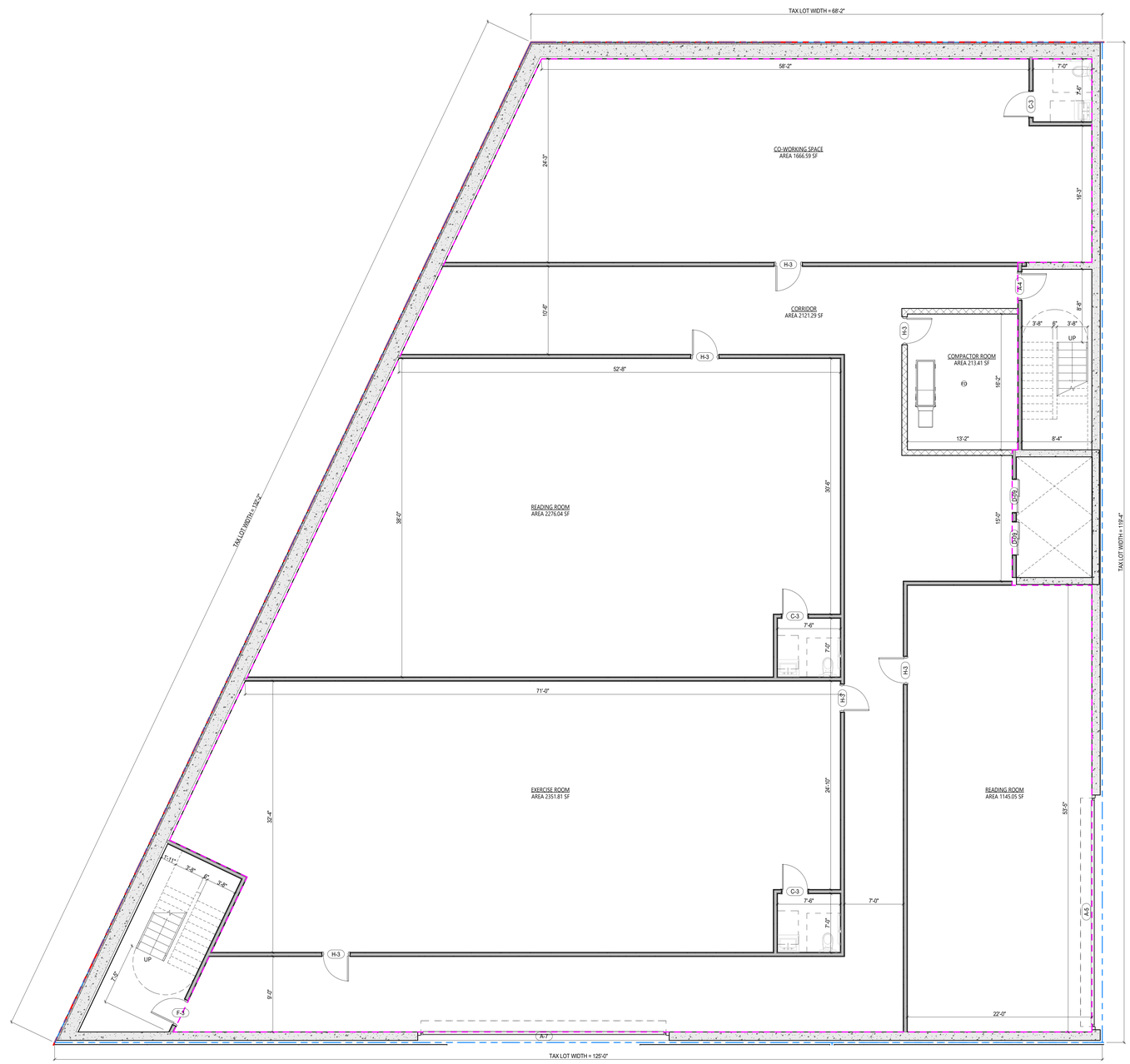
A-008B.00

Scale:	1/8" = 1'-0"
Date:	12/1/2025 7:22:51 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

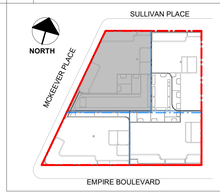
1 | 00 SUBCELLAR 2 OVERALL PLAN
1/16" = 1'-0"



2 | BLDG B - PROPOSED SUBCELLAR 2 ENLARGED PLAN
3/16" = 1'-0"



KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

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DOB SCAN STICKER:

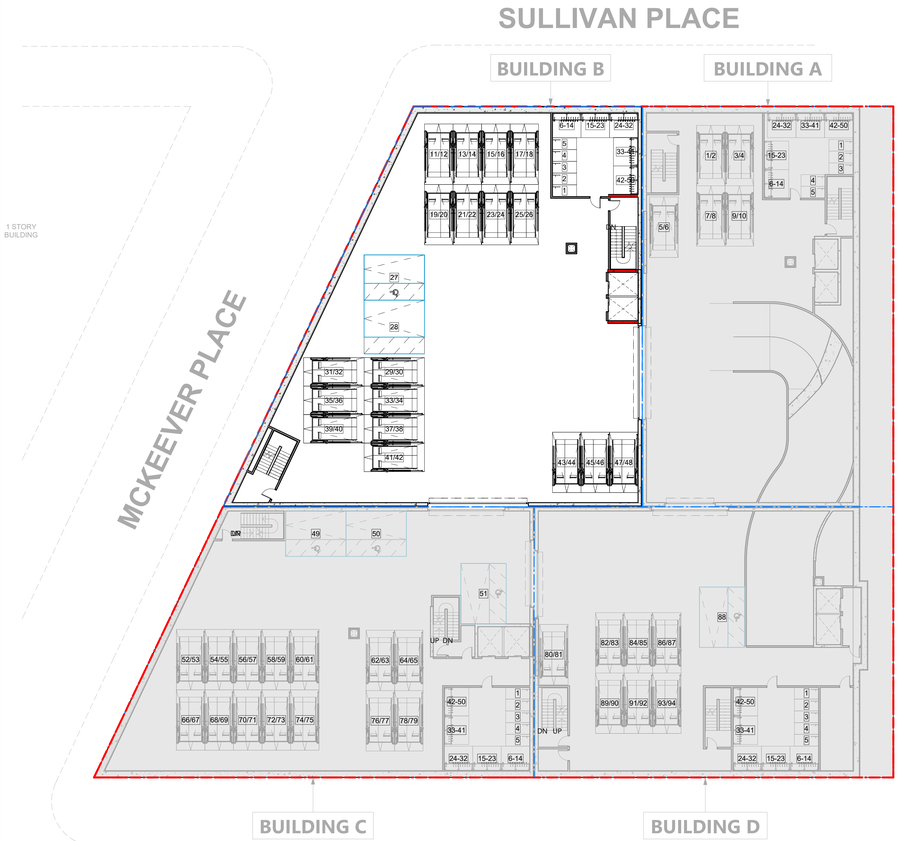
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED
SUB-CELLAR 02 PLAN

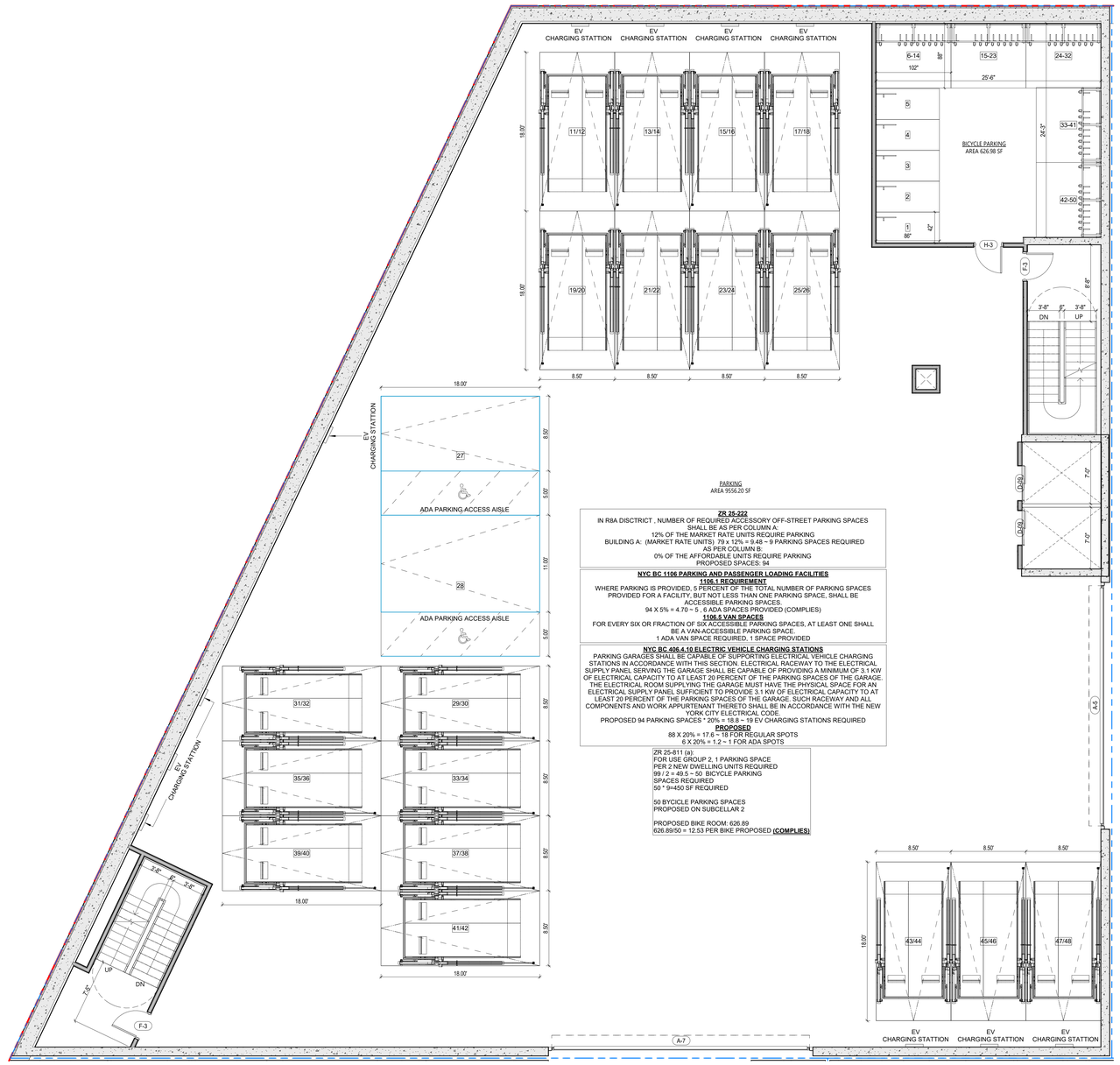
A-100B.00

Scale:	As indicated
Date:	12/1/2025 7:22:55 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 | 00 SUBCELLAR 1 OVERALL PLAN
1/16" = 1'-0"



2 | BLDG B - PROPOSED SUBCELLAR 1 ENLARGED PLAN
3/16" = 1'-0"



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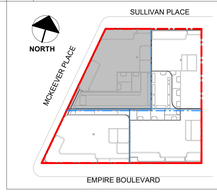

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

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DOB SCAN STICKER:

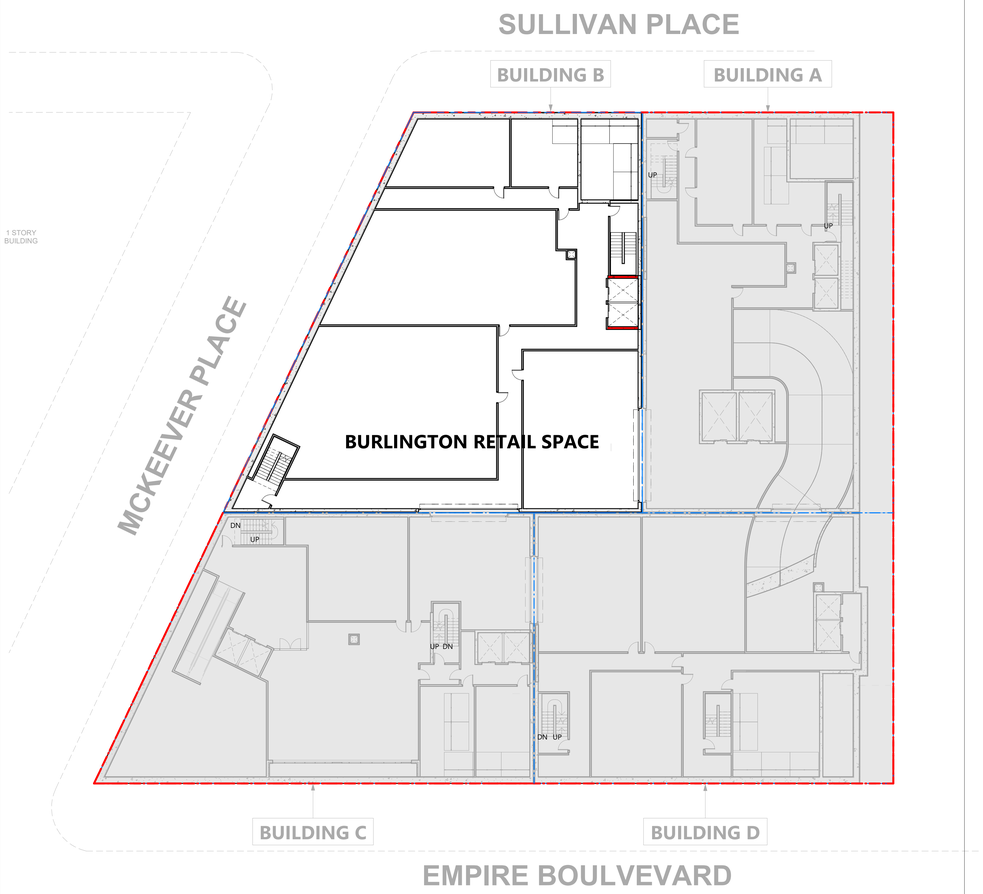
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED
SUB-CELLAR 01 PLAN

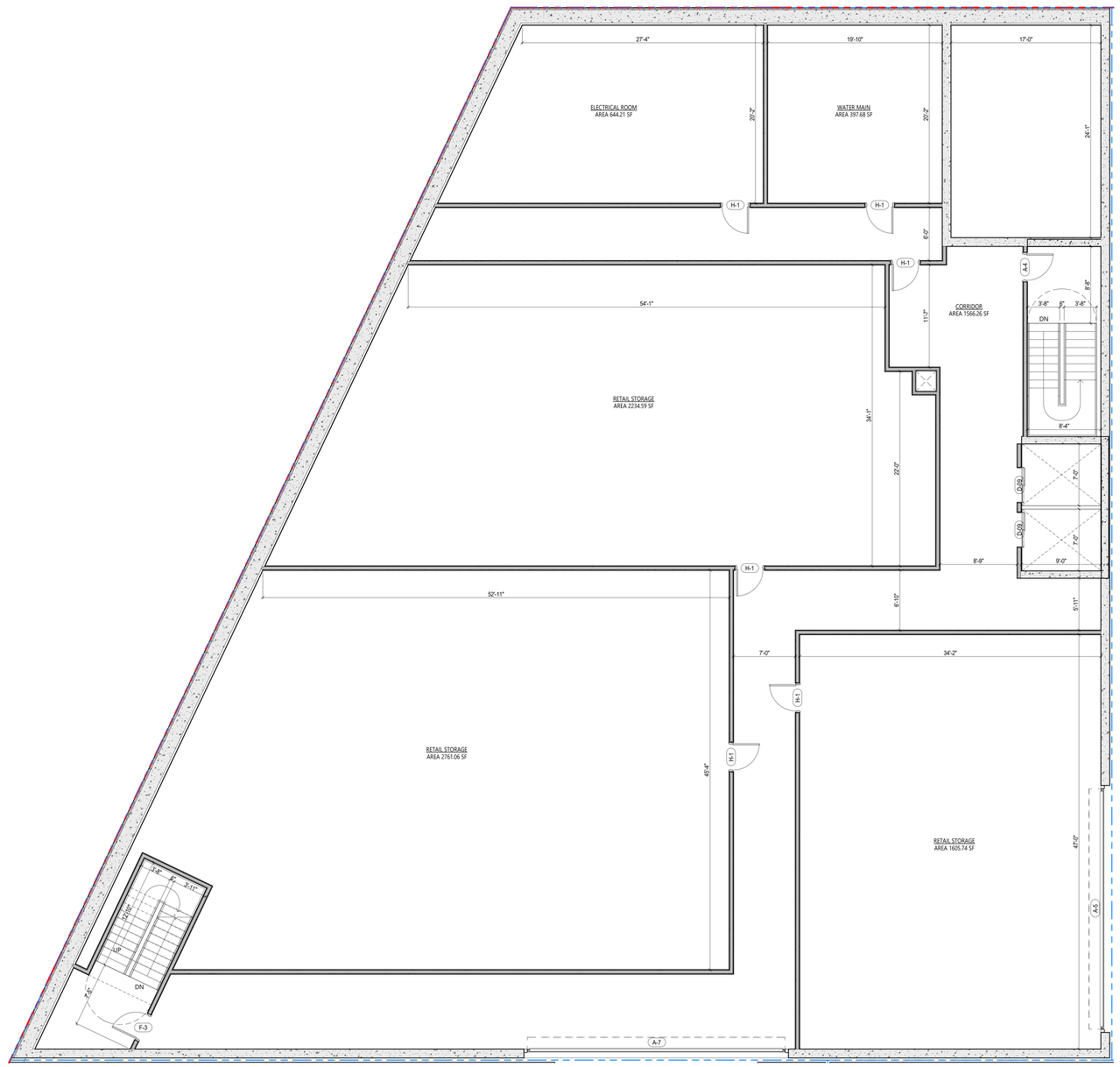
A-101B.00

Scale:	As indicated
Date:	12/1/2025 7:22:58 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 | BLDG B - PROPOSED CELLAR OVERALL PLAN
1/16" = 1'-0"



2 | BLDG B - PROPOSED CELLAR ENLARGED PLAN
3/16" = 1'-0"



KEY PLAN
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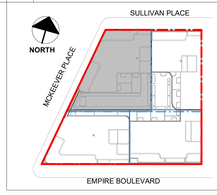

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

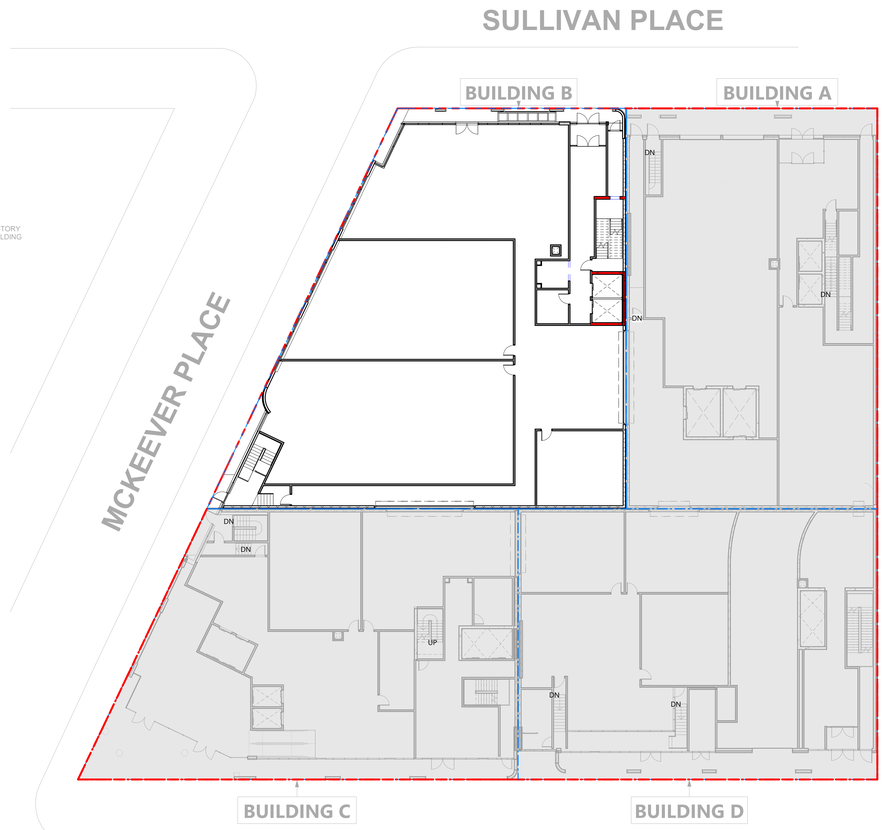
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED CELLAR PLAN

A-102B.00

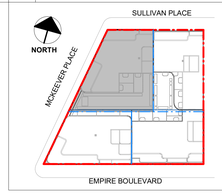
Scale:	As indicated
Date:	12/1/2025 7:23:02 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG B - PROPOSED 1ST FL. T.O.S LOBBY OVERALL PLAN
1/16" = 1'-0"



2 BLDG B - PROPOSED 1ST FL. ENLARGED PLAN
3/16" = 1'-0"

KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

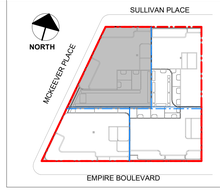
SHEET TITLE
PROPOSED 1ST FLOOR PLAN

A-103B.00

Scale:	As indicated
Date:	12/1/2025 7:23:05 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG B - PROPOSED 2ND FL. PLAN
3/16" = 1'-0"

KEY PLAN
N.T.S.



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Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

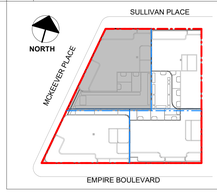
SHEET TITLE
PROPOSED 2ND FLOOR PLAN

A-104B.00

Scale:	As indicated
Date:	12/1/2025 7:23:09 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG B - PROPOSED 3RD - 10TH FL. PLAN
3/16" = 1'-0"

KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

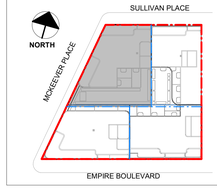
SHEET TITLE
PROPOSED 3RD - 10TH FLOOR PLAN

A-105B.00

Scale:	As indicated
Date:	12/1/2025 7:23:12 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG B - PROPOSED 11TH FL. PLAN
3/16" = 1'-0"

KEY PLAN
N.T.S.



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227 Catherine Street
South Amboy, NJ 08879

Structure Engineer:
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40-12 28th Street
Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

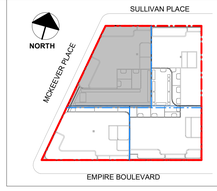
SHEET TITLE
PROPOSED 11TH FLOOR PLAN

A-106B.00

Scale:	As indicated
Date:	12/1/2025 7:23:15 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG B - PROPOSED 12TH FL. PLAN
3/16" = 1'-0"

KEY PLAN
N.T.S.



KAO-HWA LEE
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(609) 216 2975

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

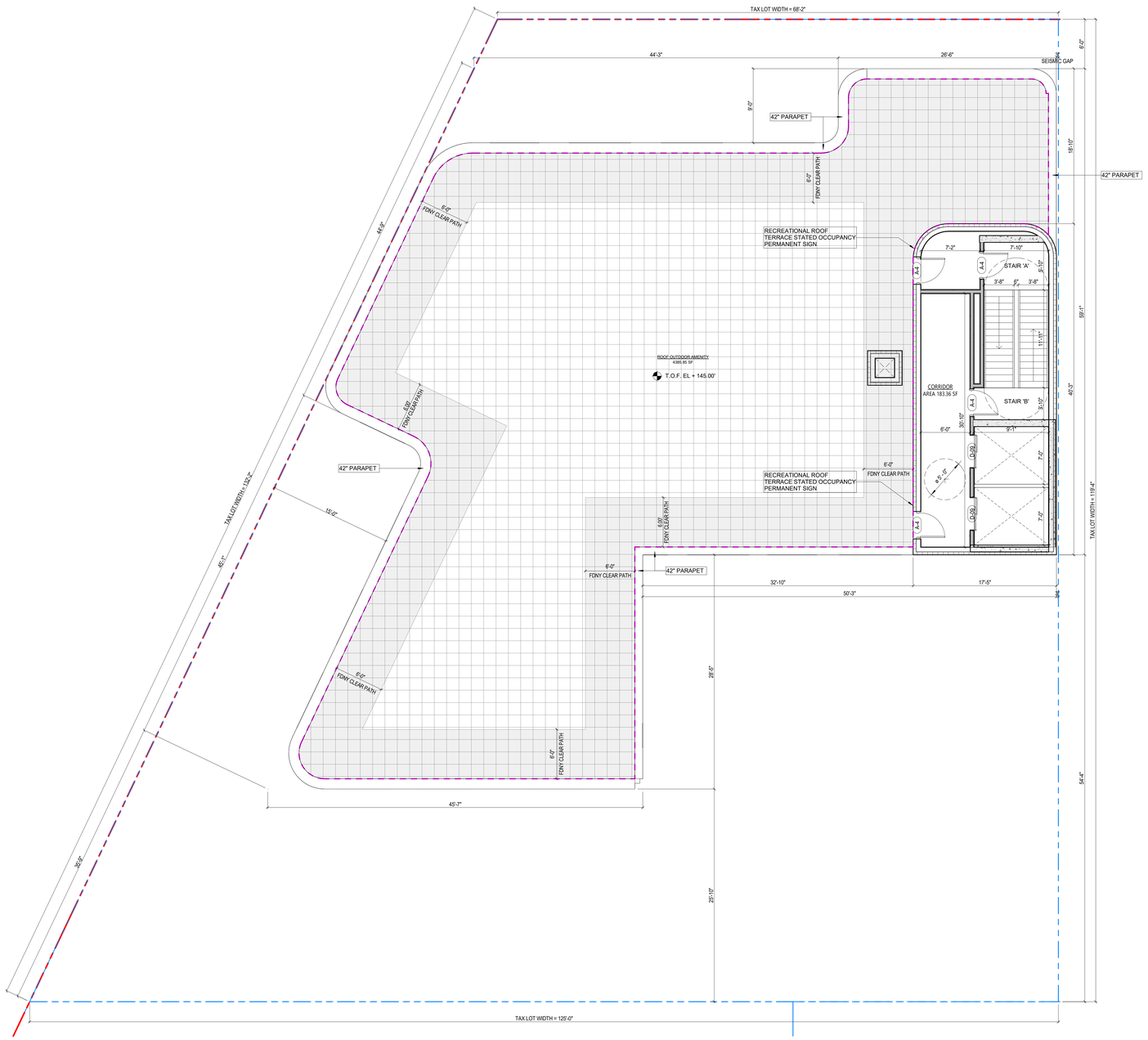
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED 12TH - 14TH FLOOR PLAN

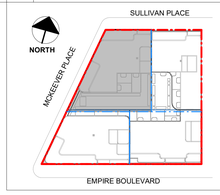
A-107B.00

Scale:	As indicated
Date:	12/1/2025 7:23:18 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG B - PROPOSED 15B_ROOF PLAN
3/16" = 1'-0"



KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

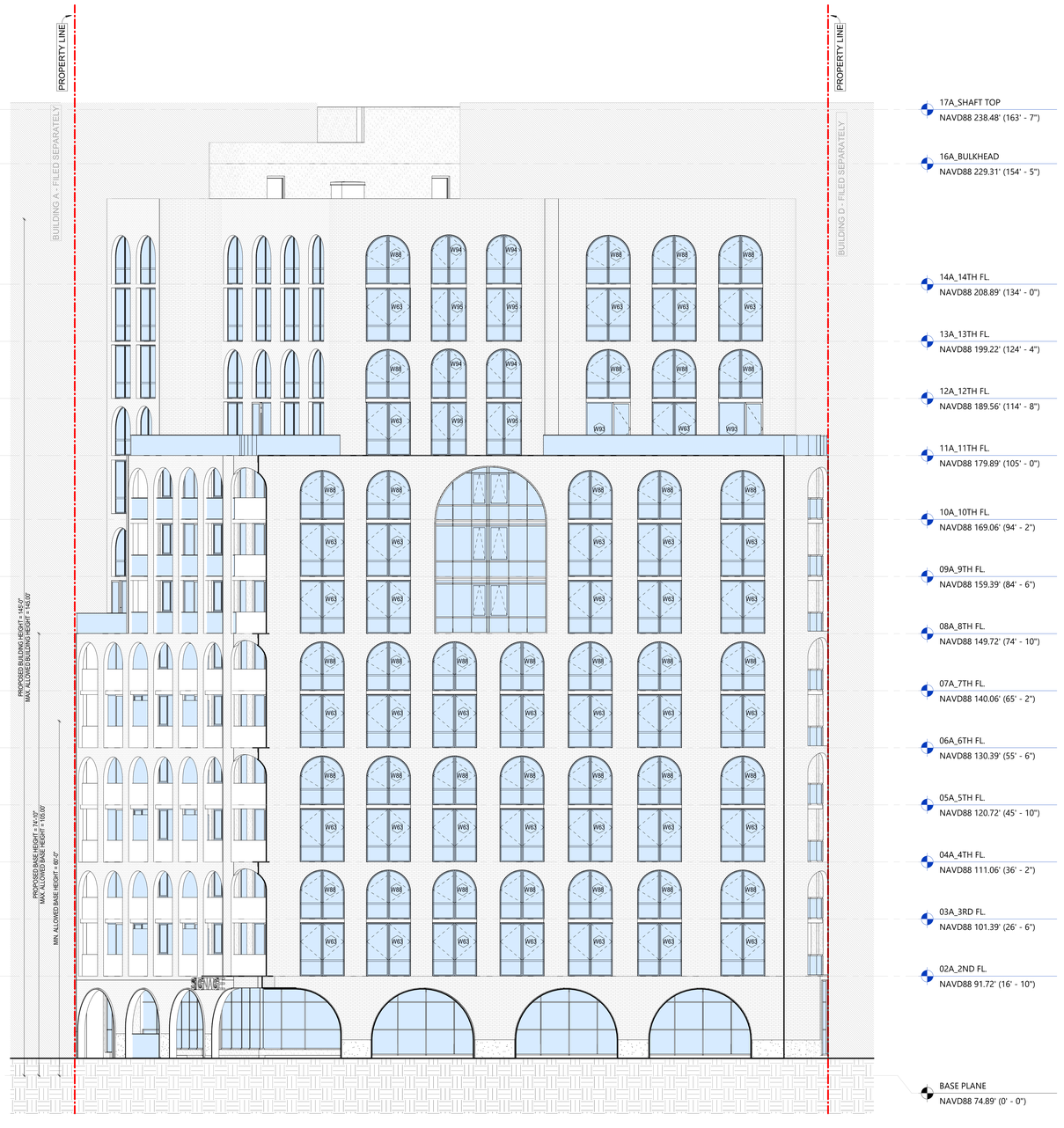
SHEET TITLE
PROPOSED ROOF PLAN

A-108B.00

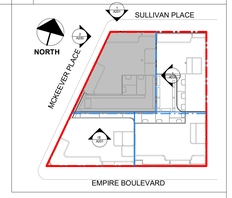
Scale:	As indicated
Date:	12/1/2025 7:23:20 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 EAST ELEVATION
1/8" = 1'-0"

2 WEST ELEVATION
1/8" = 1'-0"



KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

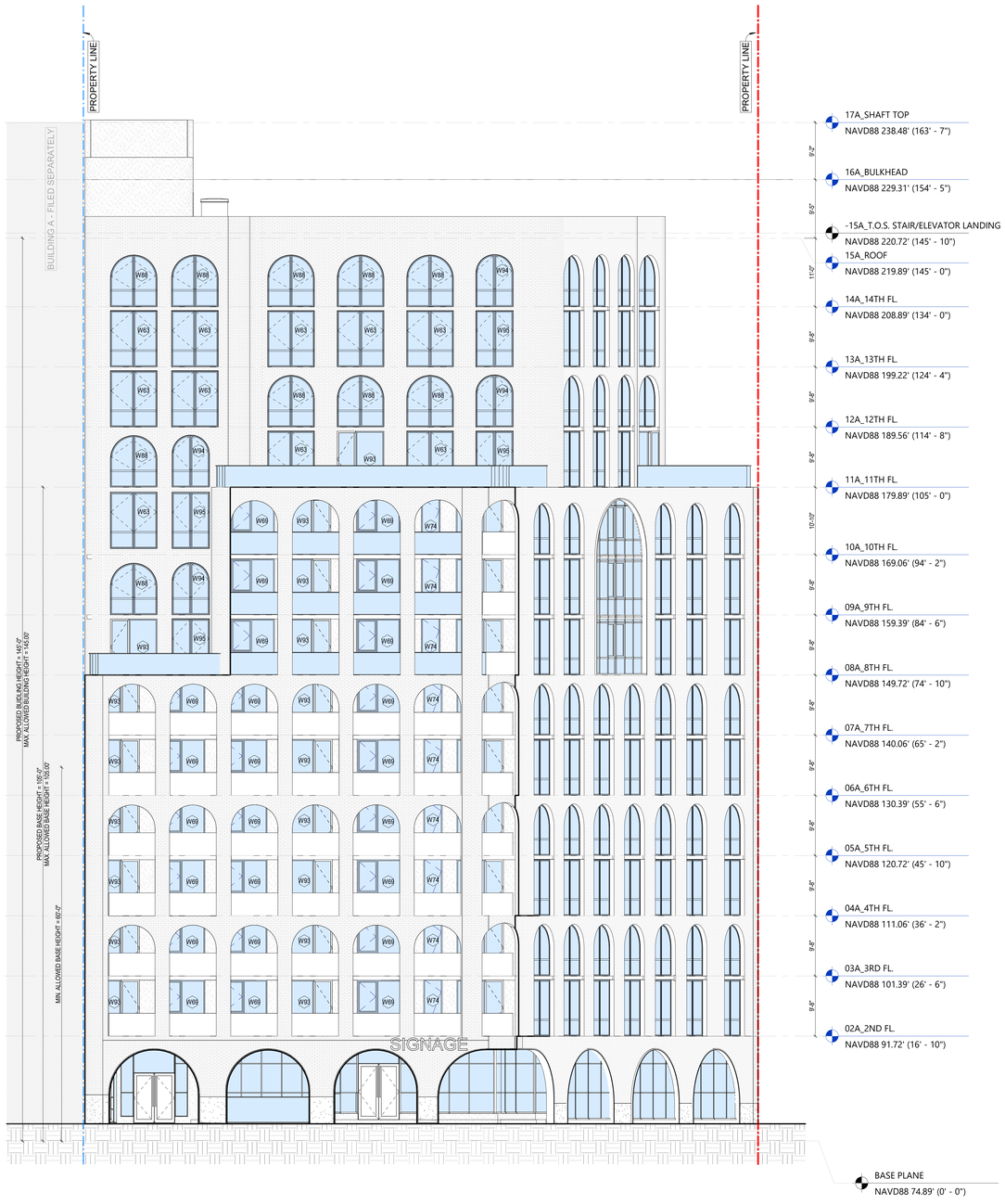
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
EAST & WEST ELEVATION

A-200B.00

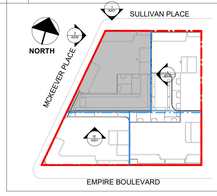
Scale:	As indicated
Date:	12/1/2025 7:23:32 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 NORTH ELEVATION
1/8" = 1'-0"



2 SOUTH ELEVATION
1/8" = 1'-0"

KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

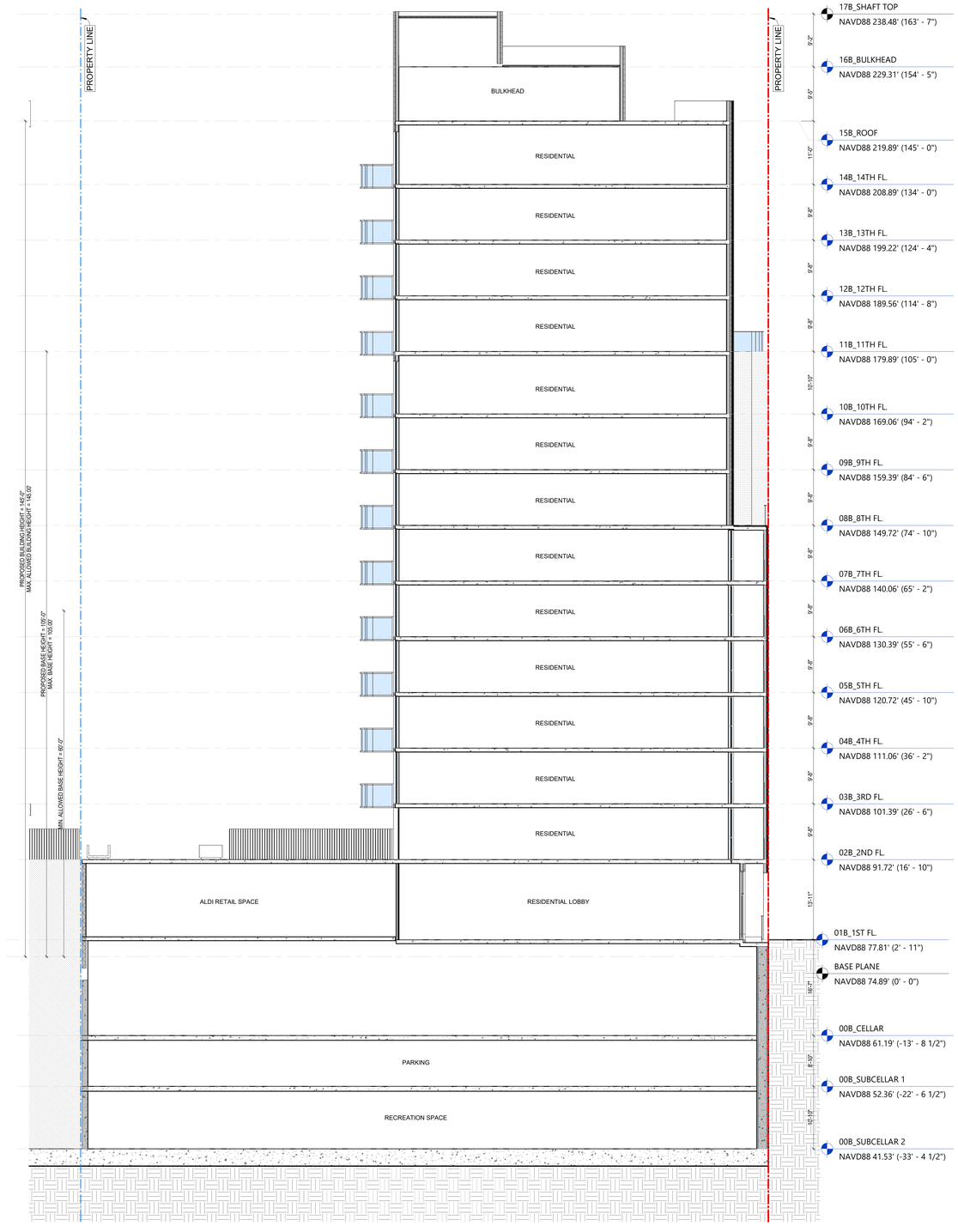
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
NORTH & SOUTH ELEVATION

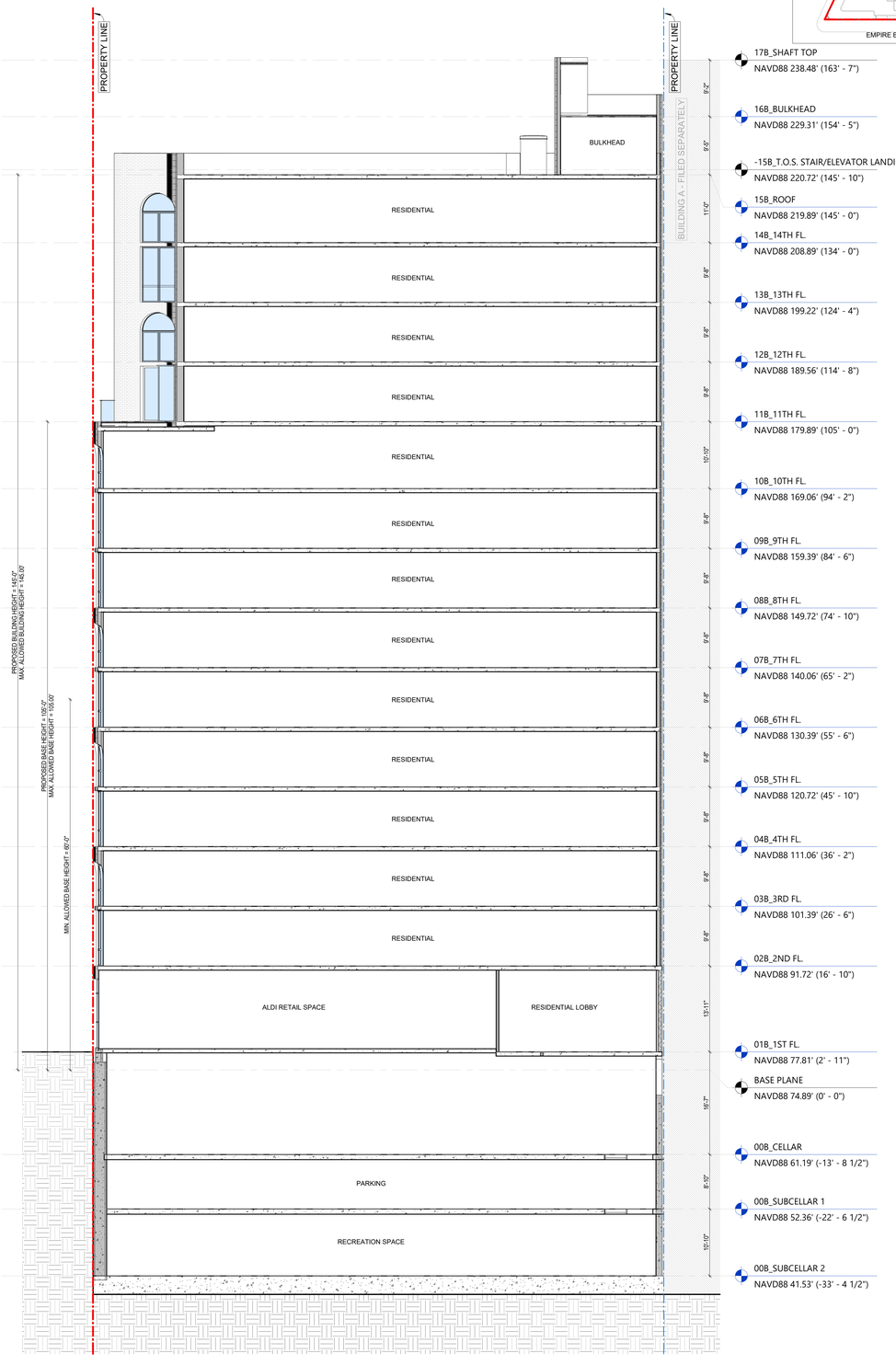
A-201B.00

Scale:	As indicated
Date:	12/1/2025 7:23:39 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

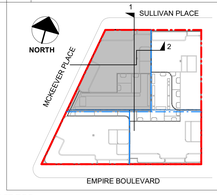
1 LONGITUDINAL SECTION
1/8" = 1'-0"



2 CROSS SECTION
1/8" = 1'-0"



KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

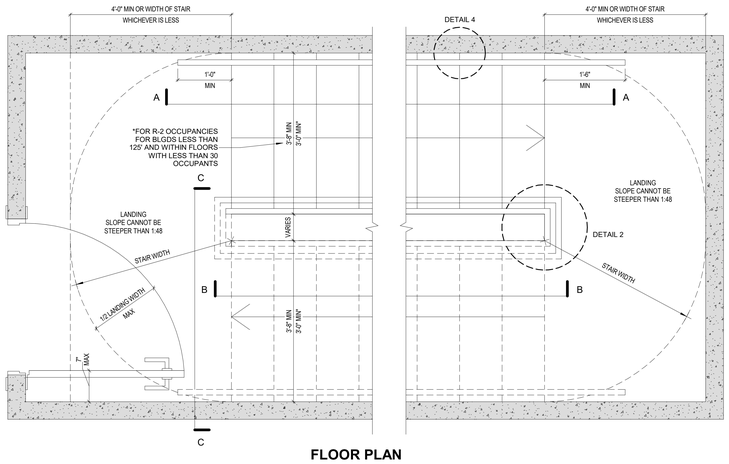
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
BUILDING SECTIONS

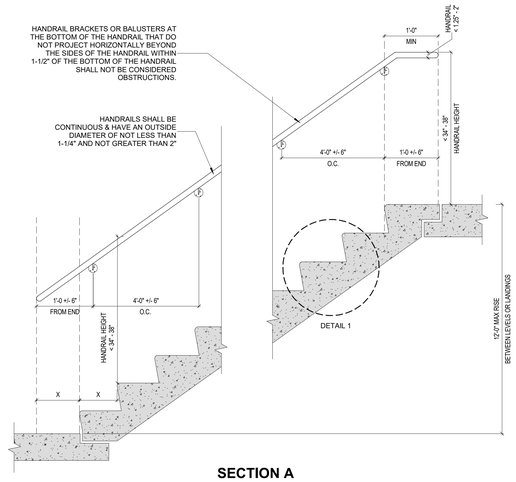
A-300B.00

Scale:	As indicated
Date:	12/1/2025 7:23:42 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

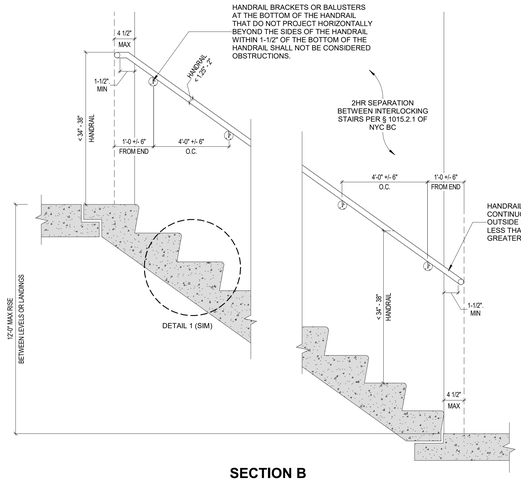
1 U-SHAPE STAIRS DETAILS



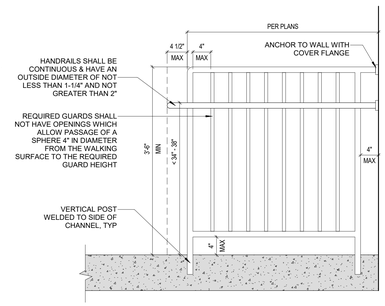
FLOOR PLAN



SECTION A

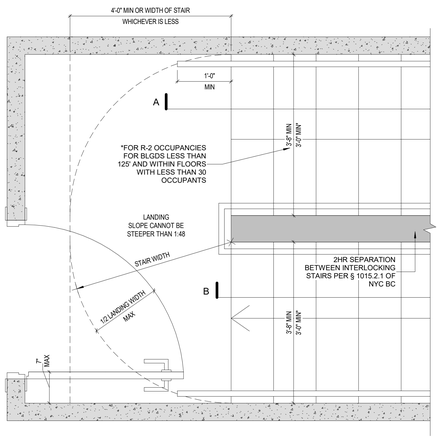


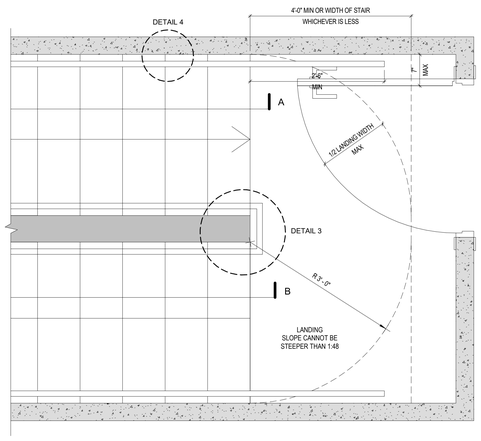
SECTION B



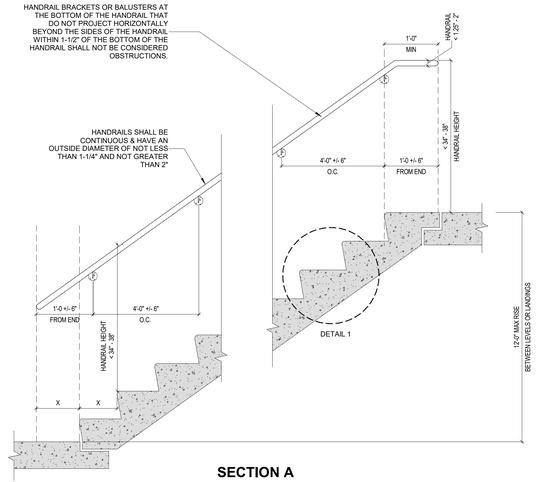
SECTION C
(ONLY ON 1ST FLOOR)

2 TWO INTERLOCKING / SCISSORS STAIRS DETAILS

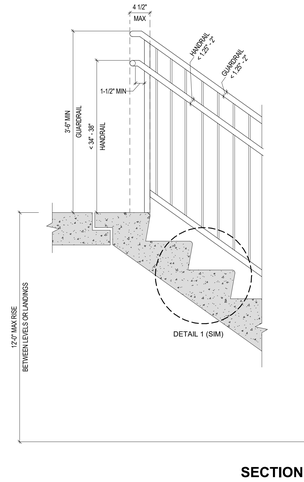


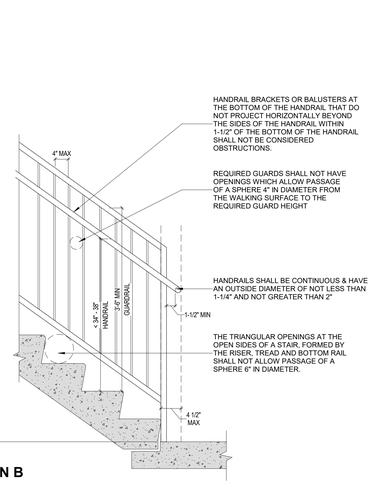


FLOOR PLAN



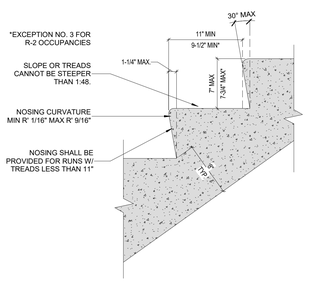
SECTION A



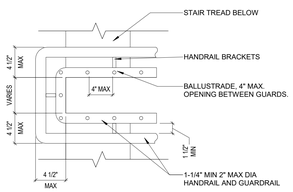


SECTION B

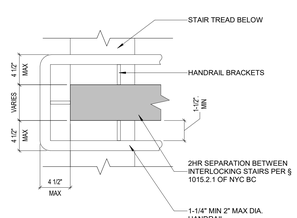
STAIRS DETAILS



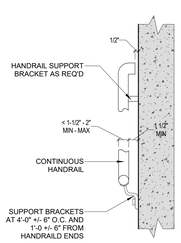
DETAIL 1



DETAIL 2



DETAIL 3

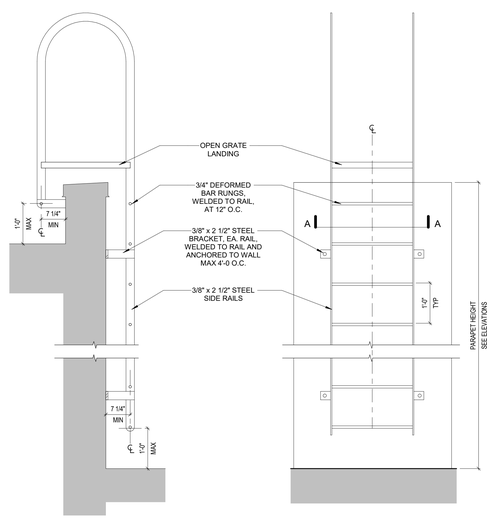


DETAIL 4

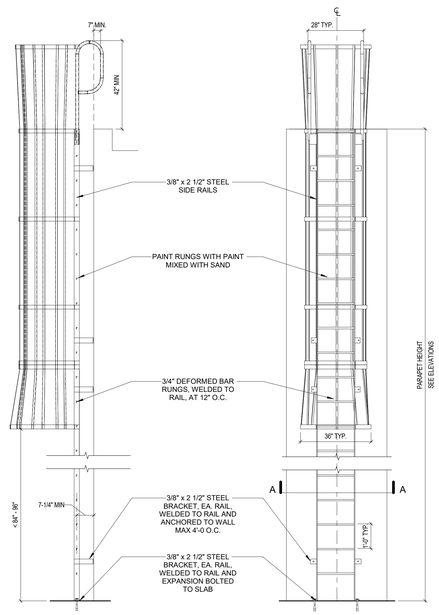
3 ROOF LADDERS

ROOF LADDERS NOTES

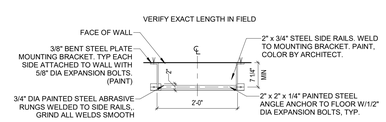
1. PER OSHA 1910.28(B)(9) LADDERS OVER 24 FT HIGH SHALL HAVE A PERSONAL FALL ARREST SYSTEM MEETING OSHA 1926.502(D)
2. ALL LADDERS SHALL MEET OSHA REGULATIONS FOR FIXED LADDERS 29 CFR SECTION 1910.23



ROOF LADDER - STRADDLE



ROOF LADDER - W/ CAGE



SECTION A

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SIGNATURE & SEAL

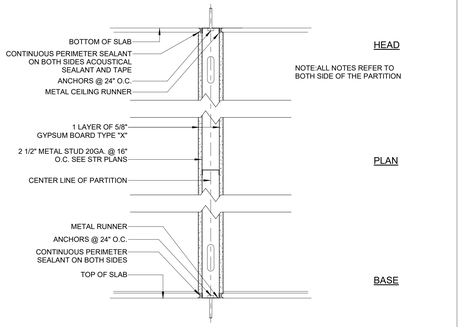
DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
STAIRS DETAILS

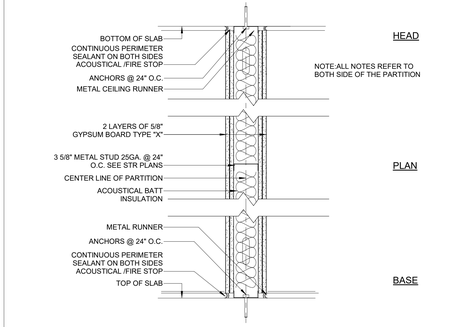
A-404B.00

Scale:	As indicated
Date:	12/1/2025 7:23:45 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	



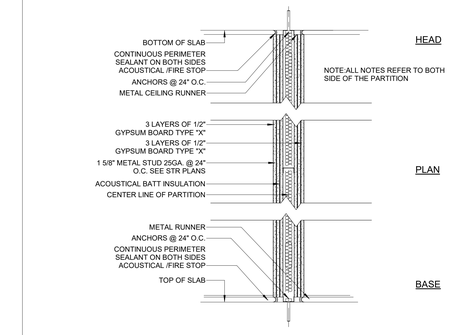
1 INTERIOR PARTITION

FIRE RATING: NON FIRE RATED
STC: NO STC REQUIRED



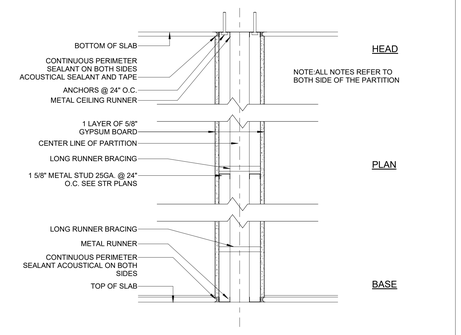
5 INTERIOR PARTITION

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC



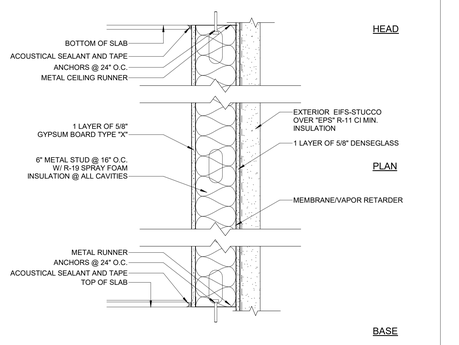
9 INTERIOR PARTITION

FIRE RATING: 3HR
FIRE TEST: UL. DESIGN NO: U455
STC: +50 STC



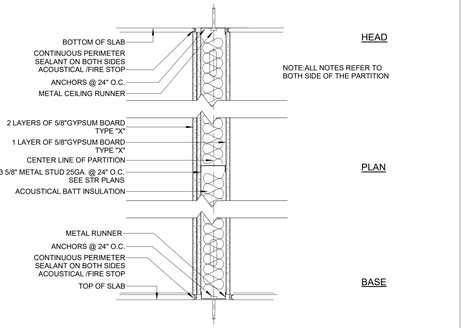
13 POCKET WALL

FIRE RATING: NON FIRE RATED
STC: NO STC REQUIRED



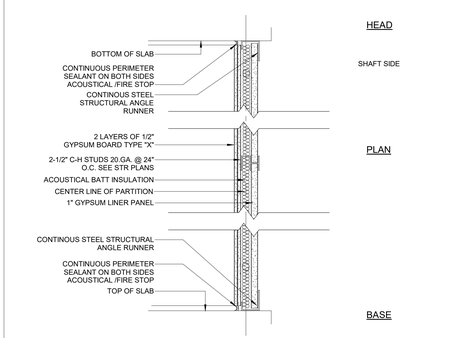
E2 EXTERIOR STUCCO WALL

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U419
STC: +50 STC



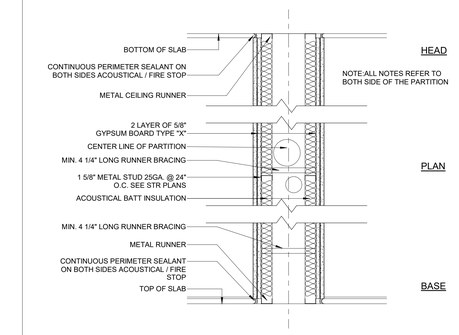
2 INTERIOR PARTITION

FIRE RATING: NON FIRE RATED
STC: +48 STC



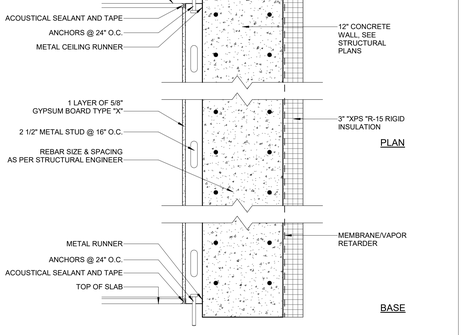
6 EXIT ENCLOUSURE RCNY 1014-01

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC



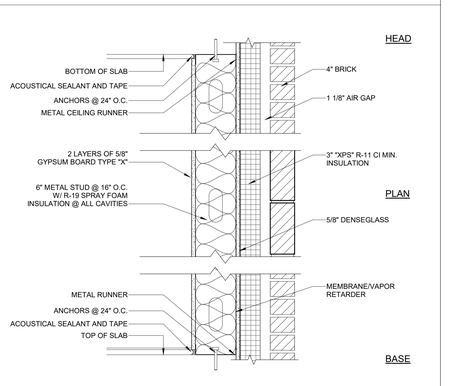
10 PLUMBING CHASE

FIRE RATING:NON FIRE RATED
STC: +48 STC



M1 CONCRETE MASONRY WALL

FIRE RATING: NON FIRE RATED
STC: NO STC REQUIRED



E3 EXTERIOR STUCCO WALL

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC

3 INTERIOR PARTITION

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U417 & U465
STC: +48 STC

7 ELEVATOR SHAFT

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U415
STC: +50 STC

11 PIPE CHASE

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U420
STC: +50 STC

S1 INTERIOR SHEAR WALL

FIRE RATING: 2HR
STC: NO STC REQUIRED

E4 EXTERIOR STUCCO SHEAR WALL

FIRE RATING: 2HR
STC: +50 STC

4 INTERIOR PARTITION

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U419
STC: +50 STC

8 MECHANICAL DUCT SHAFT WALL

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U415
STC: +50 STC

12 PIPE CHASE

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U420
STC: +50 STC

E1 EXTERIOR BASEMENT WALL

FIRE RATING: 2HR
STC: NO STC REQUIRED

E4 EXTERIOR BRICK WALL

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC

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South Amboy, NJ 08879

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MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

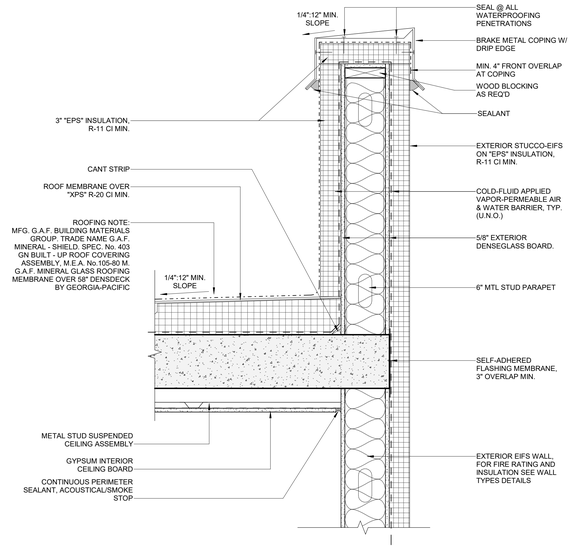
DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
WALL TYPES & DETAILS

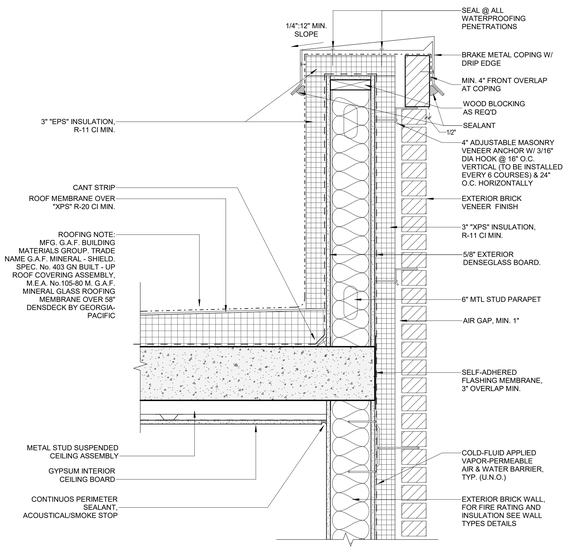
A-500B.00

Scale:	1 1/2" = 1'-0"
Date:	12/1/2025 7:23:47 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	



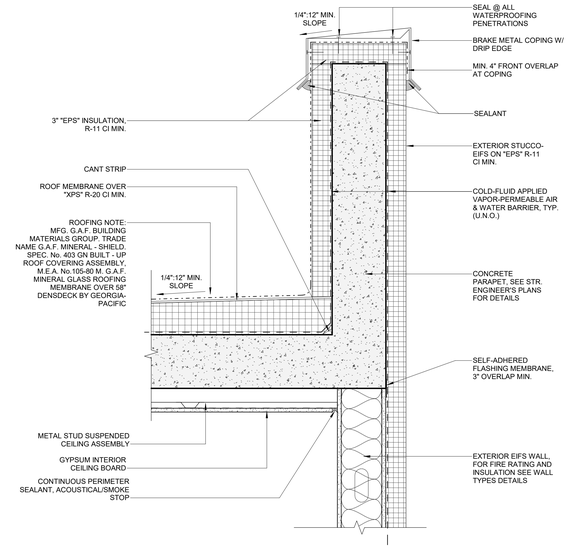
1 EIFS WALL @ STUD PARAPET

SCALE: 1 1/2" = 1'-0"



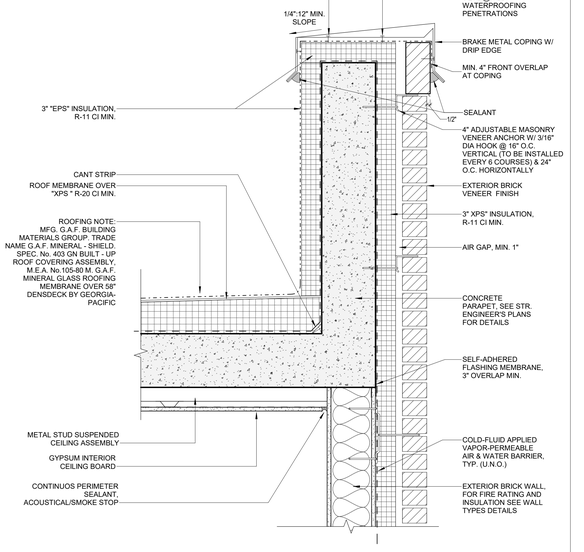
4 BRICK WALL 1HR @ STUD PARAPET

SCALE: 1 1/2" = 1'-0"



7 EIFS WALL @ CONC. PARAPET

SCALE: 1 1/2" = 1'-0"



9 BRICK WALL 1HR @ CONC. PARAPET

SCALE: 1 1/2" = 1'-0"

2 EIFS WALL @ CONC. SLAB

SCALE: 1 1/2" = 1'-0"

5 BRICK WALL 1HR @ CONC. SLAB

SCALE: 1 1/2" = 1'-0"

8 EIFS WALL @ CMU PARAPET

SCALE: 1 1/2" = 1'-0"

10 BRICK WALL 1HR @ CMU PARAPET

SCALE: 1 1/2" = 1'-0"

3 EIFS WALL @ BALCONY

SCALE: 1 1/2" = 1'-0"

6 BRICK WALL 1HR @ BALCONY

SCALE: 1 1/2" = 1'-0"

11 DETAIL @ FOUNDATION WALL

SCALE: 1 1/2" = 1'-0"

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DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
SECTION DETAILS

A-510B.00

Scale:	1 1/2" = 1'-0"
Date:	12/1/2025 7:23:49 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

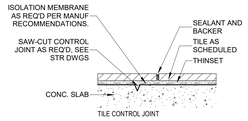
FINISH NOTES:

1. METAL EDGE SHALL BE PROVIDED ON ON SERVICE SIDE OF ALL DOORS.

2. ISOLATION MEMBRANE:
   - FOLLOW MANUF INSTRUCTIONS
   - MIN 6" COVERAGE FROM CRACK IN ANY DIRECTION
   - MIN 1-1/2x TILE SIZE
   - WHERE ANY PORTION OF A TILE SPANS A CRACK, TILE MUST REST COMPLETELY ON ISOLATION MEMBRANE

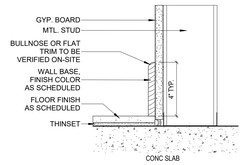
3. SEALANTS ON JOINTS MUST MATCH GROUT COLOR

TILE CONTROL JOINT

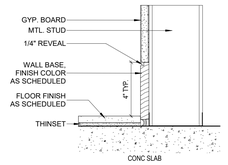


*THIS DETAIL IS NOT TO BE USED WITH BUILDING EXPANSION JOINTS. EXPANSION JOINTS MUST CARRY THRU THE TILE LAYER.

TYP. WALL BASE DETAIL

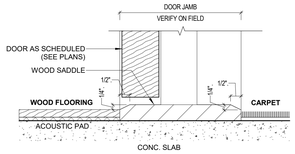


TYP. RECESSED WALL BASE DETAIL

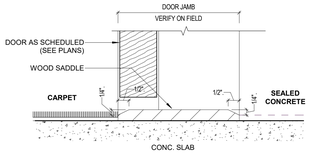


TRANSITION @ DOOR THRESHOLD

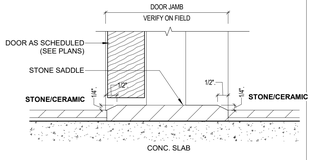
WOOD TO CARPET



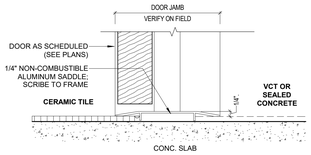
CARPET / SEALED CONCRETE



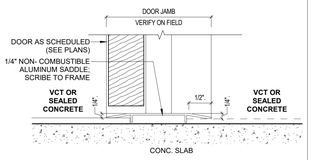
WOOD TO STONE/CERAMIC TILE



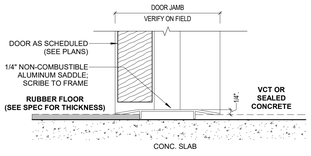
CERAMIC TILE / CARPET



TILE TO TILE



CERAMIC TILE / SEALED CONCRETE

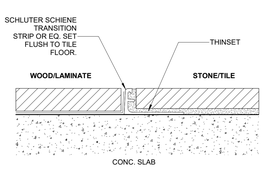


VCT TO VCT/SEALED CONCRETE

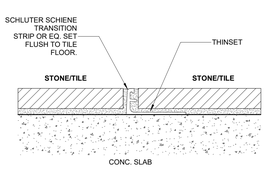
RUBBER / SEALED CONCRETE

TYPICAL TRANSITION

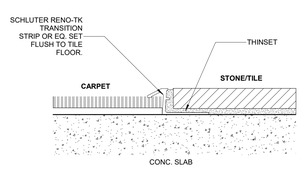
WOOD/LAMINATE TO TILE



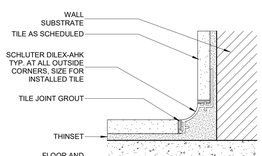
TILE TO TILE



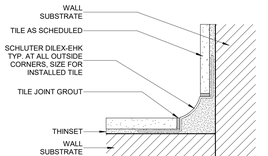
TILE TO CARPET



TILE TO VCT



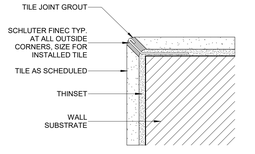
TILE TO CONCRETE



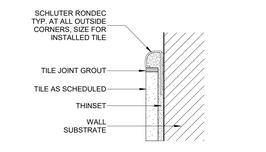
CARPET TO CONCRETE

BATHROOM TILE TRIM

COVE/BASE



INSIDE CORNER



OUTSIDE CORNER

EDGE TRIM

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SIGNATURE & SEAL

DOB SCAN STICKER:

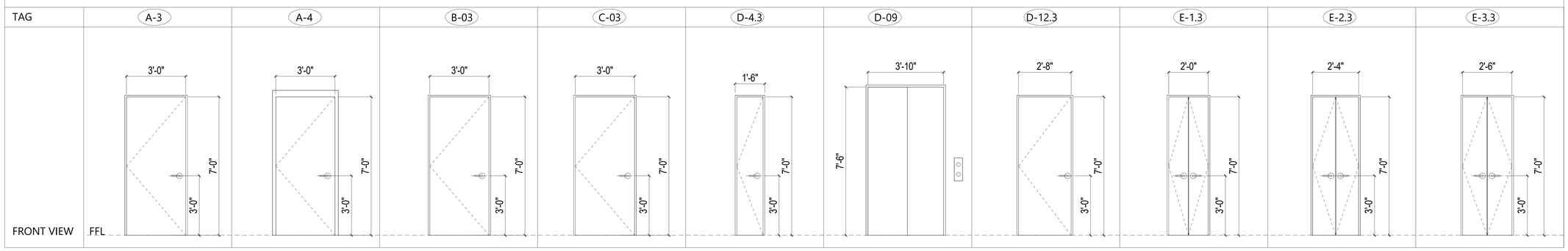
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
FLOOR AND TRANSITION DETAILS

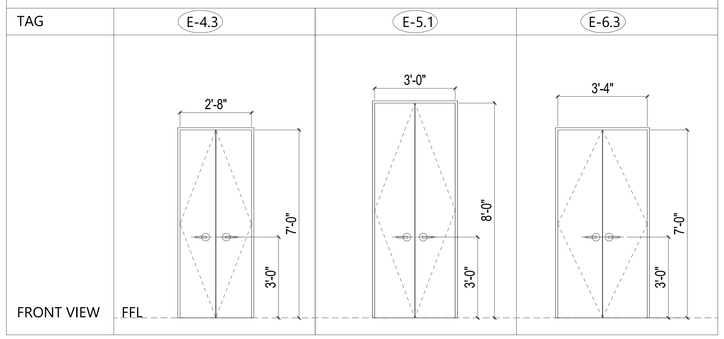
A-701B.00

Scale:	As indicated
Date:	12/1/2025 7:23:51 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

INTERIOR DOOR LEGEND



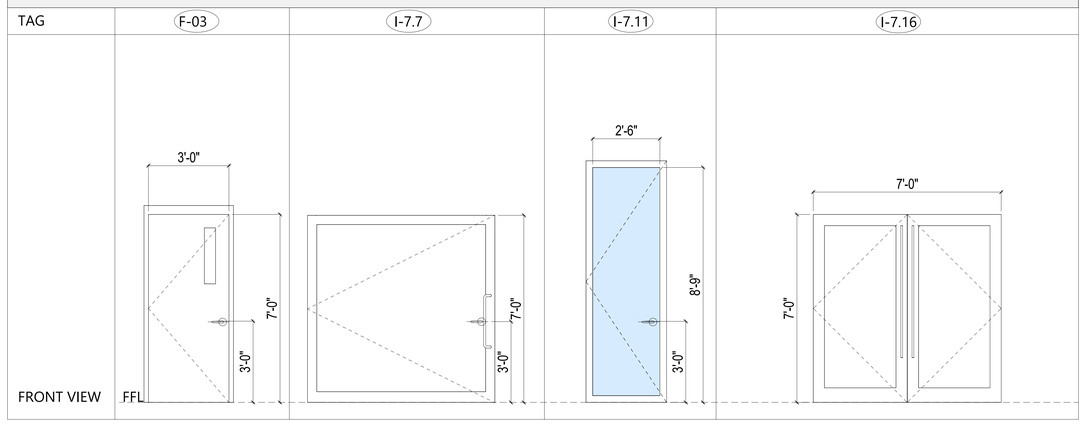
INTERIOR DOOR LEGEND

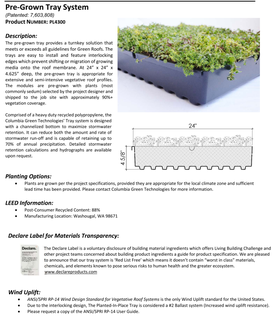


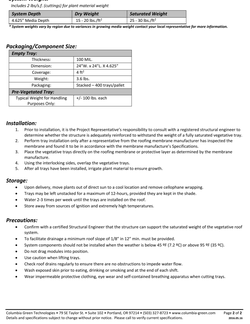
INTERIOR DOOR SCHEDULE - BUILDING B							
TAG	QTY	Operation	TYPE	COMMENTS	Fire Rating	WIDTH	HEIGHT
A-3	28	SINGLE SWING	HINGED DOOR	METAL APARTMENT DOOR 1-1/2 HR HSPF	1.5 HR FPSC	3' - 0"	7' - 0"
A-4	20	SINGLE SWING	HINGED DOOR	METAL APARTMENT DOOR 1-1/2 HR HSPF	1.5 HR FPSC	3' - 0"	7' - 0"
B-3	191	SINGLE SWING	HINGED DOOR	NON-RATED INTERIOR DOOR		3' - 0"	7' - 0"
C-3	113	SINGLE SWING	HINGED DOOR	NON-RATED INTERIOR DOOR		3' - 0"	7' - 0"
D-4.3	9	SINGLE SWING	HINGED DOOR	NON-RATED INTERIOR DOOR		1' - 4"	7' - 0"
D-09	20	SLIDING	ELEVATOR DOOR	SLIDING ELEVATOR DOOR		3' - 8"	7' - 6"
D-12.3	9	SINGLE SWING	HINGED DOOR	NON-RATED INTERIOR DOOR		2' - 8"	7' - 0"
E-1.3	86	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		2' - 0"	7' - 0"
E-2.3	41	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		2' - 4"	7' - 0"
E-3.3	79	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		2' - 6"	7' - 0"
E-4.3	36	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		2' - 8"	7' - 0"
E-5.1	10	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		3' - 0"	8' - 0"
E-6.3	49	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		3' - 4"	7' - 0"

EXTERIOR DOOR SCHEDULE - BUILDING B													
TAG	COUNT	Manufacturer	Model	Construction Type	Operation	TYPE	COMMENTS	WIDTH	HEIGHT	U-FACTOR	SHGC	AIR LEAKAGE	VT	Area
F-3	4	PELLA	SUPER 82	METAL	SINGLE SWING	HINGED DOOR	METAL APARTMENT DOOR 1-1/2 HR HSPF	3' - 0"	7' - 0"	N/A	N/A	<0.02 CFM SF	0.56	0.00 SF
I-7.7	1	PELLA	SUPER 82	METAL	SINGLE SWING	SINGLE GLASS	GLAZED BALCONY DOOR	3' - 1"	7' - 10 1/2"	.25	.27	<0.02 CFM SF	0.56	0.00 SF
I-7.11	126	PELLA	SUPER 82	METAL	SINGLE SWING	SINGLE GLASS	GLAZED BALCONY DOOR	3' - 0"	9' - 0"	.25	.27	<0.02 CFM SF	0.56	3402.00 SF
I-7.16	3	PELLA	SUPER 82	METAL	SWINGING	DOUBLE GLASS DOOR	GLAZED DOUBLE DOOR ENTRY	6' - 6"	<varies>	.25	.27	<0.02 CFM SF	0.56	161.69 SF
														3563.69 SF

EXTERIOR DOOR LEGEND







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SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
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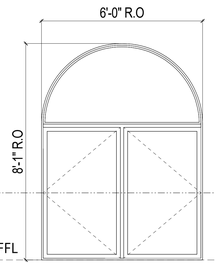
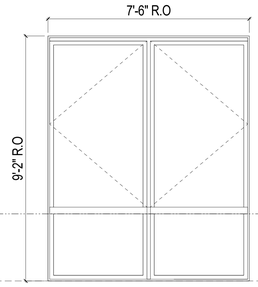
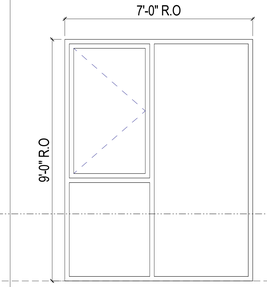
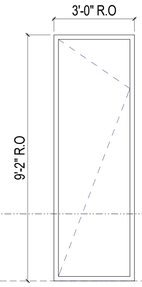
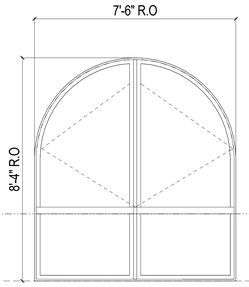
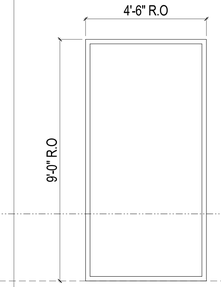
Brooklyn, NY 11225

SHEET TITLE
DOOR LEGEND & SCHEDULE

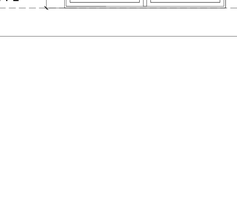
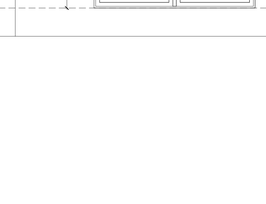
A-700B.00

Scale: 1/2" = 1'-0"
Date: 12/1/2025 7:23:55 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

WINDOW LEGEND

TAG	W35	W63	W69	W70	W74	W88	W93
FRONT VIEW							
GLAZING LESS THAN 30" ABOVE FLOOR LEVEL DOES NOT CONTRIBUTE TO NATURAL LIGHT							

WINDOW LEGEND

TAG	W94	W95
FRONT VIEW		
GLAZING LESS THAN 30" ABOVE FLOOR LEVEL DOES NOT CONTRIBUTE TO NATURAL LIGHT		

WINDOW SCHEDULE - BUILDING B

TAG	COUNT	MANUFACTURER	MODEL	Construction Type	OPERATION	COMMENTS	GLAZING	WIDTH	HEIGHT	U-FACTOR	SHGC	AIR LEAKAGE	VT	TOTAL SF
W35	23	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	6' - 0"	5' - 0"	.26	.33	<0.02 CFM SF	0.56	0.00 SF
W63	47	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	7' - 6"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	3172.50 SF
W69	24	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	7' - 0"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	1512.00 SF
W70	13	ZEPHYR	SUPER 82	VINYL	FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	3' - 0"	9' - 2"	.26	.33	<0.02 CFM SF	0.56	357.50 SF
W74	22	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	3' - 0"	9' - 2"	.26	.33	<0.02 CFM SF	0.56	605.00 SF
W88	44	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	7' - 6"	4' - 6"	.26	.33	<0.02 CFM SF	0.56	1485.00 SF
W93	112	ZEPHYR	SUPER 82	VINYL	FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	4' - 6"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	4536.00 SF
W94	13	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	6' - 0"	5' - 4"	.26	.33	<0.02 CFM SF	0.56	416.00 SF
W95	41	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	6' - 0"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	2214.00 SF
														14298.00 SF

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Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
WINDOW LEGEND & SCHEDULE

A-710B.00

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Checked by:	
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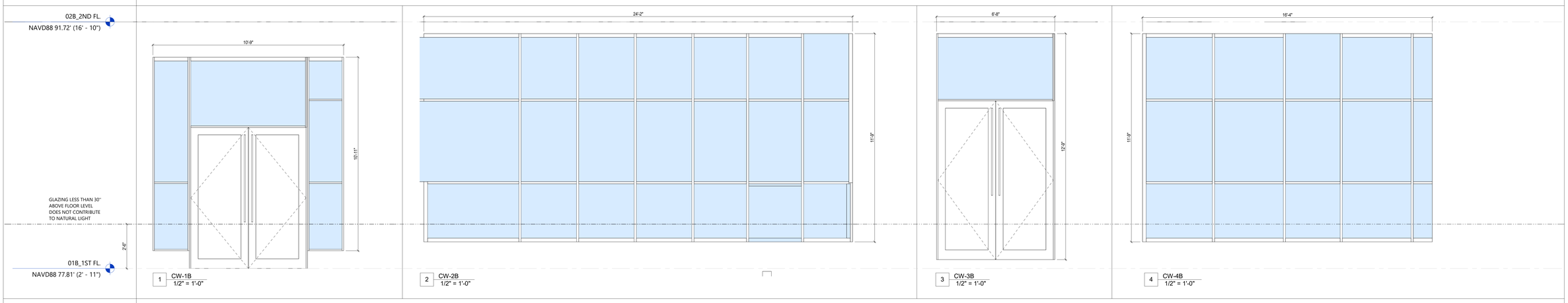

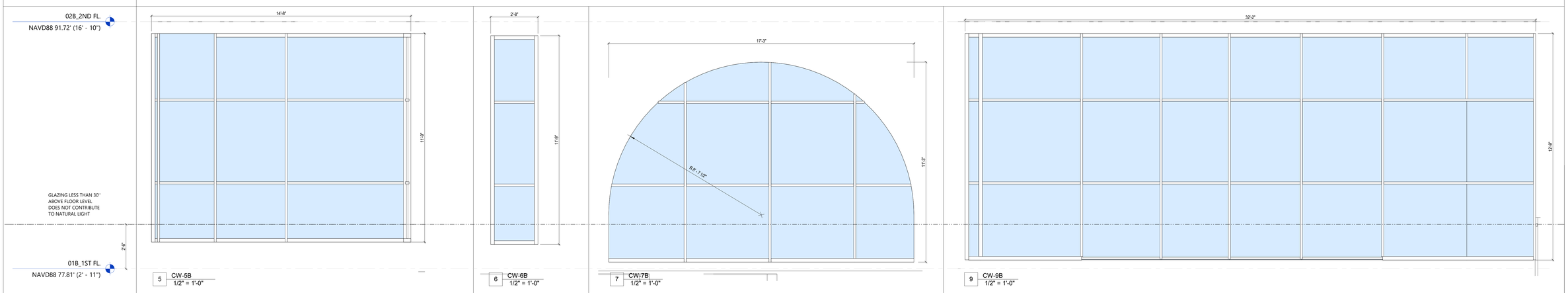

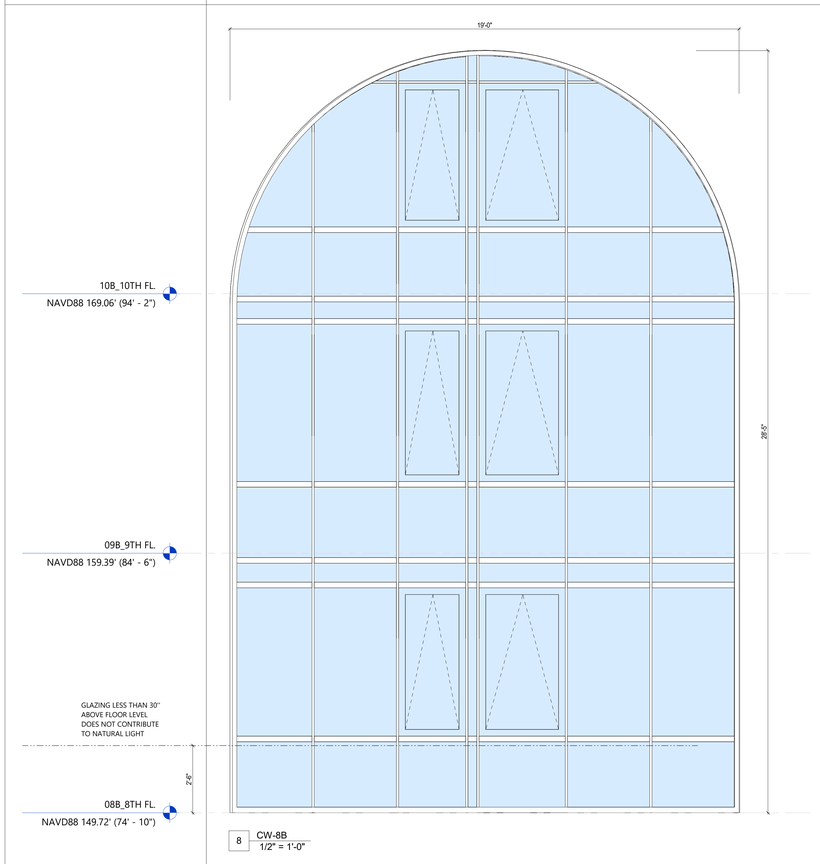

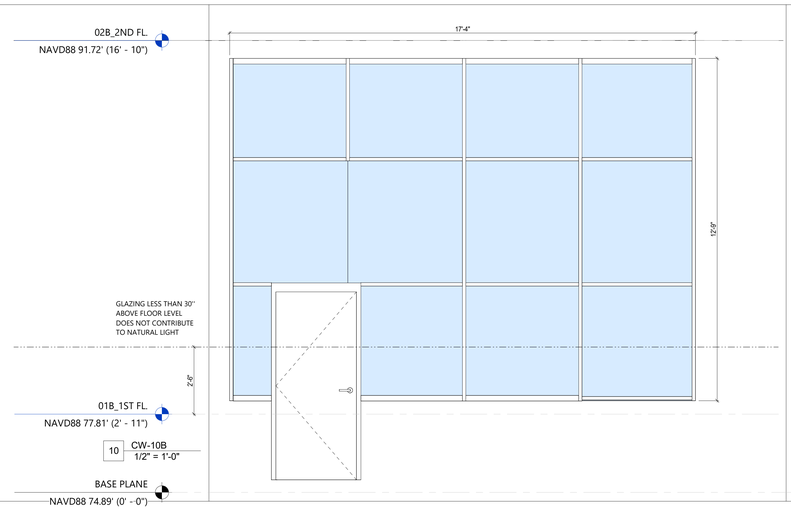

CURTAIN WALL SCHEDULE - BUILDING B				
Mark	Count	Length	Unconnected Height	Area
CW-1B	3	<varies>	<varies>	124.01 SF
CW-2B	1	24' - 2"	11' - 9"	283.96 SF
CW-3B	1	6' - 8"	12' - 9"	85.00 SF
CW-4B	1	16' - 4"	11' - 9"	191.92 SF
CW-5B	1	14' - 5"	11' - 9"	169.40 SF
CW-6B	1	2' - 8"	11' - 9"	31.33 SF
CW-7B	3	20' - 4"	12' - 9"	486.15 SF
CW-8B	1	19' - 0"	19' - 11 1/2"	500.49 SF
CW-9B	1	32' - 2"	12' - 9"	410.15 SF
CW-10B	1	17' - 4"	12' - 9"	206.61 SF
				2489.01 SF

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LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
CURTAIN WALL
LEGEND & SCHEDULE

A-711B.00

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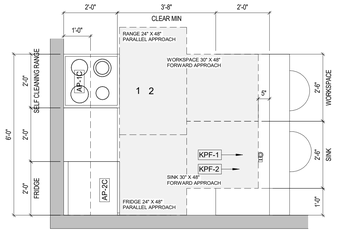
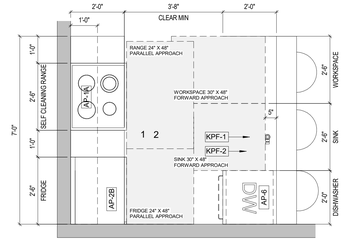
Checked by:	
DOB JOB NUMBER:	

ISLAND OPEN



PLAN 6'-0"



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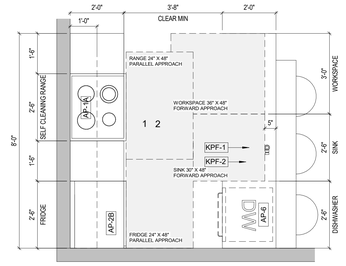
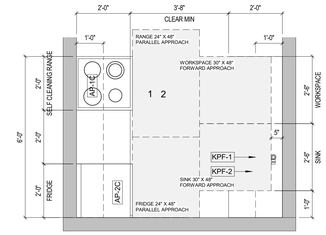


PLAN 8'-0"

U-SHAPE CLOSE



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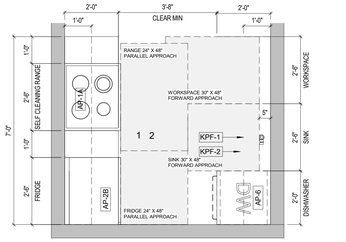

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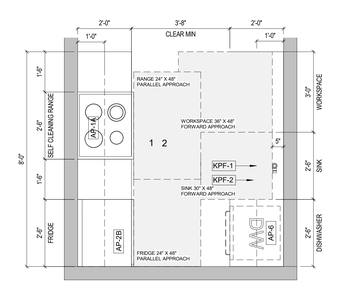
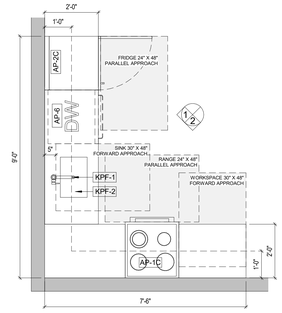


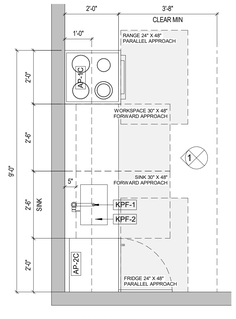
PLAN 8'-0"

L-SHAPE KITCHEN

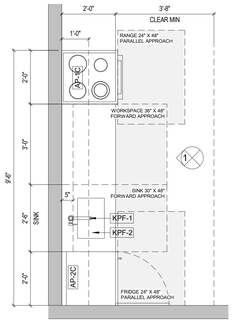


PLAN 9'-0" x 7'-6"

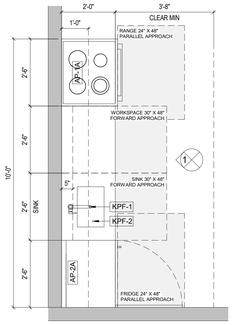
STRAIGHT KITCHEN



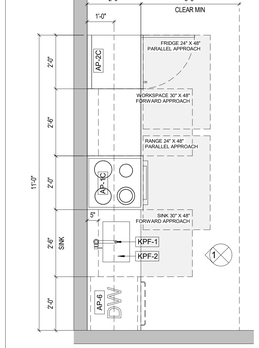
PLAN 9'-0"



PLAN 9'-6"

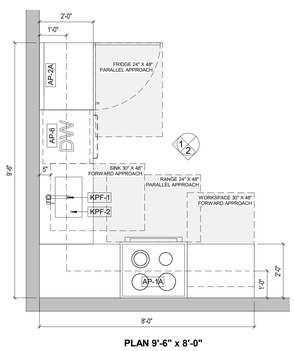


PLAN 10'-0"



PLAN 11'-0"

L-SHAPE KITCHEN



PLAN 9'-6" x 8'-0"

FIXTURE & APPLIANCE SCHEDULE

PLUMBING FIXTURES & ACCESSORIES

TAG	TYPE	MANUFACTURER	MODEL	FINISH
KPF-1	KITCHEN FAUCET	BLANCO	LINUS 526375	BLK
KPF-2	KITCHEN SINK	BLANCO	PRECIS ADA SILGRANIT	BLK
PF-2	BATHROOM SINK	KOHLER	VERTICYL L K-8189-0	WHT
PF-3	ADA TOILET	TOTO	ECO ULTRAMAX MS854114EL / MS854114ELR#01	WHT
PF-4	STANDARD TUB	FINE FIXTURES	BTA104	WHT
PF-4R	ADA TUB	AMERICAN STANDARD	2973.102 / 2973.202	WHT
PF-5	SHOWER HANDLE / DIVERTER	HANSGROHE	FINORIS	BLK
PF-5R	ADA SHOWER HANDLE / DIVERTER	SYMMONS	DIA - S3508BTRM-T736-MB	BLK
PF-6	BATHROOM FAUCET	HANSGROHE	FINORIS	BLK
BF-1	TOILET PAPER HOLDER	GATCO	RECESSED T.H.	BLK
BF-1R	RECESSED TOILET PAPER HOLDER / SHELF	HANSGROHE	ADDSTORIS 41772670	BLK
BF-2	VANITY MIRROR			
BF-3	REMOVABLE IN-TUB SEAT	ASI	8358	
	ADA GRAB BARS	KOHLER	K-10540	BLK

APPLIANCES

AP-1A	30" STOVE TOP	BLOMBERG	DWS51502SS	SS
AP-1B	30" BUILT-IN OVEN	BLOMBERG	DW51600SS	SS
AP-1C	24" STOVE TOP			
AP-2A	30" FRIDGE / FREEZER	BLOMBERG	BRFB1812SSLN	SS
AP-2B	30" FRIDGE / FREEZER ADA	FRIGIDAIRE	FFHT1835VS	SS
AP-2C	24" FRIDGE / FREEZER			
AP-4	STACKABLE WASHER / DRYER UNIT	BLOMBERG	WM72200W + DV17600W	WHT
AP-5	ADA COMBINATION WASHER / DRYER UNIT	BLOMBERG	WMD24400W	WHT
AP-6	DISHWASHER			

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00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ENLARGED KITCHEN PLANS & ELEVATIONS

A-910B.00

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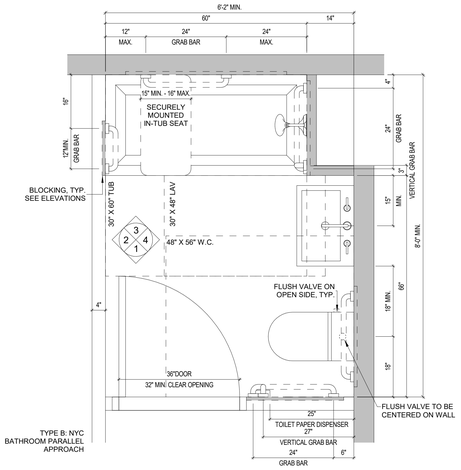
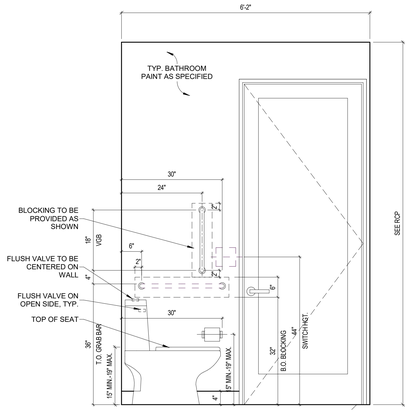
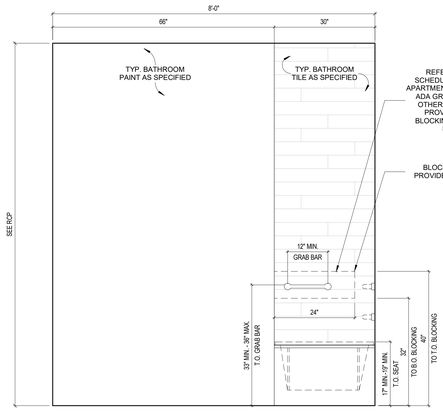
Date:	12/1/2025 7:24:04 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	



PLANS



ELEVATION 1



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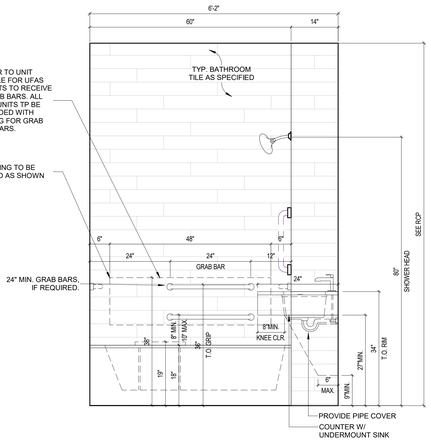
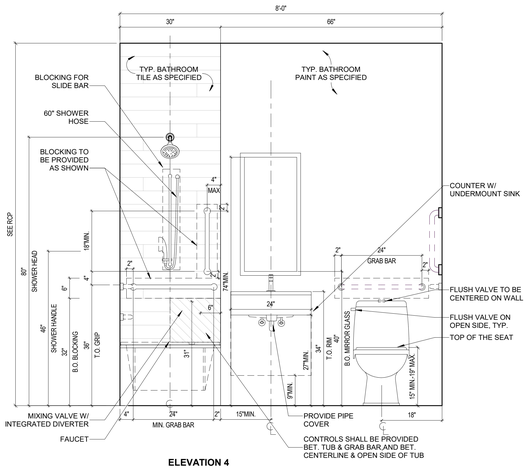


ELEVATION 3



ELEVATION 4

1 BATHROOM TYPE 1A - PLAN

SCALE: 3/4" = 1'-0"

PLANS

ELEVATION 1

ELEVATION 2

ELEVATION 3

ELEVATION 4

2 BATHROOM TYPE 1B - PLAN

SCALE: 3/4" = 1'-0"

PLANS

ELEVATION 1

ELEVATION 2

ELEVATION 3

ELEVATION 4

3 BATHROOM TYPE 2 - PLAN

SCALE: 3/4" = 1'-0"

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DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ENLARGED BATHROOM PLANS & ELEVATIONS

A-911B.00

Scale:	3/4" = 1'-0"
Date:	12/1/2025 7:24:06 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

73 EMPIRE BOULEVARD

BROOKLYN, NEW YORK 11225

PROPOSED 14 STORY MIX-USE DEVELOPMENT (RESIDENTIAL & COMMERCIAL)

BLDG C - DRAWING INDEX DOB			
DRAWING NO.	SHEET NO.	REVISION NO.	SHEET TITLE
1	T-001C	00	TITLE SHEET
2	Z-001C	00	ZONING ANALYSIS
3	Z-002C	00	ZONING ANALYSIS
4	Z-003C	00	ZONING MAPS
5	Z-004C	00	ZONING DIAGRAMS
6	Z-005C	00	ZONING DIAGRAMS
7	Z-010C	00	GROSS FLOOR AREA DIAGRAMS
8	Z-011C	00	GROSS FLOOR AREA DIAGRAMS
9	Z-020C	00	FLOOR AREA DEDUCTIONS
10	Z-021C	00	FLOOR AREA DEDUCTIONS
12	G-001C	00	PROJECT SUMMARY & BUILDING CODE COMPLIANCE
13	G-004C	00	MEANS OF EGRESS NOTES
13	G-002C	00	GENERAL NOTES
14	G-005C	00	ACCESSIBILITY NOTES
15	V-001C	00	ARCHITECTURAL SURVEY
16	A-001C	00	SUBCELLAR 1 & 2 LIFE SAFETY PLANS
17	A-002C	00	CELLAR - 1ST FLOOR LIFE SAFETY PLANS
18	A-003C	00	2ND - 10TH FLOOR LIFE SAFETY PLANS
19	A-004C	00	11TH - 14TH FLOOR LIFE SAFETY PLANS
20	A-005C	00	ROOF LIFE SAFETY PLANS
21	A-006C	00	SITE PLAN
22	A-100C	00	PROPOSED SUB-CELLAR 02 PLAN

BLDG C - DRAWING INDEX DOB			
DRAWING NO.	SHEET NO.	REVISION NO.	SHEET TITLE
23	A-101C	00	PROPOSED SUB-CELLAR 01 PLAN
24	A-102C	00	PROPOSED CELLAR PLAN
25	A-103C	00	PROPOSED 1ST FLOOR PLAN
26	A-104C	00	PROPOSED 2ND - 10TH FLOOR PLAN
27	A-105C	00	PROPOSED 11TH - 14TH FLOOR PLAN
28	A-106C	00	PROPOSED ROOF PLAN
29	A-200C	00	EAST & WEST ELEVATION
30	A-201C	00	NORTH ELEVATION
31	A-202C	00	SOUTH ELEVATION
32	A-300C	00	BUILDING SECTIONS
33	A-404C	00	STAIRS DETAILS
34	A-500C	00	WALL TYPES & DETAILS
35	A-510C	00	SECTION DETAILS
36	A-701C	00	FLOOR AND TRANSITION DETAILS
37	A-700C	00	DOOR LEGEND & SCHEDULE
38	A-710C	00	WINDOW LEGEND & SCHEDULE
39	A-711C	00	CURTAIN WALL LEGEND & SCHEDULE
40	A-712C	00	CURTAIN WALL LEGEND & SCHEDULE
41	A-910C	00	ENLARGED KITCHEN PLANS & ELEVATIONS
42	A-911C	00	ENLARGED BATHROOM PLANS & ELEVATIONS

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SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
TITLE SHEET

T-001C.00

Scale:
Date: 12/1/2025 7:26:03 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

ZONING ANALYSIS			
ADDRESS:	67 SOUTH 6TH ST, BROOKLYN, NY 11249		
BLOCK:	2455		
TAX LOT:	27		
ZONING DISTRICT:	C4-4D / R-8A EQUIVALENT		
ZONING MAP:	16d		
COMMUNITY DISTRICT :	BROOKLYN COMMUNITY DISTRICT 9		
INCLUSIONARY HOUSING	MANDATORY AS PER ZR APPENDIX F		
LOT AREA:	38,119.0 SF		
TRANSIT APPROVALS REQUIREMENT	NO TRANSIT APPROVAL IS REQUIRED. THE SITE IS NOT LOCATED WITHIN 200' OF A TRANSIT AUTHORITY		
APPLICABLE ZR SECTION	ITEM	PERMITTED/REQUIRED	PROPOSED
ZR 12-10	DEFINITIONS		
ZR 12-10 FLOOR AREA (c)(1))	FLOOR AREA	FLOOR SPACE WITHIN A FULLY ELECTRIFIED BUILDING OR AN ULTRA LOW ENERGY BUILDING, OF AN AMOUNT EQUIVALENT TO FIVE PERCENT OF THE FLOOR AREA LOCATED WITHIN SUCH BUILDING, AND EXCLUSIVE OF ANY FLOOR SPACE OTHERWISE EXCLUDED FROM FLOOR AREA;	PROPOSED BUILDING IS COMPYING WITH THIS PROVISION. 5% OF FLOOR AREA DEDUCTED, SEE ZONING TABLE ON Z-001
ZR 32-00	APPLICABILITY AND DEFINITIONS		
ZR 32-10	USE ALLOWANCES	IN C4 DISTRICTS, USE GROUP II, IIIB, & VI IS PERMITTED	PROPOSED USES: II(RESIDENTIAL), VI (RETAIL)
ZR 32-30	GROUND FLOOR LEVEL USE AND TRANSPARENCY REQUIREMENTS	GROUND FLOOR LEVEL USES FOR TIER B FRONTAGES ON THE PORTION OF A GROUND FLOOR LEVEL FACING A TIER B STREET FRONTAGE, WITHIN THE MINIMUM QUALIFYING DEPTH, THE UNDERLYING USE REGULATIONS ARE MODIFIED AS FOLLOWS: DWELLING UNITS SHALL NOT BE PERMITTED; USES IN GROUP III SHALL NOT BE PERMITTED; NOT BE PERMITTED; USES LISTED UNDER USE GROUP IV SHALL BE LIMITED TO THOSE LISTED UNDER PUBLIC SERVICE BUILDINGS, AND RENEWABLE ENERGY AND GREEN INFRASTRUCTURE; GUEST ROOMS OR SUITES ASSOCIATED WITH TRANSIENT ACCOMMODATIONS LISTED UNDER USE GROUP V SHALL NOT BE PERMITTED; USES LISTED UNDER USE GROUP VII SHALL BE LIMITED IN SIZE TO 5,000 SQUARE FEET PER ESTABLISHMENT; THE MAXIMUM STREET WALL WIDTH OF ANCILLARY RESIDENTIAL USES OR LOBBIES ACCESSING USES NOT PERMITTED ON THE GROUND FLOOR LEVEL SHALL BE LIMITED TO 50 PERCENT OF THE GROUND FLOOR LEVEL STREET FRONTAGES, OR 50 FEET, WHICHEVER IS GREATER; OFF-STREET PARKING SPACES OR LOADING BERTHS, SHALL NOT BE PERMITTED, EXCEPT THAT: ENTRANCES AND EXITS TO PARKING AND LOADING FACILITIES LOCATED BEYOND THE MINIMUM QUALIFYING DEPTH SHALL BE PERMITTED, SUBJECT TO ANY APPLICABLE CURB CUT REGULATIONS OF THIS SECTION, INCLUSIVE, OR THIS RESOLUTION; FOR BUILDINGS ALONG A TIER B STREET FRONTAGE, AND NO FRONTAGE ALONG ANOTHER STREET WHERE A LOADING BERTH IS PERMITTED, LOADING BERTHS WITH A MAXIMUM STREET WALL WIDTH OF 50 FEET SHALL BE PERMITTED; AND FOR BUILDINGS WITH A STREET WALL WIDTH IN EXCESS OF 100 FEET AND WITH NO FRONTAGE ALONG ANOTHER STREET WHERE PARKING SPACES ARE PERMITTED WITHIN A MINIMUM QUALIFYING DEPTH, PARKING SPACES SHALL BE PERMITTED IN THE STREET WALL PORTION IN EXCESS OF 100 FEET, PROVIDED THAT: THE MAXIMUM STREET WALL WIDTH OF SUCH PARKING SPACES DOES NOT EXCEED 50 FEET; THE FRONTAGE ALLOCATED TO SUCH PARKING SPACES SHALL BE INCLUDED IN THE MAXIMUM PERCENTAGE PERMITTED FOR ANCILLARY RESIDENTIAL USES OR LOBBIES; AND SUCH PARKING SPACES SHALL BE SCREENED IN ACCORDANCE WITH THE PROVISIONS FOR TIER A STREET FRONTAGES SET FORTH IN PARAGRAPH (A) OF SECTION 32-312. PARKING SPACES ACCESSORY TO ACCESS TRANSIT STATIONS, AS DEFINED IN SECTION 66-11, SHALL BE PERMITTED WITHOUT RESTRICTION. TRANSPARENCY REQUIREMENTS ALONG THE TIER B STREET FRONTAGE OF A GROUND FLOOR LEVEL, STREET WALLS SHALL BE GLAZED WITH TRANSPARENT MATERIALS, WHICH MAY INCLUDE SHOW WINDOWS, TRANSOM WINDOWS, OR GLAZED PORTIONS OF DOORS. SUCH TRANSPARENT MATERIALS SHALL OCCUPY AT LEAST 50 PERCENT OF THE SURFACE AREA OF SUCH GROUND FLOOR LEVEL STREET WALL BETWEEN A HEIGHT OF TWO FEET AND 12 FEET, OR THE HEIGHT OF THE GROUND FLOOR CEILING, WHICHEVER IS HIGHER, AS MEASURED FROM THE ADJOINING SIDEWALK. TRANSPARENT MATERIALS PROVIDED TO SATISFY SUCH 50 PERCENT REQUIREMENT SHALL NOT BEGIN HIGHER THAN 2 FEET, 6 INCHES, ABOVE THE LEVEL OF THE ADJOINING SIDEWALK, WITH THE EXCEPTION OF TRANSOM WINDOWS, OR PORTIONS OF WINDOWS SEPARATED BY MULLIONS OR OTHER STRUCTURAL DIVIDERS, AND SHALL HAVE A MINIMUM WIDTH OF TWO FEET. HOWEVER, SUCH TRANSPARENCY REQUIREMENTS SHALL NOT APPLY TO PORTIONS OF THE GROUND FLOOR LEVEL OCCUPIED BY ENTRANCES OR EXITS TO PARKING OR LOADING FACILITIES, TO DOORS ACCESSING EMERGENCY EGRESS STAIRWELLS AND PASSAGEWAYS, OR TO COMMUNITY FACILITY BUILDINGS.	BUILDING COMPLIES WITH THIS SECTION: NO DWELLINGS PROPOSED WITHIN 30'-0" ON THE GROUND FLOOR. MAX LOBBY WIDTH IS BELOW 50% OF STREET FRONTAGE SEE A-101 GROUND LEVEL PROVIDED WITH GLAZING OVER 50% SEE A-101
ZR 35-00	APPLICABILITY AND DEFINITIONS		
ZR 35-01	APPLICABILITY OF THIS CHAPTER	THE BULK REGULATIONS OF THIS CHAPTER APPLY TO ANY MIXED BUILDING LOCATED ON ANY ZONING LOT OR PORTION OF A ZONING LOT IN ANY COMMERCIAL DISTRICT IN WHICH SUCH BUILDING IS PERMITTED. THE BULK REGULATIONS OF THIS CHAPTER SHALL ALSO APPLY IN ANY COMMERCIAL DISTRICT WHERE THERE ARE MULTIPLE BUILDINGS ON A SINGLE ZONING LOT AND SUCH ZONING LOT CONTAINS A RESIDENTIAL USE AND EITHER A COMMERCIAL USE OR A COMMUNITY FACILITY USE. IN ADDITION, THE BULK REGULATIONS OF THIS CHAPTER, OR OF SPECIFIED SECTIONS THEREOF, ALSO APPLY IN OTHER PROVISIONS OF THIS RESOLUTION WHERE THEY ARE INCORPORATED BY CROSS-REFERENCE.	
ZR 35-10	GENERAL PROVISIONS	EXCEPT AS OTHERWISE PROVIDED IN THIS CHAPTER, THE PORTIONS OF A BUILDING USED FOR RESIDENTIAL USE ARE SUBJECT TO THE BULK REGULATIONS SET FORTH IN ARTICLE II, CHAPTER 3, AND THE PORTIONS OF A BUILDING USED FOR COMMERCIAL OR COMMUNITY FACILITY USE ARE SUBJECT TO THE BULK REGULATIONS SET FORTH IN ARTICLE III, CHAPTER 3. SPECIAL PROVISIONS APPLYING TO MIXED BUILDINGS OR ZONING LOTS WITH MULTIPLE BUILDINGS SUBJECT TO THE PROVISIONS OF THIS CHAPTER ARE SET FORTH IN SECTIONS 35-20 (APPLICABILITY OF RESIDENCE DISTRICT BULK REGULATIONS), INCLUSIVE, 35-30 (APPLICABILITY OF FLOOR AREA AND OPEN SPACE REGULATIONS), INCLUSIVE, 35-40 (APPLICABILITY OF DENSITY REGULATIONS), INCLUSIVE, 35-50 (MODIFICATION OF YARD REGULATIONS) AND 35-60 (MODIFICATION OF HEIGHT AND SETBACK REGULATIONS), INCLUSIVE.	
ZR 35-20	APPLICABILITY OF RESIDENCE DISTRICT BULK REGULATIONS		
ZR 35-21	GENERAL PROVISIONS	IN THE DISTRICTS INDICATED, THE BULK REGULATIONS SET FORTH IN ARTICLE II, CHAPTER 3 SHALL APPLY TO ALL RESIDENTIAL PORTIONS OF BUILDINGS IN ACCORDANCE WITH THE PROVISIONS AND MODIFICATIONS SET FORTH IN THE REMAINING SECTIONS OF THIS CHAPTER. THE PURPOSE OF THESE MODIFICATIONS IS TO MAKE THE REGULATIONS SET FORTH IN ARTICLE II, CHAPTER 3, APPLICABLE TO COMMERCIAL DISTRICTS.	
ZR 35-23 ZR 34-112	GENERAL PROVISIONS	IN C4-4D DISTRICTS , THE APPLICABLE BULK REGULATIONS ARE THE BULK REGULATIONS FOR THE RESIDENTIAL EQUIVALENT IS R8A	
ZR 35-30	APPLICABILITY OF FLOOR AREA AND OPEN SPACE REGULATIONS		
ZR 35-31	MAXIMUM FLOOR AREA RATIO	THE MAXIMUM FLOOR AREA RATIO PERMITTED FOR A COMMERCIAL OR COMMUNITY FACILITY USE SHALL BE AS SET FORTH IN ARTICLE III, CHAPTER 3, AND THE MAXIMUM FLOOR AREA RATIO PERMITTED FOR A RESIDENTIAL USE SHALL BE AS SET FORTH IN ARTICLE II, CHAPTER 3, EXCEPT AS SET FORTH IN SECTION 35-30. INCLUSIVE. THE TOTAL OF ALL SUCH FLOOR AREA RATIOS SHALL NOT EXCEED THE GREATEST FLOOR AREA RATIO PERMITTED FOR ANY SUCH USE ON THE ZONING LOT, EXCEPT WHERE EXPLICITLY STATED OTHERWISE. SPECIAL RULES FOR CERTAIN AREAS ARE SET FORTH IN SECTION 35-36 (SPECIAL FLOOR AREA RATIO AND RELATED BULK PROVISIONS FOR CERTAIN AREAS).	SEE ZR 23-153 AND ZR 33-121 BELOW FOR RESIDENTIAL AND COMMERCIAL FLOOR AREA REGULATIONS
ZR 33-123	FLOOR AREA RATIO	IN C4-4D DISTRICT THE COMMERCIAL & COMMUNITY FACILITY FLOOR AREA RATIO IS: 6.5 LOT AREA: 38,119 SF 6.5 X 38,119 = 247,773.50 SF	PROPOSED COMMERCIAL ZFA: 0 SF PROPOSED COMMUNIT FACILITY ZFA: 0 SF PROPOSED TOTAL COMMERCIAL/COMMUNITY ZFA: 0 SF OK
ZR 23-22	FLOOR AREA RATIO	IN R8A EQUIVALENT THE MAX RESIDENTIAL FLOOR AREA RATIO FOR QUALIFYING AFFORDABLE HOUSING IS: 7.2 LOT AREA: 38,119 SF 7.2 X 38,119 = 274,456.80 SF	PROPOSED RESIDENTIAL ZFA: 0 SF OK
ZR 35-40 ZR 23-52	MAXIMUM NUMBER OF DWELLING UNITS	MAX RESIDENTIAL FLOOR AREA: 274,456.80 / 680 = 403.61 = MAX 403 DWELLING UNITS	PROPOSED DWELLING UITS IN BUILDING A: 99 PROPOSED DWELLING UITS IN BUILDING B: 99 PROPOSED DWELLING UITS IN BUILDING C: 99 PROPOSED DWELLING UITS IN BUILDING D: 99 PROPOSED TOTAL DWELLING UNITS : 396
ZR 35-50	MODIFICATION OF YARD REGULATIONS		
ZR 35-51	MODIFICATION OF FRONT YARD REQUIREMENTS	IN C4 DISTRICT, NO FRONT YARD SHALL BE REQUIRED.	NO FRONT YARD PROVIDED
ZR 35-52	MODIFICATION OF SIDE YARD REQUIREMENTS	IN C4 DISTRICTS, NO SIDE YARD SHALL BE REQUIRED. HOWEVER, IF ANY OPEN AREA EXTENDING ALONG A SIDE LOT LINE IS PROVIDED AT ANY LEVEL, IT SHALL HAVE A MINIMUM WIDTH OF FIVE FEET	NO SIDE YARD PROVIDED
35-53	MODIFICATION OF REAR YARD REQUIREMENTS	IN C4 DISTRICTS, FOR A RESIDENTIAL PORTION OF A MIXED BUILDING, THE REQUIRED RESIDENTIAL REAR YARD SHALL BE PROVIDED AT THE FLOOR LEVEL OF THE LOWEST STORY USED FOR DWELLING UNITS OR ROOMING UNITS, WHERE ANY WINDOW OF SUCH DWELLING UNITS OR ROOMING UNITS FACES ONTO SUCH REAR YARD. IF LEVEL OF SUCH YARD IS AT OR HIGHER THAN THE FIRST STORY, DECKS, PARAPET WALLS, ROOF THICKNESS, SOLAR ENERGY SYSTEMS UP TO FOUR FEET HIGH, VEGETATED ROOFS, AND WEIRS, SHALL BE PERMITTED, PURSUANT TO SECTION 23-41 (PERMITTED OBSTRUCTIONS), INCLUSIVE.	SEE 23-343 (a) (3) FOR THE EXCEPTION
23-343 (a) (3)	REAR YARD EQUIVALENT REQUIREMENTS	NO REAR YARD EQUIVALENT REGULATIONS SHALL APPLY TO ANY ZONING LOT THAT INCLUDES A THROUGH LOT PORTION THAT IS CONTIGUOUS ON ONE SIDE TO TWO CORNER LOT PORTIONS AND SUCH ZONING LOT OCCUPIES THE ENTIRE BLOCK FRONTAGE OF A STREET	PROPOSED ZONING LOT HAS A THROUGH LOT PORTION THAT IS CONTIGUOUS ON ONE SIDE TO TWO CORNER LOT PORTIONS AND SUCH ZONING LOT OCCUPIES THE ENTIRE BLOCK FRONTAGE OF A STREET THEREFORE A REAR YARD EQUIVALENT IS NOT REQUIRED
ZR 35-60	MODIFICATION OF HEIGHT AND SETBACK REGULATIONS		
ZR 35-63	HEIGHT AND SETBACK REQUIREMENTS IN COMMERCIAL DISTRICTS WITH R6 THROUGH R12 EQUIVALENCY	C1 C2 C4 C5 C6 IN COMMERCIAL DISTRICTS MAPPED WITHIN, OR WITH A RESIDENTIAL EQUIVALENT OF R6 THROUGH R12 DISTRICTS, THE STREET WALL LOCATION OF A BUILDING SHALL BE AS SET FORTH IN SECTION 35-631, AND THE HEIGHT AND SETBACK PROVISIONS SHALL BE AS SET FORTH IN SECTION 35-632. ADDITIONAL HEIGHT AND SETBACK PROVISIONS ARE SET FORTH IN SECTION 35-633 AND SECTION 35-64. INCLUSIVE. THE HEIGHT OF ALL BUILDINGS OR OTHER STRUCTURES SHALL BE MEASURED FROM THE BASE PLANE. FOR THE PURPOSES OF THIS SECTION, WHERE BASE PLANES OF DIFFERENT ELEVATIONS APPLY TO DIFFERENT PORTIONS OF A BUILDING OR OTHER STRUCTURE, EACH SUCH PORTION OF THE BUILDING MAY BE CONSIDERED TO BE A SEPARATE BUILDING.	
ZR 35-631	STREET WALL LOCATION	C1 C2 C4 C5 C6 IN THE DISTRICTS INDICATED, THE APPLICABLE STREET WALL LOCATION PROVISIONS OF THIS SECTION SHALL APPLY. SUCH PROVISIONS SHALL APPLY TO THE PORTION OF A STREET WALL LOCATED BELOW THE MAXIMUM BASE HEIGHT AND BEFORE THE REQUIRED SETBACK AS SET FORTH IN SECTION 23-432 (HEIGHT AND SETBACK REQUIREMENTS). (B) PERCENTAGE-BASED RULES AT LEAST 70 PERCENT OF THE AGGREGATE WIDTH OF STREET WALLS SHALL BE LOCATED WITHIN EIGHT FEET OF THE STREET LINE AND SHALL EXTEND TO AT LEAST THE MINIMUM BASE HEIGHT SPECIFIED IN SECTION 23-432, OR THE HEIGHT OF THE BUILDING, WHICHEVER IS LESS. UP TO 30 PERCENT OF THE AGGREGATE WIDTH OF STREET WALLS MAY BE RECESSED BEYOND EIGHT FEET OF THE STREET LINE, PROVIDED THAT ANY SUCH RECESSES DEEPER THAN 10 FEET ALONG A WIDE STREET OR 15 FEET ALONG A NARROW STREET ARE LOCATED WITHIN AN OUTER COURT.	100% OF PROPOSED STREET WALL IS LOCATED WITHIN 8' OF THE PROPERTY LINE
ZR 35-632 ZR 23-432	HEIGHT AND SETBACK REQUIREMENTS	IN R8A EQUIVALENT DISTRICT FOR QUALIFYING AFFORDABLE HOUSING MIN. BASE HEIGHT: 60' MAX. BASE HEIGHT: 105' MAX. BUILDING HEIGHT: 145'	PROPOSED BASE HEIGHT: 105' PROPOSED BUILDING HEIGHT: 145'
ZR 36-20	REQUIRED ACCESSORY OFF-STREET PARKING SPACES FOR COMMERCIAL AND COMMUNITY FACILITY USE		
ZR 36-26	WAIVER FOR MIXED-USE DEVELOPMENTS	IN ALL DISTRICTS, AS INDICATED, THE NON-RESIDENTIAL PARKING REQUIREMENTS OF SECTION 36-20 SHALL BE WAIVED FOR USES LOCATED WITHIN BUILDINGS CONTAINING RESIDENCES ON ANY ZONING LOT (a)WITHIN THE SPECIAL MIXED USE PARKING AREA ; (1)SPECIAL MIXED USE PARKING AREAS" SHALL REFER TO SPECIAL GEOGRAPHIES WHERE UNIQUE PARKING REQUIREMENTS APPLY TO MIXED USE #BUILDINGS# .#SPECIAL MIXED USE PARKING AREAS# SHALL INCLUDE AREAS WITHIN THE BOUNDARIES SHOWN IN APPENDIX I OF THIS RESOLUTION.	THE PROPERTY FALLS UNDER APPENDIX I THEREFORE, THE PARKING IS WAIVED FOR THE COMMERCIAL
ZR 25-222	RESIDETIAL PARKING REQUIREMENTS	**IN R8A DISTRICTS, WITHIN THE OUTER TRANSIT ZONE , FOR DWELLING UNITS CREATED AS PART OF A DEVELOPMENT OR ENLARGEMENT AFTER DECEMBER 5, 2024, THE NUMBER OF REQUIRED ACCESSORY OFF-STREET PARKING SPACES SHALL BE DETERMINED BY MULTIPLYING THE NUMBER OF DWELLING UNITS BY THE APPLICABLE PARKING REQUIREMENT SET FORTH FOR THE APPLICABLE DISTRICT IN COLUMNS A OR B OF THE TABLE. HOWEVER, WHERE THE CALCULATION RESULTS IN A NUMBER OF PARKING SPACES LESS THAN OR EQUAL TO THE NUMBER IN COLUMN C, NO PARKING SPACES SHALL BE REQUIRED FOR RESIDENCES ON THE ZONING LOT.** **AS PER COLUMN A: 12% OF THE MARKET RATE UNITS REQUIRE PARKING** **BUILDING A: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **BUILDING B: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **BUILDING C: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **BUILDING D: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **TOTAL PARKING REQUIRED = 36 SPACES REQUIRED** **AS PER COLUMN B: 0% OF THE AFFORDABLE UNITS REQUIRE PARKING**	TOTAL NUMBER OF PARKING PROVIDED = 94
ZR 36-70	BICYCLE PARKING		
ZR 36-711	REQUIRED ENCLOSED BICYCLE PARKING SPACES FOR RESIDENTIAL USE	IN R8A DISTRICTS, 1 PARKING SPACE PER 2 NEW DWELLING UNITS REQUIRED BUILDING A: 99/2 = 50 PARKING SPACES REQUIRED BUILDING B: 99/2 = 50 PARKING SPACES REQUIRED BUILDING C: 99/2 = 50 PARKING SPACES REQUIRED BUILDING D: 99/2 = 50 PARKING SPACES REQUIRED	BUILDING A: 50 PARKING SPACES PROVIDED BUILDING B: 50 PARKING SPACES PROVIDED BUILDING C: 50 PARKING SPACES PROVIDED BUILDING D: 50 PARKING SPACES PROVIDED
ZR 36-711 (d)	REQUIRED ENCLOSED BICYCLE PARKING SPACES FOR #COMMERCIAL USE	FOR GENERAL RETAIL SERVICES, 1 PARKING SPACE PER 10,000 SF REQUIRED. WAIVED IF UNER 5 SPACES REQUIRED BUILDING A: 4999.69 / 10000= .12 ~ 1 BICYCLE PARKING SPACES REQUIRED	PROPOSED COMMERCIAL/COMMUNITY FACILITY BICYCLE PARKING SPACES: 0
ZR 23-00	RESIDENTIAL BULK REGULATIONS		
ZR 23-12	MINIMUM LOT AREA	MIN. LOT AREA: 1700 SF	PROPOSED LOT AREA: 38,119.0 SF
ZR 23-12	MINIMUM LOT WIDTH	MIN. LOT WIDTH: 18'-0"	PROPOSED LOT WIDTH: 200'-0"
ZR-23-362 (a)	LOT COVERAGE	THE MAXIMUM RESIDENTIAL LOT COVERAGE FOR INTERIOR LOTS OR THROUGH LOTS SHALL BE 80 PERCENT AND THE MAXIMUM RESIDENTIAL LOT COVERAGE FOR CORNER LOTS SHALL BE 100 PERCENT.	PROPOSED LOT COVERAGE ON CORNER LOT PORTION IS: 96.84% PROPOSED LOT COVERAGE ON THROUGH LOT PORTION IS: 80%
ZR 23-60	ADDITIONAL DEISGN ELEMENTS		
ZR 23-61 ZR 26-41	STREET TREES AND PLANTING	IN DISTRICTS R1 TO R12, THE FOLLOWING SHALL PROVIDE STREET TREES IN ACCORDANCE WITH SECTION 26-14 (STREET TREE PLANTING: IN ACCORDANCE WITH APPLICABILITY REQUIREMENTS OF UNDERLYING DISTRICT REGULATIONS, ONE STREET TREE, PRE-EXISTING OR NEWLY PLANTED, SHALL BE PROVIDED FOR EVERY 25 FEET OF STREET FRONTAGE OF THE ZONING LOT. FRACTIONS EQUAL TO OR GREATER THAN ONE-HALF RESULTING FROM THIS CALCULATION SHALL BE CONSIDERED TO BE ONE TREE.	TOTAL STREET FRONTAGE : 602.7' 24 TREES REQUIRED EXISTING TREES TO BE PROTECTED ON SITE: 5 PROPOSED TREE TO BE PAID INTO ON-SITE TREE FUNDS = 16 PROPOSED TREE TO BE PAID INTO OFF-SITE TREE FUNDS = 3
23-613	FRONT YARD PLANTING REQUIREMENTS	IN DISTRICTS R1 TO R12, THE AREA OF THE ZONING LOT BETWEEN THE STREET LINE AND ALL STREET WALLS OF THE BUILDING AND THEIR PROLONGATIONS SHALL BE PLANTED AT GROUND LEVEL, OR IN RAISED PLANTING BEDS THAT ARE PERMANENTLY AFFIXED TO THE GROUND, EXCEPT THAT SUCH PLANTINGS SHALL NOT BE REQUIRED AT THE ENTRANCES TO AND EXITS FROM THE BUILDING, WITHIN DRIVEWAYS ACCESSING OFF-STREET PARKING SPACES LOCATED WITHIN, TO THE SIDE, OR REAR OF SUCH BUILDING, IN ANY AREA WHERE THERE IS A PERMITTED OBSTRUCTION	PROPOSED AREA BETWEEN THE STREET LINE AND BUILDING WALL IS PROVIDED WITH PLANTING
ZR 23-62	BALCONIES	IN DISTRICTS R1 TO R12, BALCONIES MAY PROJECT INTO OR OVER ANY OPEN AREAS NOT OCCUPIED BY BUILDINGS AT THAT PARTICULAR LEVEL, PROVIDED THAT: (a) WITHIN ANY YARDS, COURTS, OR OTHER REQUIRED OPEN AREAS, SUCH BALCONY SHALL: (1) NOT PROJECT BY MORE THAN ONE THIRD OF THE DEPTH OF SUCH AREAS SPECIFIED ABOVE, OR A DISTANCE GREATER THAN SEVEN FEET, WHICHEVER IS LESS, AS MEASURED FROM THE PLANE SURFACE OF THE BUILDING WALL FROM WHICH IT PROJECTS; (2) NOT COVER MORE THAN 10 PERCENT OF ANY OPEN AREA REQUIRED PURSUANT TO SECTION 23-30, INCLUSIVE, OR ANY OUTDOOR RECREATION SPACE PROVIDED PURSUANT TO SECTION 23-63; AND (3) HAVE AN AGGREGATE WIDTH, AT THE LEVEL OF ANY STORY, NOT EXCEEDING 50 PERCENT OF THE WIDTH AT THAT LEVEL OF THE PLANE SURFACE OF THE BUILDING WALL FROM WHICH IT PROJECTS; AND (b) WITHIN ANY OPEN AREAS, WHETHER REQUIRED OR NOT, SUCH BALCONY SHALL: (1) BE UNENCLOSED EXCEPT FOR BUILDING WALLS AND PARAPETS, RAILINGS, OR SAFETY GUARDS, WHETHER APPLIED SINGLY, OR IN COMBINATION, PROVIDED THAT: (i) PARAPETS SHALL NOT EXCEED FOUR FEET IN HEIGHT; (ii) RAILINGS SHALL NOT EXCEED 4 FEET, 6 INCHES IN HEIGHT AND SHALL BE AT LEAST 50 PERCENT OPEN FOR THE PORTION THAT EXCEEDS FOUR FEET IN HEIGHT; AND (iii) SAFETY GUARDS SHALL NOT EXCEED 10 FEET IN HEIGHT AND SHALL BE AT LEAST 50 PERCENT TRANSPARENT MATERIALS FOR THE PORTION THAT EXCEEDS FOUR FEET IN HEIGHT. IN ADDITION, WHERE SUCH BALCONY HAS A ROOFED PORTION ABOVE IT, THERE SHALL BE AN OPENING THAT IS NOT LESS THAN 40 PERCENT OF THE HEIGHT BETWEEN THE BOTTOM OF THE ROOF AND THE FINISHED FLOOR LEVEL OF SUCH BALCONY. HOWEVER, SUCH BALCONIES MAY BE RECESSED INTO A BUILDING WALL UP TO A MAXIMUM DEPTH OF SIX FEET PROVIDED THAT AT LEAST 33 PERCENT OF THE PERIMETER OF SUCH BALCONY IS UNENCLOSED EXCEPT FOR A PARAPET, RAILING, OR SAFETY GUARD; AND (2) BE LOCATED AT LEAST 13 FEET ABOVE CURB LEVEL, EXCEPT THAT FOR BUILDINGS CONTAINING RESIDENCES NOT MORE THAN 35 FEET IN HEIGHT, SUCH BALCONY MAY BE LOCATED AT OR HIGHER THAN THE FLOOR LEVEL OF THE SECOND STORY PROVIDED THAT SUCH BALCONY IS LOCATED NOT LOWER THAN SEVEN FEET ABOVE CURB LEVEL OR SEVEN FEET ABOVE NATURAL GRADE, WHICHEVER IS HIGHER.	PROPOSED BALCONIES ARE IN COMPLIANCE OC SECTION 23-62 AND ARE NOT GREATER THAN 50% OF THE TOTAL WALL WIDTH. SEE SHEET A-101

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING ANALYSIS

Z-001C.00

Scale: 12" = 1'-0"
Date: 12/1/2025 7:26:05 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

ZONING FLOOR AREA							
NAME	USE GROUP	GFA	DEDUCTIONS	TOTAL	5% ULTRA LOW EN	ZFA	FAR
BUILDING A							
COMMERCIAL							
00A_CELLAR	VI	7692.14 SF	7692.14 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01A_1ST FL. RETAIL	VI	4999.69 SF	4536.25 SF	463.44 SF	23.17 SF	440.27 SF	0.01
		12691.83 SF	12228.39 SF	463.44 SF	23.17 SF	440.27 SF	0.01
RESIDENTIAL							
00A_SUBCELLAR 2	II	7692.14 SF	7692.14 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00A_SUBCELLAR 1	II	7692.14 SF	7692.14 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01A_ 1ST FL.	II	3259.06 SF	579.85 SF	2679.20 SF	133.96 SF	2545.24 SF	0.07
02A_2ND FL.	II	6543.76 SF	3760.04 SF	2783.72 SF	139.19 SF	2644.53 SF	0.07
03A_3RD FL.	II	6543.76 SF	1102.12 SF	5441.64 SF	272.08 SF	5169.56 SF	0.14
04A_4TH FL.	II	5857.40 SF	1102.12 SF	4755.28 SF	237.76 SF	4517.52 SF	0.12
05A_5TH FL.	II	5857.40 SF	1102.12 SF	4755.28 SF	237.76 SF	4517.52 SF	0.12
06A_6TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
07A_7TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
08A_8TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
09A_9TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
10A_10TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
11A_11TH FL.	II	5489.70 SF	1055.47 SF	4434.23 SF	221.71 SF	4212.52 SF	0.11
12A_12TH FL.	II	5489.70 SF	1055.47 SF	4434.23 SF	221.71 SF	4212.52 SF	0.11
13A_13TH FL.	II	5489.70 SF	1891.02 SF	3598.68 SF	179.93 SF	3418.75 SF	0.09
14A_14TH FL.	II	5489.70 SF	1055.47 SF	4434.23 SF	221.71 SF	4212.52 SF	0.11
15A_ROOF	II	569.87 SF	569.87 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		95246.40 SF	34168.41 SF	61077.99 SF	3053.91 SF	58024.08 SF	1.52
BUILDING B							
COMMERCIAL							
00B_CELLAR	VI	11464.06 SF	11464.06 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01B_1ST FL. RETAIL	VI	10084.56 SF	4536.25 SF	5548.32 SF	277.42 SF	5270.90 SF	0.14
		21548.62 SF	16000.31 SF	5548.32 SF	277.42 SF	5270.90 SF	0.14
RESIDENTIAL							
00B_SUBCELLAR 2	II	11464.06 SF	11464.06 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00B_SUBCELLAR 1	II	11464.06 SF	11464.06 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01B_1ST FL.	II	1268.91 SF	451.78 SF	817.14 SF	40.86 SF	776.28 SF	0.02
02B_2ND FL.	II	6494.93 SF	822.24 SF	5672.69 SF	283.63 SF	5389.06 SF	0.14
03B_3RD FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
04B_4TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
05B_5TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
06B_6TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
07B_7TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
08B_8TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
09B_9TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
10B_10TH FL	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
11B_11TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
12B_12TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
13B_13TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
14B_14TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
15B_ROOF	II	692.91 SF	692.91 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		104970.45 SF	34713.13 SF	70257.35 SF	3512.85 SF	66744.50 SF	1.75
BUILDING C							
COMMERCIAL							
00C_CELLAR	VI	8957.70 SF	8957.70 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01C_1ST FL. RETAIL	VI	6555.24 SF	4536.25 SF	2019.00 SF	100.95 SF	1918.05 SF	0.05
		15512.95 SF	13493.95 SF	2019.00 SF	100.95 SF	1918.05 SF	0.05
RESIDENTIAL							
00C_SUBCELLAR 2	II	8957.70 SF	8957.70 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00C_SUBCELLAR 1	II	8957.70 SF	8957.70 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01C_1ST FL.	II	1779.77 SF	551.00 SF	1228.77 SF	61.44 SF	1167.33 SF	0.03
02C_2ND FL.	II	6387.91 SF	673.97 SF	5713.93 SF	285.70 SF	5428.23 SF	0.14
03C_3RD FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
04C_4TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
05C_5TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
06C_6TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
07C_7TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
08C_8TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
09C_9TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
10C_10TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
11C_11TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
12C_12TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
13C_13TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
14C_14TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
15C_ROOF	II	985.53 SF	985.53 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		104397.11 SF	29784.42 SF	74612.74 SF	3730.62 SF	70882.12 SF	1.86
BUILDING D							
COMMERCIAL							
00D_CELLAR	VI	7848.13 SF	7848.13 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01D_1ST FL. RETAIL	VI	6063.41 SF	4536.25 SF	1527.16 SF	76.36 SF	1450.80 SF	0.04
		13911.54 SF	12384.38 SF	1527.16 SF	76.36 SF	1450.80 SF	0.04
RESIDENTIAL							
00D_SUBCELLAR 2	II	7848.13 SF	7848.13 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00D_SUBCELLAR 1	II	7848.13 SF	7848.13 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01D_1ST FL.	II	1652.78 SF	444.95 SF	1207.84 SF	60.39 SF	1147.45 SF	0.03
02D_2ND FL.	II	6487.73 SF	851.42 SF	5636.31 SF	281.82 SF	5354.49 SF	0.14
03D_3RD FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
04D_4TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
05D_5TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
06D_6TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
07D_7TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
08D_8TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
09D_9TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
10D_10TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
11D_11TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
12D_12TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
13D_13TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
14D_14TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
15D_ROOF	II	734.87 SF	734.87 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		100596.51 SF	27916.04 SF	72680.47 SF	3634.01 SF	69046.46 SF	1.81
GRAND TOTAL		468875.42 SF	180689.03 SF	288186.47 SF	14409.29 SF	273777.18 SF	7.18

BUILDING C_ TOTAL DEDUCTION BY CODE CATEGORY	
DEDUCTIONS	TOTAL SF
AMENITY	358.06 SF
BULKHEAD	985.53 SF
CELLAR	26873.10 SF
CORRIDOR DEDUCTION	7464.95 SF
MECHANICAL ROOM	122.94 SF
REFUSE ROOM	300.02 SF
SHAFT	2077.52 SF
STAIRS	560.00 SF
Grand total	38742.12 SF

BUILDING C _ DEDUCTION PER ZR 12-10	
DEDUCTION	TOTAL SF
BULKHEAD	985.53 SF
CELLAR	26873.10 SF
MECHANICAL ROOM	122.94 SF
SHAFT	2077.52 SF
STAIRS	560.00 SF
Grand total	30619.09 SF

BUILDING C _ DEDUCTION PER ZR 23-23	
DEDUCTION	TOTAL SF
AMENITY	358.06 SF
CORRIDOR DEDUCTION	7464.95 SF
REFUSE ROOM	300.02 SF
Grand total	8123.03 SF

BUILDING C _ ZFA AFTER ZR 12-10 DEDUCTIONS	
RESIDENTIAL GFA	113,354.82 SF
ZR 12-10 DEDUCTONS	30,619.09 SF
113,354.82 - 30,619.09	82,735.73 SF

LEVEL	A	B	C	D	E	F	G	H
1								
2	201	202	203	204	205	206	207	
	STUDIO	2-BR	2-BR	STUDIO	1-BR	2-BR	1-BR	
	432 SF	724 SF	714 SF	303 SF	473 SF	695 SF	457 SF	
3	301	302	303	304	305	306	307	308
	2-BR	2-BR	2-BR	STUDIO	1-BR	2-BR	2-BR	2-BR
	740 SF	753 SF	715 SF	303 SF	474 SF	695 SF	705 SF	728 SF
4	401	402	403	404	405	406	407	408
	2-BR	2-BR	2-BR	STUDIO	1-BR	2-BR	2-BR	2-BR
	740 SF	753 SF	715 SF	303 SF	474 SF	695 SF	705 SF	728 SF
5	501	502	503	504	505	506	507	508
	2-BR	2-BR	2-BR	STUDIO	1-BR	2-BR	2-BR	2-BR
	740 SF	753 SF	715 SF	303 SF	474 SF	695 SF	705 SF	728 SF
6	601	602	603	604	605	606	607	608
	2-BR	2-BR	2-BR	STUDIO	1-BR	2-BR	2-BR	2-BR
	740 SF	753 SF	715 SF	303 SF	474 SF	695 SF	705 SF	728 SF
7	701	702	703	704	705	706	707	708
	2-BR	2-BR	2-BR	STUDIO	1-BR	2-BR	2-BR	2-BR
	740 SF	753 SF	715 SF	303 SF	474 SF	695 SF	705 SF	728 SF
8	801	802	803	804	805	806	807	808
	2-BR	2-BR	2-BR	STUDIO	1-BR	2-BR	2-BR	2-BR
	740 SF	753 SF	715 SF	303 SF	474 SF	695 SF	705 SF	728 SF
9	901	902	903	904	905	906	907	908
	2-BR	2-BR	2-BR	STUDIO	1-BR	2-BR	2-BR	2-BR
	740 SF	753 SF	715 SF	303 SF	474 SF	695 SF	705 SF	728 SF
10	1001	1002	1003	1004	1005	1006	1007	1008
	2-BR	2-BR	2-BR	STUDIO	1-BR	2-BR	2-BR	2-BR
	740 SF	753 SF	715 SF	303 SF	474 SF	695 SF	705 SF	728 SF
11	1101	1102	1103	1104	1105	1106	1107	
	2-BR	2-BR	2-BR	STUDIO	1-BR	2-BR	2-BR	
	727 SF	753 SF	720 SF	304 SF	471 SF	662 SF	655 SF	
12	1201	1202	1203	1204	1205	1206	1207	
	2-BR	2-BR	2-BR	STUDIO	1-BR	2-BR	2-BR	
	727 SF	753 SF	720 SF	304 SF	471 SF	662 SF	655 SF	
13	1301	1302	1303	1304	1305	1306	1307	
	2-BR	2-BR	2-BR	STUDIO	1-BR	2-BR	2-BR	
	727 SF	753 SF	720 SF	304 SF	471 SF	662 SF	655 SF	
14	1401	1402	1403	1404	1405	1406	1407	
	2-BR	2-BR	2-BR	STUDIO	1-BR	2-BR	2-BR	
	727 SF	753 SF	720 SF	304 SF	471 SF	662 SF	655 SF	

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Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

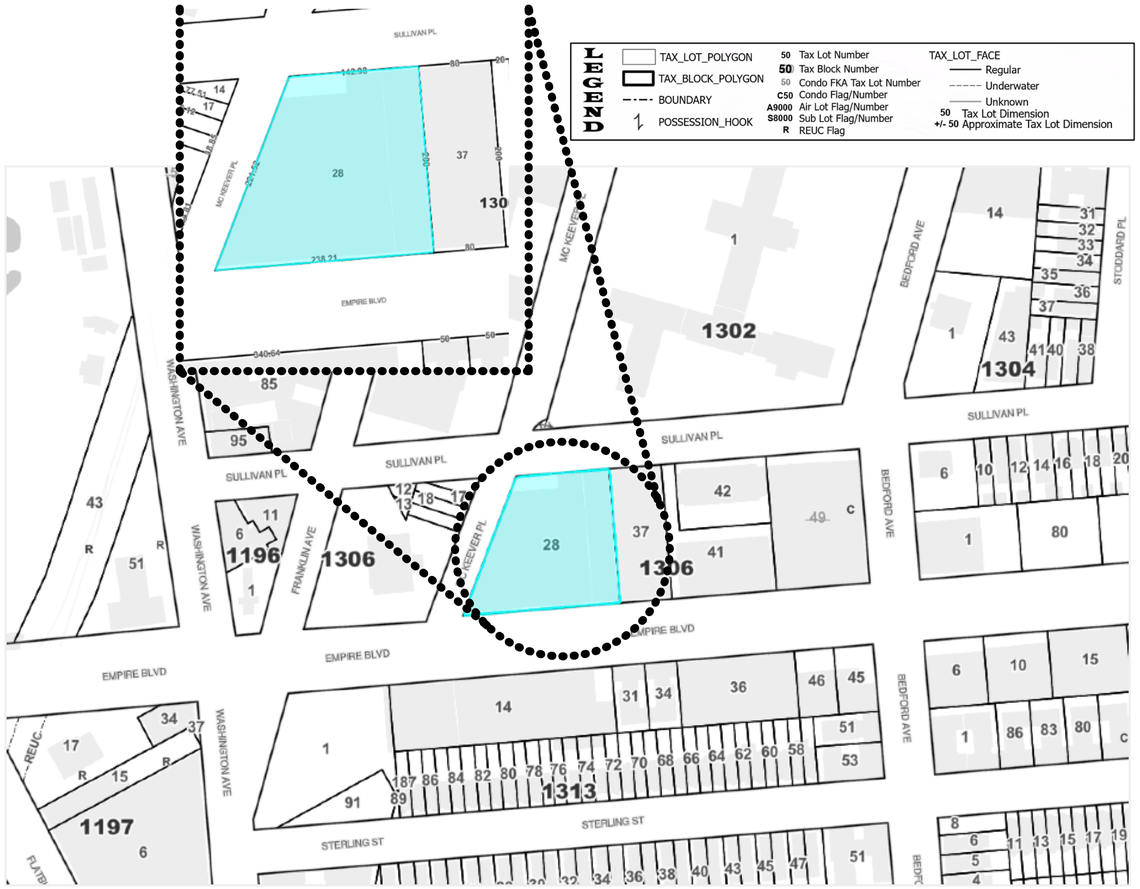
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING ANALYSIS

Z-002C.00

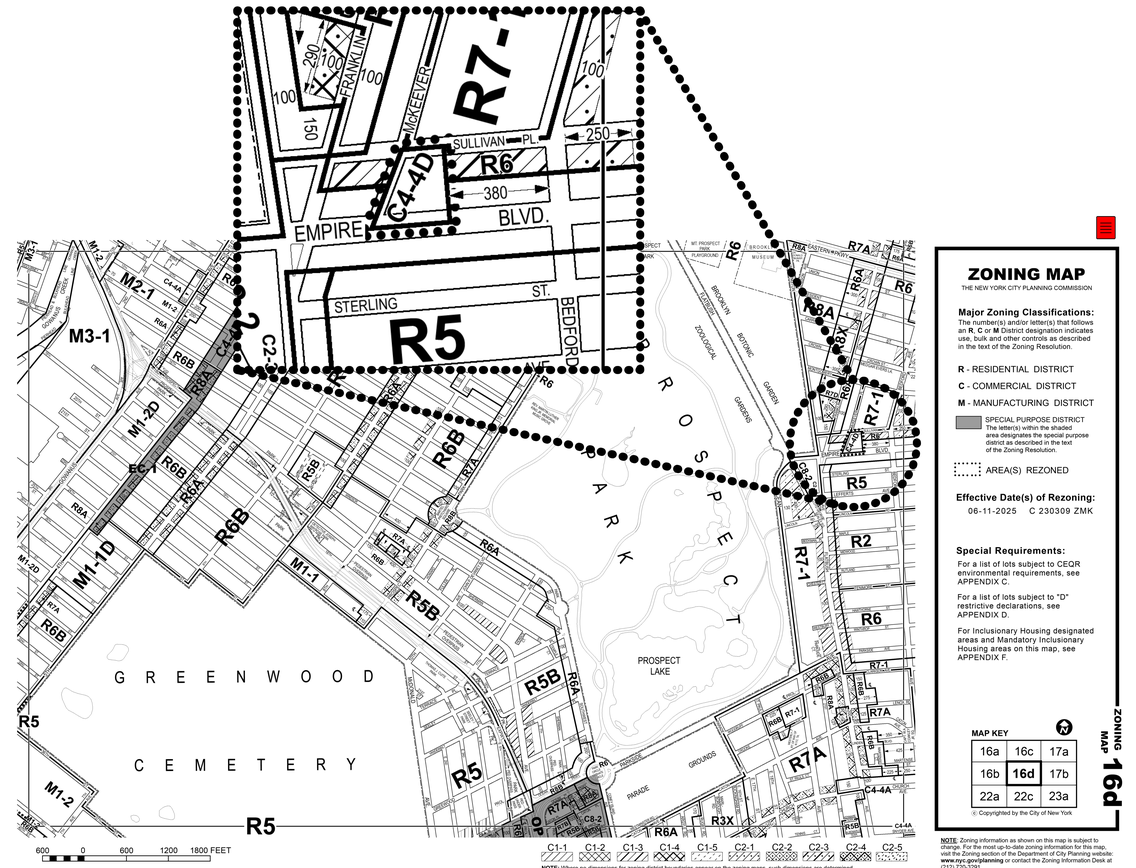
Scale: 12" = 1'-0"
Date: 12/1/2025 7:26:12 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 TAX MAP
N.T.S.



2 FLOOD MAP - ZONE 'X' SEPTEMBER 5, 2007
N.T.S.

3 ZONING MAP
N.T.S.



ZONING MAP
THE NEW YORK CITY PLANNING COMMISSION

Major Zoning Classifications:
The number(s) and/or letter(s) that follows an **R**, **C** or **M** District designation indicates use, bulk and other controls as described in the text of the Zoning Resolution.

R - RESIDENTIAL DISTRICT
C - COMMERCIAL DISTRICT
M - MANUFACTURING DISTRICT
SPECIAL PURPOSE DISTRICT The letter(s) within the shaded area designates the special purpose district as described in the text of the Zoning Resolution.
AREA(S) REZONED

Effective Date(s) of Rezoning:
06-11-2025 C 230309 ZMK

Special Requirements:
For a list of lots subject to CEQR environmental requirements, see APPENDIX C.
For a list of lots subject to "D" restrictive declarations, see APPENDIX D.
For Inclusionary Housing designated areas and Mandatory Inclusionary Housing areas on this map, see APPENDIX F.

MAP KEY

16a	16c	17a
16b	**16d**	17b
22a	22c	23a

ZONING MAP 16d

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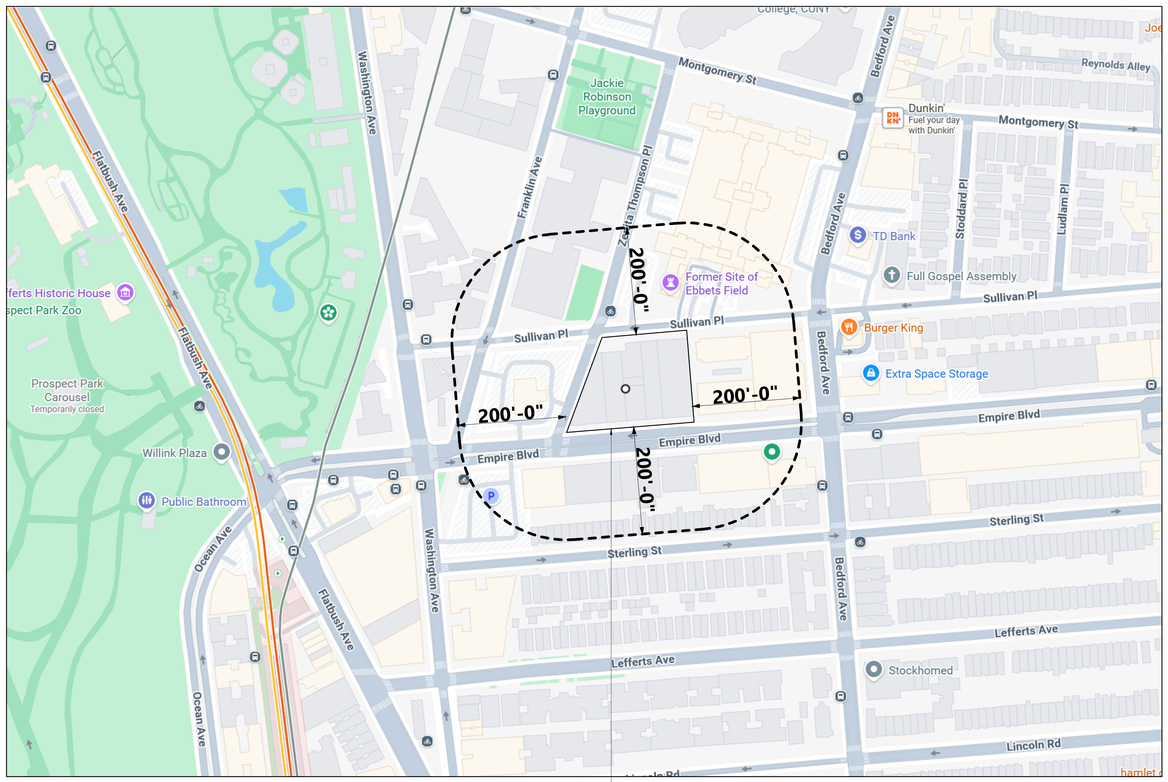
C1-1 C1-2 C1-3 C1-4 C1-5 C2-1 C2-2 C2-3 C2-4 C2-5

NOTE: Where no dimensions for zoning district boundaries appear on the zoning maps, such dimensions are determined in Article VII, Chapter 8 (Location of District Boundaries) of the Zoning Resolution.

NOTE: Zoning information as shown on this map is subject to change. For the most up-to-date zoning information for this map, visit the Zoning section of the Department of City Planning website: **www.nyc.gov/planning** or contact the Zoning Information Desk at (212) 720-3291.

TRANSIT MAP
1" = 100'-0"



SITE IS NOT LOCATED WITHIN 200' OF A TRANSIT AUTHORITY PROPOERTY

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227 Catherine Street
South Amboy, NJ 08879

Structure Engineer:
STRUCTURAL ENGINEERING TECHONOLOGIES P.C
40-12 28th Street
Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

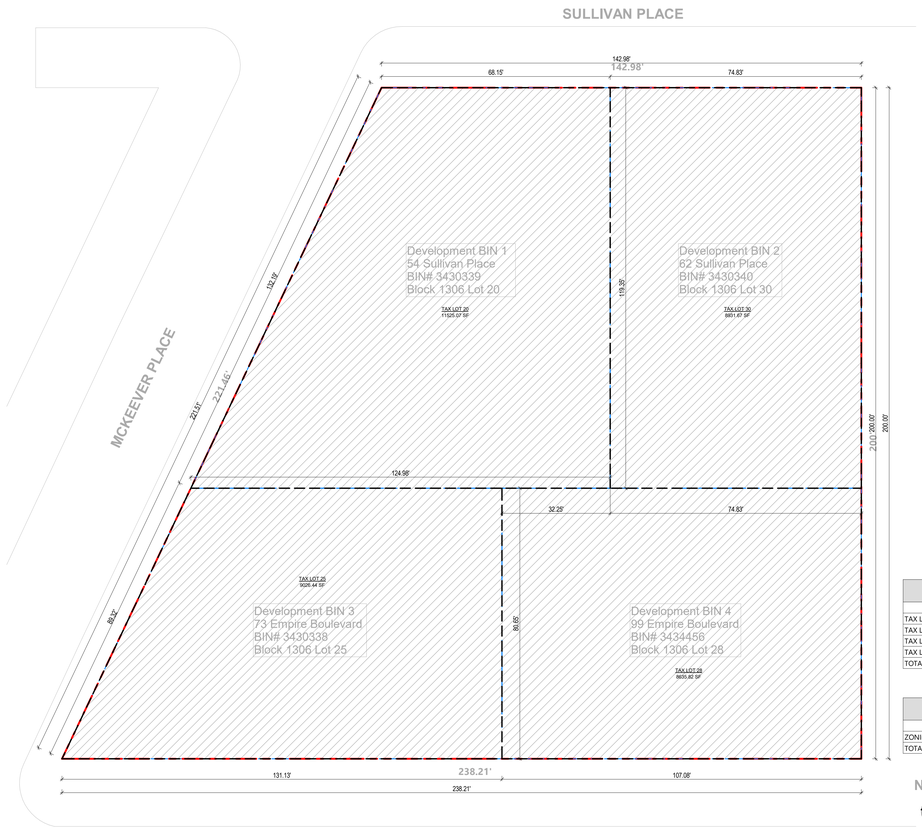
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING MAPS

Z-003C.00

Scale: 1" = 100'-0"
Date: 12/1/2025 7:26:14 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 LOT AREA & BASE PLANE CALCULATION
1/16" = 1'-0"

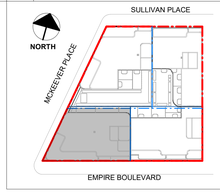


TAX LOTS	
Name	SF
TAX LOT 20	11525.07 SF
TAX LOT 30	8931.67 SF
TAX LOT 28	8635.82 SF
TAX LOT 25	9026.44 SF
TOTAL	38119.00 SF

COMBINED LOT AREA	
Name	SF
ZONING LOT COMBINED	38119.00 SF
TOTAL	38119.00 SF

2 LOT COVERAGE CALCULATION
1/16" = 1'-0"

KEY PLAN
N.T.S.

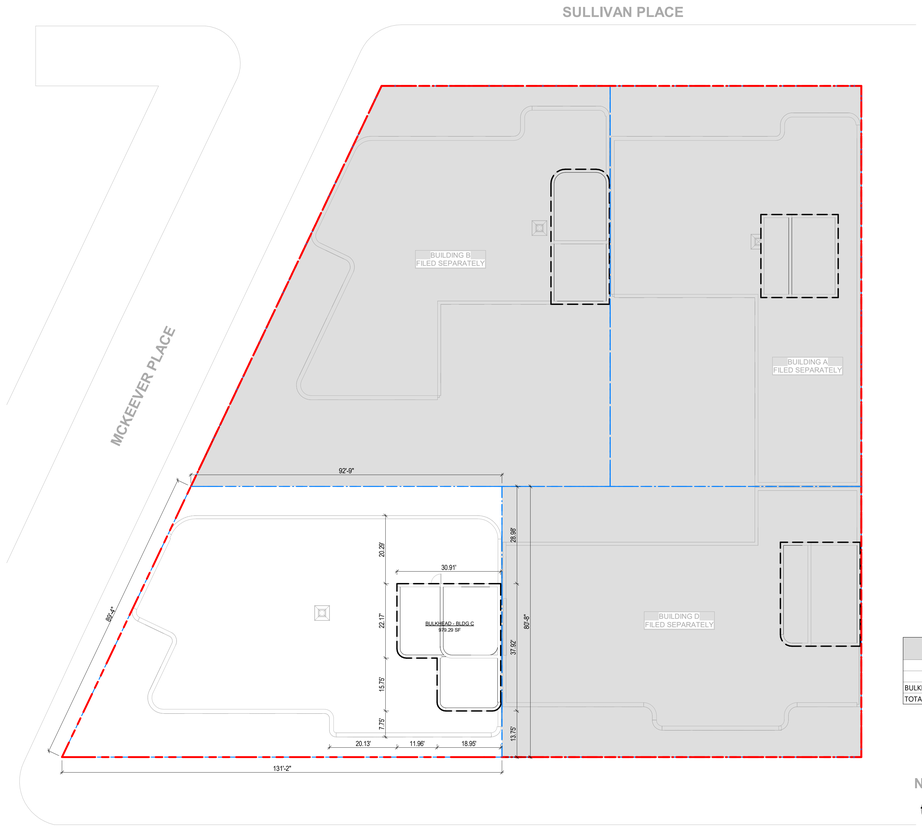


LOT COVERAGE ALLOWED WITHIN 100FT = 100%

AREA SCHEDULE (LOT COVERAGE)	
Name	Area
PORTION OF BUIDLING A - BEYOND 100FT	5395 SF
PORTION OF BUILDING C - BEYOND 100FT	423 SF
PORTION OF BUILDING D - BEYOND 100FT	6956 SF
TOTAL	12774 SF

MAXIMUM PERMITTED LOT COVERAGE: 80% x 15,967.53 = 12,774.02 SF
PROPOSED LOT COVERAGE: (12774 / 15967.53) x 100 = 79.99%

3 PERMITTED OBSTRUCTION CALCULATION
1/16" = 1'-0"



BULKHEAD AREA CALCULATION - BLDG C			
Name	Length	Width	Area
BULKHEAD - BLDG C	0' - 0"	0' - 0"	979 SF
TOTAL			979 SF

4 BLDG C - COURTYARD ANALYSIS DIAGRAM
1/16" = 1'-0"

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

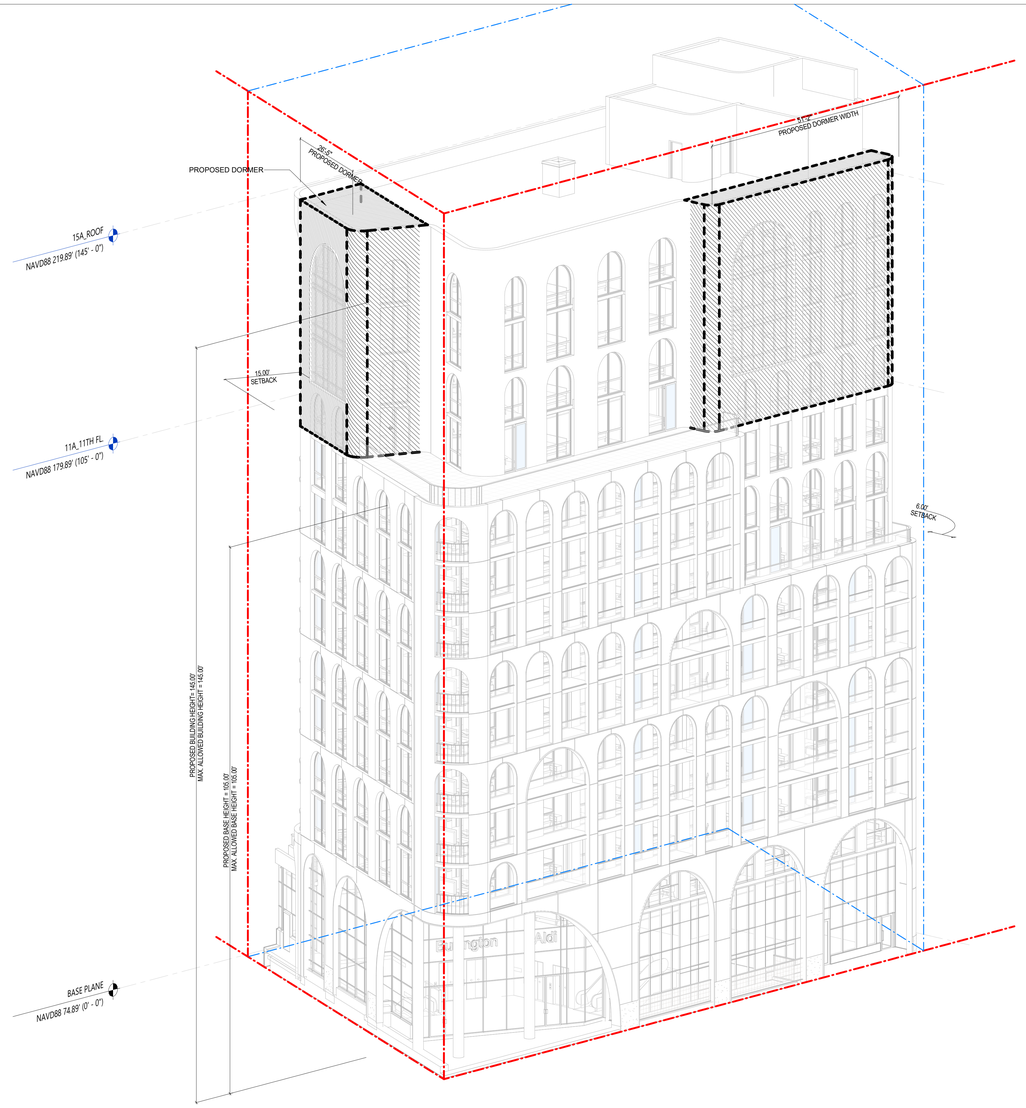
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING DIAGRAMS

Z-004C.00

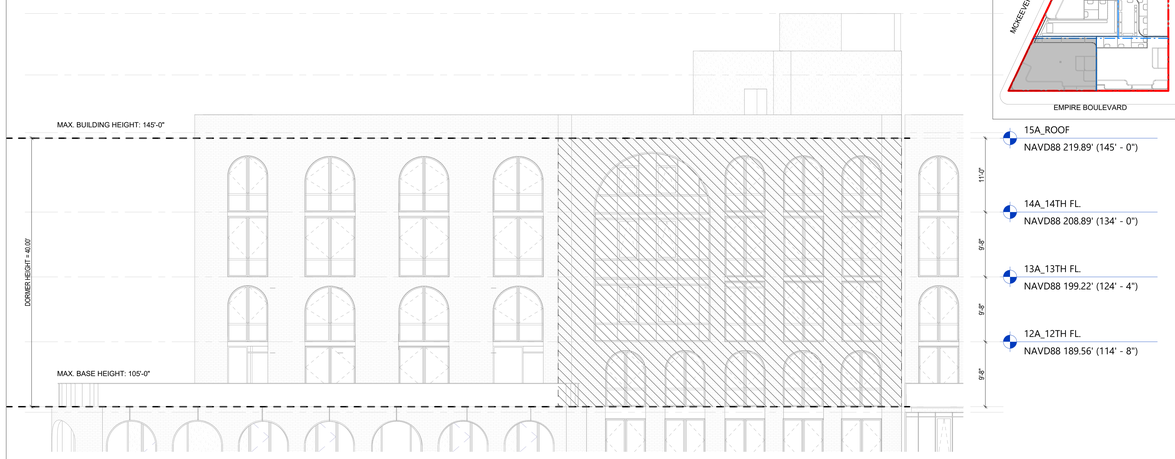
Scale:	As indicated
Date:	12/1/2025 7:26:30 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

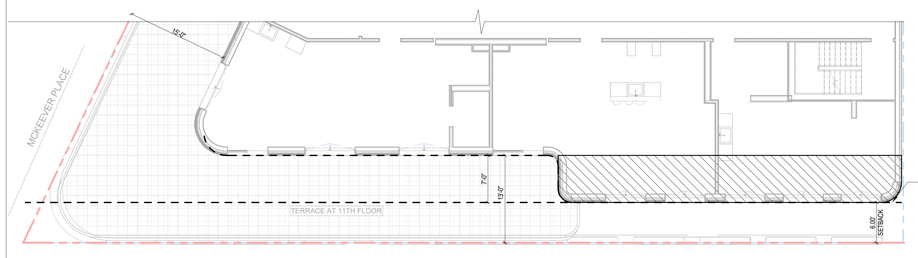
1 3D DIAGRAM - BLDG C



2 DORMER CALCULATIONS - EMPIRE BLVD. (SOUTH ELEVATION) - BLDG C

1/8" = 1'-0"





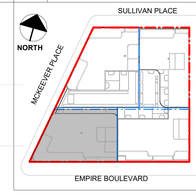
EMPIRE BLVD DORMER CALCULATION

STREET WALL WIDTH = 128'-0"
PERMITTED DORMER = 128'-0" x 40% = 51'-2 3/8"
PROPOSED DORMER = 51'-2"

2.1 11TH FL. - PARTIAL PLAN
1/8" = 1'-0"

EMPIRE BOULEVARD

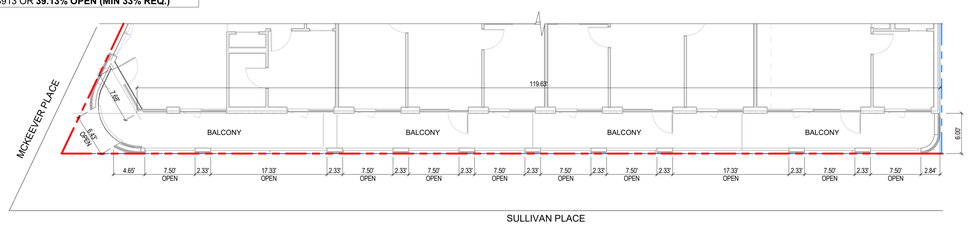
KEY PLAN
N.T.S.



3 BALCONY CALCULATIONS

BLDG C - BALCONY ENCLOSURE:
OPENINGS: 7.5' (6) + 17.33' + 17.33' + 6.43' = 101.09'
PERIMETER OF THE BALCONY: 123.14 + 123.14 + 6' + 6' = 258.28'

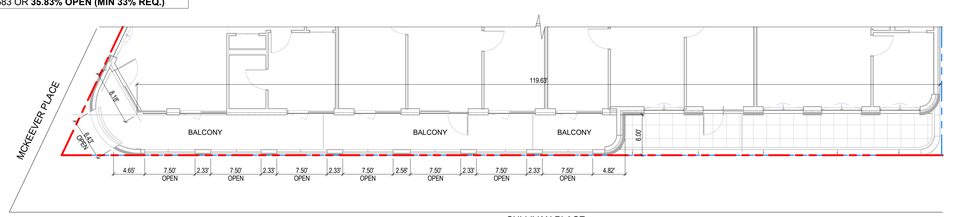
101.09' / 258.28' = 0.3913 OR **39.13% OPEN (MIN 33% REQ.)**



3.1 BLDG C - 3RD TO 7TH PARTIAL FLOOR PLAN
1/8" = 1'-0"

BLDG C - BALCONY ENCLOSURE:
OPENINGS: 7.5' (7) + 6.43' = 58.93'
PERIMETER OF THE BALCONY: 76.22 + 76.22 + 6' + 6' = 164.44'

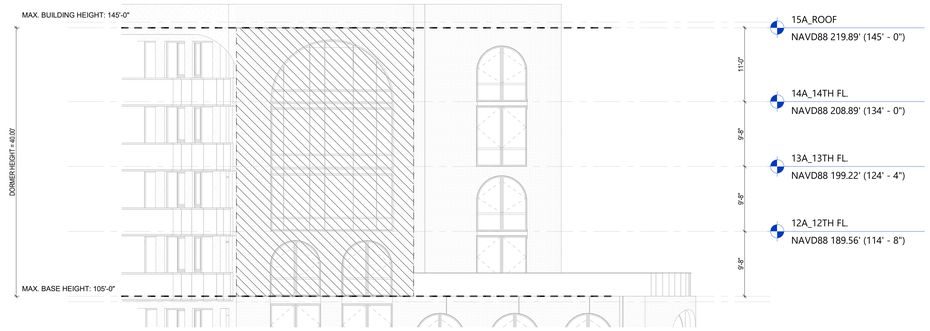
58.93' / 164.44' = 0.3583 OR **35.83% OPEN (MIN 33% REQ.)**

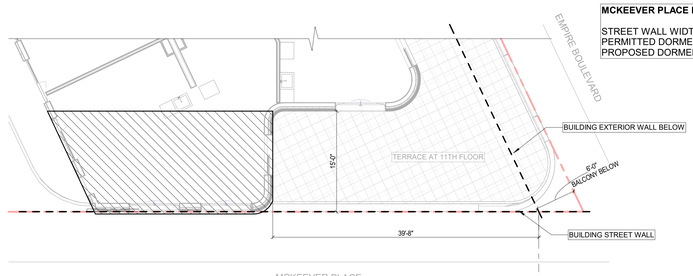


3.2 BLDG C - 8TH TO 10TH PARTIAL FLOOR PLAN
1/8" = 1'-0"

4 DORMER CALCULATIONS - MCKEEVER PLACE (WEST ELEVATION) - BLDG C

1/8" = 1'-0"





MCKEEVER PLACE DORMER CALCULATION

STREET WALL WIDTH = 66'-1"
PERMITTED DORMER = 66'-1" x 40% = 26'-5 3/16"
PROPOSED DORMER = 26'-5"

MCKEEVER PLACE

4.1 11TH FL. - PARTIAL PLAN
1/8" = 1'-0"

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MEP Engineer:
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369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING DIAGRAMS

Z-005C.00

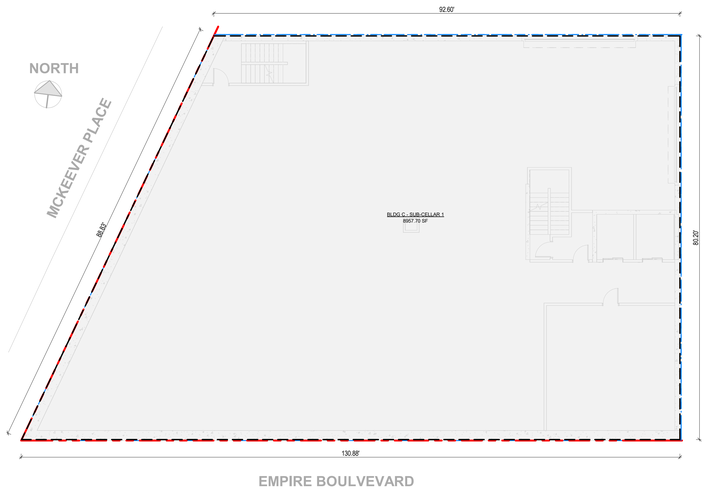
Scale:	As indicated
Date:	12/1/2025 7:26:38 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 00C_SUBCELLAR 2
3/32" = 1'-0"

AREA - 00 SUBCELLAR 2 FLOOR - BLDG C	
Name	SF
BLDG C - SUB-CELLAR 2	8957.70 SF
	8957.70 SF

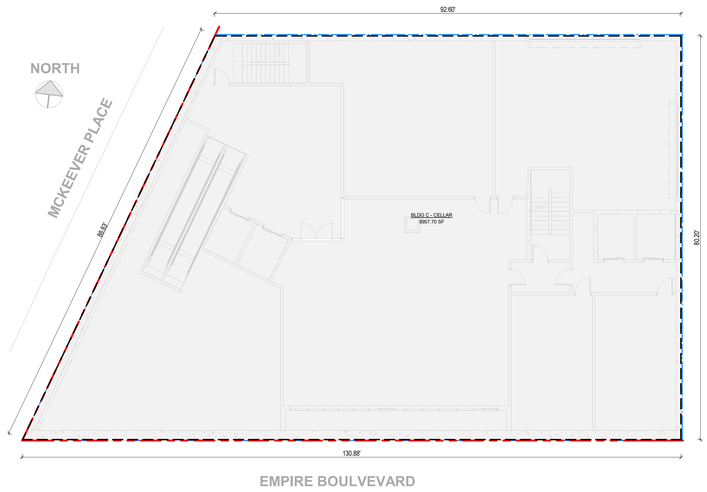
2 00C_SUBCELLAR 1
3/32" = 1'-0"

AREA - 00 SUBCELLAR 1 FLOOR - BLDG C	
Name	SF
BLDG C - SUB-CELLAR 1	8957.70 SF
	8957.70 SF

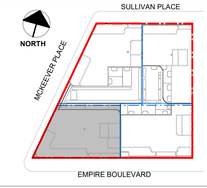


3 00C_CELLAR
3/32" = 1'-0"

AREA - 00 CELLAR FLOOR - BLDG C	
Name	SF
BLDG C - CELLAR	8957.70 SF
	8957.70 SF



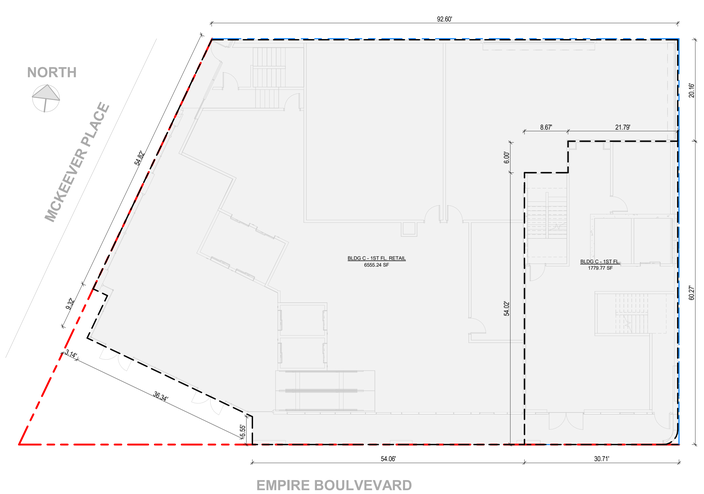
KEY PLAN
N.T.S.



4 01C_1ST FL.
3/32" = 1'-0"

AREA - 1ST FLOOR - BLDG C - RESIDENTIAL	
Name	SF
BLDG C - 1ST FL.	1779.77 SF
	1779.77 SF

AREA - 1ST FLOOR - BLDG C - RETAIL	
Name	SF
BLDG C - 1ST FL. RETAIL	6555.24 SF
	6555.24 SF

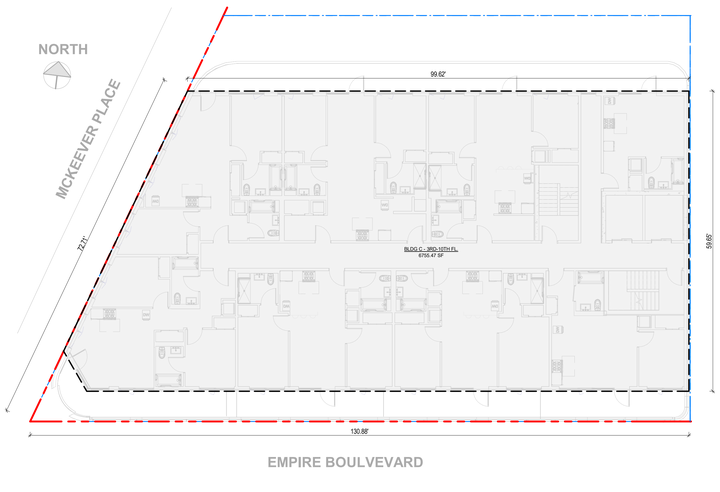


5 02C_2ND FL.
3/32" = 1'-0"

AREA - 2ND FLOOR - BLDG C	
Name	SF
BLDG C - 2ND FL.	6387.91 SF
	6387.91 SF

6 03C_3RD FL.
3/32" = 1'-0"

AREA - 3RD FLOOR - BLDG C	
Name	SF
BLDG C - 3RD-10TH FL.	6755.47 SF
	6755.47 SF



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SHEET TITLE
GROSS FLOOR AREA DIAGRAMS

Z-010C.00

Scale:	As indicated
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DOB JOB NUMBER:	

1 11C_11TH FL.
3/32" = 1'-0"

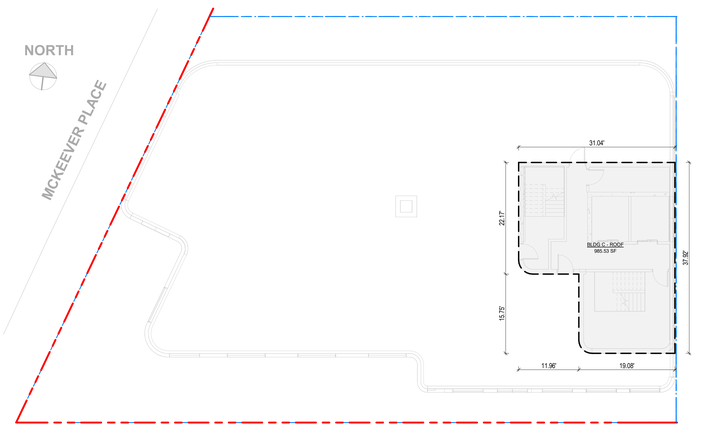
AREA - 11TH FLOOR - BLDG C	
Name	SF
BLDG C - 11TH FL.	5821.18 SF
	5821.18 SF

2 12C_12TH FL.
3/32" = 1'-0"

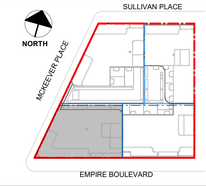
AREA - 12TH FLOOR - BLDG C	
Name	SF
BLDG C - 12TH - 14TH FL.	5821.18 SF
	5821.18 SF

3 15C_ROOF
3/32" = 1'-0"

AREA - ROOF - BLDG C	
Name	SF
BLDG C - ROOF	985.53 SF
	985.53 SF



KEY PLAN
N.T.S.



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GROSS FLOOR AREA DIAGRAMS

Z-011C.00

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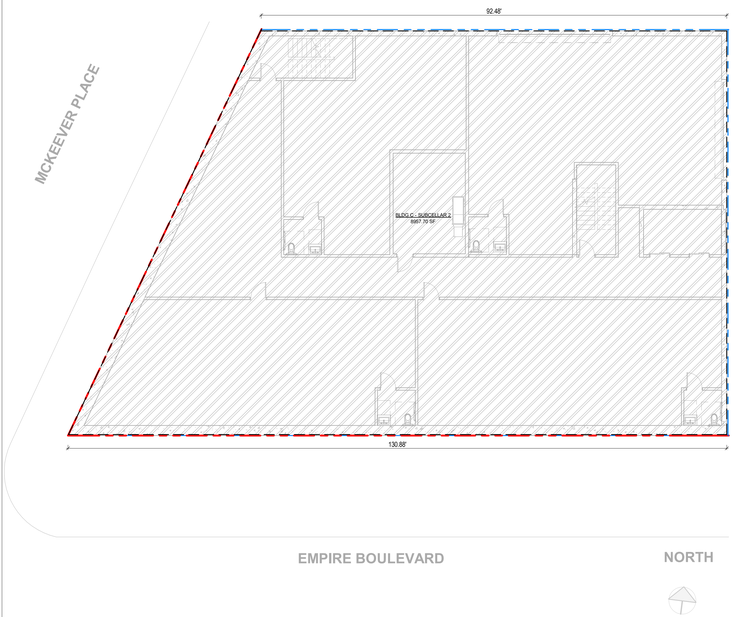
DOB JOB NUMBER:	

1 BLDG C - SUBCELLAR 2 FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 00_SUBCELLAR 2 -...	
DEDUCTION	TOTAL SF
CELLAR	8957.70 SF
Grand total	8957.70 SF

DEDUCTIONS LEGEND

CELLAR

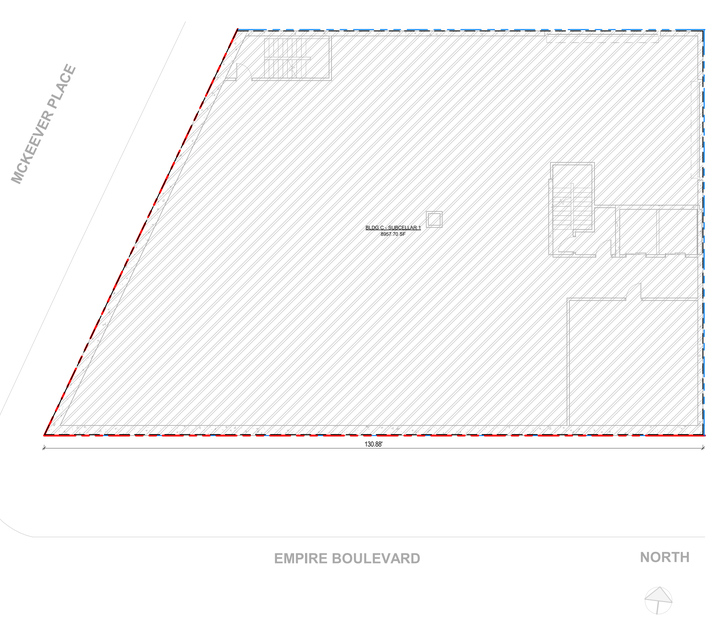


2 BLDG C - SUBCELLAR 1 FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 00_SUBCELLAR 1 -...	
DEDUCTION	TOTAL SF
CELLAR	8957.70 SF
Grand total	8957.70 SF

DEDUCTIONS LEGEND

CELLAR

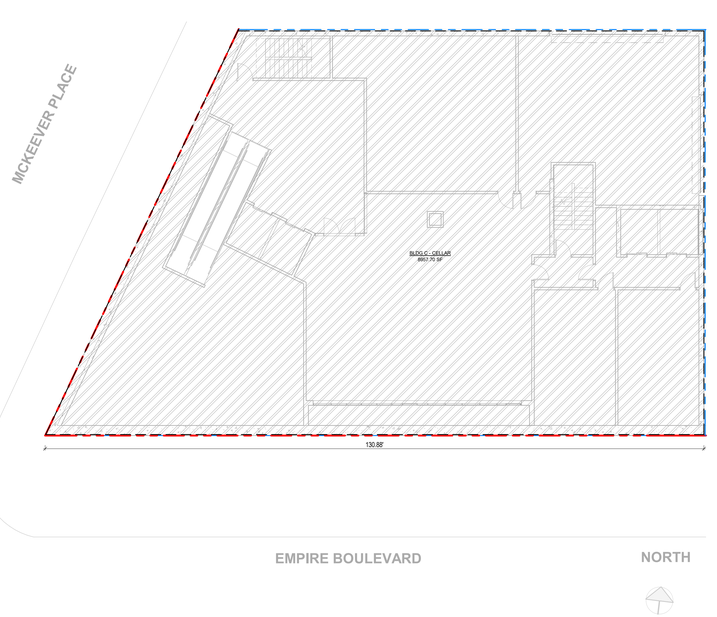


3 BLDG C - CELLAR FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 00_CELLAR - BLDG C	
DEDUCTION	TOTAL SF
CELLAR	8957.70 SF
Grand total	8957.70 SF

DEDUCTIONS LEGEND

CELLAR



KEY PLAN
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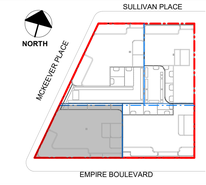


4 BLDG C - 1ST FLOOR DEDUCTION PLAN
3/32" = 1'-0"

DEDUCTIONS - 1ST FLOOR - BLDG C	
DEDUCTION	TOTAL SF
AMENITY	358.06 SF
CORRIDOR DEDUCTION	70.56 SF
CORRIDOR DEDUCTION	60.75 SF
CORRIDOR DEDUCTION	21.64 SF
STAIRS	10.00 SF

DEDUCTIONS - 1ST FLOOR - BLDG C	
DEDUCTION	TOTAL SF
STAIRS	10.00 SF
STAIRS	10.00 SF
STAIRS	10.00 SF
Grand total	551.00 SF

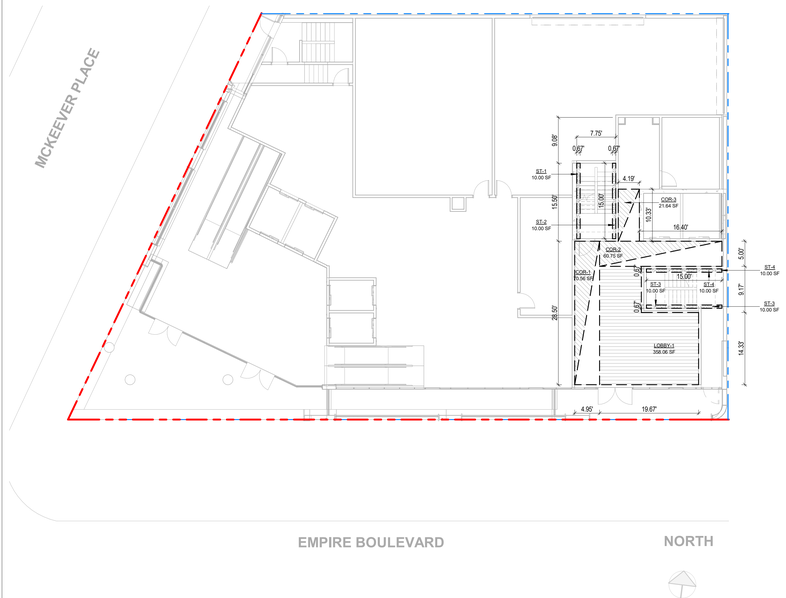
DEDUCTIONS LEGEND

AMENITY

CORRIDOR DEDUCTION

STAIRS

50% Deduction
(b) Length of Corridor



5 BLDG C - 2ND FL. FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 2ND FLOOR - BLDG C	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	362.68 SF
CORRIDOR DEDUCTION	117.00 SF
REFUSE ROOM	24.00 SF
SHAFT	7.92 SF
SHAFT	5.69 SF
SHAFT	3.96 SF
SHAFT	9.69 SF
SHAFT	10.91 SF

DEDUCTIONS - 2ND FLOOR - BLDG C	
DEDUCTION	TOTAL SF
SHAFT	32.50 SF
SHAFT	2.14 SF
SHAFT	1.74 SF
SHAFT	3.72 SF
SHAFT	2.50 SF
SHAFT	9.25 SF
SHAFT	2.14 SF
SHAFT	5.69 SF
SHAFT	11.50 SF
SHAFT	1.74 SF
SHAFT	2.50 SF

DEDUCTIONS - 2ND FLOOR - BLDG C	
DEDUCTION	TOTAL SF
SHAFT	13.07 SF
SHAFT	1.94 SF
SHAFT	1.74 SF
STAIRS	10.00 SF
STAIRS	10.00 SF
STAIRS	10.00 SF
STAIRS	10.00 SF
Grand total	673.97 SF

DEDUCTIONS LEGEND

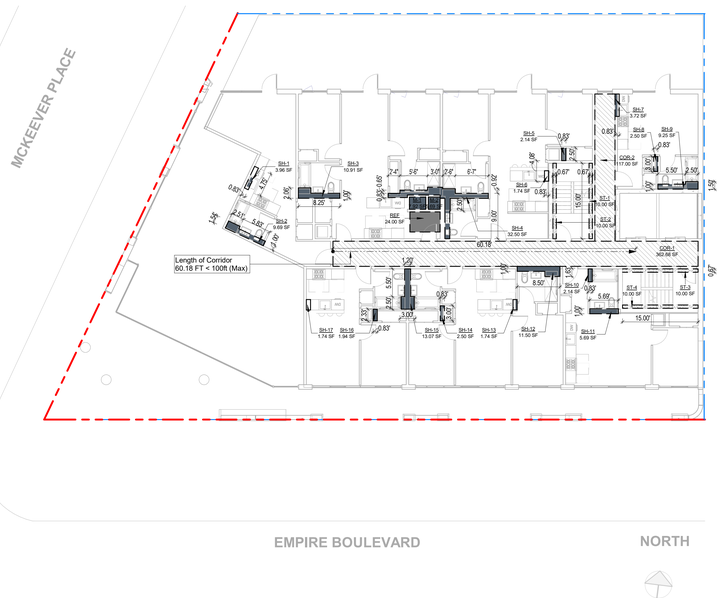
CORRIDOR DEDUCTION

REFUSE ROOM

SHAFT

STAIRS

50% Deduction
(b) Length of Corridor



6 BLDG C - 3RD - 10TH FL. FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 3RD FLOOR - BLDG C	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	480.00 SF
CORRIDOR DEDUCTION	117.00 SF
REFUSE ROOM	24.00 SF
SHAFT	7.92 SF
SHAFT	5.69 SF
SHAFT	3.75 SF

DEDUCTIONS - 3RD FLOOR - BLDG C	
DEDUCTION	TOTAL SF
SHAFT	34.97 SF
SHAFT	32.67 SF
SHAFT	2.08 SF
SHAFT	1.74 SF
SHAFT	3.72 SF
SHAFT	2.50 SF
SHAFT	9.25 SF
SHAFT	2.14 SF
SHAFT	5.69 SF
SHAFT	5.03 SF

DEDUCTIONS - 3RD FLOOR - BLDG C	
DEDUCTION	TOTAL SF
SHAFT	10.50 SF
SHAFT	1.74 SF
SHAFT	2.50 SF
SHAFT	14.12 SF
SHAFT	2.01 SF
SHAFT	1.74 SF
SHAFT	10.50 SF
SHAFT	2.08 SF
SHAFT	5.33 SF
SHAFT	5.50 SF

DEDUCTIONS - 3RD FLOOR - BLDG C	
DEDUCTION	TOTAL SF
SHAFT	2.08 SF
SHAFT	3.75 SF
SHAFT	1.46 SF
STAIRS	10.00 SF
STAIRS	10.00 SF
STAIRS	10.00 SF
STAIRS	10.00 SF
Grand total	841.46 SF

DEDUCTIONS LEGEND

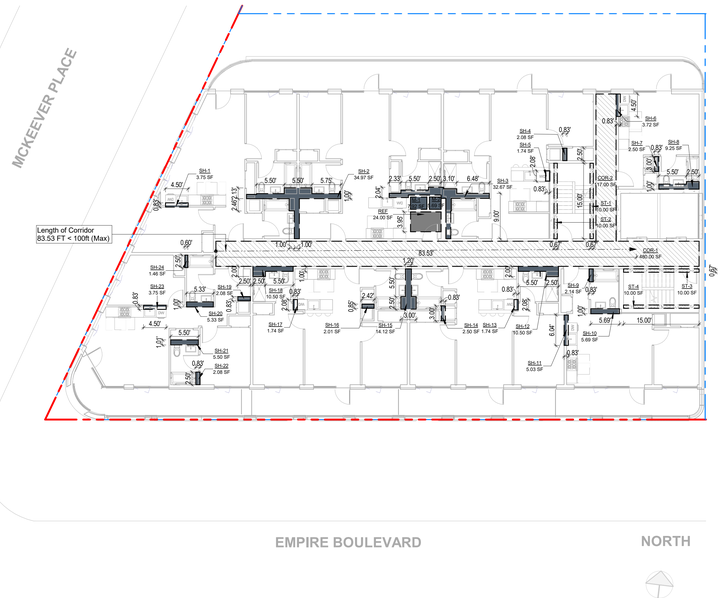
CORRIDOR DEDUCTION

REFUSE ROOM

SHAFT

STAIRS

50% Deduction
(b) Length of Corridor



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SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
FLOOR AREA DEDUCTIONS

Z-020C.00

Scale:	As indicated
Date:	12/1/2025 7:27:21 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG C - 11TH FL. FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 11TH FLOOR - BLDG C	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	397.08 SF
CORRIDOR DEDUCTION	117.00 SF
REFUSE ROOM	21.00 SF
SHAFT	7.92 SF
SHAFT	5.91 SF
SHAFT	2.25 SF
SHAFT	31.07 SF

DEDUCTIONS - 11TH FLOOR - BLDG C	
DEDUCTION	TOTAL SF
SHAFT	32.57 SF
SHAFT	1.77 SF
SHAFT	2.14 SF
SHAFT	3.72 SF
SHAFT	9.25 SF
SHAFT	2.50 SF
SHAFT	2.14 SF
SHAFT	5.69 SF
SHAFT	12.08 SF
SHAFT	1.74 SF

DEDUCTIONS - 11TH FLOOR - BLDG C	
DEDUCTION	TOTAL SF
SHAFT	22.17 SF
SHAFT	5.38 SF
SHAFT	2.50 SF
SHAFT	2.08 SF
SHAFT	3.76 SF
STAIRS	10.00 SF
STAIRS	10.00 SF
STAIRS	10.00 SF
STAIRS	10.00 SF

DEDUCTIONS LEGEND

CORRIDOR DEDUCTION

REFUSE ROOM

SHAFT

STAIRS

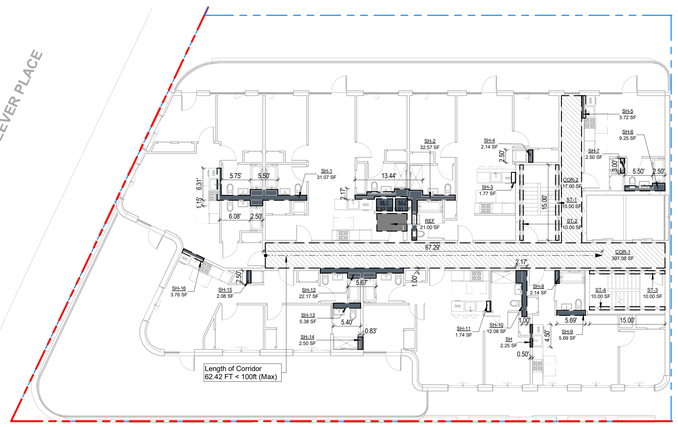
100% Deductions

a. Corridors Termination

(2) The corridor has daylighting through windows with a glazed area of at least 20 square feet, and such windows are located:

(i) Directly within the corridor;

b. Length of Corridor



2 BLDG C - 12TH - 14TH FL. FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 12TH FLOOR - BLDG C	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	397.08 SF
CORRIDOR DEDUCTION	117.00 SF
REFUSE ROOM	21.00 SF
SHAFT	7.92 SF
SHAFT	5.91 SF
SHAFT	31.07 SF
SHAFT	32.57 SF
SHAFT	2.14 SF

DEDUCTIONS - 12TH FLOOR - BLDG C	
DEDUCTION	TOTAL SF
SHAFT	1.77 SF
SHAFT	3.72 SF
SHAFT	2.50 SF
SHAFT	9.25 SF
SHAFT	2.14 SF
SHAFT	5.69 SF
SHAFT	1.74 SF
SHAFT	12.08 SF
SHAFT	22.17 SF
SHAFT	5.38 SF
SHAFT	2.50 SF

DEDUCTIONS - 12TH FLOOR - BLDG C	
DEDUCTION	TOTAL SF
SHAFT	2.08 SF
SHAFT	3.76 SF
SHAFT	2.25 SF
STAIRS	10.00 SF
STAIRS	10.00 SF
STAIRS	10.00 SF
STAIRS	10.00 SF
Grand total	731.71 SF

DEDUCTIONS LEGEND

CORRIDOR DEDUCTION

REFUSE ROOM

SHAFT

STAIRS

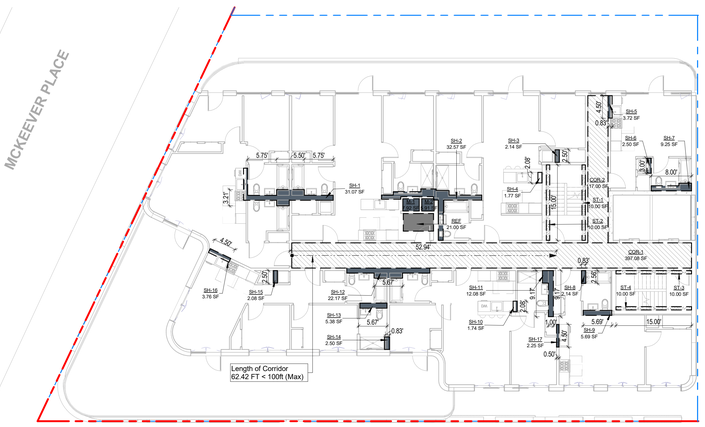
100% Deductions

a. Corridors Termination

(2) The corridor has daylighting through windows with a glazed area of at least 20 square feet, and such windows are located:

(i) Directly within the corridor;

b. Length of Corridor

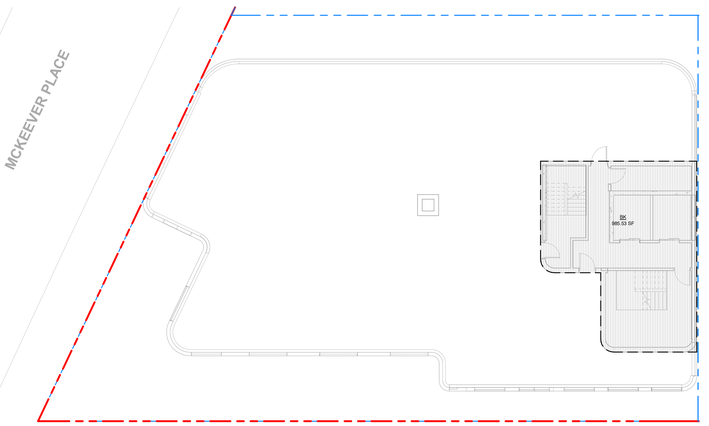


3 BLDG C - 15C_ROOF FLOOR AREA DEDUCTION
3/32" = 1'-0"

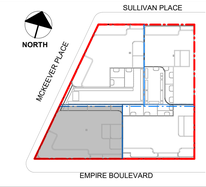
DEDUCTIONS - ROOF - BLDG C	
DEDUCTION	TOTAL SF
BULKHEAD	985.53 SF
Grand total	985.53 SF

DEDUCTIONS LEGEND

BULKHEAD



KEY PLAN
N.T.S.



BUILDING C_ TOTAL DEDUCTION BY CODE CATEGORY	
DEDUCTION	TOTAL SF
AMENITY	358.06 SF
BULKHEAD	985.53 SF
CELLAR	26873.10 SF
CORRIDOR DEDUCTION	7464.95 SF
MECHANICAL ROOM	122.94 SF
REFUSE ROOM	300.02 SF
SHAFT	2077.52 SF
STAIRS	560.00 SF
Grand total	38742.12 SF

BUILDING C _ DEDUCTION PER ZR 12-10	
DEDUCTION	TOTAL SF
BULKHEAD	985.53 SF
CELLAR	26873.10 SF
MECHANICAL ROOM	122.94 SF
SHAFT	2077.52 SF
STAIRS	560.00 SF
Grand total	30619.09 SF

BUILDING C _ DEDUCTION PER ZR 23-23	
DEDUCTION	TOTAL SF
AMENITY	358.06 SF
CORRIDOR DEDUCTION	7464.95 SF
REFUSE ROOM	300.02 SF
Grand total	8123.03 SF

BUILDING C _ ZFA AFTER ZR 12-10 DEDUCTIONS	
RESIDENTIAL GFA	113,354.82 SF
ZR 12-10 DEDUCTONS	30,619.09 SF
113,354.82 - 30,619.09	82,735.73 SF

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Date: 12/1/2025 7:27:34 PM
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ABBREVIATIONS

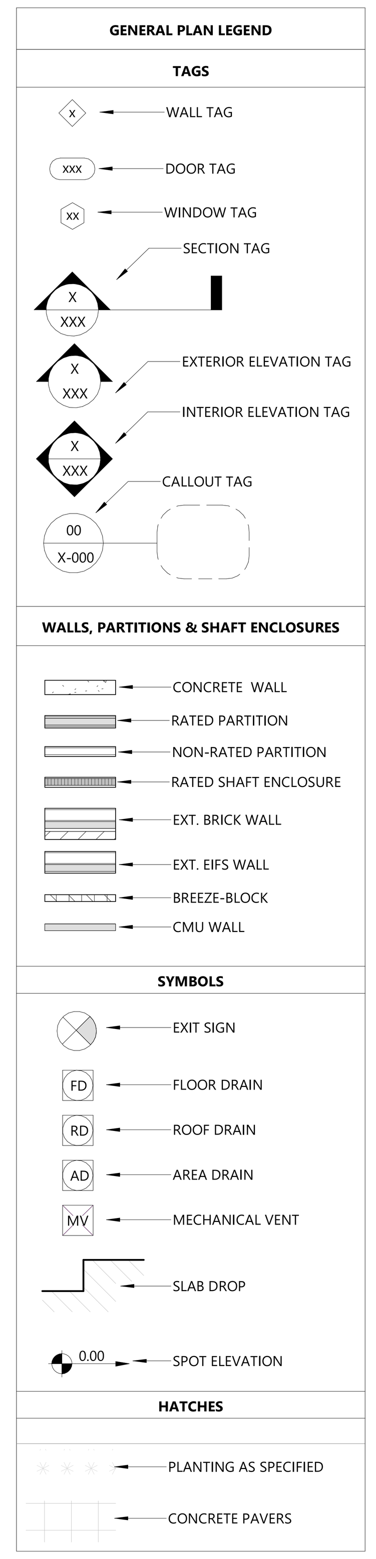
A – ARCHITECTURAL
AD – ADDITION
AL – ALUMINUM
AP – ACCESS PANEL
AT – ATTIC
AV – AIR VENT
B – BUILDING
BM – BENCH MARK
BP – BUILDING PAPER
C – CONCRETE
CA – CEILING ASSEMBLY
CB – CATCH BASIN
CD – CORRIDOR DOOR
CL – CENTER LINE
CMU – CONCRETE MASONRY UNIT
CO – CLEANOUT
CP – COLUMN PIPE
CR – CORNER
CS – COLD STORAGE
CT – CERAMIC TILE
D – DOOR
DB – DOOR BUCK
DF – DIFFUSER
DG – DRAINAGE
DL – DEAD LOAD
DN – DOWNSPOUT
DP – DOWNSPOUT
DR – DRIVEWAY
DW – DOWNSPOUT
E – ELECTRICAL
EC – ELECTRICAL CABINET
ED – EMERGENCY DOOR
EL – ELEVATION
EM – EXPANSION JOINT
EN – ENTRANCE
EP – EDGE PROTECTION
ER – EMERGENCY EXIT
ES – EXIT SIGN
ET – EGRESS
EV – EXHAUST VENT
F – FIXTURE
FA – FIRE ALARM
FB – FIRE BLANKET
FC – FLOOR COVERING
FD – FLOOR DRAIN
FE – FIRE EXTINGUISHER
FF – FINISH FLOOR
FG – FIBER GLASS
FH – FIRE HOSE
FL – FINISH LINE
FM – FIRE MARSHAL
FP – FLOOR PLAN
FS – FLOOR SYSTEM
FT – FLOOR TILE
FV – FLOOR VENT
G – GLAZING
GA – GLAZING ASSEMBLY
GB – GAS BOILER
GC – GENERAL CONTRACTOR
GD – GROUND DRAIN
GF – GRADED FILL
GG – GLASS GUARD
GH – GUARDRAIL
GI – GALVANIZED IRON
GL – GLASS
GM – GUTTER
GP – GROUND PLAN
GR – GRILLE
GS – GLASS SYSTEM
GT – GUTTER
H – HVAC
HA – HEATING AIR
HB – HEAT BARRIER
HC – HEATING COIL
HD – HEAVY DUTY
HE – HEAT EXCHANGER
HF – HIGH FINISH
HG – HEAT GRID
HI – HIGH INTENSITY
HL – HEADER
HM – HEAT MAT
HP – HIGH PRESSURE
HR – HEAT RECOVERY
HS – HEAT SHIELD
HT – HIGH TEMP
I – INTERIOR
IA – INTERIOR ASSEMBLY
IB – INSULATED BOARD
IC – INTERIOR COLUMN
ID – INTERIOR DOOR
IE – INTERIOR ELEVATION
IF – INSULATED FRAME
IG – INTERIOR GLAZING
IH – INSULATION HOLDER
II – INSULATED INTERIOR
IJ – INSULATED JOINT
IL – INTERIOR LIGHTING
IM – INTERIOR METAL
IN – INTERIOR NETTING
IO – INPUT OUTLET
IP – INTERIOR PANEL
IR – INSULATED ROOF
IS – INTERIOR STAIRS
IT – INSULATED TILE
J – JUNCTION
JA – JOINT ASSEMBLY
JB – JUNCTION BOX
JC – JOINT CONNECTION
JD – JOINT DETAIL
JE – JOINT EDGE
JF – JOINT FILLER
JG – JOINT GAP

JH – JOINT HOLDER
JI – JOINT INSULATION
JJ – JOINT JAMB
JK – JOINT KIT
JL – JOINT LINE
JM – JOINT MATERIAL
JN – JOINT NAILING
JO – JOINT OPENING
JP – JOINT PANEL
JR – JOINT REPAIR
JS – JOINT SEALANT
JT – JOINT TREATMENT
K – KITCHEN
KA – KITCHEN ASSEMBLY
KB – KITCHEN CABINET
KC – KITCHEN COUNTER
KD – KITCHEN DOOR
KE – KITCHEN EQUIPMENT
KF – KITCHEN FLOOR
KG – KITCHEN GRID
KH – KITCHEN HOOD
KI – KITCHEN ISLAND
KK – KITCHEN KIT
KL – KITCHEN LAYOUT
KM – KITCHEN MONITOR
KN – KITCHEN NOOK
KO – KITCHEN OUTLET
KP – KITCHEN PANEL
KR – KITCHEN RAIL
KS – KITCHEN SINKKT – KITCHEN TILE
L – LIGHTING
LA – LIGHTING ASSEMBLY
LB – LIGHTING BRACKET
LC – LIGHTING CONTROL
LD – LIGHTING DESIGN
LE – LIGHTING ELEVATION
LF – LIGHTING FIXTURE
LG – LIGHTING GRID
LH – LIGHTING HOLDER
LI – LIGHTING INSTALLATION
LJ – LIGHTING JUNCTION
LK – LIGHTING KIT
LL – LIGHTING LAYOUT
LM – LIGHTING MOUNT
LN – LIGHTING NICHE
LO – LIGHTING OUTLET
LP – LIGHTING PANEL
LQ – LIGHTING QUALITY
LR – LIGHTING RECESS
LS – LIGHTING SWITCH
LT – LIGHTING TYPE
M – MECHANICAL
MA – MECHANICAL ASSEMBLY
MB – MECHANICAL BOX
MC – MECHANICAL CONNECTION
MD – MECHANICAL DUCT
ME – MECHANICAL EQUIPMENT
MF – MECHANICAL FITTING
MG – MECHANICAL GRID
MH – MECHANICAL HEAT
MI – MECHANICAL INSULATION
MJ – MECHANICAL JUNCTION
MK – MECHANICAL KIT
ML – MECHANICAL LAYOUT
MM – MECHANICAL MOUNT
MN – MECHANICAL NOISE
MO – MECHANICAL OUTLET
MP – MECHANICAL PANEL
MQ – MECHANICAL QUALITY
MR – MECHANICAL RECESS
MS – MECHANICAL SUPPORT
MT – MECHANICAL TYPE
N – NORTH
NA – NORTH ARROW
NB – NORTH BOUND
NC – NORTH CORNER
NE – NORTH ELEVATION
NF – NORTH FACING
NG – NORTH GRID
NH – NORTH HEADING
NI – NORTH INDEX
NJ – NORTH JUNCTION
NK – NORTH KIT
NL – NORTH LINE
NM – NORTH MARK
NN – NORTH NODE
NO – NORTH ORIENTATION
NP – NORTH PLAN
NQ – NORTH QUALITY
NR – NORTH REFERENCE
NS – NORTH SIDE
NT – NORTH TILE
O – OPENING
OA – OPENING ASSEMBLY
OB – OPENING BRACKET
OC – OPENING CONNECTION
OD – OPENING DETAIL
OE – OPENING EDGE
OF – OPENING FRAME
OG – OPENING GLASS
OH – OPENING HEIGHT
OI – OPENING INSULATION
OJ – OPENING JOINT
OK – OPENING KIT
OL – OPENING LAYOUT
OM – OPENING MATERIAL
ON – OPENING NICHE
OP – OPENING PANEL
OQ – OPENING QUALITY
OR – OPENING REVEAL
OS – OPENING SIZE
OT – OPENING TYPE
P – PLAN
PA – PLAN ASSEMBLY

PB – PLAN BLOCK
PC – PLAN CONNECTION
PD – PLAN DETAIL
PE – PLAN ELEVATION
PF – PLAN FIXTURE
PG – PLAN GRID
PH – PLAN HEIGHT
PI – PLAN INDEX
PJ – PLAN JUNCTION
PK – PLAN KIT
PL – PLAN LAYOUT
PM – PLAN MARK
PN – PLAN NODE
PO – PLAN ORIENTATION
PP – PLAN PANEL
PQ – PLAN QUALITY
PR – PLAN REFERENCE
PS – PLAN SCALE
PT – PLAN TYPE
Q – QUANTITY
QA – QUANTITY ASSEMBLY
QB – QUANTITY BLOCK
QC – QUANTITY CONTROL
QD – QUANTITY DETAIL
QE – QUANTITY ESTIMATE
QF – QUANTITY FINISH
QG – QUANTITY GRID
QH – QUANTITY HEIGHT
QI – QUANTITY INPUT
QJ – QUANTITY JUNCTION
QK – QUANTITY KIT
QL – QUANTITY LINE
QM – QUANTITY MATERIAL
QN – QUANTITY NODE
QO – QUANTITY OUTPUT
QP – QUANTITY PANEL
QR – QUANTITY REFERENCE
QS – QUANTITY SCALE
QT – QUANTITY TREATMENT
R – ROOF
RA – ROOF ASSEMBLY
RB – ROOF BEAM
RC – ROOF CONNECTION
RD – ROOF DETAIL
RE – ROOF EDGE
RF – ROOF FINISH
RG – ROOF GRID
RH – ROOF HEIGHT
RI – ROOF INSULATION
RJ – ROOF JOINT
RK – ROOF KIT
RL – ROOF LINE
RM – ROOF MATERIAL
RN – ROOF NICHE
RO – ROOF OPENING
RP – ROOF PANEL
RQ – ROOF QUALITY
RR – ROOF REVEAL
RS – ROOF SLOPE
RT – ROOF TREATMENT
S – STRUCTURAL
SA – STRUCTURAL ASSEMBLY
SB – STRUCTURAL BEAM
SC – STRUCTURAL CONNECTION
SD – STRUCTURAL DETAIL
SE – STRUCTURAL EDGE
SF – STRUCTURAL FINISH
SG – STRUCTURAL GRID
SH – STRUCTURAL HEIGHT
SI – STRUCTURAL INSULATION
SJ – STRUCTURAL JOINT
SK – STRUCTURAL KIT
SL – STRUCTURAL LINE
SM – STRUCTURAL MATERIAL
SN – STRUCTURAL NODE
SO – STRUCTURAL OPENING
SP – STRUCTURAL PANEL
SQ – STRUCTURAL QUALITY
SR – STRUCTURAL REVEAL
SS – STRUCTURAL SUPPORT
ST – STRUCTURAL TYPE
T – TILE
TA – TILE ASSEMBLY
TB – TILE BLOCK
TC – TILE CONNECTION
TD – TILE DETAIL
TE – TILE EDGE
TF – TILE FINISH
TG – TILE GRID
TH – TILE HEIGHT
TI – TILE INSULATION
TJ – TILE JOINT
TK – TILE KIT
TL – TILE LINE
TM – TILE MATERIAL
TN – TILE NICHE
TO – TILE OPENING
TP – TILE PANEL
TQ – TILE QUALITY
TR – TILE REVEAL
TS – TILE SIZE
TT – TILE TREATMENT
U – UTILITY
UA – UTILITY ASSEMBLY
UB – UTILITY BOX
UC – UTILITY CONNECTION
UD – UTILITY DETAIL
UE – UTILITY EDGE
UF – UTILITY FIXTURE
UG – UTILITY GRID
UH – UTILITY HEIGHT
UI – UTILITY INSULATION
UJ – UTILITY JOINT
UK – UTILITY KIT

UL – UTILITY LAYOUT
UM – UTILITY MATERIAL
UN – UTILITY NODE
UO – UTILITY OUTLET
UP – UTILITY PANEL
UQ – UTILITY QUALITY
UR – UTILITY REFERENCE
US – UTILITY SIZE
UT – UTILITY TYPE
V – VENTILATION
VA – VENTILATION ASSEMBLY
VB – VENTILATION BOX
VC – VENTILATION CONNECTION
VD – VENTILATION DUCT
VE – VENTILATION EQUIPMENT
VF – VENTILATION FIXTURE
VG – VENTILATION GRID
VH – VENTILATION HEIGHT
VI – VENTILATION INSULATION
VJ – VENTILATION JOINT
VK – VENTILATION KIT
VL – VENTILATION LINE
VM – VENTILATION MATERIAL
VN – VENTILATION NICHE
VO – VENTILATION OUTLET
VP – VENTILATION PANEL
VQ – VENTILATION QUALITY
VR – VENTILATION REVEAL
VS – VENTILATION SIZE
VT – VENTILATION TYPE
W – WALL
WA – WALL ASSEMBLY
WB – WALL BRACE
WC – WALL CONNECTION
WD – WALL DETAIL
WE – WALL EDGE
WF – WALL FINISH
WG – WALL GRID
WH – WALL HEIGHT
WI – WALL INSULATION
WJ – WALL JOINT
WK – WALL KIT
WL – WALL LINE
WM – WALL MATERIAL
WN – WALL NICHE
WO – WALL OPENING
WP – WALL PANEL
WQ – WALL QUALITY
WR – WALL REVEAL
WS – WALL SUPPORT
WT – WALL TYPE
X – SECTION
XA – SECTION ASSEMBLY
XB – SECTION BLOCK
XC – SECTION CONNECTION
XD – SECTION DETAIL
XE – SECTION EDGE
XF – SECTION FINISH
XG – SECTION GRID
XH – SECTION HEIGHT
XI – SECTION INSULATION
XJ – SECTION JOINT
XK – SECTION KIT
XL – SECTION LAYOUT
XM – SECTION MATERIAL
XN – SECTION NODE
XO – SECTION OPENING
XP – SECTION PANEL
XQ – SECTION QUALITY
XR – SECTION REVEAL
XS – SECTION SUPPORT
XT – SECTION TYPE
Y – YARD
YA – YARD ASSEMBLY
YB – YARD BLOCK
YC – YARD CONNECTION
YD – YARD DRAIN
YE – YARD EDGE
YF – YARD FIXTURE
YG – YARD GRID
YH – YARD HEIGHT
YI – YARD INSULATION
YJ – YARD JOINT
YK – YARD KIT
YL – YARD LAYOUT
YM – YARD MATERIAL
YN – YARD NODE
YO – YARD OPENING
YP – YARD PANEL
YQ – YARD QUALITY
YR – YARD REVEAL
YS – YARD SUPPORT
YT – YARD TYPE
Z – ZONE
ZA – ZONE ASSEMBLY
ZB – ZONE BLOCK
ZC – ZONE CONNECTION
ZD – ZONE DETAIL
ZE – ZONE EDGE
ZF – ZONE FINISH
ZG – ZONE GRID
ZH – ZONE HEIGHT
ZI – ZONE INSULATION
ZJ – ZONE JOINT
ZK – ZONE KIT
ZL – ZONE LAYOUT
ZM – ZONE MATERIAL
ZN – ZONE NODE
ZO – ZONE OPENING
ZP – ZONE PANEL
ZQ – ZONE QUALITY
ZR – ZONE REVEAL
ZS – ZONE SUPPORT
ZT – ZONE TYPE

LEGENDS AND SYMBOLS



SPECIAL INSPECTIONS

SPECIAL INSPECTIONS CATEGORIES		
TR-1 ARCHITECTURAL SPECIAL INSPECTIONS		
SPECIAL INSPECTIONS	Code Section 2014 BC	Code Section 2022 BC
STRUCTURAL STEEL - WELDING	BC 1704.3.1	BC 1705.2.1
STRUCTURAL STEEL - DETAILS	BC 1704.3.2	BC 1705.2.2
STRUCTURAL STEEL - HIGH STRENGTH BOLTING	BC 1704.3.3	BC 1705.2.3
STRUCTURAL COLD - FORMED STEEL	BC 1704.3.4	BC 1705.2.6
OPEN-WEB STEEL JOISTS AND JOISTS GIRDERS	N/A	BC 1705.2.7
CONCRETE - CAST-IN-PLACE	BC 1704.4	BC 1705.3
CONCRETE - PRECAST	BC 1704.4	BC 1705.3
CONCRETE - PRESTRESSED	BC 1704.4	BC 1705.3
MASONRY	BC 1704.5	BC 1705.4
WOOD - INSTALLATION OF HIGH-LOAD DIAPHRAGMS	BC 1704.6.1	BC 1705.5.1
WOOD - INSTALLATION OF METAL-PLATE-CONNECTED TRUSSES	BC 1704.6.2	BC 1705.5.2
WOOD - INSTALLATION OF PREFABRICATED I-JOISTS	BC 1704.6.3	BC 1705.5.3
WOOD - SEISMIC RESISTANCE	N/A	BC 1705.5.5
CONSTRUCTION UTILIZING CLT OR SCL, TYPE IV	N/A	BC 1705.5.6
SUBGRADE INSPECTION	BC 1704.7.1	BC 1705.6
SUBSURFACE CONDITIONS - FILL PLACEMENT & IN-PLACE DENSITY	BC 1704.7.2 / 3	BC 1705.6
SUBSURFACE INVESTIGATIONS (BORINGS / TEST PITS)	BC 1704.7.4	BC 1705.6
DEEP FOUNDATION ELEMENTS	BC 1704.7.8	BC 1705.7
PRESTRESSED ROCK AND SOIL ANCHORS...	N/A	BC 1705.8.1
HELICAL PILES (BB # 2014-020)	BC 1704.8.5	BC 1705.9
VERTICAL MASONRY FOUNDATION ELEMENTS	BC 1704.9	BC 1705.19
WALL PANELS, CURTAIN WALLS, AND VENEERS	BC 1704.10	BC 1705.20
DESIGNATED SEISMIC SYSTEM	N/A	BC 1705.12.1
SEISMIC RESISTANCE OF ACCESS FLOORS	N/A	BC 1705.12.2
SEISMIC RESISTANCE OF PLUMBING, MECHANICAL, FUEL GAS & ELECTRICAL COMPONENTS	N/A	BC 1705.12.3
SEISMIC RESISTANCE OF STORAGE RACKS	N/A	BC 1705.12.4
SPRAYED FIRE-RESISTANT MATERIALS	BC 1704.11	BC 1705.14
MASTIC AND INTUMESCENT FIRE-RESISTANT COATINGS	BC 1704.12	BC 1705.15
EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS)	BC 1704.13	DELETED
ALTERNATIVE MATERIALS - OTCR BUILDINGS BULLETIN # _________	BC 1704.14	BC 1705.1.1
COMBUSTIBLE EXTERIOR WALL COVERINGS	N/A	BC 1705.16
SMOKE CONTROL SYSTEMS TESTING	BC 1704.15	BC 1705.18
MECHANICAL SYSTEMS	BC 1704.16	BC 1705.21
FUEL-OIL STORAGE AND FUEL-OIL PIPING SYSTEMS	BC 1704.17	BC 1705.22
HIGH-PRESSURE STEAM PIPING (WELDING)	BC 1704.18	BC 1705.23
HIGH TEMPERATURE HOT WATER PIPING (WELDING)	BC 1704.18	BC 1705.23
HIGH-PRESSURE FUEL-GAS PIPING (WELDING)	BC 1704.19	BC 1705.24
STRUCTURAL STABILITY - ALTERATIONS OF EXISTING BUILDINGS	BC 1704.20.1	BC 1705.25.1
CONSTRUCTION OPERATIONS INFLUENCING ADJACENT STRUCTURES	N/A	BC 1705.25.2
EXCAVATIONS - SHEETING, SHORING, AND BRACING...	BC 1704.20.2	BC 1705.25.3
UNDERPINNING AND ALTERNATE METHODS OF SUPPORT OF BUILDINGS AND & BC1817 ADJACENT...	N/A	BC 1705.25.4
UNDERPINNING	BC 1704.20.3 & BC 1814	DELETED
MECHANICAL DEMOLITION	BC 1704.20.4	BC 1705.25.5.1
RAISING AND MOVING OF A BUILDING	BC 1704.20.5	BC 1705.25.6
TENANT PROTECTION PLAN COMPLIANCE	N/A	BC 1705.26
SOIL PERCOLATION TEST - PRIVATE ON-SITE STORM WATER DRAINAGE DISPOSAL SYSTEMS, AND DETENTION FACILITIES	BC 1704.21.1.2	BC 1705.27.1.2
PRIVATE ON-SITE STORM WATER DRAINAGE DISPOSAL SYSTEMS, AND DETENTION FACILITIES INSTALLATION	BC 1704.21.2	BC 1705.27.2
INDIVIDUAL ON-SITE PRIVATE SEWAGE DISPOSAL SYSTEMS INSTALLATION	BC 1704.22	BC 1705.28
SPRINKLER SYSTEMS	BC 1704.23	BC 1705.29
STANDPIPE SYSTEMS	BC 1704.24	BC 1705.30
HEATING SYSTEMS	BC 1704.25	BC 1705.31
CHIMNEYS AND VENTS	BC 1704.26	BC 1705.32
FIRE-RESISTANT PENETRATIONS AND JOINTS	BC 1704.27	BC 1705.17
ALUMINUM WELDING	BC 1704.28	BC 1705.33
FLOOD ZONE COMPLIANCE (ATTACH FEMA ELEVATION / DRY FLOODPROOFING CERTIFICATE WHERE APPLICABLE)	BC 1704.29 & BC G105	BC 1705.34 & BC G107.2
LUMINOUS EGRESS PATH MARKINGS	BC 1704.30 & BC 1024.8	BC 1705.35 & BC 10.25.8
EMERGENCY AND STANDBY POWER SYSTEMS (GENERATORS)	BC 1704.31	BC 1705.36
POST-INSTALLED ANCHORS (BB#2014-018, 2014-019)	BC 1704.32	BC 1705.37
NON POTABLE WATER SYSTEMS	N/A	BC 1705.38
EXHAUST AND VENT SYSTEMS IN PLENUMS AND DUCTS	N/A	BC 1705.39
SEISMIC ISOLATION SYSTEMS	BC 1707.8	BC 1705.12.5
CONCRETE DESIGN MIX	BC 1905.3 & BC 1913.5	BC 1905.3
CONCRETE SAMPLING AND TESTING	BC 1905.6 & BC 1913.10	BC 1905.6
Progress Inspection Categories	**Code Section**	
PRELIMINARY	28-116.2.1 & BC 110.2	28-116.2.1 & BC 110.2
FOOTING AND FOUNDATION	BC 110.3.1	BC 110.3.1
LOWEST FLOOR ELEVATION	BC 110.3.2	BC 110.3.2
STRUCTURAL WOOD FRAME	BC 110.3.3	BC 110.3.3
FIRE-RESISTANCE RATED CONSTRUCTION	BC 110.3.4	BC 110.3.5
ENERGY CODE COMPLIANCE INSPECTIONS (TR8)	BC 110.3.5	BC 110.3.4
PUBLIC ASSEMBLY EMERGENCY LIGHTING	28-116.2.2	28-116.2.2
FINAL (TR1)	28-116.2.4.2 & BC 110.5	28-114 / 116 & BC 110.5

TR-8 ENERGY CODE PROGRESS INSPECTIONS

The conditional* TR8s listed below are conditional only if the job type is New Building or Alteration-CO New Building with Existing Elements to Remain, except HVAC TR8s that apply to all job types.

Progress Inspections	Table Reference in 1RCNY §5000-01(h) (1)and (2)	Work Type(s)
Air sealing and insulation — testing	(IA7), (IIA7)	GC* (Residential)
Air barrier — visual inspection	(IA6), (IIA6)	AN, SG, GC*, SL**, GR**
Air barrier continuity plan testing	(IIA8)	GC
Electrical motors	(IIC7), (IIC6)	GC, MS
Exterior lighting power	(IIC4)	SG, GC, MS
Fenestration air leakage	(IA4), (IIA4)	GC*
Fenestration and door U-factor and product ratings	(IA3), (IIA3)	GC*
Fenestration areas	(IA5), (IIA5)	GC*
Fireplaces	(IB1), (IIB1)	GC, MS
HVAC-R and service water piping design and insulation	(IB5), (IIB5)	PL, GC, MS, BE*
Insulation placement and R values	(IA2), (IIA2)	SG, GC*, FO, GR
Interior lighting power	(IC2), (IIC3)	GC, MS
Lighting controls	(IIC5)	SG, GC, MS
Lighting in dwelling units	(IIC2)	GC, MS
Maintenance information	(ID1), (IID1)	PL, GC, MS, BE, SL, GR**
Metering	(IC1), (IIC1)	PL, GC, MS
Permanent certificate	(ID2)	PL, GC* (Residential), MS, BE
Protection of exposed foundation insulation	(IA1), (IIA1)	GC, FO
Solar Ready Requirements	(ID3)	GC
Ventilation and air distribution system	(IB2)	MS* (Residential), GC
Vestibules	(IIA9)	GC

FIRE-RESISTANCE-RATED CONSTRUCTION

1. FIRE WALLS, FLOORS, BARRIERS, PARTITIONS, AND SHAFT ENCLOSURES SHALL COMPLY WITH PROVISIONS OF CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODEAND SHALL BE CONTINUOUS THROUGH ANY CONCEALED SPACE IN FLOOR OR ROOF CONSTRUCTION, UNLESS OTHERWISE EXEMPTED BY BC.
2. OPENINGS IN FIRE WALLS, FLOORS, BARRIERS, PARTITIONS, AND SHAFT ENCLOSURES TO COMPLY WITH CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODE.
3. PENETRATIONS IN FIRE WALLS, FLOORS, BARRIERS, PARTITIONS, AND SHAFT ENCLOSURES FOR PIPE SLEEVES, ELECTRIC DEVICES, ETC., SHALL BE PROVIDED WITH UL APPROVED FIRE SAFING MATERIALS TO MEET OR EXCEED THE FIRE RATING OF THE FIRE RATED CONDITION AND SHALL COMPLY WITH CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODE.
4. WHERE PIPES, WIRES, CONDUITS, DUCTS, ETC., PIERCE FIRE PROTECTION OF INDIVIDUALLY ENCASED STRUCTURAL MEMBERS, SUCH PENETRATION SHALL NOT EXCEED 2 PERCENT OF ANY ONE FACE SUCH PROTECTION AND SHALL BE CLOSED OFF WITH CLOSE FITTING METAL ESCUTCHEONS OR PLATES.
5. FIRE BLOCKING: CONCEALED SPACES WITHIN PARTITIONS, WALLS, FLOORS, ROOFS, STAIRS, FURRING PIPE SPACES, COLUMN ENCLOSURES, ETC., SHALL BE FIRE-BLOCKED AND DRAFT-STOPPED IN COMPLIANCE WITH CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODE(EXCEPT WHERE CONCEALED SPACE IS SPRINKLERED OR IS CONSTRUCTED AS A SHAFT).
6. CONDUITS IN FIRE-RATED PARTITIONS SHALL NOT EXCEED 3/4 INCH DIAMETER. OUTLETS IN FIRE RATED PARTITIONS SHALL BE BACKED UP WITH APPROVED MATERIALS TO MEET OR EXCEED THE REQUIRED FIRE RATING OF THE PARTITION.
7. SMOKE/FIRE DAMPERS OR DOORS SHALL BE PROVIDED WHERE DUCTS PENETRATE FIRE RATED WALLS OR CEILING.
8. GAS RISERS NOT PERMITTED WITHIN FIRE RATED WALLS.

NYC FIRE CODE 2022 SECTION 906 & NFPA 10 -FIRE PROTECTION EQUIPMENT

1. EXITS AND EXIT ACCESS DOORS SHALL BE MARKED BY AN APPROVED EXIT SIGN READILY VISIBLE FROM ANY DIRECTION OF EGRESS TRAVEL. THE PATH OF EGRESS TRAVEL TO EXITS AND WITHIN EXITS SHALL BE MARKED BY READILY VISIBLE EXIT SIGNS TO CLEARLY INDICATE THE DIRECTION OF EGRESS TRAVEL IN CASES WHERE THE EXIT OR THE PATH OF EGRESS TRAVEL IS NOT IMMEDIATELY VISIBLE TO THE OCCUPANTS.
2. EXIT SIGNS SHALL BE INTERNALLY LIGHTED, HAVING AN INITIAL BRIGHTNESS OF THE LETTERS OF AT LEAST 25 FOOT-LAMBERTS. LETTERS SHALL BE RED, THE BACKGROUND SHALL BE CLEAR OR WHITE. LETTERS SHALL BE BLOCK LETTERING, AT LEAST 8" HIGH WITH 3/4" STROKES. EXIT LIGHTING SHALL BE ON CIRCUITS THAT ARE SEPARATE FROM ANY OTHER CIRCUITS, TAKEN OFF AHEAD OF THE MAIN SWITCH.
3. EXIT DOORS SHALL BE READILY OPERABLE AT ALL TIMES FROM THE SIDE WHICH EGRESS IS TO BE MADE. DOORS MAY BE GIVEN A LOCKING FUNCTION IN THE DIRECTION OPPOSITE EGRESS TRAVEL TO PREVENT ACCESS FROM THE OUTDOORS AT STREET LEVEL.
4. PROVIDE EXIT SIGNS AND DIRECTION EXIT SIGNS WITH A MINIMUM 6" HIGH BY 3/4" STROKE BLOCK LETTERS ON A CONTRASTING BACKGROUND.
5. WHENEVER A SPACE IS OCCUPIED, EXIT SIGNS SHALL BE LIGHTED SO THEY ARE CLEARLY VISIBLE.
6. EXIT SIGNS SHALL BE ELECTRICALLY ILLUMINATED. TWO LAMPS SHALL BE ENERGIZED FROM SEPARATE CIRCUITS. ILLUMINATION SHALL NORMALLY BE PROVIDED BY THE PREMISES WIRING SYSTEM. IN THE EVENT OF FAILURE OF THIS SYSTEM, ILLUMINATION SHALL BE AUTOMATICALLY PROVIDED FROM AN EMERGENCY SYSTEM. EMERGENCY LIGHTING SHALL GIVE A VALUE OF ONE FOOT CANDLE AT FLOOR LEVEL. VERIFY IF ILLUMINATED SIGN ARE TO HAVE BATTERY BACKUP.
7. EXIT PATH LIGHTING SHALL BE PROVIDED FOR ANY STAIRWAY, HALLWAY, EXIT PASSAGEWAY OR EGRESS TO A PUBLIC WAY ANYTIME THE BUILDING IS OCCUPIED. EMERGENCY LIGHTING SHALL BE PROVIDED GIVING LIGHT VALUE OF ONE FOOT CANDLE AT THE FLOOR LEVEL.

FIRE DEPARTMENT NOTES

1. CONTRACTOR SHALL SUBMIT SPRINKLER PLANS AND OBTAIN APPROVAL PRIOR TO INSTALLATION.
2. CONTRACTOR SHALL SUBMIT FIRE ALARM PLANS AND OBTAIN APPROVAL PRIOR TO INSTALLATION.

SEISMIC STRUCTURAL SEPARATION CALCULATION

STRUCTURES SEPARATED FROM ADJACENT STRUCTURES:
AT LEAST 1" FOR EACH 50 FEET OF HEIGHT AND A MINIMUM OF 1".
PROPOSED BUILDING HEIGHT = 145.0'
NEW BUILDING STRUCTURE SEPARATION REQUIRED = 145.0'/50' = 2.9'
NEW BUILDING STRUCTURE SEPARATION PROPOSED = 3" > 2.9" (COMPLIES)

PROPOSED BUILDING SEISMIC EVALUATION

STRUCTURAL OCCUPANCY/RISK CATEGORY: II
SEISMIC DESIGN CATEGORY: B

GENERAL CODE COMPLIANCE NOTES

1. **CODE COMPLIANCE**: ALL WORK SHALL BE DONE AND PERFORMED ACCORDING TO THE RULES, REGULATIONS, AND REQUIREMENTS OF THE NYC BUILDING CODE.
2. **PROPERTY MAINTENANCE**: THE PROPERTY OWNER IS RESPONSIBLE FOR THE ONGOING SAFETY AND UPKEEP OF THE BUILDING AND ITS FACILITIES AS OUTLINED IN ARTICLES 301 THROUGH 304 OF THE NYC BUILDING CODE.
3. **NOTIFICATION**: PROVIDE WRITTEN NOTICE TO THE COMMISSIONER AT LEAST 24 BUT NO MORE THAN 48 HOURS BEFORE COMMENCING WORK (BC 3304.3.1). NOTIFY ADJOINING LOT OWNERS AFFECTED BY FOUNDATION, EARTHWORK, OR DEMOLITION WORK AT LEAST TEN DAYS PRIOR TO STARTING (BC 3304.3.2).
4. **LICENSED CONTRACTOR**: ALL CONSTRUCTION MUST BE PERFORMED BY A LICENSED CONTRACTOR. PERMITS MUST BE OBTAINED FROM THE APPROPRIATE NYC DEPARTMENT OF BUILDINGS BOROUGH OFFICE.
5. **INSURANCE AND PERMITS**: BEFORE STARTING WORK, THE CONTRACTOR MUST FILE ALL REQUIRED INSURANCE CERTIFICATES WITH THE DEPARTMENT OF BUILDINGS AND SECURE ALL NECESSARY PERMITS, LICENSES, AND FEES.
6. **WORK OVERSIGHT**: THE CONTRACTOR IS RESPONSIBLE FOR DIRECTING AND SUPERVISING THE CONSTRUCTION WORK, INCLUDING MANAGING METHODS, TECHNIQUES, SEQUENCES, AND COORDINATION AMONG TRADES.
7. **SITE FAMILIARIZATION**: THE CONTRACTOR MUST VISIT THE SITE TO ASSESS POTENTIAL CONSTRUCTION CHALLENGES.
8. **VERIFICATION OF CONDITIONS**: VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS ON-SITE BEFORE STARTING WORK. REPORT ANY DISCREPANCIES BETWEEN DRAWINGS AND ACTUAL CONDITIONS TO THE ARCHITECT.
9. **PUBLIC AND WORKER SAFETY**: ENSURE SAFETY FOR THE PUBLIC AND CONSTRUCTION WORKERS. PROVIDE BARRIERS, MAINTAIN CLEAR FIRE EXITS, AND BARRICADE ANY UNSAFE CONDITIONS.
10. **PROTECTION AND REPAIRS**: PROTECT EXISTING CONSTRUCTION AND EQUIPMENT. REPAIR OR REPLACE ANY DAMAGE CAUSED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.
11. **DEBRIS MANAGEMENT**: CLEAN UP CONSTRUCTION DEBRIS DAILY AND DISPOSE OF MATERIALS LEGALLY OFF-SITE. ON-SITE STORAGE OR BURIAL OF DEBRIS IS NOT PERMITTED.
12. **WORK LAYOUT**: LAYOUT WORK AND PROVIDE NECESSARY DIMENSIONS FOR OTHER TRADES (PLUMBING, ELECTRICAL, ETC.).
13. **SUBCONTRACTOR COMPLIANCE**: PLUMBING, ELECTRICAL, AND OTHER SUBCONTRACTOR WORK MUST BE PERFORMED BY LICENSED PROFESSIONALS AND MUST COMPLY WITH NYC CODES. SUBCONTRACTORS ARE RESPONSIBLE FOR ARRANGING INSPECTIONS AND OBTAINING SIGN-OFFS.
14. **DESIGN DEVIATIONS**: NO DEVIATIONS FROM DESIGN DRAWINGS ARE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE ARCHITECT.
15. **DIMENSIONAL ACCURACY**: CHECK AND VERIFY ALL DIMENSIONS, NOTES, AND WORK ON-SITE BEFORE STARTING. REPORT ANY DISCREPANCIES TO THE ARCHITECT AND RELY ONLY ON WRITTEN DIMENSIONS.
16. **UNSPECIFIED ITEMS**: IF DRAWINGS AND NOTES DO NOT ADDRESS SPECIFIC ITEMS, CONSULT THE GENERAL CONTRACTOR FOR GUIDANCE. INCLUDE A CONTINGENCY FACTOR TO ENSURE A COMPLETE SYSTEM IF NO CONSULTATION IS MADE.
17. **SITE REPAIRS**: REPAIR OR REPLACE ANY DAMAGED SIDEWALKS, CURBS, OR ROADWAYS AS DIRECTED BY RELEVANT NYC AGENCIES.
18. **PLAN APPROVAL**: ALL PLANS MUST BE REVIEWED, COMMENTED ON, AND APPROVED BY THE BUILDING DEPARTMENT AND OTHER CITY AGENCIES BEFORE CONSTRUCTION BEGINS.
19. **ARCHITECT'S ROLE**: THE ARCHITECT OF RECORD IS NOT RESPONSIBLE FOR SUPERVISING CONSTRUCTION. SITE VISITS AND REPORTS BY THE ARCHITECT ARE FOR PROGRESS DOCUMENTATION AND GENERAL CONTRACTOR USE ONLY.
20. **ADDITIONAL INSTRUCTIONS**: THE ARCHITECT MAY ISSUE FURTHER DRAWINGS, DETAILS, OR INSTRUCTIONS RELATED TO DESIGN VARIATIONS, OMISSIONS, OR SUBSTITUTIONS. THE CONTRACTOR MUST CORRECT ANY DEFECTS OR FAULTS AT THEIR OWN COST.
21. **CERTIFIED DRAWINGS**: ELEVATOR OPENINGS MUST BE CERTIFIED BY THE ELEVATOR SUBCONTRACTOR BEFORE FORMING. REQUIRED MODIFICATIONS MUST BE APPROVED BY THE ARCHITECT BEFORE PROCEEDING.
22. **CONSULTATION**: CONSULT THE ARCHITECT IF DIMENSIONS, DETAILS, OR DESIGN INTENT ARE UNCLEAR.
23. **COMPLIANCE**: ALL CONSTRUCTION MUST COMPLY WITH FEDERAL, STATE, AND LOCAL CODES, ORDINANCES, RULES, AND REGULATIONS REGARDING LABOR AND MATERIALS.
24. **CONTRACTOR ACCOUNTABILITY**: EACH CONTRACTOR IS RESPONSIBLE FOR THEIR WORK AND MUST REPORT DISCREPANCIES IN PLANS OR DETAILS TO THE ARCHITECT.
25. **MATERIAL STANDARDS**: MATERIALS, ASSEMBLIES, AND CONSTRUCTION METHODS MUST MEET NYC BUILDING CODE REQUIREMENTS.
26. **INSPECTION REPORTS**: MATERIALS AND METHODS REGULATED BY THE CODE BUT NOT LISTED MUST BE SUBJECT TO INSPECTION. SIGNED COPIES OF ALL TEST AND INSPECTION REPORTS MUST BE FILED THROUGH THE ARCHITECT WITH THE DEPARTMENT OF BUILDINGS.
27. **BORING DIAGRAM**: FILE A BORING DIAGRAM BEFORE STARTING CONSTRUCTION, AS PER BC 1802.
28. **PERMIT POSTING**: PERMITS MUST BE POSTED IN A VISIBLE LOCATION FOR PUBLIC INSPECTION THROUGHOUT THE DURATION OF THE WORK AND UNTIL THE PERMIT EXPIRES.
29. **FIRE FIGHTING EQUIPMENT**: PROVIDE FIRE FIGHTING EQUIPMENT AS REQUIRED BY THE FIRE DEPARTMENT.
30. **EXIT ACCESSIBILITY**: ENSURE ALL EXITS REMAIN ACCESSIBLE AND UNOBSTRUCTED, ARE INTERNALLY ILLUMINATED, AND ARE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
31. **EXIT ILLUMINATION**: MAINTAIN AT LEAST 2 FOOT CANDLES OF ILLUMINATION AT THE FLOOR LEVEL IN EXITS AT ALL TIMES.

SMOKE DETECTING DEVICES NOTES

1. **INSTALLATION STANDARDS**: SMOKE AND CARBON MONOXIDE DETECTORS MUST BE INSTALLED PER THE HOUSING MAINTENANCE CODE, MULTIPLE DWELLING LAW, NYC BUILDING CODE, AND NYC ELECTRICAL CODE.
2. **DETECTOR REQUIREMENTS**: EACH DWELLING UNIT MUST HAVE AN APPROVED CARBON MONOXIDE AND SMOKE DETECTOR DEVICE, POWERED DIRECTLY FROM THE BUILDING'S WIRING WITH NO SWITCHES IN THE CIRCUIT (BC 28-908.7.1.1).
3. **COMBINED DETECTORS**: COMBINED SMOKE AND CARBON MONOXIDE DETECTORS ARE ACCEPTABLE IF THEY MEET THE REQUIREMENTS OF THE ADMINISTRATIVE CODE AND APPLICABLE RULES.
4. **DETECTOR PLACEMENT**: INSTALL DETECTORS WITHIN 15 FEET OF SLEEPING ROOM ENTRANCES, WALL OR CEILING MOUNTED, AND INDICATED ON PLANS AS PER NFPA #78/80.
5. **MAINTENANCE AND TESTING**: MAINTAIN AND TEST CARBON MONOXIDE DETECTION SYSTEMS ACCORDING TO ARTICLE 103 OF CHAPTER 1 OF THE GENERAL ADMINISTRATIVE PROVISIONS OF THE 2014 NYC BC, INCLUDING SYSTEMS INTERCONNECTED WITH A FIRE ALARM OR MONITORED BY A CENTRAL STATION.

ACCESSIBILITY

BUILDINGS AND FACILITIES SHALL BE DESIGNED AND CONSTRUCTED TO BE ACCESSIBLE IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE 2022 NEW YORK CITY BUILDING CODE AND ICC/ANSI A117.1-2009 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES, UNIFORM FEDERAL ACCESSIBILITY STANDARDS FOR ACCESSIBLE DESIGN AND HUD FAIR HOUSING ACT PUBLISHED ON MARCH 6, 1991.

SAFETY DURING CONSTRUCTION

ALL CONSTRUCTION SHALL CONFORM TO THE RULES AND REGULATIONS OF THE 2022 NEW YORK CITY BUILDING CODE.

ENERGY NOTES

ALL BUILDING MECHANICAL, SERVICE WATER HEATING AND ELECTRICAL SYSTEMS AND ASSOCIATED CONTROLS SHALL BE COMMISSIONED, IN ACCORDANCE WITH SECTION C408 OF THE 2020 NYC ECC.

DATUM NOTE

UNLESS OTHERWISE NOTED, ELEVATIONS INDICATED IN THESE DRAWINGS REFER TO NAVD 88 DATUM

OTHER AGENCY REQUIREMENTS

GENERAL NOTES

1. THE BUILDING IS WITHIN 200 FT OF ANY FACILITY INFRASTRUCTURE OR PROPERTY UNDER THE JURISDICTION OF THE NEW YORK CITY TRANSIT AUTHORITY, THE METROPOLITAN TRANSPORTATION AUTHORITY OR THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY. THEREFORE, BC 3304.3.5 AND AC 28-104.10 ARE APPLICABLE.

GENERAL BUILDING DATA

ALL CONSTRUCTION SHALL CONFORM TO THE RULES AND REGULATIONS OF THE 2022 NEW YORK CITY BUILDING CODE.

ADDRESS:	73 EMPIRE BOULEVARD, 11225
BLOCK:	1306
TAX LOT(S):	25
ZONING LOT AREA:	38,119.00 SF
DEVELOPMENT SITE LOT AREA:	9,026.44 SF
ZONING DISTRICT:	C4-4D/R8A EQUIVALENT
ZONING MAP:	16d
NO. OF STORIES:	14 STORIES MIXED USE DEVELOPMENT (RESIDENTIAL & COMMERCIAL)
ZONING USE GROUPS:	II,VI
PRIMARY OCCUPANCY:	R-2 (MULTI-FAMILY RESIDENTIAL)
SECONDARY OCCUPANCY GROUP:	M (MERCANTILE)
PRIMARY STRUCTURAL SYSTEM:	CONCRETE (CIP)
CONSTRUCTION CLASS:	I-B
HIGH RISE BUILDING:	YES
SITE SAFETY PROJECT:	YES
FLOOD ZONE:	ZONE 'X'
LANDMARK:	NO

JOB DESCRIPTION & SCOPE OF WORK

CONSTRUCTION OF A NEW 14 STORY AFFORDABLE HOUSING BUILDING (MIH) WITH 99 UNITS, TYPE-1B CONSTRUCTION

APPLICABLE BUILDING CODE

CODE
2022 NEW YORK CITY BUILDING CODE
2022 NEW YORK CITY FIRE CODE
2022 NEW YORK CITY PLUMBING CODE
2022 NEW YORK CITY MECHANICAL CODE
2022 NEW YORK CITY FUEL GAS CODE
2022 NEW YORK CITY ENERGY CODE
2010 ADA STANDARDS
2011 NEW YORK CITY ELECTRICAL CODE
ANSI A117.1 - 2009
NYC HOUSING MAINTENANCE CODE
NYC MULTIPLE DWELLING LAW
NYC LOCAL LAW
NYC TITLE 1 RCNY
FAIR HOUSING ACT
ALL WORK IS TO COMPLY WITH CODES BELOW AND ITS APPLICBLE REFERNCE SUBCODES AND AMENDMENTS

SECTION BC 403 HIGH-RISE BUILDINGS

403.1 APPLICABILITY
HIGH-RISE BUILDINGS SHALL COMPLY WITH SECTIONS 403.2 THROUGH 403.8.

EXCEPTION: THE PROVISIONS OF SECTIONS 403.2 THROUGH 403.8 SHALL NOT APPLY TO THE FOLLOWING BUILDINGS AND STRUCTURES:

1. AIR TRAFFIC CONTROL TOWERS IN ACCORDANCE WITH SECTION 412.3.
2. BUILDINGS OCCUPIED ENTIRELY BY GROUP R-3 CLASSIFICATION.
3. OPEN PARKING GARAGES IN ACCORDANCE WITH SECTION 406.5.
4. THE PORTION OF A BUILDING CONTAINING A GROUP A-5 OCCUPANCY IN ACCORDANCE WITH SECTION 303.6.
5. SPECIAL INDUSTRIAL OCCUPANCIES IN ACCORDANCE WITH SECTION 503.1.1.
6. BUILDINGS WITH:
   6.1. A GROUP H-1 OCCUPANCY;
   6.2. A GROUP H-2 OCCUPANCY IN ACCORDANCE WITH SECTION 415.8, 415.9.2, 415.9.3 OR 426.1; OR
   6.3. A GROUP H-3 OCCUPANCY IN ACCORDANCE WITH SECTION 415.8.

403.2 CONSTRUCTION
THE CONSTRUCTION OF HIGH-RISE BUILDINGS SHALL COMPLY WITH THE PROVISIONS OF SECTIONS 403.2.1 THROUGH 403.2.4.

403.2.1 TYPES OF CONSTRUCTION
THE FOLLOWING MODIFICATIONS TO THE MINIMUM FIRE-RESISTANCE RATING OF THE BUILDING ELEMENTS IN TABLE 601 SHALL BE AS FOLLOWS:

1. HIGH RISE BUILDINGS 420 FEET (128 M) OR GREATER IN BUILDING HEIGHT SHALL BE CONSTRUCTED OF TYPE IA CONSTRUCTION.

2. FOR HIGH RISE BUILDINGS NOT GREATER THAN 420 FEET (128 M) IN BUILDING HEIGHT, AND CONSTRUCTED TO MEET THE FIRE-RESISTANCE RATING REQUIREMENTS OF TYPE IB OR IIA CONSTRUCTION, THE REQUIRED FIRE-RESISTANCE RATING OF COLUMNS SUPPORTING FLOORS SHALL BE CONSTRUCTED TO MEET TYPE IA CONSTRUCTION.

403.2.2 SEISMIC CONSIDERATIONS
FOR SEISMIC CONSIDERATIONS, SEE CHAPTER 16.

403.2.3 STRUCTURAL INTEGRITY OF INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES
FOR ALL HIGH-RISE BUILDINGS, EXIT ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES SHALL COMPLY WITH SECTIONS 403.2.3.1 THROUGH 403.2.3.4.

EXCEPTION: WHERE FIRE-RESISTANCE RATING IS NOT REQUIRED BY THIS CODE FOR THE ENCLOSURE OR PORTIONS THEREOF.

403.2.3.1 WALL ASSEMBLY
THE WALL ASSEMBLIES MAKING UP THE ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES SHALL MEET OR EXCEED SOFT BODY IMPACT CLASSIFICATION LEVEL 2 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

403.2.3.2 WALL ASSEMBLY MATERIALS
THE FACE OF THE WALL ASSEMBLIES MAKING UP THE ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES THAT ARE NOT EXPOSED TO THE INTERIOR OF THE ENCLOSURES FOR INTERIOR EXIT STAIRWAYS OR ELEVATOR HOISTWAY ENCLOSURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH ONE OF THE FOLLOWING METHODS:

1. THE WALL ASSEMBLY SHALL INCORPORATE NO FEWER THAN TWO LAYERS OF IMPACT-RESISTANT CONSTRUCTION BOARD EACH OF WHICH MEETS OR EXCEEDS HARD BODY IMPACT CLASSIFICATION LEVEL 2 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

2. THE WALL ASSEMBLY SHALL INCORPORATE NO FEWER THAN ONE LAYER OF IMPACT-RESISTANT CONSTRUCTION MATERIAL THAT MEETS OR EXCEEDS HARD BODY IMPACT CLASSIFICATION LEVEL 3 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

3. THE WALL ASSEMBLY INCORPORATES MULTIPLE LAYERS OF ANY MATERIAL, TESTED IN TANDEM, THAT MEETS OR EXCEEDS HARD BODY IMPACT CLASSIFICATION LEVEL 3 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

403.2.3.3 CONCRETE AND MASONRY WALLS
CONCRETE OR MASONRY WALLS SHALL BE DEEMED TO SATISFY THE REQUIREMENTS OF SECTIONS 403.2.3.1 AND 403.2.3.2.

403.2.3.4 OTHER WALL ASSEMBLIES
ANY OTHER WALL ASSEMBLY THAT PROVIDES IMPACT RESISTANCE EQUIVALENT TO THAT REQUIRED BY SECTIONS 403.2.3.1 AND 403.2.3.2 FOR HARD BODY IMPACT CLASSIFICATION LEVEL 3, AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M, SHALL BE PERMITTED.

403.2.4 SPRAYED FIRE-RESISTANT MATERIALS (SFRM)
THE BOND STRENGTH OF THE SFRM INSTALLED THROUGHOUT THE BUILDING SHALL BE IN ACCORDANCE WITH TABLE 403.2.4.

UP TO 420 FEET - 430 PSF
GREATER THAN 420 FEET - 1,000 PSF

FOR SI: 1 FOOT = 304.8 MM, 1 POUND PER SQUARE FOOT (PSF) = 0.0479 KW/M2.
A. ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS.

403.3 AUTOMATIC SPRINKLER SYSTEM
BUILDINGS AND STRUCTURES SHALL BE EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 AND A SECONDARY WATER SUPPLY WHERE REQUIRED BY SECTION 403.3.3.

403.3.1 NUMBER OF SPRINKLER RISERS AND SYSTEM DESIGN
EACH SPRINKLER SYSTEM ZONE IN BUILDINGS THAT ARE MORE THAN 300 FEET (91 440 MM) IN BUILDING HEIGHT SHALL BE SUPPLIED BY NO FEWER THAN TWO RISERS. EACH RISER SHALL SUPPLY SPRINKLERS ON ALTERNATE FLOORS. IF MORE THAN TWO RISERS ARE PROVIDED FOR A ZONE, SPRINKLERS ON ADJACENT FLOORS SHALL NOT BE SUPPLIED FROM THE SAME RISER.

403.3.1.1 RISER LOCATION
SPRINKLER RISERS SHALL BE PLACED IN INTERIOR EXIT STAIRWAYS AND RAMPS THAT ARE REMOTELY LOCATED IN ACCORDANCE WITH SECTION 1007.1.

403.3.2 WATER SUPPLY TO REQUIRED FIRE PUMPS
REQUIRED FIRE PUMPS SHALL BE PROVIDED WITH WATER SUPPLIES IN ACCORDANCE WITH SECTION 905.2 AND NFPA 14 AS MODIFIED BY APPENDIX Q OF THIS CODE.

403.3.3 SECONDARY ON-SITE WATER SUPPLY
A SECONDARY ON-SITE WATER SUPPLY EQUAL TO THE HYDRAULICALLY CALCULATED SPRINKLER DEMAND, INCLUDING THE HOSE STREAM REQUIREMENT, SHALL BE PROVIDED FOR HIGH-RISE BUILDINGS IN SEISMIC DESIGN CATEGORY C OR D AS DETERMINED BY THIS CODE, AND IN ANY HIGH-RISE BUILDING WITH OCCUPIED FLOORS LOCATED MORE THAN 500 FEET (152 M) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS. THE SECONDARY ON-SITE WATER SUPPLY SHALL HAVE A DURATION OF NOT LESS THAN 30 MINUTES AS DETERMINED BY THE OCCUPANCY HAZARD CLASSIFICATION IN ACCORDANCE WITH NFPA 13 AS MODIFIED BY APPENDIX Q OF THIS CODE.

403.3.4 FIRE PUMP ROOM
FIRE PUMPS SHALL BE LOCATED IN ROOMS PROTECTED IN ACCORDANCE WITH SECTION 913.2.1.

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SOUTH AMBOY, NJ 08879
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CLIENT:
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Structure Engineer:
STRUCTURAL ENGINEERING TECHONOLOGIES P.C
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MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROJECT SUMMARY & BUILDING CODE COMPLIANCE

G-001C.00

Scale:	12" = 1'-0"
Date:	12/1/2025 7:27:41 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

MEANS OF EGRESS

SECTION BC 1003 GENERAL MEANS OF EGRESS

1003.1 APPLICABILITY
THE GENERAL REQUIREMENTS SPECIFIED IN SECTIONS 1003 THROUGH 1015 SHALL APPLY TO ALL THREE ELEMENTS OF THE MEANS OF EGRESS SYSTEM, IN ADDITION TO THOSE SPECIFIC REQUIREMENTS FOR THE EXIT ACCESS, THE EXIT AND THE EXIT DISCHARGE DETAILED ELSEWHERE IN THIS CHAPTER.

1003.2 CEILING HEIGHT
THE MEANS OF EGRESS SHALL HAVE A CEILING HEIGHT OF NOT LESS THAN 7 FEET, 6 INCHES (2286 MM).
EXCEPTIONS:

1. CEILINGS THAT ARE PERMITTED TO BE LESS THAN 7 FEET, 6 INCHES (2286 MM) IN ACCORDANCE WITH SECTION 1208.2.
2. CEILINGS OF DWELLING UNITS AND SLEEPING UNITS WITHIN RESIDENTIAL OCCUPANCIES IN ACCORDANCE WITH SECTION 1208.2.
3. ALLOWABLE PROJECTIONS IN ACCORDANCE WITH SECTION 1003.3.
4. STAIR HEADROOM IN ACCORDANCE WITH SECTION 1011.3.
5. DOOR HEIGHT IN ACCORDANCE WITH SECTION 1010.1.3.
6. RAMP HEADROOM IN ACCORDANCE WITH SECTION 1012.5.2.
7. THE CLEAR HEIGHT OF FLOOR LEVELS IN VEHICULAR AND PEDESTRIAN TRAFFIC AREAS OF PUBLIC AND PRIVATE PARKING GARAGES IN ACCORDANCE WITH SECTION 406.4.1.
8. AREAS ABOVE AND BELOW MEZZANINE FLOORS IN ACCORDANCE WITH SECTION 505.2.

1003.3 PROTRUDING OBJECTS
PROTRUDING OBJECTS ON CIRCULATION PATHS SHALL COMPLY WITH THE REQUIREMENTS OF SECTIONS 1003.3.1 THROUGH 1003.3.4.

1003.3.3 HORIZONTAL PROJECTIONS
EXCEPTION: HANDRAILS ARE PERMITTED TO PROTRUDE 41/2 INCHES (114.3 MM) FROM THE WALL.

1003.4 FLOOR SURFACE
WALKING SURFACES OF THE MEANS OF EGRESS SHALL HAVE A SLIP-RESISTANT SURFACE AND BE SECURELY ATTACHED.

1003.5 ELEVATION CHANGE
WHERE CHANGES IN ELEVATION OF LESS THAN 12 INCHES (304.8 MM) EXIST IN THE MEANS OF EGRESS, SLOPED SURFACES SHALL BE USED. WHERE THE SLOPE IS GREATER THAN ONE UNIT VERTICAL IN 20 UNITS HORIZONTAL (5-PERCENT SLOPE), RAMPS COMPLYING WITH SECTION 1012 SHALL BE USED. WHERE THE DIFFERENCE IN ELEVATION IS 6 INCHES (152.4 MM) OR LESS, THE RAMP SHALL BE EQUIPPED WITH HANDRAILS OR FLOOR FINISH MATERIALS THAT CONTRAST WITH ADJACENT FLOOR FINISH MATERIALS.
EXCEPTIONS: AT LOCATIONS THAT ARE NOT REQUIRED TO BE ACCESSIBLE BY CHAPTER 11:

1. A SINGLE STEP WITH A MAXIMUM RISER HEIGHT OF 7 INCHES (177.8 MM) IS PERMITTED FOR BUILDINGS WITH OCCUPANCIES IN GROUPS F, H, R-2, R-3, S AND U AT EXTERIOR DOORS.
2. A STEP WITH A SINGLE RISER OR A STAIR WITH TWO RISERS AND A TREAD IS PERMITTED WHERE THE RISERS AND TREADS COMPLY WITH SECTION 1011.5, THE MINIMUM DEPTH OF THE TREAD IS 13 INCHES (330 MM) AND NOT LESS THAN ONE HANDRAIL COMPLYING WITH SECTION 1014 IS PROVIDED WITHIN 30 INCHES (762 MM) OF THE CENTERLINE OF THE NORMAL PATH OF EGRESS TRAVEL ON THE STEP OR STAIR.
3. A STEP IS PERMITTED IN AISLES SERVING SEATING THAT HAS A DIFFERENCE IN ELEVATION LESS THAN 12 INCHES (304.8 MM) PROVIDED THAT THE RISERS AND TREADS COMPLY WITH SECTION 1029.13 AND THE AISLE IS PROVIDED WITH A HANDRAIL COMPLYING WITH SECTION 1029.15.
4. THROUGHOUT A STORY IN A GROUP I-2 OCCUPANCY, ANY CHANGE IN ELEVATION IN PORTIONS OF THE MEANS OF EGRESS THAT SERVE NONAMBULATORY PERSONS SHALL BE BY MEANS OF A RAMP OR SLOPED WALKWAY.

1003.6 MEANS OF EGRESS CONTINUITY
THE PATH OF EGRESS TRAVEL ALONG A MEANS OF EGRESS SHALL NOT BE INTERRUPTED BY A BUILDING ELEMENT OTHER THAN A MEANS OF EGRESS COMPONENT AS SPECIFIED IN THIS CHAPTER. OBSTRUCTIONS SHALL NOT BE PLACED IN THE MINIMUM WIDTH OR REQUIRED CAPACITY OF A MEANS OF EGRESS COMPONENT EXCEPT PROJECTIONS PERMITTED BY THIS CHAPTER. THE MINIMUM WIDTH OR REQUIRED CAPACITY OF A MEANS OF EGRESS SYSTEM SHALL NOT BE DIMINISHED ALONG THE PATH OF EGRESS TRAVEL.

1003.7 ELEVATORS, ESCALATORS AND MOVING WALKS
ELEVATORS, ESCALATORS AND MOVING WALKS SHALL NOT BE USED AS A COMPONENT OF A REQUIRED MEANS OF EGRESS FROM ANY OTHER PART OF THE BUILDING.

SECTION BC 1004 OCCUPANT LOAD

1004.1 DESIGN OCCUPANT LOAD
IN DETERMINING MEANS OF EGRESS REQUIREMENTS, THE NUMBER OF OCCUPANTS FOR WHOM MEANS OF EGRESS FACILITIES SHALL BE PROVIDED SHALL BE ESTABLISHED BY THE LARGEST NUMBER COMPUTED IN ACCORDANCE WITH SECTION 1004.1.3, UNLESS OTHERWISE PERMITTED BY SECTION 1004.1.3.1, 1004.1.3.2 OR 1004.2.

TABLE 1004.1.3 MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR
ACCESSORY STORAGE AREAS, MECHANICAL EQUIPMENT ROOM	300 GROSS
AGRICULTURAL BUILDING	300 GROSS
AIRCRAFT HANGARS	500 GROSS
ASSEMBLY	
GAMING FLOORS (KENO, SLOTS, ETC.)	11 GROSS
EXHIBIT GALLERY AND MUSEUM	30 NET
ASSEMBLY WITH FIXED SEATS	SEE SECTION 1004.3
ASSEMBLY WITHOUT FIXED SEATS	
CONCENTRATED (CHAIRS ONLY—NOT FIXED)	7 NET
DANCE FLOOR	5 NET
DANCE FLOOR (BALLROOM)	10 NET
STANDING SPACE	5 NET
UNCONCENTRATED (TABLES AND CHAIRS)	15 NET
BOWLING CENTERS, ALLOW 5 PERSONS FOR EACH LANE INCLUDING 15 FEET OF RUNWAY, AND FOR ADDITIONAL AREAS	7 NET
BUSINESS AREAS, INCLUDING ACCESSORY AREAS ON TERRACES AND ROOFTOPS	100 GROSSb, d
COURTROOMS — OTHER THAN FIXED SEATING AREAS	40 NET
DAY CARE:	
AGE UNDER 6 MONTHS	50 NET
AGE 6 MONTHS — 2 YEARS	40 NET
AGE 2 YEARS — 6 YEARS	30 NET
AGE ABOVE 6 YEARS	50 NET
DORMITORIES	50 GROSS
EDUCATIONAL	
CLASSROOM AREA	20 NET
SHOPS AND OTHER VOCATIONAL ROOM AREAS	50 NET
KINDERGARTEN, AND PRE-KINDERGARTEN	30 NET
EXERCISE ROOMS	50 GROSS
GYMNASIUMS	15 NET
GROUP H-5 FABRICATION AND MANUFACTURING AREAS	200 GROSS
INDUSTRIAL AREAS	100 GROSS
INSTITUTIONAL AREAS	
INPATIENT TREATMENT AREAS	240 GROSS
OUTPATIENT AREAS	100 GROSS
SLEEPING AREAS	120 GROSS
KITCHENS, COMMERCIAL	200 GROSS
LIBRARY	
READING ROOMS	50 NET
STACK AREA	100 GROSS
LOCKER ROOMS	50 GROSS
MALL BUILDINGS - COVERED AND OPEN	SEE SECTION 402.8.2
MERCANTILE	
AREAS ON OTHER FLOORS	60 GROSS
BASEMENT AND GRADE FLOOR AREAS	30 GROSS
STORAGE, STOCK, SHIPPING AREAS	300 GROSS
PARKING GARAGES	200 GROSS
PASSENGER TERMINAL	
BAGGAGE CLAIM	20 GROSS
BAGGAGE HANDLING	300 GROSS
CONCOURSE	100 GROSS
PASSENGER TERMINAL OR PLATFORM	1.5 X C*
WAITING AREA (STANDING)	15 GROSS
WAITING AREAS (SEATED)	5 NET
RESIDENTIAL	
WITHIN DWELLING UNITS	200 GROSS
ROOFTOP AND TERRACE ACCESSORY TO GROUPS R-2 AND R-3	200 GROSSb, c, d
INDOOR RESIDENTIAL AMENITY SPACES ACCESSORY TO GROUP R-2 (CONCENTRATED)	15 NET
INDOOR RESIDENTIAL AMENITY SPACES ACCESSORY TO GROUP R-2 (UNCONCENTRATED)	50 NET
SKATING RINKS, SWIMMING POOLS	
RINK AND POOL	50 GROSS
DECKS	15 GROSS
STAGES AND PLATFORMS	15 NET FOR PERFORMING AREA AND 50 NET REMAINING AREA
WAREHOUSES	500 GROSS

Assembly Code

C*-CAPACITY OF ALL PASSENGER VEHICLES THAT CAN BE UNLOADED SIMULTANEOUSLY.
FOR SI: 1 SQUARE FOOT = 0.0929 M2, 1 FOOT = 304.8 MM.*

a. FLOOR AREA IN SQUARE FEET PER OCCUPANT.
b. FOR THE PURPOSES OF OCCUPANT LOAD CALCULATION, PERMANENT FIXTURES AND AMENITIES SUCH AS SHRUBS, DECORATIVE POOLS, NON-WALKABLE PAVING SURFACES, ETC. MAY BE DEDUCTED FROM THE TOTAL FLOOR AREA.
c. A ROOFTOP OR TERRACE IN GROUP R-2 OR R-3 OCCUPANCIES THAT IS PROVIDED FOR THE INCIDENTAL, RECREATIONAL USE BY THE RESIDENTIAL TENANTS RESIDING IN THE SAME RESIDENTIAL BUILDING.
d. WHERE THE MAXIMUM OCCUPANT LOAD OF THE ROOFTOP OR TERRACE EXCEEDS 74 PERSONS BASED ON OCCUPANT LOAD CALCULATIONS, A PLACE OF ASSEMBLY CERTIFICATE OF OPERATION IS REQUIRED PURSUANT TO SECTION 28-117.1 OF THE ADMINISTRATIVE CODE AND ITEM 1 OF SECTION 303.7 OF THIS CODE.
e. TO BE USED ONLY WHEN THE OCCUPANT LOAD FOR THE FUNCTION OF THE SPACE IS NOT LISTED ELSEWHERE IN TABLE 1004.1.3.

SECTION BC 1005 MEANS OF EGRESS SIZING

1005.1 GENERAL
ALL PORTIONS OF THE MEANS OF EGRESS SYSTEM SHALL BE SIZED IN ACCORDANCE WITH THIS SECTION.
1005.2 MINIMUM WIDTH BASED ON COMPONENT
THE MINIMUM WIDTH, IN INCHES (MM), OF ANY MEANS OF EGRESS COMPONENTS SHALL BE NOT LESS THAN THAT SPECIFIED FOR SUCH COMPONENT, ELSEWHERE IN THIS CODE.
1005.3 REQUIRED CAPACITY BASED ON OCCUPANT LOAD
THE REQUIRED CAPACITY, IN INCHES (MM), OF THE MEANS OF EGRESS FOR ANY ROOM, AREA, SPACE OR STORY SHALL BE NOT LESS THAN THAT DETERMINED IN ACCORDANCE WITH SECTIONS 1005.3.1 AND 1005.3.2.
1005.3.1 STAIRWAYS
THE CAPACITY, IN INCHES, OF MEANS OF EGRESS STAIRWAYS SHALL BE CALCULATED BY MULTIPLYING THE OCCUPANT LOAD SERVED BY SUCH STAIRWAYS BY A MEANS OF EGRESS CAPACITY FACTOR OF 0.3 INCH (7.6 MM) PER OCCUPANT. WHERE STAIRWAYS SERVE MORE THAN ONE STORY, ONLY THE OCCUPANT LOAD OF EACH STORY CONSIDERED INDIVIDUALLY SHALL BE USED IN CALCULATING THE REQUIRED CAPACITY OF THE STAIRWAYS SERVING THAT STORY.
EXCEPTIONS:

1. FACILITIES WITH SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO USE THE CAPACITY FACTORS IN TABLE 1029.6.2 INDICATED FOR STEPPED AISLES FOR EXIT ACCESS OR EXIT STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS PROVIDED WITH A SMOKE CONTROL SYSTEM COMPLYING WITH SECTION 909.
2. FACILITIES WITH OUTDOOR SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO THE CAPACITY FACTORS IN SECTION 1029.6.3 INDICATED FOR STEPPED AISLES FOR EXIT ACCESS OR EXIT STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS OPEN TO THE OUTDOORS.

1005.3.2 OTHER EGRESS COMPONENTS
THE CAPACITY, IN INCHES, OF MEANS OF EGRESS COMPONENTS OTHER THAN STAIRWAYS SHALL BE CALCULATED BY MULTIPLYING THE OCCUPANT LOAD SERVED BY SUCH COMPONENT BY A MEANS OF EGRESS CAPACITY FACTOR OF 0.2 INCH (5.1 MM) PER OCCUPANT.
EXCEPTIONS:

1. FACILITIES WITH SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO USE THE CAPACITY FACTORS IN TABLE 1029.6.2 INDICATED FOR LEVEL OR RAMPED AISLES FOR MEANS OF EGRESS COMPONENTS OTHER THAN STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS PROVIDED WITH A SMOKE CONTROL SYSTEM COMPLYING WITH SECTION 909.
2. FACILITIES WITH OUTDOOR SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO THE CAPACITY FACTORS IN SECTION 1029.6.3 INDICATED FOR LEVEL OR RAMPED AISLES FOR MEANS OF EGRESS COMPONENTS OTHER THAN STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS OPEN TO THE OUTDOORS.

1005.4 CONTINUITY
THE MINIMUM WIDTH OR REQUIRED CAPACITY OF THE MEANS OF EGRESS REQUIRED FROM ANY STORY OF A BUILDING SHALL NOT BE REDUCED ALONG THE PATH OF EGRESS TRAVEL UNTIL ARRIVAL AT THE PUBLIC WAY.

1005.5 DISTRIBUTION OF MINIMUM WIDTH AND REQUIRED CAPACITY
WHERE MORE THAN ONE EXIT, OR ACCESS TO MORE THAN ONE EXIT, IS REQUIRED, THE MEANS OF EGRESS SHALL BE CONFIGURED SUCH THAT THE LOSS OF ANY ONE EXIT, OR ACCESS TO ONE EXIT, SHALL NOT REDUCE THE AVAILABLE CAPACITY OR WIDTH TO LESS THAN 50 PERCENT OF THE REQUIRED CAPACITY OR WIDTH.

1005.6 EGRESS CONVERGENCE
WHERE THE MEANS OF EGRESS FROM STORIES ABOVE AND BELOW CONVERGE AT AN INTERMEDIATE LEVEL, THE CAPACITY OF THE MEANS OF EGRESS FROM THE POINT OF CONVERGENCE SHALL BE NOT LESS THAN THE LARGEST MINIMUM WIDTH OR THE SUM OF THE REQUIRED CAPACITIES FOR THE STAIRWAYS OR RAMPS SERVING THE TWO ADJACENT STORIES, WHICHEVER IS LARGER.

1005.7 ENCROACHMENT
ENCROACHMENTS INTO THE REQUIRED MEANS OF EGRESS WIDTH SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THIS SECTION.

1005.7.1 DOORS
DOORS, WHEN FULLY OPENED, SHALL NOT REDUCE THE REQUIRED WIDTH BY MORE THAN 7 INCHES (177.8 MM). DOORS IN ANY POSITION SHALL NOT REDUCE THE REQUIRED WIDTH BY MORE THAN ONE-HALF.
EXCEPTIONS:

1. SURFACE-MOUNTED LATCH RELEASE HARDWARE SHALL BE EXEMPT FROM INCLUSION IN THE 7-INCH (177.8 MM) MAXIMUM ENCROACHMENT WHERE BOTH OF THE FOLLOWING CONDITIONS EXIST:
   1. THE HARDWARE IS MOUNTED TO THE SIDE OF THE DOOR FACING AWAY FROM THE ADJACENT WALL WHERE THE DOOR IS IN THE OPEN POSITION.
   2. THE HARDWARE IS MOUNTED NOT LESS THAN 34 INCHES (865 MM) NOR MORE THAN 48 INCHES (1220 MM) ABOVE THE FINISHED FLOOR.
2. THE RESTRICTIONS ON DOOR SWING SHALL NOT APPLY TO DOORS WITHIN INDIVIDUAL DWELLING UNITS AND SLEEPING UNITS OF GROUP R-2 OCCUPANCIES AND WITHIN INDIVIDUAL DWELLING UNITS OF GROUP R-3 OCCUPANCIES.

1005.7.2 OTHER PROJECTIONS
HANDRAIL PROJECTIONS SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1014.8. OTHER NONSTRUCTURAL PROJECTIONS SUCH AS TRIM AND SIMILAR DECORATIVE FEATURES SHALL BE PERMITTED TO PROJECT INTO THE REQUIRED WIDTH NOT MORE THAN 11/2 INCHES (38.1 MM) ON EACH SIDE.
EXCEPTION: PROJECTIONS ARE PERMITTED IN CORRIDORS WITHIN GROUP I-2 IN ACCORDANCE WITH SECTION 407.4.3.

1005.7.3 PROTRUDING OBJECTS
PROTRUDING OBJECTS SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF SECTION 1003.3.

SECTION BC 1006 NUMBER OF EXITS AND EXIT ACCESS DOORWAYS

1006.2 EGRESS FROM SPACES
ROOMS, AREAS OR SPACES, INCLUDING MEZZANINES, WITHIN A STORY OR BASEMENT SHALL BE PROVIDED WITH THE NUMBER OF EXITS OR ACCESS TO EXITS IN ACCORDANCE WITH THIS SECTION.

SECTION BC 1006 NUMBER OF EXITS AND EXIT ACCESS DOORWAYS

1006.2 EGRESS FROM SPACES
ROOMS, AREAS OR SPACES, INCLUDING MEZZANINES, WITHIN A STORY OR BASEMENT SHALL BE PROVIDED WITH THE NUMBER OF EXITS OR ACCESS TO EXITS IN ACCORDANCE WITH THIS SECTION.

TABLE 1006.2.1 SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Sprinkler System (feet)		With Sprinkler System (feet)
		Occupant Load		
		OL ≤ 30	OL > 30	
Ac, Ef, M	74	76	75	75a
B	74	100	75	100a
F	49	75	75	100a
H-1, H-2, H-3	3	NP	NP	25b
H-4b, H-5b, I-1, I-3, I-4	10	NP	NP	75a
I-2d	See Section 407	NP	NP	75a
R-1	20	NP	NP	75a
R-2	20g	NP	NP	125a
S	29	100	75e	100a
U	74	100	75	75a

Assembly Code

FOR SI: 1 FOOT = 304.8 MM.
NP = NOT PERMITTED.

a. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2. SEE SECTION 903 FOR OCCUPANCIES WHERE AUTOMATIC SPRINKLER SYSTEMS ARE PERMITTED IN ACCORDANCE WITH SECTION 903.3.1.2.
b. GROUP H OCCUPANCIES EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.2.5.
c. FOR A ROOM OR SPACE USED FOR ASSEMBLY PURPOSES HAVING FIXED SEATING, SEE SECTION 1029.8.
d. FOR THE TRAVEL DISTANCE LIMITATIONS IN GROUP I-2, SEE SECTION 407.4.
e. THE LENGTH OF COMMON PATH OF EGRESS TRAVEL DISTANCE IN A GROUP S-2 OPEN PARKING GARAGE SHALL BE NOT MORE THAN 100 FEET (30 480 MM).
f. DAY CARE MAXIMUM OCCUPANT LOAD IS 10.
g. ROOMS, AREAS, OR SPACES THAT ARE ACCESSORY TO A GROUP R-2 OCCUPANCY MAY HAVE A MAXIMUM OCCUPANT LOAD OF 49.

1006.3.1 EGRESS BASED ON OCCUPANT LOAD
EACH STORY OR OCCUPIED ROOF DESIGNED FOR HUMAN OCCUPANCY OR USE SHALL HAVE THE MINIMUM NUMBER OF EXITS, OR ACCESS TO EXITS, AS SPECIFIED IN TABLE 1006.3.1. A SINGLE EXIT OR ACCESS TO A SINGLE EXIT SHALL BE PERMITTED IN ACCORDANCE WITH SECTION 1006.3.2. THE REQUIRED NUMBER OF EXITS, OR EXIT ACCESS STAIRWAYS OR RAMPS PROVIDING ACCESS TO EXITS, FROM ANY SUCH STORY OR OCCUPIED ROOF SHALL BE MAINTAINED UNTIL ARRIVAL AT THE EXIT DISCHARGE OR A PUBLIC WAY.

TABLE 1006.3.1
MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS PER STORY

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

Assembly Code

1006.3.2 SINGLE EXITS
A SINGLE EXIT OR ACCESS TO A SINGLE EXIT SHALL BE PERMITTED FROM ANY STORY OR OCCUPIED ROOF DESIGNED FOR HUMAN OCCUPANCY OR USE WHERE ONE OF THE FOLLOWING CONDITIONS EXISTS:

1. THE OCCUPANT LOAD, NUMBER OF DWELLING UNITS AND EXIT ACCESS TRAVEL DISTANCE DO NOT EXCEED THE VALUES IN TABLE 1006.3.2.
2. ROOMS, AREAS AND SPACES COMPLYING WITH SECTION 1006.2.1 WITH EXITS THAT DISCHARGE DIRECTLY TO THE EXTERIOR AT THE LEVEL OF EXIT DISCHARGE ARE PERMITTED TO HAVE ONE EXIT OR ACCESS TO A SINGLE EXIT.
3. OPEN OR ENCLOSED PARKING GARAGES WHERE VEHICLES ARE MECHANICALLY PARKED SHALL BE PERMITTED TO HAVE ONE EXIT PROVIDED SUCH EXIT SHALL NOT BE A VEHICLE RAMP.
4. GROUP R-3 OCCUPANCIES SHALL BE PERMITTED TO HAVE ONE EXIT OR ACCESS TO A SINGLE EXIT.
5. INDIVIDUAL SINGLE-STORY OR MULTISTORY DWELLING UNITS SHALL BE PERMITTED TO HAVE A SINGLE EXIT OR ACCESS TO A SINGLE EXIT FROM THE DWELLING UNIT PROVIDED THAT BOTH OF THE FOLLOWING CRITERIA ARE MET:
   1. THE DWELLING UNIT COMPLIES WITH SECTION 1006.2.1 AS A SPACE WITH ONE MEANS OF EGRESS.
   2. EITHER THE EXIT FROM THE DWELLING UNIT DISCHARGES DIRECTLY TO THE EXTERIOR AT THE LEVEL OF EXIT DISCHARGE, OR THE EXIT ACCESS OUTSIDE THE DWELLING UNIT'S ENTRANCE DOOR PROVIDES ACCESS TO NOT LESS THAN TWO APPROVED INDEPENDENT EXITS.
6. BUILDINGS OF OCCUPANCY GROUP R-2 WHERE ALL OF THE FOLLOWING CONDITIONS ARE MET:
   1. THE BUILDING DOES NOT EXCEED FOUR STORIES;
   2. THE BUILDING CONTAINS NOT MORE THAN THREE DWELLING UNITS PER STORY;
   3. THE BUILDING IS OF CONSTRUCTION TYPE I OR II;
   4. THE BUILDING DOES NOT EXCEED 2,500 SQUARE FEET (232.3 M2) PER STORY;
   5. EACH DWELLING UNIT HAS AT LEAST ONE WINDOW FACING THE STREET, OR FACING A LAWFUL YARD WITH OPEN, UNOBSTRUCTED, AND DIRECT ACCESS TO THE STREET. SUCH YARD OR DIRECT ACCESS SHALL BE A MINIMUM WIDTH EQUAL TO 25 PERCENT OF THE VERTICAL DISTANCE FROM THE WINDOWSILL OF THE HIGHEST OPERABLE WINDOW, FACING SUCH YARD OR DIRECT ACCESS, TO THE GRADE OF SUCH YARD OR DIRECT ACCESS DIRECTLY BELOW SUCH WINDOW, BUT SHALL IN NO CASE BE LESS THAN 36 INCHES (914.4 MM) WIDE;
   6. THE STAIRWAY EXTENDS TO THE ROOF SURFACE THROUGH A STAIRWAY BULKHEAD COMPLYING WITH SECTION 1509.2, PROVIDED THE ROOF HAS A SLOPE NOT STEEPER THAN 20 DEGREES (0.35 RAD), OR THE STAIRWAY IS CONSTRUCTED AGAINST THE STREET WALL, WITH ONE WINDOW FACING THE STREET AT EACH LANDING AND ACCESS TO THE ROOF IS PROVIDED VIA A SCUTTLE WITH A STATIONARY, NONCOMBUSTIBLE ACCESS LADDER;
   7. THE STAIRWAY IS ENCLOSED IN 2-HOUR FIRE-RATED WALLS WITH ALL EXIT DOORS LEADING INTO THE STAIRWAY HAVING AT LEAST 11/2-HOUR FIRE RATING; AND
   8. THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.2.
7. BUILDINGS OF OCCUPANCY GROUP R-2 OF CONSTRUCTION TYPE I OR II NOT EXCEEDING SIX STORIES AND NOT EXCEEDING 2,000 SQUARE FEET (185.8 M2) PER STORY.

TABLE 1006.3.2
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT

STORY	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER FLOOR	MAXIMUM TRAVEL DISTANCE (feet)
FIRST STORY ABOVE GRADE PLANE OR CELLAR	A, Bb, Ec, Fb, M, U, Sb	49	75
	H-2, H-3	3	25
	H-4, H-5, I, Re	10	75
	Sa	29	100
SECOND STORY ABOVE GRADE PLANE	B, F, M, Sa	29	75
	R-2d,e	NA	50
THIRD STORY ABOVE GRADE PLANE	R-2d,e	NA	50

Assembly Code

FOR SI: 1 FOOT = 304.8 MM.
NP = NOT PERMITTED.
NA = NOT APPLICABLE.

a. FOR THE REQUIRED NUMBER OF EXITS FOR OPEN OR ENCLOSED PARKING GARAGES, SEE SECTION 1006.3.2, ITEM 3.
b. GROUP B, F AND S OCCUPANCIES IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 SHALL HAVE A MAXIMUM TRAVEL DISTANCE OF 100 FEET.
c. DAY CARE OCCUPANCIES SHALL HAVE A MAXIMUM OCCUPANT LOAD OF 10.
d. MAXIMUM FOUR DWELLING UNITS PER FLOOR.
e. BUILDINGS CLASSIFIED AS OCCUPANCY GROUP R-2 EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2 AND PROVIDED WITH EMERGENCY ESCAPE AND RESCUE OPENINGS IN ACCORDANCE WITH SECTION 1030.
f. LIMITED TO THE CELLAR CLOSEST TO GRADE PLANE.

1006.3.2.1 MIXED OCCUPANCIES
WHERE ONE EXIT, OR EXIT ACCESS STAIRWAY OR RAMP PROVIDING ACCESS TO EXITS AT OTHER STORIES, IS PERMITTED TO SERVE INDIVIDUAL STORIES, MIXED OCCUPANCIES SHALL BE PERMITTED TO BE SERVED BY SINGLE EXITS PROVIDED EACH INDIVIDUAL OCCUPANCY COMPLIES WITH THE APPLICABLE REQUIREMENTS OF TABLE 1006.3.2 FOR THAT OCCUPANCY. WHERE APPLICABLE, CUMULATIVE OCCUPANT LOADS FROM ADJACENT OCCUPANCIES SHALL BE CONSIDERED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1004.1. IN EACH STORY OF A MIXED OCCUPANCY BUILDING, THE MAXIMUM NUMBER OF OCCUPANTS SERVED BY A SINGLE EXIT SHALL BE SUCH THAT THE SUM OF THE RATIOS OF THE CALCULATED NUMBER OF OCCUPANTS OF THE SPACE DIVIDED BY THE ALLOWABLE NUMBER OF OCCUPANTS INDICATED IN TABLE 1006.3.2 FOR EACH OCCUPANCY DOES NOT EXCEED ONE. WHERE DWELLING UNITS ARE LOCATED ON A STORY WITH OTHER OCCUPANCIES, THE ACTUAL NUMBER OF DWELLING UNITS DIVIDED BY FOUR PLUS THE RATIO FROM THE OTHER OCCUPANCY DOES NOT EXCEED ONE.

1006.4 OPEN OR ENCLOSED PARKING GARAGES
OPEN OR ENCLOSED PARKING GARAGES SHALL NOT HAVE LESS THAN TWO EXITS FROM EACH PARKING TIER. AN UNENCLOSED VEHICLE RAMP CONSTRUCTED IN ACCORDANCE WITH SECTION 1012.1 MAY SERVE AS ONE OF THE REQUIRED EXITS WHEN PROVIDED WITH PEDESTRIAN FACILITIES ALONG THE RAMP. SUCH RAMPS SERVING AS PART OF A NONASSESSABLE MEANS OF EGRESS IN OPEN OR ENCLOSED PARKING GARAGES THREE STORIES OR LESS IN HEIGHT AND SERVING NOT MORE THAN ONE LEVEL BELOW GRADE IS PERMITTED TO COMPLY WITH SECTION 1012.2, EXCEPTION 2.
EXCEPTION: ONE EXIT SHALL BE PERMITTED IN PARKING GARAGES COMPLYING WITH ITEM 3 OF SECTION 1006.3.2.

SECTION BC 1007 EXIT AND EXIT ACCESS DOORWAY CONFIGURATION

1007.1 GENERAL
EXITS, EXIT ACCESS DOORWAYS, AND EXIT ACCESS STAIRWAYS AND RAMPS SERVING SPACES, INCLUDING INDIVIDUAL BUILDING STORIES, SHALL BE SEPARATED IN ACCORDANCE WITH THE PROVISIONS OF THIS SECTION.

1007.1.1 TWO EXITS OR EXIT ACCESS DOORWAYS
ASSEMBLY
WHERE TWO EXITS, EXIT ACCESS DOORWAYS, EXIT ACCESS STAIRWAYS OR RAMPS, OR ANY COMBINATION THEREOF, ARE REQUIRED FROM ANY PORTION OF THE EXIT ACCESS, THEY SHALL BE PLACED A DISTANCE APART EQUAL TO NOT LESS THAN ONE-HALF OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE BUILDING OR AREA TO BE SERVED MEASURED IN A STRAIGHT LINE BETWEEN THEM. STAIRS SHARING ANY COMMON WALL, FLOOR, CEILING, SCISSOR STAIR ASSEMBLY, OR OTHER ENCLOSURE SHALL BE COUNTED AS ONE EXIT STAIRWAY.

EXCEPTIONS:

1. CORRIDOR MEASUREMENTS. WHERE INTERIOR EXIT STAIRWAYS OR RAMPS ARE INTERCONNECTED BY A 1-HOUR FIRE-RESISTANCE-RATED CORRIDOR CONFORMING TO THE REQUIREMENTS OF SECTION 1020, THE REQUIRED EXIT SEPARATION SHALL BE MEASURED ALONG THE SHORTEST DIRECT LINE OF TRAVEL WITHIN THE CORRIDOR.
2. REMOTE LOCATION IN SPRINKLERED BUILDINGS. WHERE A BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2, THE SEPARATION DISTANCE SHALL BE NOT LESS THAN ONE-THIRD OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE AREA SERVED.
3. GROUP R-2 OCCUPANCIES. IN GROUP R-2 OCCUPANCIES, WHERE STAIRS ARE ENCLOSED IN WALLS HAVING AT LEAST A 2-HOUR FIRE RESISTANCE RATING AND CONSTRUCTED OF MASONRY OR MASONRY EQUIVALENT IN ACCORDANCE WITH DEPARTMENT RULES:
   A. THE EXIT DOORS TO SUCH STAIRS SHALL BE PLACED A DISTANCE APART EQUAL TO NO LESS THAN 15 FEET (4572 MM); AND
   B. SUCH STAIRS SHALL BE PERMITTED TO SHARE COMMON WALLS, FLOORS, CEILINGS OR SCISSOR STAIRS ASSEMBLIES OR OTHER ENCLOSURES PROVIDED THAT THE CONSTRUCTION SEPARATING THE STAIRS IS ALSO OF AT LEAST A 2-HOUR FIRE-RESISTANCE RATING AND CONSTRUCTED OF MASONRY OR MASONRY EQUIVALENT IN ACCORDANCE WITH DEPARTMENT RULES.
   C. THE EXIT DOORS TO SUCH STAIRS SHALL BE PLACED A DISTANCE APART EQUAL TO NO LESS THAN 15 FEET (4572 MM); AND
   D. SUCH STAIRS SHALL BE PERMITTED TO SHARE COMMON WALLS, FLOORS, CEILINGS OR SCISSOR STAIRS ASSEMBLIES.

1007.1.1.1 MEASUREMENT POINT
THE SEPARATION DISTANCE REQUIRED IN SECTION 1007.1.1 SHALL BE MEASURED IN ACCORDANCE WITH THE FOLLOWING:

1. THE SEPARATION DISTANCE TO EXIT OR EXIT ACCESS DOORWAYS SHALL BE MEASURED TO THE CENTER POINT OF THE REQUIRED DOORWAY.
2. THE SEPARATION DISTANCE TO EXIT ACCESS STAIRWAYS SHALL BE MEASURED TO THE CENTER POINT OF THE CLOSEST RISER.
3. THE SEPARATION DISTANCE TO EXIT ACCESS RAMPS SHALL BE MEASURED TO THE CENTER POINT OF THE START OF THE RAMP RUN.

1007.1.2 THREE OR MORE EXITS OR EXIT ACCESS DOORWAYS
WHERE ACCESS TO THREE OR MORE EXITS IS REQUIRED, NOT LESS THAN TWO EXIT OR EXIT ACCESS DOORWAYS SHALL BE ARRANGED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1007.1.1. ADDITIONAL REQUIRED EXIT OR EXIT ACCESS DOORWAYS SHALL BE ARRANGED A REASONABLE DISTANCE APART SO THAT IF ONE BECOMES BLOCKED, THE OTHERS WILL BE AVAILABLE.

1007.1.3 REMOTENESS OF EXIT ACCESS STAIRWAYS OR RAMPS
WHERE TWO EXIT ACCESS STAIRWAYS OR RAMPS PROVIDE THE REQUIRED MEANS OF EGRESS TO EXITS AT ANOTHER STORY, THE REQUIRED SEPARATION DISTANCE SHALL BE MAINTAINED FOR ALL PORTIONS OF SUCH EXIT ACCESS STAIRWAYS OR RAMPS..

SECTION BC 1016 EXIT ACCESS

1016.1 GENERAL
THE EXIT ACCESS SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF SECTIONS 1003 THROUGH 1015. EXIT ACCESS ARRANGEMENT SHALL COMPLY WITH SECTIONS 1016 THROUGH 1021.
1016.2 EGRESS THROUGH INTERVENING SPACES
EGRESS THROUGH INTERVENING SPACES SHALL COMPLY WITH THIS SECTION.

1. EXIT ACCESS THROUGH AN ENCLOSED ELEVATOR LOBBY IS PERMITTED. ACCESS TO NOT LESS THAN ONE OF THE REQUIRED EXITS SHALL BE PROVIDED WITHOUT TRAVEL THROUGH THE ENCLOSED ELEVATOR LOBBIES REQUIRED BY SECTION 3006. WHERE THE PATH OF EXIT ACCESS TRAVEL PASSES THROUGH AN ENCLOSED ELEVATOR LOBBY, THE LEVEL OF PROTECTION REQUIRED FOR THE ENCLOSED ELEVATOR LOBBY IS NOT REQUIRED TO BE EXTENDED TO THE EXIT UNLESS DIRECT ACCESS TO AN EXIT IS REQUIRED BY OTHER SECTIONS OF THIS CODE.
2. EGRESS FROM A ROOM OR SPACE SHALL NOT PASS THROUGH ADJOINING OR INTERVENING ROOMS OR AREAS, EXCEPT WHERE SUCH ADJOINING ROOMS OR AREAS AND THE AREA SERVED ARE ACCESSORY TO ONE OR THE OTHER, ARE NOT A GROUP H OCCUPANCY AND PROVIDE A DISCERNIBLE PATH OF EGRESS TRAVEL TO AN EXIT.
   EXCEPTION: MEANS OF EGRESS ARE NOT PROHIBITED THROUGH ADJOINING OR INTERVENING ROOMS OR SPACES IN A GROUP H, S OR F OCCUPANCY WHERE THE ADJOINING OR INTERVENING ROOMS OR SPACES ARE THE SAME OR A LESSER HAZARD OCCUPANCY GROUP.
3. AN EXIT ACCESS SHALL NOT PASS THROUGH A ROOM THAT CAN BE LOCKED TO PREVENT EGRESS.
4. MEANS OF EGRESS FROM DWELLING UNITS OR SLEEPING AREAS SHALL NOT LEAD THROUGH OTHER SLEEPING AREAS, TOILET ROOMS OR BATHROOMS.
5. EGRESS SHALL NOT PASS THROUGH KITCHENS, STORAGE ROOMS, CLOSETS OR SPACES USED FOR SIMILAR PURPOSES.
   EXCEPTIONS:
6. MEANS OF EGRESS ARE NOT PROHIBITED THROUGH A KITCHEN AREA SERVING ADJOINING ROOMS CONSTITUTING PART OF THE SAME DWELLING UNIT OR SLEEPING UNIT.
7. MEANS OF EGRESS ARE NOT PROHIBITED THROUGH STOCKROOMS IN GROUP M WHERE ALL OF THE FOLLOWING ARE MET:
   1. THE STOCK IS OF THE SAME HAZARD CLASSIFICATION AS THAT FOUND IN THE MAIN RETAIL AREA.
   2. NOT MORE THAN 50 PERCENT OF THE EXIT ACCESS IS THROUGH THE STOCKROOM.
   3. THE STOCKROOM IS NOT SUBJECT TO LOCKING FROM THE EGRESS SIDE.
   4. THERE IS A DEMARCATED, MINIMUM 44-INCH (1117.6 MM) WIDE AISLE DEFINED BY FULL- OR PARTIAL-HEIGHT FIXED WALLS OR SIMILAR CONSTRUCTION THAT WILL MAINTAIN THE REQUIRED WIDTH AND LEAD DIRECTLY FROM THE RETAIL AREA TO THE EXIT WITHOUT OBSTRUCTIONS.

1016.2.1 MULTIPLE TENANTS
WHERE MORE THAN ONE TENANT OCCUPIES ANY ONE FLOOR OF A BUILDING OR STRUCTURE, EACH TENANT SPACE, DWELLING UNIT AND SLEEPING UNIT SHALL BE PROVIDED WITH ACCESS TO THE REQUIRED EXITS WITHOUT PASSING THROUGH ADJACENT TENANT SPACES, DWELLING UNITS AND SLEEPING UNITS.
EXCEPTION: THE MEANS OF EGRESS FROM A SMALLER TENANT SPACE SHALL NOT BE PROHIBITED FROM PASSING THROUGH A LARGER ADJOINING TENANT SPACE WHERE THE FOLLOWING CONDITIONS ARE MET:

1. SUCH ROOMS OR SPACES OF THE SMALLER TENANT OCCUPY LESS THAN 10 PERCENT OF THE AREA OF THE LARGER TENANT SPACE THROUGH WHICH THEY PASS;
2. THE LARGER TENANT IS A GROUP M OCCUPANCY AND THE SMALLER TENANT SPACE IS OF THE SAME OR SIMILAR OCCUPANCY GROUP;
3. A DISCERNIBLE PATH OF EGRESS TRAVEL IS PROVIDED FROM THE SMALLER TENANT SPACE TO AN EXIT;
4. THE MEANS OF EGRESS INTO THE ADJOINING SPACE IS NOT SUBJECT TO LOCKING FROM THE EGRESS SIDE OF THE SMALLER TENANT SPACE; AND
5. THE SMALLER TENANT SPACE SERVES THE SAME OCCUPANTS, CUSTOMERS, OR PATRONS AS THE LARGER TENANT SPACE.

1016.3 INTERVENING PUBLIC HALL IN GROUP R-2 OCCUPANCIES
BUILDINGS IN OCCUPANCY GROUP R-2 SHALL COMPLY WITH THE INTERVENING PUBLIC HALL REQUIREMENTS IN ACCORDANCE WITH SECTIONS 1016.3.1 AND 1016.3.2.
1016.3.1 GROUP R-2 NONHIGH-RISE OCCUPANCIES
IN BUILDINGS IN OCCUPANCY GROUP R-2 NOT SUBJECT TO SECTION 403, A DOOR FROM A DWELLING UNIT SHALL OPEN INTO AN INTERVENING PUBLIC HALL. SUCH PUBLIC HALL SHALL BE CONSTRUCTED AS A PUBLIC CORRIDOR IN ACCORDANCE WITH SECTION 1020. OPENING PROTECTIVES IN ACCORDANCE WITH EXCEPTION 3 OF SECTION 707.6 SHALL NOT BE PERMITTED.
EXCEPTIONS:

1. NO INTERVENING PUBLIC HALL SHALL BE REQUIRED FOR ANY OF THE FOLLOWING:
2. A BUILDING THAT IS BOTH THREE STORIES OR LESS IN HEIGHT, AND CONTAINS TWO OR FEWER DWELLING UNITS PER STORY; OR
3. A BUILDING THAT COMPLIES WITH ITEM 6 OF SECTION 1006.3.2.
4. NO INTERVENING PUBLIC HALL SHALL BE REQUIRED WHERE THE DOORS OPENING TO THE APARTMENTS ARE SMOKE AND DRAFT CONTROLLED DOORS COMPLYING WITH UL 1784 WITHOUT ARTIFICIAL BOTTOM SEALS, IN ACCORDANCE WITH SECTIONS 716.5 AND 716.5.7.3 OF THIS CODE, AND THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1 OF THIS CODE. THIS EXCEPTION SHALL NOT APPLY TO ANY BUILDING THAT COMPLIES WITH ITEM 7 OF SECTION 1006.3.2 OF THIS CODE WHERE THERE IS MORE THAN ONE APARTMENT PER STORY.

1016.3.2 GROUP R-2 HIGH-RISE OCCUPANCIES
IN HIGH-RISE BUILDINGS IN OCCUPANCY GROUP R-2, ALL DOORS FROM A DWELLING UNIT SHALL OPEN INTO AN INTERVENING PUBLIC HALL. SUCH PUBLIC HALL SHALL BE CONSTRUCTED AS A PUBLIC CORRIDOR IN ACCORDANCE WITH SECTION 1020. OPENING PROTECTIVES IN ACCORDANCE WITH EXCEPTION 3 OF SECTION 707.6 SHALL NOT BE PERMITTED. SUCH PUBLIC HALL SHALL PROVIDE ACCESS TO AT LEAST TWO EXITS.
EXCEPTION: WHERE THE ONLY DWELLING UNITS ON A STORY OF A BUILDING ARE THE UPPER STORIES OF MULTISTORY (DUPLEX) DWELLING UNITS;

1. ANY PUBLIC HALLS SHALL BE PERMITTED TO PROVIDE ACCESS TO ONLY ONE EXIT; OR
2. NO SUCH PUBLIC HALL SHALL BE REQUIRED WHERE SMOKE AND DRAFT CONTROLLED DOORS COMPLYING WITH UL 1784 WITHOUT ARTIFICIAL BOTTOM SEALS, IN ACCORDANCE WITH SECTIONS 716.5 AND 716.5.7.3 OF THIS CODE, ARE PROVIDED. THIS EXCEPTION SHALL NOT BE CONSTRUED TO EFFECT, ALTER, OR CHANGE ANY REQUIREMENT OF THIS CODE TO PROVIDE TWO MEANS OF EGRESS FROM EACH APARTMENT ON EACH STORY.

SECTION BC 1017 EXIT ACCESS TRAVEL DISTANCE

1017.1 GENERAL
TRAVEL DISTANCE WITHIN THE EXIT ACCESS PORTION OF THE MEANS OF EGRESS SYSTEM SHALL BE IN ACCORDANCE WITH THIS SECTION.

1017.2 LIMITATIONS
EXIT ACCESS TRAVEL DISTANCE SHALL NOT EXCEED THE VALUES GIVEN IN TABLE 1017.2.

TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCEa

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A	See Section 1029.7	
E, F-1, M, R, S-1	150	200b
B	200	300c
F-2, S-2, U	200	250c
H-1	Not Permitted	75d
H-2	Not Permitted	100d
H-3	Not Permitted	150d
H-4	Not Permitted	175d
H-5	Not Permitted	200c
I-1, I-2, I-3, I-4	Not Permitted	200c

FOR SI: 1 FOOT = 304.8 MM. Assembly Code

a. SEE THE FOLLOWING SECTIONS FOR MODIFICATIONS TO EXIT ACCESS TRAVEL DISTANCE REQUIREMENTS:
   SECTION 402.8: FOR THE DISTANCE LIMITATION IN MALLS.
   SECTION 404.9: FOR THE DISTANCE LIMITATION THROUGH AN ATRIUM SPACE.
   SECTION 407.4: FOR THE DISTANCE LIMITATION IN GROUP I-2.
   SECTIONS 408.6.1 AND 408.8.1: FOR THE DISTANCE LIMITATIONS IN GROUP I-3.
   SECTION 411.4: FOR THE DISTANCE LIMITATION IN SPECIAL AMUSEMENT BUILDINGS.
   SECTION 412.7: FOR THE DISTANCE LIMITATIONS IN AIRCRAFT MANUFACTURING FACILITIES.
   SECTION 407.4.2: FOR THE DISTANCE LIMITATION IN GROUP I-2 HOSPITAL SUITES.
   SECTION 1006.2.2.2: FOR THE DISTANCE LIMITATION IN REFRIGERATION MACHINERY ROOMS.
   SECTION 1006.2.2.3: FOR THE DISTANCE LIMITATION IN REFRIGERATED ROOMS AND SPACES.
   SECTION 1006.3.2: FOR BUILDINGS WITH ONE EXIT.
   SECTION 1029.7: FOR INCREASED LIMITATION IN ASSEMBLY SEATING.
   SECTION 3103.4: FOR TEMPORARY STRUCTURES.
   SECTION 3104.9: FOR PEDESTRIAN WALKWAYS.
b. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2. SEE SECTION 903 FOR OCCUPANCIES WHERE SPRINKLER SYSTEMS ARE PERMITTED IN ACCORDANCE WITH SECTION 903.3.1.2.
c. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1.
   GROUP H OCCUPANCIES EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.2.5.1.

1017.2.1 EXTERIOR EGRESS BALCONY INCREASE
EXIT ACCESS TRAVEL DISTANCES SPECIFIED IN TABLE 1017.2 SHALL BE INCREASED UP TO AN ADDITIONAL 100 FEET (30 480 MM) PROVIDED THE LAST PORTION OF THE EXIT ACCESS LEADING TO THE EXIT OCCURS ON AN EXTERIOR EGRESS BALCONY CONSTRUCTED IN ACCORDANCE WITH SECTION 1021. THE LENGTH OF SUCH BALCONY SHALL BE NOT LESS THAN THE AMOUNT OF THE INCREASE TAKEN.

1017.3 MEASUREMENT
EXIT ACCESS TRAVEL DISTANCE SHALL BE MEASURED FROM THE MOST REMOTE POINT WITHIN A STORY ALONG THE NATURAL AND UNOBSTRUCTED PATH OF HORIZONTAL AND VERTICAL EGRESS TRAVEL TO THE ENTRANCE TO AN EXIT.
EXCEPTIONS:

1. IN OPEN PARKING GARAGES, EXIT ACCESS TRAVEL DISTANCE IS PERMITTED TO BE MEASURED TO THE CLOSEST RISER OF AN EXIT ACCESS STAIRWAY OR THE CLOSEST SLOPE OF AN EXIT ACCESS RAMP.
2. IN BUILDINGS OF GROUP A-5 WITH OPEN-AIR SEATING SERVED BY EXIT ACCESS STAIRWAYS AND RAMPS, EXIT ACCESS TRAVEL DISTANCE IS PERMITTED TO BE MEASURED TO THE CLOSEST RISER OF AN EXIT ACCESS STAIRWAY OR THE CLOSEST SLOPE OF AN EXIT ACCESS RAMP.
3. EXIT ACCESS TRAVEL DISTANCE IN ASSEMBLY OCCUPANCIES SHALL BE MEASURED IN ACCORDANCE WITH SECTION 1029.

1017.3.1 EXIT ACCESS STAIRWAYS AND RAMPS
TRAVEL DISTANCE ON EXIT ACCESS STAIRWAYS OR RAMPS SHALL BE INCLUDED IN THE EXIT ACCESS TRAVEL DISTANCE MEASUREMENT. THE MEASUREMENT ALONG STAIRWAYS SHALL BE MADE ON A PLANE PARALLEL AND TANGENT TO THE STAIR TREAD NOSINGS IN THE CENTER OF THE STAIR AND LANDINGS. THE MEASUREMENT ALONG RAMPS SHALL BE MADE ON THE WALKING SURFACE IN THE CENTER OF THE RAMP AND LANDINGS.

SECTION BC 1018 AISLES

1018.1 GENERAL
AISLES AND AISLE ACCESSWAYS SERVING AS A PORTION OF THE EXIT ACCESS IN THE MEANS OF EGRESS SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION. AISLES OR AISLE ACCESSWAYS SHALL BE PROVIDED FROM ALL OCCUPIED PORTIONS OF THE EXIT ACCESS THAT CONTAIN SEATS, TABLES, FURNISHINGS, DISPLAYS AND SIMILAR FIXTURES OR EQUIPMENT. THE MINIMUM WIDTH OR REQUIRED CAPACITY OF AISLES SHALL BE UNOBSTRUCTED.
EXCEPTION: ENCROACHMENTS COMPLYING WITH SECTION 1005.7.
1018.2 AISLES IN ASSEMBLY SPACES
AISLES AND AISLE ACCESSWAYS SERVING A ROOM OR SPACE USED FOR ASSEMBLY PURPOSES SHALL COMPLY WITH SECTION 1029.

1018.3 AISLES IN GROUPS B AND M
IN GROUP B AND M OCCUPANCIES, THE MINIMUM CLEAR AISLE WIDTH SHALL BE DETERMINED BY SECTION 1005 FOR THE OCCUPANT LOAD SERVED, BUT SHALL BE NOT LESS THAN 36 INCHES (914.4 MM).
EXCEPTION: NONPUBLIC AISLES SERVING LESS THAN 50 PEOPLE AND NOT REQUIRED TO BE ACCESSIBLE BY CHAPTER 11 NEED NOT EXCEED 28 INCHES (711.2 MM) IN WIDTH.

1018.4 AISLE ACCESSWAYS IN GROUP M
AN AISLE ACCESSWAY SHALL BE PROVIDED ON NOT LESS THAN ONE SIDE OF EACH ELEMENT WITHIN THE MERCHANDISE PAD. THE MINIMUM CLEAR WIDTH FOR AN AISLE ACCESSWAY NOT REQUIRED TO BE ACCESSIBLE SHALL BE 30 INCHES (762 MM). THE REQUIRED CLEAR WIDTH OF THE AISLE ACCESSWAY SHALL BE MEASURED PERPENDICULAR TO THE ELEMENTS AND MERCHANDISE WITHIN THE MERCHANDISE PAD. THE 30-INCH (762 MM) MINIMUM CLEAR WIDTH SHALL BE MAINTAINED TO PROVIDE A PATH TO AN ADJACENT AISLE OR AISLE ACCESSWAY. THE COMMON PATH OF EGRESS TRAVEL SHALL NOT EXCEED 30 FEET (9144 MM) FROM ANY POINT IN THE MERCHANDISE PAD.
EXCEPTION: FOR AREAS SERVING NOT MORE THAN 50 OCCUPANTS, THE COMMON PATH OF EGRESS TRAVEL SHALL NOT EXCEED 75 FEET (22 860 MM).

SECTION BC 1019 EXIT ACCESS STAIRWAYS AND RAMPS

1019.1 GENERAL
EXIT ACCESS STAIRWAYS AND RAMPS SERVING AS AN EXIT ACCESS COMPONENT IN A MEANS OF EGRESS SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION. THE NUMBER OF STORIES CONNECTED BY EXIT ACCESS STAIRWAYS AND RAMPS SHALL INCLUDE BASEMENTS, BUT NOT MEZZANINES.

1019.2 ALL OCCUPANCIES
EXIT ACCESS STAIRWAYS AND RAMPS THAT SERVE FLOOR LEVELS WITHIN A SINGLE STORY ARE NOT REQUIRED TO BE ENCLOSED.

1019.3 OCCUPANCIES OTHER THAN GROUPS H, I-2 AND I-3
IN OTHER THAN GROUP H, I-2 AND I-3 OCCUPANCIES, EXIT ACCESS STAIRWAYS OR RAMPS SHALL BE ENCLOSED WITH A SHAFT ENCLOSURE CONSTRUCTED IN ACCORDANCE WITH SECTION 713.
EXCEPTION: IN OTHER THAN GROUP H, I-2 AND I-3 OCCUPANCIES, EXIT ACCESS STAIRWAYS OR RAMPS THAT COMPLY WITH ONE OF THE FOLLOWING CONDITIONS NEED NOT BE ENCLOSED:

1. A MAXIMUM OF 50 PERCENT OF THE EXIT ACCESS STAIRWAYS AND RAMPS THAT SERVE ONLY TWO CONSECUTIVE STORIES NEED NOT BE ENCLOSED, PROVIDED EACH SUCH INTERCONNECTED STORY HAS ACCESS TO THE MINIMUM NUMBER OF APPROVED INDEPENDENT EXITS AS REQUIRED BY SECTION 1006, AND IN NO CASE BE LESS THAN TWO MEANS OF EGRESS. SUCH INTERCONNECTED STORIES SHALL NOT BE OPEN TO OTHER STORIES. UNENCLOSED EXIT ACCESS STAIRWAYS AND RAMPS SHALL BE REMOTELY LOCATED IN ACCORDANCE WITH SECTION 1007.
2. IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, EXIT ACCESS STAIRWAYS AND RAMPS THAT SERVE BETWEEN ONLY THE FIRST AND SECOND STORIES ABOVE GRADE, PROVIDED THE FIRST AND SECOND STORIES HAVE ACCESS TO THE MINIMUM NUMBER OF APPROVED INDEPENDENT EXITS AS REQUIRED BY SECTION 1006, AND IN NO CASE BE LESS THAN TWO MEANS OF EGRESS. SUCH INTERCONNECTED STORIES SHALL NOT BE OPEN TO OTHER STORIES. UNENCLOSED EXIT ACCESS STAIRWAYS AND RAMPS SHALL BE REMOTELY LOCATED IN ACCORDANCE WITH SECTION 1007.
3. IN GROUP R-1, R-2 OR R-3 OCCUPANCIES THAT ARE FULLY SPRINKLERED IN ACCORDANCE WITH SECTION 903.3.1.1, 903.3.1.2 OR 903.3.1.3, EXIT ACCESS STAIRWAYS AND RAMPS CONNECTING FOUR STORIES OR LESS AND CONTAINED WITHIN AN INDIVIDUAL RESIDENTIAL DWELLING UNIT.
4. EXIT ACCESS STAIRWAYS AND RAMPS IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, WHERE THE AREA OF THE VERTICAL OPENING BETWEEN STORIES DOES NOT EXCEED TWICE THE HORIZONTAL PROJECTED AREA OF THE STAIRWAY OR RAMP AND THE OPENING IS PROTECTED BY A DRAFT CURTAIN AND CLOSELY SPACED SPRINKLERS IN ACCORDANCE WITH NFPA 13 AS MODIFIED BY APPENDIX Q. IN OTHER THAN GROUP B AND M OCCUPANCIES, THIS PROVISION IS LIMITED TO OPENINGS THAT DO NOT CONNECT MORE THAN FOUR STORIES.
5. EXIT ACCESS STAIRWAYS AND RAMPS WITHIN AN ATRIUM COMPLYING WITH THE PROVISIONS OF SECTION 404.
6. EXIT ACCESS STAIRWAYS AND RAMPS IN OPEN PARKING GARAGES THAT SERVE ONLY THE PARKING GARAGE.
7. EXIT ACCESS STAIRWAYS AND RAMPS SERVING OPEN-AIR SEATING IN BUILDINGS OF GROUP A-5, WHERE ALL PORTIONS OF THE MEANS OF EGRESS ARE ESSENTIALLY OPEN TO THE OUTSIDE.
8. EXIT ACCESS STAIRWAYS AND RAMPS SERVING THE BALCONY, GALLERY OR PRESS BOX AND THE MAIN ASSEMBLY FLOOR IN OCCUPANCIES SUCH AS THEATERS, PLACES OF RELIGIOUS WORSHIP, AUDITORIUMS AND SPORTS FACILITIES.

1019.4 GROUP I-2 AND I-3 OCCUPANCIES
IN GROUP I-2 AND I-3 OCCUPANCIES, FLOOR OPENINGS BETWEEN STORIES CONTAINING EXIT ACCESS STAIRWAYS OR RAMPS ARE REQUIRED TO BE ENCLOSED WITH A SHAFT ENCLOSURE CONSTRUCTED IN ACCORDANCE WITH SECTION 713.
EXCEPTION: IN GROUP I-3 OCCUPANCIES, EXIT ACCESS STAIRWAYS OR RAMPS CONSTRUCTED IN ACCORDANCE WITH SECTION 408 ARE NOT REQUIRED TO BE ENCLOSED.

SECTION BC 1020 CORRIDORS

1020.1 CONSTRUCTION
CORRIDORS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THIS SECTION. INTERIOR CORRIDOR WALLS REQUIRED TO BE FIRE-RESISTANCE RATED SHALL COMPLY WITH SECTION 708 FOR FIRE PARTITIONS. PUBLIC CORRIDOR WALLS SHALL COMPLY WITH SECTION 707 FOR FIRE BARRIERS.

1020.1.1 INTERIOR CORRIDORS
INTERIOR CORRIDORS SHALL BE FIRE-RESISTANCE RATED IN ACCORDANCE WITH TABLE 1020.1.1.
EXCEPTIONS:

1. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS IN AN OCCUPANCY IN GROUP E WHERE EACH ROOM THAT IS USED FOR INSTRUCTION HAS NOT LESS THAN ONE DOOR OPENING DIRECTLY TO THE EXTERIOR AND ROOMS FOR ASSEMBLY PURPOSES HAVE NOT LESS THAN ONE-HALF OF THE REQUIRED MEANS OF EGRESS DOORS OPENING DIRECTLY TO THE EXTERIOR. EXTERIOR DOORS SPECIFIED IN THIS EXCEPTION ARE REQUIRED TO BE AT GROUND LEVEL.
2. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS CONTAINED WITHIN A DWELLING UNIT OR SLEEPING UNIT IN AN OCCUPANCY IN GROUP R.
3. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS IN OPEN PARKING GARAGES.
4. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS IN AN OCCUPANCY IN GROUP B THAT IS A SPACE REQUIRING ONLY A SINGLE MEANS OF EGRESS COMPLYING WITH SECTION 1006.2.
5. CORRIDORS ADJACENT TO THE EXTERIOR WALLS OF BUILDINGS SHALL BE PERMITTED TO HAVE UNPROTECTED OPENINGS ON UNRATED EXTERIOR WALLS WHERE UNRATED WALLS ARE PERMITTED BY TABLE 602 AND UNPROTECTED OPENINGS ARE PERMITTED BY TABLE 705.8.
6.

TABLE 1020.1.1
INTERIOR CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY INTERIOR CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		WITHOUT SPRINKLER SYSTEM	WITH SPRINKLER SYSTEMc
H-1, H-2, H-3	ALL	NOT PERMITTED	1
H-4, H-5	GREATER THAN 30	NOT PERMITTED	1
A, B, E, F, M, S, U	GREATER THAN 30	1	0
R	GREATER THAN 10	1d	0
I-2a, I-4	ALL	NOT PERMITTED	0
I-1, I-3	ALL	NOT PERMITTED	1b

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a. FOR REQUIREMENTS FOR OCCUPANCIES IN GROUP I-2, SEE SECTIONS 407.2 AND 407.3.
b. FOR A REDUCTION IN THE FIRE-RESISTANCE RATING FOR OCCUPANCIES IN GROUP I-3, SEE SECTION 408.8.
c. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2 WHERE ALLOWED.
d. INTERIOR CORRIDORS WITHIN DWELLING OR SLEEPING UNITS IN GROUP R OCCUPANCIES PURSUANT TO SECTION 1020.1.1, EXCEPTION 2 SHALL NOT REQUIRE FIRE-RESISTANCE RATING.

1020.1.2 PUBLIC CORRIDORS
PUBLIC CORRIDORS SHALL BE FIRE-RESISTANCE RATED IN ACCORDANCE WITH TABLE 1020.1.2.

TABLE 1020.1.2
PUBLIC CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	REQUIRED FIRE-RESISTANCE RATING (hours)
H-1, H-2, H-3	2
H-4, H-5	1
A, E, F, M, S, U	1
B	1a
R (Noncombustible)	1c
R (Combustible)	2b
I-1, I-2, I-3, I-4	1

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a. PUBLIC CORRIDORS NEED NOT BE FIRE RATED IN HIGH-RISE BUILDINGS IN OCCUPANCY GROUP B EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, WHERE SUCH BUILDING IS PROVIDED WITH SMOKEPROOF ENCLOSURES IN STAIRWAYS IN ACCORDANCE WITH SECTION 403.5.4.
b. PUBLIC CORRIDORS IN BUILDINGS NOT EXCEEDING TWO STORIES IN HEIGHT, OR THAT ARE THREE STORIES IN HEIGHT AND OCCUPIED BY NOT MORE THAN ONE FAMILY ON EACH STORY, MAY BE CONSTRUCTED WITH 1-HOUR FIRE-RESISTANCE RATING.
c. CORRIDORS SERVING ACCESSORY ROOMS OR SPACES IN GROUP R-2 OCCUPANCIES PURSUANT TO SECTION 1004.1.1.2.3 SHALL BE CONSTRUCTED WITH FIRE BARRIERS WITH 1-HOUR FIRE-RESISTANCE RATING, AND 2-HOUR FIRE-RESISTANCE RATING WHERE THE DEAD-END DISTANCE EXCEEDS 40 FEET (12 192 MM) IN LENGTH.

1020.2 WIDTH AND CAPACITY
THE REQUIRED CAPACITY OF CORRIDORS SHALL BE DETERMINED AS SPECIFIED IN SECTION 1005, BUT THE MINIMUM WIDTH SHALL BE NOT LESS THAN THAT SPECIFIED IN TABLE 1020.2.
EXCEPTION: IN GROUP I-2 OCCUPANCIES, CORRIDORS ARE NOT REQUIRED TO HAVE A CLEAR WIDTH OF 96 INCHES (2438.4 MM) IN AREAS WHERE THERE WILL NOT BE STRETCHER OR BED MOVEMENT FOR ACCESS TO CARE OR AS PART OF THE DEFEND-IN-PLACE STRATEGY.

TABLE 1020.2
MINIMUM CORRIDOR WIDTH

OCCUPANCY	MINIMUM WIDTH (inches)
ANY FACILITIES NOT LISTED BELOW	44
ACCESS TO AND UTILIZATION OF MECHANICAL, PLUMBING OR ELECTRICAL SYSTEMS OR EQUIPMENT	24
WITH AN OCCUPANT LOAD OF 50 OR LESS, EXCEPT AS OTHERWISE REQUIRED BY CHAPTER 11	36
WITHIN A DWELLING UNIT, IN OCCUPANCY GROUPS I-1 AND R-1, EXCEPT AS OTHERWISE REQUIRED BY SECTION 1107	36
WITHIN A DWELLING UNIT, IN OCCUPANCY GROUPS R-2 AND R-3, EXCEPT AS OTHERWISE REQUIRED BY SECTION 1107	30
IN GROUP E SERVING CLASSROOMS	66
IN CORRIDORS AND AREAS SERVING STRETCHER TRAFFIC IN OCCUPANCIES WHERE PATIENTS RECEIVE OUTPATIENT MEDICAL CARE THAT CAUSES THE PATIENTS TO BE INCAPABLE OF SELF-PRESERVATION	72
GROUP I-2 IN AREAS WHERE REQUIRED FOR BED MOVEMENT	96

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1020.3 OBSTRUCTION
THE MINIMUM WIDTH OR REQUIRED CAPACITY OF CORRIDORS SHALL BE UNOBSTRUCTED.
EXCEPTION: ENCROACHMENTS COMPLYING WITH SECTION 1005.7.

1020.4 DEAD ENDS
WHERE MORE THAN ONE EXIT OR EXIT ACCESS DOORWAY IS REQUIRED, THE EXIT ACCESS SHALL BE ARRANGED SUCH THAT THERE ARE NO DEAD ENDS IN CORRIDORS MORE THAN 20 FEET (6096 MM) IN LENGTH.
EXCEPTIONS:

1. IN OCCUPANCIES IN GROUP I-3 OF CONDITION 2, 3 OR 4, THE DEAD END IN A CORRIDOR SHALL NOT EXCEED 50 FEET (15 240 MM).
2. IN OCCUPANCIES IN GROUPS B, E, F, I-1, M, R-1, S AND U, WHERE THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, THE LENGTH OF THE DEAD-END CORRIDORS SHALL NOT EXCEED 50 FEET (15 240 MM).
3. DEAD-END LENGTH NOT EXCEEDING 2.5 TIMES THE LEAST WIDTH OF THE DEAD-END CORRIDOR.
4. IN OCCUPANCIES IN GROUP R-2, THE DEAD END IN A CORRIDOR SHALL NOT EXCEED 40 FEET (12 192 MM). HOWEVER, WHERE THE CORRIDORS ARE COMPLETELY ENCLOSED IN CONSTRUCTION HAVING A 2-HOUR FIRE-RESISTANCE RATING WITH ALL DOORS OPENING INTO THE CORRIDOR BEING SELF-CLOSING AND HAVING A FIRE-RESISTANCE RATING OF 11/2 HOURS, THE LENGTH OF DEAD-END CORRIDOR SHALL NOT EXCEED 80 FEET (24 384 MM).

SECTION BC 1022 EXITS

1022.1 GENERAL
EXITS SHALL COMPLY WITH SECTIONS 1022 THROUGH 1027 AND THE APPLICABLE REQUIREMENTS OF SECTIONS 1003 THROUGH 1015. AN EXIT SHALL NOT BE USED FOR ANY PURPOSE THAT INTERFERES WITH ITS FUNCTION AS A MEANS OF EGRESS. ONCE A GIVEN LEVEL OF EXIT PROTECTION IS ACHIEVED, SUCH LEVEL OF PROTECTION SHALL NOT BE REDUCED UNTIL ARRIVAL AT THE EXIT DISCHARGE. EXITS SHALL BE CONTINUOUS FROM THE POINT OF ENTRY INTO THE EXIT TO THE EXIT DISCHARGE.
EXCEPTION: INTERIOR EXIT STAIRWAYS WITH DOORS THAT ARE AUTOMATIC-CLOSING BY SMOKE DETECTION PURSUANT TO THE EXCEPTION SET FORTH IN SECTION 713.7 MAY BE USED FOR TRAVEL BETWEEN FLOORS AND THIS USE SHALL NOT BE DEEMED TO INTERFERE WITH FUNCTION AS A MEANS OF EGRESS.

1022.2 EXTERIOR EXIT DOORS
BUILDINGS OR STRUCTURES USED FOR HUMAN OCCUPANCY SHALL HAVE NOT LESS THAN ONE EXTERIOR DOOR THAT MEETS THE REQUIREMENTS OF SECTION 1010.1.1.

1022.2.1 DETAILED REQUIREMENTS
EXTERIOR EXIT DOORS SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF SECTION 1010.1.

1022.2.2 ARRANGEMENT
EXTERIOR EXIT DOORS SHALL LEAD DIRECTLY TO THE EXIT DISCHARGE OR THE PUBLIC WAY.

SECTION BC 1023 INTERIOR EXIT STAIRWAYS AND RAMPS

1023.1 GENERAL
INTERIOR EXIT STAIRWAYS AND RAMPS SERVING AS AN EXIT COMPONENT IN A MEANS OF EGRESS SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION. INTERIOR EXIT STAIRWAYS AND RAMPS SHALL BE ENCLOSED AND LEAD DIRECTLY TO THE EXTERIOR OF THE BUILDING OR SHALL BE EXTENDED TO THE EXTERIOR OF THE BUILDING WITH AN EXIT PASSAGEWAY CONFORMING TO THE REQUIREMENTS OF SECTION 1024, EXCEPT AS PERMITTED IN SECTION 1028.1. AN INTERIOR EXIT STAIRWAY OR RAMP SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN AS A MEANS OF EGRESS AND A CIRCULATION PATH.

1023.2 CONSTRUCTION
ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND RAMPS SHALL BE CONSTRUCTED AS FIRE BARRIERS IN ACCORDANCE WITH SECTION 707 OR HORIZONTAL ASSEMBLIES CONSTRUCTED IN ACCORDANCE WITH SECTION 711, OR BOTH. INTERIOR EXIT STAIRWAY AND RAMP ENCLOSURES SHALL HAVE A FIRE-RESISTANCE RATING OF NOT LESS THAN 2 HOURS WHERE CONNECTING FOUR STORIES OR MORE AND NOT LESS THAN 1 HOUR WHERE CONNECTING LESS THAN FOUR STORIES. THE NUMBER OF STORIES CONNECTED BY THE INTERIOR EXIT STAIRWAYS OR RAMPS SHALL INCLUDE ANY BASEMENTS, BUT NOT ANY MEZZANINES. INTERIOR EXIT STAIRWAYS AND RAMPS SHALL HAVE A FIRE-RESISTANCE RATING NOT LESS THAN THE FLOOR ASSEMBLY PENETRATED, BUT NEED NOT EXCEED 2 HOURS. IN GROUP R-1 AND R-2 OCCUPANCIES, WHERE INTERIOR EXIT STAIRWAYS AND RAMPS ARE REQUIRED TO HAVE A FIRE-RESISTANCE RATING OF 2 HOURS, SUCH ENCLOSURES SHALL BE CONSTRUCTED OF MASONRY OR MASONRY EQUIVALENT. WALL ASSEMBLIES CONSTITUTING MASONRY EQUIVALENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH DEPARTMENT RULES.
EXCEPTIONS:

1. INTERIOR EXIT STAIRWAYS AND RAMPS IN GROUP I-3 OCCUPANCIES IN ACCORDANCE WITH THE PROVISIONS OF SECTION 408.3.8.
2. INTERIOR EXIT STAIRWAYS WITHIN AN ATRIUM ENCLOSED IN ACCORDANCE WITH SECTION 404.6.

1023.3 TERMINATION
INTERIOR EXIT STAIRWAYS AND RAMPS SHALL TERMINATE AT AN EXIT DISCHARGE OR A PUBLIC WAY.
EXCEPTION: A COMBINATION OF INTERIOR EXIT STAIRWAYS, INTERIOR EXIT RAMPS AND EXIT PASSAGEWAYS, CONSTRUCTED IN ACCORDANCE WITH SECTIONS 1023.2, 1023.3.1 AND 1024, RESPECTIVELY, AND FORMING A CONTINUOUS PROTECTED ENCLOSURE, SHALL BE PERMITTED TO EXTEND AN INTERIOR EXIT STAIRWAY OR RAMP TO THE EXIT DISCHARGE OR A PUBLIC WAY.

1023.3.1 EXTENSION
WHERE INTERIOR EXIT STAIRWAYS AND RAMPS ARE EXTENDED TO AN EXIT DISCHARGE OR A PUBLIC WAY BY AN EXIT PASSAGEWAY, THE INTERIOR EXIT STAIRWAY AND RAMP SHALL BE SEPARATED FROM THE EXIT PASSAGEWAY BY A FIRE BARRIER CONSTRUCTED IN ACCORDANCE WITH SECTION 707 OR A HORIZONTAL ASSEMBLY CONSTRUCTED IN ACCORDANCE WITH SECTION 711, OR BOTH. THE FIRE-RESISTANCE RATING SHALL BE NOT LESS THAN THAT REQUIRED FOR THE INTERIOR EXIT STAIRWAY AND RAMP. A FIRE DOOR ASSEMBLY COMPLYING WITH SECTION 716.5 SHALL BE INSTALLED IN THE FIRE BARRIER TO PROVIDE A MEANS OF EGRESS FROM THE INTERIOR EXIT STAIRWAY AND RAMP TO THE EXIT PASSAGEWAY. OPENINGS IN THE FIRE BARRIER OTHER THAN THE FIRE DOOR ASSEMBLY ARE PROHIBITED. PENETRATIONS OF THE FIRE BARRIER ARE PROHIBITED.
EXCEPTIONS:

1. PENETRATIONS OF THE FIRE BARRIER IN ACCORDANCE WITH SECTION 1023.5 SHALL BE PERMITTED.
2. SEPARATION BETWEEN AN INTERIOR EXIT STAIRWAY OR RAMP AND THE EXIT PASSAGEWAY EXTENSION SHALL NOT BE REQUIRED WHERE THERE ARE NO OPENINGS INTO THE EXIT PASSAGEWAY EXTENSION.

1023.4 OPENINGS
INTERIOR EXIT STAIRWAY AND RAMP OPENING PROTECTIVES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 716. OPENINGS IN INTERIOR EXIT STAIRWAYS AND RAMPS OTHER THAN UNPROTECTED EXTERIOR OPENINGS SHALL BE LIMITED TO THOSE NECESSARY FOR EXIT ACCESS TO THE ENCLOSURE FROM NORMALLY OCCUPIED SPACES AND FOR EGRESS FROM THE ENCLOSURE. ELEVATORS SHALL NOT OPEN INTO INTERIOR EXIT STAIRWAYS AND RAMPS.

1023.5 PENETRATIONS
PENETRATIONS INTO OR THROUGH INTERIOR EXIT STAIRWAYS AND RAMPS ARE PROHIBITED EXCEPT FOR EQUIPMENT AND DUCTWORK NECESSARY FOR INDEPENDENT VENTILATION OR PRESSURIZATION, HYDRONIC PIPING AND RELATED HEATING EQUIPMENT LIMITED TO SERVING THE INTERIOR EXIT STAIRWAY OR RAMP IN WHICH SUCH PIPING AND EQUIPMENT IS LOCATED, SPRINKLER PIPING, STANDPIPES, ELECTRICAL RACEWAY FOR FIRE DEPARTMENT COMMUNICATION SYSTEMS AND ELECTRICAL RACEWAY SERVING THE INTERIOR EXIT STAIRWAY AND RAMP AND TERMINATING AT A STEEL BOX NOT EXCEEDING 16 SQUARE INCHES (0.010 M2). SUCH PENETRATIONS SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 714. THERE SHALL NOT BE PENETRATIONS OR COMMUNICATION OPENINGS, WHETHER PROTECTED OR NOT, BETWEEN ADJACENT INTERIOR EXIT STAIRWAYS AND RAMPS.
EXCEPTION: MEMBRANE PENETRATIONS SHALL BE PERMITTED ON THE OUTSIDE OF THE INTERIOR EXIT STAIRWAY AND RAMP. SUCH PENETRATIONS SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 714.3.2.

1023.6 VENTILATION
EQUIPMENT AND DUCTWORK FOR INTERIOR EXIT STAIRWAY AND RAMP VENTILATION AS PERMITTED BY SECTION 1023.5 SHALL COMPLY WITH ONE OF THE FOLLOWING ITEMS:

1. SUCH EQUIPMENT AND DUCTWORK SHALL BE LOCATED EXTERIOR TO THE BUILDING AND SHALL BE DIRECTLY CONNECTED TO THE INTERIOR EXIT STAIRWAY AND RAMP BY DUCTWORK ENCLOSED IN CONSTRUCTION AS REQUIRED FOR SHAFTS.
2. WHERE SUCH EQUIPMENT AND DUCTWORK IS LOCATED WITHIN THE INTERIOR EXIT STAIRWAY AND RAMP, THE INTAKE AIR SHALL BE TAKEN DIRECTLY FROM THE OUTDOORS AND THE EXHAUST AIR SHALL BE DISCHARGED DIRECTLY TO THE OUTDOORS, OR SUCH AIR SHALL BE CONVEYED THROUGH DUCTS ENCLOSED IN CONSTRUCTION AS REQUIRED FOR SHAFTS.
3. WHERE LOCATED WITHIN THE BUILDING, SUCH EQUIPMENT AND DUCTWORK SHALL BE SEPARATED FROM THE REMAINDER OF THE BUILDING, INCLUDING OTHER MECHANICAL EQUIPMENT, WITH CONSTRUCTION AS REQUIRED FOR SHAFTS.
   IN EACH CASE, OPENINGS INTO THE FIRE-RESISTANCE-RATED CONSTRUCTION SHALL BE LIMITED TO THOSE NEEDED FOR MAINTENANCE AND OPERATION AND SHALL BE PROTECTED BY OPENING PROTECTIVES IN ACCORDANCE WITH SECTION 716 FOR SHAFT ENCLOSURES. THE INTERIOR EXIT STAIRWAY AND RAMP VENTILATION SYSTEMS SHALL BE INDEPENDENT OF OTHER BUILDING VENTILATION SYSTEMS.

1023.7 INTERIOR EXIT STAIRWAY AND RAMP EXTERIOR WALLS
EXTERIOR WALLS OF THE INTERIOR EXIT STAIRWAY OR RAMP SHALL COMPLY WITH THE REQUIREMENTS OF SECTION 705 FOR EXTERIOR WALLS. WHERE NONRATED WALLS OR UNPROTECTED OPENINGS ENCLOSE THE EXTERIOR OF THE STAIRWAY OR RAMPS AND THE WALLS OR OPENINGS ARE EXPOSED BY OTHER PARTS OF THE BUILDING AT AN ANGLE OF LESS THAN 180 DEGREES (3.14 RAD), THE BUILDING EXTERIOR WALLS WITHIN 10 FEET (3048 MM) HORIZONTALLY OF A NONRATED WALL OR UNPROTECTED OPENING SHALL HAVE A FIRE-RESISTANCE RATING OF NOT LESS THAN 1 HOUR. OPENINGS WITHIN SUCH EXTERIOR WALLS SHALL BE PROTECTED BY OPENING PROTECTIVES HAVING A FIRE PROTECTION RATING OF NOT LESS THAN 3/4 HOUR. THIS CONSTRUCTION SHALL EXTEND VERTICALLY FROM THE GROUND TO A POINT 10 FEET (3048 MM) ABOVE THE TOPMOST LANDING OF THE STAIRWAY OR RAMP, OR TO THE ROOF LINE, WHICHEVER IS LOWER.

1023.8 DISCHARGE IDENTIFICATION
AN INTERIOR EXIT STAIRWAY AND RAMP SHALL NOT CONTINUE BELOW ITS LEVEL OF EXIT DISCHARGE UNLESS AN APPROVED BARRIER IS PROVIDED AT THE LEVEL OF EXIT DISCHARGE TO PREVENT PERSONS FROM UNINTENTIONALLY CONTINUING INTO LEVELS BELOW. DIRECTIONAL EXIT SIGNS SHALL BE PROVIDED AS SPECIFIED IN SECTION 1013. AN APPROVED BARRIER SHALL CONSIST OF PARTITIONS, DOORS, OR GATES SEPARATING THE PORTION OF THE INTERIOR EXIT STAIRWAY ABOVE GRADE FROM THE PORTION BELOW GRADE. WHERE DOORS OR GATES ARE PROVIDED AS APPROVED BARRIERS, SUCH DOORS OR GATES SHALL BE SELF-CLOSING, OPENING IN THE DIRECTION OF EXIT TRAVEL FROM THE FLOORS BELOW GRADE, AND PROVIDED WITH LANDINGS IN ACCORDANCE WITH SECTIONS 1010.1.5 AND 1010.1.6.
EXCEPTIONS:

1. SUCH BARRIER SEPARATING THE ABOVE-GRADE PORTION OF THE INTERIOR EXIT STAIRWAYS AND RAMPS FROM THE PORTION BELOW GRADE SHALL NOT BE REQUIRED IN GROUP E AND R-3 OCCUPANCIES.
2. SUCH BARRIER SEPARATING THE ABOVE-GRADE PORTION OF THE INTERIOR EXIT STAIRWAYS AND RAMPS FROM THE PORTION BELOW GRADE SHALL NOT BE REQUIRED WHERE THE STAIRWAY OR RAMP DESIGN IS INTENDED TO CONTINUE THE PATH OF EGRESS THROUGH A BELOW GRADE LEVEL.

1023.9 STAIRWAY IDENTIFICATION AND FLOOR LEVEL SIGNS
SIGNS IDENTIFYING STAIRWAYS SHALL COMPLY WITH SECTION 1023.9.1. SIGNS IDENTIFYING FLOOR LEVELS SHALL COMPLY WITH SECTIONS 1023.9.2 THROUGH 1023.9.5.

1023.9.1 STAIRWAY IDENTIFICATION SIGNS
A STAIRWAY IDENTIFICATION SIGN INDICATING EACH STAIR BY ALPHABETIC LETTER SHALL BE POSTED ON BOTH SIDES OF EACH STAIR DOOR. THE ALPHABETIC LETTERS DESIGNATING THE IDENTIFICATION OF THE INTERIOR EXIT STAIRWAY AND RAMP SHALL BE NOT LESS THAN 3 INCHES (76.2 MM) IN HEIGHT. SUCH SIGN SHALL COMPLY WITH ITEMS 2, 5 AND 6 OF SECTION 1023.9.4.

1023.9.2 FLOOR IDENTIFICATION SIGNS
A FLOOR IDENTIFICATION SIGN SHALL BE PROVIDED AT EACH FLOOR LANDING IN AN INTERIOR EXIT STAIRWAY AND RAMP CONNECTING MORE THAN THREE STORIES. SUCH SIGN SHALL DESIGNATE:

- THE FLOOR LEVEL;
- THE TERMINUS OF THE TOP AND BOTTOM OF THE INTERIOR EXIT STAIRWAY AND RAMP;
- THE IDENTIFICATION OF THE INTERIOR EXIT STAIRWAY AND RAMP;
- THE STORY OF THE EXIT DISCHARGE; AND
- THE AVAILABILITY OF ROOF ACCESS FROM THE INTERIOR EXIT STAIRWAY AND RAMP FOR THE FIRE DEPARTMENT.

1023.9.3 ACCESSIBLE FLOOR LEVEL IDENTIFICATION SIGNS
FLOOR LEVEL IDENTIFICATION SIGNS IN VISUAL CHARACTERS, RAISED CHARACTERS AND BRAILLE COMPLYING WITH ICC A117.1 SHALL BE LOCATED AT EACH FLOOR LEVEL LANDING ADJACENT TO THE DOOR ON THE STAIR SIDE.

1023.9.4 SIGNAGE REQUIREMENTS
FLOOR IDENTIFICATION SIGNS REQUIRED BY SECTION 1023.9.2 SHALL COMPLY WITH ALL OF THE FOLLOWING REQUIREMENTS:

1. THE SIGNS SHALL BE A MINIMUM SIZE OF 18 INCHES (457.2 MM) BY 12 INCHES (304.8 MM).
2. THE TOP OF THE SIGNS SHALL BE LOCATED 5 FEET (1524 MM) ABOVE THE FLOOR LANDING IN A POSITION THAT IS READILY VISIBLE WHEN THE DOORS ARE IN THE OPEN AND CLOSED POSITIONS.
3. THE NUMBER DESIGNATING THE FLOOR LEVEL SHALL BE NOT LESS THAN 5 INCHES (127 MM) IN HEIGHT AND LOCATED IN THE CENTER OF THE SIGN.
4. OTHER LETTERING AND NUMBERS SHALL BE NOT LESS THAN 1 INCH (25.4 MM) IN HEIGHT.
5. CHARACTERS AND THEIR BACKGROUND SHALL HAVE A NONGLARE FINISH. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND, WITH EITHER LIGHT CHARACTERS ON A DARK BACKGROUND OR DARK CHARACTERS ON A LIGHT BACKGROUND.
6. WHERE SIGNS REQUIRED BY SECTION 1023.9 ARE INSTALLED IN THE INTERIOR EXIT STAIRWAYS AND RAMPS OF BUILDINGS SUBJECT TO SECTION 1025, THE SIGNS SHALL BE MADE OF THE SAME LUMINOUS MATERIALS AS REQUIRED BY SECTION 1025.4.

1023.9.5 DIRECTIONS TO OPENABLE DOORS
WHERE DOORS SERVING INTERIOR EXIT STAIRWAYS ARE LOCKED ON THE STAIR SIDE, SIGNAGE SHALL BE POSTED IN COMPLIANCE WITH SECTIONS 1031.4.1, 1031.4.2 AND 1031.4.3.

1023.10 ELEVATOR LOBBY IDENTIFICATION SIGNS
AT LANDINGS IN INTERIOR EXIT STAIRWAYS WHERE TWO OR MORE DOORS LEAD TO THE FLOOR LEVEL, ANY DOOR WITH DIRECT ACCESS TO AN ENCLOSED ELEVATOR LOBBY SHALL BE IDENTIFIED BY SIGNAGE LOCATED ON THE DOOR OR DIRECTLY ADJACENT TO THE DOOR STATING "ELEVATOR LOBBY." SIGNAGE SHALL BE IN ACCORDANCE WITH SECTION 1023.9.4, ITEMS 4, 5 AND 6.
1023.11 SMOKEPROOF ENCLOSURES AND PRESSURIZATION ALTERNATIVE
IN BUILDINGS REQUIRED TO COMPLY WITH SECTION 403 OR 405, EACH OF THE INTERIOR EXIT STAIRWAYS AND RAMPS SERVING A STORY WITH A FLOOR SURFACE LOCATED MORE THAN 75 FEET (22 860 MM) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS OR MORE THAN 30 FEET (9144 MM) BELOW THE FINISHED FLOOR OF A LEVEL OF EXIT DISCHARGE SERVING SUCH STORIES SHALL BE PROTECTED BY A SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE IN ACCORDANCE WITH SECTION 909.20.

1023.11.1 TERMINATION AND EXTENSION
A SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE SHALL TERMINATE AT AN EXIT DISCHARGE OR A PUBLIC WAY. THE SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE SHALL BE PERMITTED TO BE EXTENDED BY AN EXIT PASSAGEWAY IN ACCORDANCE WITH SECTION 1023.3. THE EXIT PASSAGEWAY SHALL BE WITHOUT OPENINGS OTHER THAN THE FIRE DOOR ASSEMBLY REQUIRED BY SECTION 1023.3.1 AND THOSE NECESSARY FOR EGRESS FROM THE EXIT PASSAGEWAY. THE EXIT PASSAGEWAY SHALL BE SEPARATED FROM THE REMAINDER OF THE BUILDING BY 2-HOUR FIRE BARRIERS CONSTRUCTED IN ACCORDANCE WITH SECTION 707 OR HORIZONTAL ASSEMBLIES CONSTRUCTED IN ACCORDANCE WITH SECTION 711, OR BOTH.
EXCEPTIONS:

1. OPENINGS IN THE EXIT PASSAGEWAY SERVING A SMOKEPROOF ENCLOSURE ARE PERMITTED WHERE THE EXIT PASSAGEWAY IS PROTECTED AND PRESSURIZED IN THE SAME MANNER AS THE SMOKEPROOF ENCLOSURE, AND OPENINGS ARE PROTECTED AS REQUIRED FOR ACCESS FROM OTHER FLOORS.
2. OPENINGS IN THE EXIT PASSAGEWAY SERVING A PRESSURIZATION ALTERNATIVE ARE PERMITTED WHERE THE EXIT PASSAGEWAY IS PROTECTED AND PRESSURIZED IN THE SAME MANNER AS THE PRESSURIZATION ALTERNATIVE.
3. THE FIRE BARRIER SEPARATING THE SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE FROM THE EXIT PASSAGEWAY IS NOT REQUIRED, PROVIDED THE EXIT PASSAGEWAY IS PROTECTED AND PRESSURIZED IN THE SAME MANNER AS THE SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE.
4. A SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE SHALL BE PERMITTED TO EGRESS THROUGH AREAS ON THE LEVEL OF EXIT DISCHARGE OR VESTIBULES AS PERMITTED BY SECTION 1028.

1023.11.2 ENCLOSURE ACCESS
ACCESS TO THE STAIRWAY OR RAMP WITHIN A SMOKEPROOF ENCLOSURE SHALL BE BY WAY OF A VESTIBULE OR AN OPEN EXTERIOR BALCONY.
EXCEPTION: ACCESS IS NOT REQUIRED BY WAY OF A VESTIBULE OR EXTERIOR BALCONY FOR STAIRWAYS AND RAMPS USING THE PRESSURIZATION ALTERNATIVE COMPLYING WITH SECTION 909.20.5.

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SIGNATURE & SEAL

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MEANS OF EGRESS NOTES

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403.4 EMERGENCY SYSTEMS
THE DETECTION, ALARM AND EMERGENCY SYSTEMS OF HIGH-RISE BUILDINGS SHALL COMPLY WITH SECTIONS 403.4.1 THROUGH 403.4.8.

403.4.1 SMOKE DETECTION
SMOKE DETECTION SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 907.2.13.1.

403.4.2 FIRE ALARMS SYSTEMS
A FIRE ALARM SYSTEM SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 907.2.13.

403.4.3 STANDPIPE SYSTEM
A HIGH-RISE BUILDING SHALL BE EQUIPPED WITH A STANDPIPE SYSTEM AS REQUIRED BY SECTION 905.3.

403.4.4 EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM
AN EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 907.5.2.2.

403.4.5 EMERGENCY RESPONDER RADIO COVERAGE
EMERGENCY RESPONDER RADIO COVERAGE SHALL BE PROVIDED IN ACCORDANCE WITH THE NEW YORK CITY FIRE CODE AND SECTION 907.2.13.2 OF THIS CODE.

403.4.6 FIRE COMMAND
A FIRE COMMAND CENTER COMPLYING WITH SECTION 911 SHALL BE PROVIDED IN A LOCATION APPROVED BY THE FIRE DEPARTMENT.

403.4.7 POST-FIRE SMOKE PURGE
A POST-FIRE SMOKE PURGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 917.

403.4.8 STANDBY AND EMERGENCY POWER
A STANDBY POWER SYSTEM COMPLYING WITH SECTION 2702 AND SECTION 3003 SHALL BE PROVIDED FOR THE STANDBY POWER LOADS SPECIFIED IN SECTION 403.4.8.3. AN EMERGENCY POWER SYSTEM COMPLYING WITH SECTION 2702 SHALL BE PROVIDED FOR THE EMERGENCY POWER LOADS SPECIFIED IN SECTION 403.4.8.4.

403.4.8.1 EQUIPMENT ROOM
IF THE STANDBY OR EMERGENCY POWER SYSTEM INCLUDES A GENERATOR SET INSIDE A BUILDING, THE SYSTEM SHALL BE LOCATED IN A SEPARATE ROOM IN ACCORDANCE WITH SECTION 2702.1.2.2.

403.4.8.2 FUEL LINE PIPING PROTECTION
FUEL LINES SUPPLYING A GENERATOR SET INSIDE A BUILDING SHALL COMPLY WITH SECTION 1305.9 OF THE NEW YORK CITY MECHANICAL CODE.

403.4.8.3 STANDBY POWER SYSTEMS
A STANDBY POWER SYSTEM COMPLYING WITH SECTION 2702 SHALL BE PROVIDED FOR STANDBY POWER LOADS SPECIFIED IN SECTIONS 403.4.8.3.1 AND 403.4.8.3.2. FUEL SOURCES FOR GENERATORS SHALL BE IN ACCORDANCE WITH SECTION 2702.1.1.

403.4.8.3.1 STANDBY POWER LOADS IN OCCUPANCIES OTHER THAN GROUP R-2
IN BUILDINGS OF ANY OCCUPANCY GROUP OTHER THAN GROUP R-2, THE FOLLOWING ARE CLASSIFIED AS STANDBY POWER LOADS:
1. POWER AND LIGHTING FOR FIRE COMMAND CENTER REQUIRED BY SECTION 403.4.6;
2. VENTILATION AND AUTOMATIC FIRE DETECTION EQUIPMENT FOR SMOKEPROOF ENCLOSURES;
3. ELEVATORS, IN ACCORDANCE WITH SECTION 3003; AND
4. STAIR PRESSURIZATION SYSTEMS WHEN PROVIDED.

403.4.8.3.2 STANDBY POWER LOADS IN GROUP R-2 OCCUPANCIES
GROUP R-2 OCCUPANCIES IN BUILDINGS GREATER THAN 125 FEET (38 100 MM) IN HEIGHT SHALL BE REQUIRED TO PROVIDE A STANDBY POWER SYSTEM TO SUPPORT THE FOLLOWING LOADS:
1. POWER AND LIGHTING FOR FIRE COMMAND CENTER REQUIRED BY SECTION 403.4.6;
2. VENTILATION AND AUTOMATIC FIRE DETECTION EQUIPMENT FOR SMOKEPROOF ENCLOSURES;
3. AT LEAST ONE ELEVATOR SERVING ALL FLOORS, OR ONE ELEVATOR PER BANK WHERE DIFFERENT BANKS SERVE DIFFERENT PORTIONS OF THE BUILDING; AND
4. STAIR PRESSURIZATION SYSTEMS WHEN PROVIDED.

403.4.8.4 EMERGENCY POWER SYSTEMS
AN EMERGENCY POWER SYSTEM COMPLYING WITH SECTION 2702 SHALL BE PROVIDED FOR EMERGENCY POWER LOADS SPECIFIED IN SECTIONS 403.4.8.4.1 AND 403.4.8.4.3. FUEL SOURCES FOR GENERATORS SHALL BE IN ACCORDANCE WITH SECTION 2702.1.1.

403.4.8.4.1 EMERGENCY POWER LOADS IN OCCUPANCIES OTHER THAN GROUP R-2
IN BUILDINGS OF ANY OCCUPANCY GROUP OTHER THAN GROUP R-2, THE FOLLOWING ARE CLASSIFIED AS EMERGENCY POWER LOADS:
1. EXIT SIGNS AND MEANS OF EGRESS ILLUMINATION REQUIRED BY CHAPTER 10;
2. ELEVATOR CAR LIGHTING;
3. EMERGENCY VOICE/ALARM COMMUNICATIONS SYSTEMS, INCLUDING FIRE DEPARTMENT IN-BUILDING AUXILIARY RADIO COMMUNICATION SYSTEMS (ARCS);
4. AUTOMATIC FIRE DETECTION SYSTEMS;
5. FIRE ALARM SYSTEMS; AND
6. ELECTRICALLY POWERED FIRE PUMPS, INCLUDING MANUAL FIRE PUMPS, AUTOMATIC FIRE PUMPS, AND SPRINKLER BOOSTER PUMPS.

403.4.8.4.2 EMERGENCY POWER LOADS IN GROUP R-2 OCCUPANCIES
GROUP R-2 OCCUPANCIES IN BUILDINGS GREATER THAN 125 FEET (38 100 MM) IN HEIGHT SHALL BE REQUIRED TO PROVIDE AN EMERGENCY POWER SYSTEM TO SUPPORT THE FOLLOWING LOADS:
1. EXIT SIGNS AND MEANS OF EGRESS ILLUMINATION REQUIRED BY CHAPTER 10;
2. EMERGENCY VOICE COMMUNICATIONS SYSTEMS, INCLUDING FIRE DEPARTMENT IN-BUILDING AUXILIARY RADIO COMMUNICATION SYSTEMS (ARCS); AND
3. ELECTRICALLY POWERED FIRE PUMPS, UNLESS ELECTRICAL POWER TO THE MOTOR IS TAKEN AHEAD OF THE MAIN FROM THE STREET SIDE OF THE HOUSE SERVICE SWITCH.

403.4.8.4.3 EMERGENCY POWER LOADS IN GROUP R-2 OCCUPANCIES 125 FEET OR LESS IN HEIGHT
GROUP R-2 OCCUPANCIES IN BUILDINGS 125 FEET (38 100 MM) OR LESS IN HEIGHT SHALL BE REQUIRED TO PROVIDE AN EMERGENCY POWER SYSTEM TO SUPPORT THE FOLLOWING LOADS:
1. EMERGENCY VOICE COMMUNICATIONS SYSTEMS IN BUILDINGS CONTAINING GROUP R-2 OCCUPANCIES IN ACCORDANCE WITH SECTION 907.5.2.2 OF THIS CODE, OR WHERE OTHERWISE PROVIDED. BATTERIES IN ACCORDANCE WITH THE NEW YORK CITY ELECTRICAL CODE ARE PERMITTED TO SERVE AS THE SECONDARY POWER SUPPLY FOR SUCH SYSTEMS.
2. FIRE DEPARTMENT IN-BUILDING AUXILIARY RADIO COMMUNICATION SYSTEMS (ARCS) IN BUILDINGS CONTAINING GROUP R-2 OCCUPANCIES IN ACCORDANCE WITH SECTION 916.3 OF THIS CODE, OR WHERE OTHERWISE PROVIDED. BATTERIES IN ACCORDANCE WITH THE NEW YORK CITY ELECTRICAL CODE ARE PERMITTED TO SERVE AS THE SECONDARY POWER SUPPLY FOR SUCH SYSTEMS.

403.5 MEANS OF EGRESS AND EVACUATION
THE MEANS OF EGRESS IN HIGH-RISE BUILDINGS SHALL COMPLY WITH SECTIONS 403.5.1 THROUGH 403.5.6.

403.5.1 REMOTENESS OF INTERIOR EXIT STAIRWAYS
REQUIRED INTERIOR EXIT STAIRWAYS SHALL BE SEPARATED BY A DISTANCE NOT LESS THAN 30 FEET (9144 MM) OR NOT LESS THAN 1/4 OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE BUILDING OR AREA TO BE SERVED, WHICHEVER IS LESS. THE DISTANCE SHALL BE MEASURED IN A STRAIGHT LINE BETWEEN THE NEAREST POINTS OF THE ENCLOSURE SURROUNDING THE INTERIOR EXIT STAIRWAYS. IN BUILDINGS WITH THREE OR MORE INTERIOR EXIT STAIRWAYS, NO FEWER THAN TWO OF THE INTERIOR EXIT STAIRWAYS SHALL COMPLY WITH THIS SECTION. STAIRS SHARING ANY COMMON WALL, FLOORS, CEILINGS, SCISSOR STAIR ASSEMBLIES, OR OTHER ENCLOSURES SHALL BE COUNTED AS ONE INTERIOR EXIT STAIRWAY.

EXCEPTION: GROUP R-2 OCCUPANCIES.

403.5.2 ADDITIONAL EXIT STAIRWAY
FOR BUILDINGS OTHER THAN GROUP R-2 THAT ARE MORE THAN 420 FEET (128 M) IN BUILDING HEIGHT, ONE ADDITIONAL EXIT STAIRWAY MEETING THE REQUIREMENTS OF SECTIONS 1011 AND 1023 SHALL BE PROVIDED IN ADDITION TO THE MINIMUM NUMBER OF EXITS REQUIRED BY SECTION 1006.3. THE TOTAL WIDTH OF ANY COMBINATION OF REMAINING EXIT STAIRWAYS WITH ONE EXIT STAIRWAY REMOVED SHALL NOT BE LESS THAN THE TOTAL WIDTH REQUIRED BY SECTION 1005.1. STAIRS SHARING ANY COMMON WALL, FLOORS, CEILINGS, SCISSOR STAIR ASSEMBLIES, OR OTHER ENCLOSURES SHALL NOT BE CONSIDERED THE ADDITIONAL EXIT STAIRWAY REQUIRED BY THIS SECTION.

EXCEPTIONS: AN ADDITIONAL EXIT STAIRWAY SHALL NOT BE REQUIRED TO BE INSTALLED IN ANY OF THE FOLLOWING INSTANCES:
1. IN BUILDINGS WHERE ALL PASSENGER ELEVATORS FOR GENERAL PUBLIC USE AND ALL OTHER ELEVATORS USED FOR OCCUPANT SELF-EVACUATION COMPLY WITH SECTIONS 3008.1 THROUGH 3008.11;
2. IN BUILDINGS WHERE ALL OF THE FOLLOWING CONDITIONS ARE MET:
2.1 THE COMMISSIONER HAS APPROVED A TIMED EGRESS ANALYSIS ESTABLISHING THE EGRESS TIME IT WOULD TAKE FOR A FULL BUILDING EVACUATION, UTILIZING THE STAIRS REQUIRED BY SECTION 1006 AND THE ADDITIONAL STAIR THAT WOULD HAVE BEEN REQUIRED PURSUANT TO SECTION 403.5.2;
2.2 THE COMMISSIONER HAS APPROVED A TIMED EGRESS ANALYSIS ESTABLISHING THE EGRESS TIME IT WOULD TAKE FOR A FULL BUILDING EVACUATION, UTILIZING THE COMBINATION OF THE STAIRS REQUIRED BY SECTION 1006 AND ELEVATORS USED FOR OCCUPANT SELF-EVACUATION AS FOLLOWS:
2.2.1 SUCH ANALYSIS NEED ONLY UTILIZE A NUMBER OF DESIGNATED ELEVATORS DESIGNED FOR OCCUPANT SELF-EVACUATION NECESSARY TO DEMONSTRATE AN EVACUATION TIME THAT IS LESS THAN THE TIME ESTABLISHED IN EXCEPTION 2.1; AND
2.2.2 EVERY BANK OF PASSENGER ELEVATORS FOR GENERAL PUBLIC USE SHALL BE SERVED BY AT LEAST ONE SUCH DESIGNATED ELEVATOR;
2.3 ALL ELEVATORS IN THE BUILDING THAT EITHER ARE PASSENGER ELEVATORS FOR GENERAL PUBLIC USE OR ARE USED FOR OCCUPANT SELF-EVACUATION SHALL COMPLY WITH SECTIONS 3008.1 THROUGH 3008.11. HOWEVER, THE STANDBY POWER GENERATING EQUIPMENT REQUIRED BY SECTION 3008.9 NEED ONLY BE SIZED TO SATISFY THE LOADS REQUIRED TO SIMULTANEOUSLY OPERATE THOSE ELEVATORS IDENTIFIED IN THE TIMED EGRESS ANALYSIS DESCRIBED IN EXCEPTION 2.2.

THE MINIMUM NUMBER OF EXITS REQUIRED BY SECTION 1006 ARE ALL AT LEAST 25 PERCENT WIDER THAN THE EXIT WIDTH REQUIRED BY CHAPTER 10. THE INCREASE IN THE STAIR WIDTH SHALL NOT BE UTILIZED IN THE TIMED EGRESS ANALYSES REQUIRED BY EXCEPTIONS 2.1 AND 2.2.

403.5.3 STAIRWAY DOOR OPERATION
OORS OPENING INTO INTERIOR STAIR ENCLOSURES SHALL NOT BE LOCKED FROM EITHER SIDE. HOWEVER, A DOOR LOCKED FROM THE STAIR SIDE MAY BE PERMITTED PROVIDED THAT SUCH DOOR IS EQUIPPED WITH AN AUTOMATIC FAIL SAFE SYSTEM FOR OPENING IN THE EVENT OF THE ACTIVATION OF ANY AUTOMATIC FIRE DETECTION SYSTEM, OR WHEN ANY ELEVATOR RECALL IS ACTIVATED, OR WHEN ANY SIGNAL IS RECEIVED FROM THE FIRE COMMAND CENTER. SUCH DOOR SHALL BE DEEMED AS OPENABLE FROM THE STAIR SIDE. STAIR REENTRY SIGNS SHALL BE POSTED THROUGHOUT THE STAIRWAY INDICATING THAT REENTRY IS PROVIDED ONLY DURING FIRE EMERGENCIES. SUCH SIGNS SHALL BE IN ACCORDANCE WITH SECTION 1031.4.2.

EXCEPTION: IN SCHOOLS CLASSIFIED AS GROUP E OCCUPANCIES THAT REQUIRE "LOCKDOWN DRILLS" AS PER SECTION 807 OF THE NEW YORK STATE EDUCATION LAW, STAIRWAY EGRESS DOORS FROM OCCUPIED SPACES ARE PERMITTED TO BE LOCKED FROM THE SIDE OPPOSITE THE EGRESS SIDE FOR THE DURATION OF THE LOCKDOWN DRILL, PROVIDED THEY ARE OPENABLE FROM THE OCCUPIED SIDE FOR EGRESS AND ARE UNLOCKED UPON DIRECTIONS FROM THE SCHOOL ADMINISTRATIVE PERSONNEL FOLLOWING THE COMPLETION OF THE LOCKDOWN DRILL.

403.5.3.1 STAIRWAY COMMUNICATION SYSTEM
A TELEPHONE OR OTHER TWO-WAY VOICE‡ COMMUNICATIONS SYSTEM CONNECTED TO AN APPROVED CONSTANTLY ATTENDED STATION SHALL BE PROVIDED AT NOT LESS THAN EVERY FIFTH FLOOR IN EACH STAIRWAY WHERE THE DOORS TO THE STAIRWAY ARE LOCKED IN ACCORDANCE WITH SECTION 403.5.3.

403.5.4 SMOKEPROOF ENCLOSURES
EVERY REQUIRED INTERIOR EXIT STAIRWAY SERVING FLOORS MORE THAN 75 FEET (22 860 MM) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS SHALL COMPLY WITH SECTIONS 909.20 AND 1023.11.

EXCEPTION: SMOKEPROOF ENCLOSURES ARE NOT REQUIRED IN OCCUPANCY GROUP R-2 UNLESS PROVIDED PURSUANT TO EXCEPTION 2 OF SECTION 917.1..

403.5.5 LUMINOUS EGRESS PATH MARKINGS
LUMINOUS EGRESS PATH MARKINGS SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 1025 AND APPENDIX S.

EXCEPTION: EGRESS PATHS SERVING GROUP R-2.

403.5.6 EMERGENCY ESCAPE AND RESCUE
EMERGENCY ESCAPE AND RESCUE OPENINGS SPECIFIED IN SECTION 1030 ARE NOT REQUIRED

403.6 ELEVATORS
ELEVATOR INSTALLATION AND OPERATION IN HIGH-RISE BUILDINGS SHALL COMPLY WITH CHAPTER 30 AND SECTIONS 403.6.1 AND 403.6.2.

403.6.1 FIRE SERVICE ACCESS ELEVATOR
IN BUILDINGS WITH AN OCCUPIED FLOOR MORE THAN 120 FEET (36 576 MM) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS, A MINIMUM OF ONE FIRE SERVICE ACCESS ELEVATOR SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 3007

403.6.2 OCCUPANT EVACUATION ELEVATORS
WHERE INSTALLED IN ACCORDANCE WITH SECTION 3008, PASSENGER ELEVATORS FOR GENERAL PUBLIC USE SHALL BE PERMITTED TO BE USED FOR OCCUPANT SELF-EVACUATION.

403.6.3 ELEVATOR LOBBIES
ELEVATOR LOBBIES SHALL BE PROVIDED IN ACCORDANCE WITH SECTIONS 3006.1.1 AND 3006.1.2.

403.7 OUTDOOR AIR INTAKES
FOR HIGH-RISE BUILDINGS, OUTDOOR AIR INTAKES SERVING SPACES ABOVE THE SECOND STORY AND SERVING SPACES GREATER THAN 10,000 SQUARE FEET (929 M2) OF FLOOR AREA SHALL BE LOCATED IN ACCORDANCE WITH SECTION 401.5 OF THE NEW YORK CITY MECHANICAL CODE.

EXCEPTION: GROUP R-2 OCCUPANCY.

403.8 OPEN WEB STEEL JOISTS
THE USE OF OPEN WEB STEEL JOISTS SHALL BE PROHIBITED IN HIGH-RISE BUILDINGS UNTIL THE COMMISSIONER PROMULGATES RULES ESTABLISHING MINIMUM ACCEPTABLE FIREPROOFING METHODS.

TABLE 504.3a

ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION									
	SEE FOOTNOTES	TYPE I		TYPE II		TYPE III		TYPE IVi	TYPE V	
		A	Bi	A	B	A	B	HT	A	B
A-1	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-2	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-3	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-4	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-5	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
B	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
E	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
F-1	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
F-2	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
H-1	S	UL	160	65	55	65	55	65	50	NP
H-2f	S	UL	160	65	55	65	55	65	50	40
H-3f	S	UL	160	65	55	65	55	65	50	40
H-4	S	UL	180	85	75	85	75	85	70	60
H-5	S	UL	160	65	55	65	55	65	50	40
I-1	S13D	60	60	60	NP	60	55	60	NP	NP
	S13R	60	60	60	NP	60	55	60	NP	NP
	S	UL	420	85	NP	85	75	85	NP	NP
I-2	S	UL	180	85	55	65	55	65	50	NP
I-3	S	UL	180	85	75	85	75	85	70	NP
I-4	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
M	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
R-1	S13R	60	60	60	NP	60	NP	60	NP	NP
	S	UL	420	85	NP	85	NP	85	NP	NP
R-2	S13R	60	60	60	NP	60	60	60	NP	NP
	S	UL	420	85	NP	85	75	85	NP	NP
R-3	NSb,c	UL	160	65	55	65	55	65	50g,h	40g
	S13D	60	60	60	60	60	55	60	50g,h	40g
	S13R	60	60	60	60	60	60	60	60g,h	60g
	S	UL	420	85	75	85	75	85	70g,h	60g
S-1	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
S-2d,e	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
Ue	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60

NOT PERMITTED IN FIRE DISTRICT | NOT PERMITTED IN FIRE DISTRICT WITHOUT SPRINKLERS

X = Number of stories in nonsprinklered 1- & 2-family buildings shall be limited by Section 903.2.8

Note: UL = Unlimited; NP = Not permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See the following sections for general exceptions to Table 504.4:
1. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
2. Section 506.3, Allowable area increase due to frontage.
3. Section 507, Unlimited area building.
b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
c. The NS value is only for use in buildings not required by this code to be equipped throughout with an automatic sprinkler system.
d. For open parking structures, see Section 406.5.
e. For private garages, see Section 406.3.
f. See Section 415.8 for limitations.
g. See Exception 9 of Section D105.1 for allowances of Type VA and VB construction for R-3 occupancies.
h. See Exception 12 of Section D105.1 for allowances of Type VA construction and height limitations for R-3 occupancies in Lower Density Growth Management Areas.
i. Type IV construction utilizing cross-laminated timber or structural composite lumber shall be sprinklered where required by Section 903.2.13.

TABLE 504.3
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
S-2 d,a	NS b,c	UL	160	65	55	65	55	65	50	40

GENERAL BUILDING HEIGHTS AND AREAS; SEPARATION OF OCCUPANCIES

	S	UL	420	85	75	85	75	85	70	60
U e	NS b,c	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60

= Not permitted in Fire District | = Not permitted in Fire District without sprinklers

For SI: 1 foot 304.8 mm.
Note: UL-Unlimited; NP-Not permitted; NS-Buildings not equipped throughout with an automatic sprinkler system; S-Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R - Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.
a. See the following sections for general exceptions to Table 504.3:
1. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
2. Section 506.3, Allowable area increase due to frontage.
3. Section 507, Unlimited area building
b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
c. The NS value is only for use in buildings not required by this code to be equipped throughout with an automatic sprinkler system.
d. For open parking structures, see Section 406.5.
e. For private garages, see Section 406.3.
f. See Section 415.8 for limitations.
g. See Exception 9 of Section D105.1 for allowances of Type VA and VB construction for R-3 occupancies.
h. See Exception 12 of Section D105.1 for allowances of Type VA construction and height limitations for R-3 occupancies in Lower Density Growth Management Areas.
i. See Section 403.2.1 for additional requirements for high-rise buildings.
j. Type IV construction utilizing cross-laminated timber or structural composite lumber shall be sprinklered where required by Section 903.2.13.

19. TABLE 508.4 OF 2022 NYC BC CHAPTER 5 GENERAL BUILDING HEIGHTS AND AREAS; SEPARATION OF OCCUPANCIES, SECTION BC 508 MIXED USE AND OCCUPANCY.

TABLE 508
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

Occupancy	A , E		I-1, I-3, 1-4		I-2		Rª		F-2, S-2ᵇ, U		B		F-1		M		S-1		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A , E	N	N	1	2	2	NP	1	2	N	1	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
I-1, I-3, 1-4	--	--	N	N	2	NP	1	NP	1	2	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
I-2	--	--	--	--	N	N	2	NP	2	NP	2	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
Rª	--	--	--	--	--	--	N	N	1c	2c	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2ᵇ, U	--	--	--	--	--	--	--	--	N	N	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
B	--	--	--	--	--	--	--	--	--	--	N	N	2	3	1	2	2	3	NP	NP	2	3	1	2	1	NP
F-1	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	2	3	NP	NP	2	3	1	2	1	NP
M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	NP	NP	2	3	1	2	1	NP
S-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	NP	NP	2	3	1	2	1	NP
H-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	NP	NP	NP	NP	NP	NP
H-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	1	NP	1	NP
H-3, H-4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1d	NP	1	NP
H-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement
NP = Not permitted
a. See Section 420
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.1.4.
d. Separation is not required between occupancies of the same classification.

MULTIPLE DWELLING LAW

GENERAL PROVISIONS

1. LIGHTING AND VENTILATION OF ROOMS SHALL BE AS PER SECTION 30, MDL.
2. SIZE OF ROOMS SHALL BE AS PER SECTION 31, MDL.
3. ALCOVES SHALL BE AS PER SECTION 32, MDL.
4. COOKING SPACES (KITCHENS & KITCHENETTES) SHALL BE AS PER SECTION 33, MDL.
5. BUILDING ENTRANCE DOORS AND LIGHTS SHALL BE AS PER SECTION 35, MDL.
6. MAIL RECEPTACLES SHALL BE AS PER SECTION 57, MDL.
7. ALL INCOMBUSTIBLE MATERIALS SHALL BE AS PER SECTION 58, MDL.
8. PARAPETS AND GUARD RAILINGS SHALL BE AS PER SECTION 62, MDL.
9. SUB-CURB USES SHALL BE AS PER SECTION 63, MDL.
10. LIGHTING, GAS METERS, GAS AND OIL APPLIANCES SHALL BE AS PER SECTION 64, MDL.
11. BOILER ROOMS SHALL BE AS PER SECTION 65, MDL.
12. WATER-CLOSET AND BATH ACCOMMODATIONS SHALL BE AS PER SECTION 76, MDL.
13. PLUMBING AND DRAINAGE SHALL BE AS PER SECTION 77, MDL.
14. REPAIRS SHALL BE MADE AS PER SECTION 78, MDL.
15. HEAT SHALL BE PROVIDED AS PER SECTION 79, MDL.
16. CLEANLINESS SHALL BE AS PER SECTION 80, MDL.
17. RECEPTACLES FOR WASTE MATTER SHALL BE AS PER SECTION 81, MDL.
18. PRIVACY SHALL BE AS PER SECTION 82, MDL.
19. JANITORIAL SERVICES SHALL BE AS PER SECTION 83, MDL.
20. CONSTRUCTION STANDARDS FOR THE CONTROL OF NOISE SHALL BE AS ER SECTION 84, MDL.

TABLE 508.4

REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

OCCUPANCY	A, E		I-1a, I-3, I-4		I-2		Ra		F-2, S-2b, U		Be		F-1		M		S-1		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A, E	N	N	1	2	2	NP	1	2	Nf	1f	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
I-1a, I-3, I-4	--	--	N	N	2	NP	1	NP	1	2	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
I-2	--	--	--	--	N	N	2	NP	2	NP	2	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
Ra	--	--	--	--	--	--	N	N	1c	2c	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2b, U	--	--	--	--	--	--	--	--	N	N	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
Be	--	--	--	--	--	--	--	--	--	--	N	N	2	3	1	2	2	3	NP	NP	2	3	1	2	1	NP
F-1	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	2	3	NP	NP	2	3	1	2	1	NP
M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	NP	NP	2	3	1	2	1	NP
S-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	NP	NP	2	3	1	2	1	NP
H-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	NP	NP	NP	NP	NP	NP
H-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	1	NP	1	NP
H-3, H-4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1d	NP	1	NP
H-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.
a. See Section 420.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.3.4.
d. Separation is not required between occupancies of the same classification.
e. See Section 422.2 for ambulatory care facilities.
f. A commercial kitchen in Group F-2 that does not comply with Section 508.1, Exception 5 shall be separated from adjoining dining spaces with 1-hour fire separation where the dining spaces are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, and separated with 2-hour fire separation where the dining spaces is not equipped throughout with an automatic sprinkler system.

OCCUPANCY FIRE-RESISTANCE RATINGS NOTES

20. TABLE 601 OF 2022 NYC BC CHAPTER 6 TYPES OF CONSTRUCTION, SECTION BC 601 GENERAL.

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame (see section 202)	3a	2a,j	1j	0	1	0	HT	1	0
Bearing walls Exterior Interior	3 3a	2 2a	1 1	0 0	2 1	2 0	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior		See Table 602							
Nonbearing walls and partitions Interior	0	0	0	0	0	0	See Section 602.4.6.	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1 1/2b,c	1b,c	1b,c	0c	1b,c	0	HT	1b,c	0

For SI: 1 foot = 304.8 mm.
a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
b. 1. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members within any portion of the roof, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant- treated wood members shall be allowed to be used for such unprotected members.
2. Except in Group F occupancies subject to regulation under Sections 264(1) and 264(2) of the New York State Labor Law, and in Group I-1, R-1, and R-2 occupancies, in Types I and II construction, fire-retardant-treated wood shall be allowed in buildings including girders and trusses as part of the roof construction when the building is:
i. Type II construction of any height; or
ii. Type I construction two stories or less; or when over two stories, the vertical distance from the upper floor to the roof is 20 feet or more. c. Except in Group F occupancies subject to regulation under Sections 264(1) and 264(2) of the New York State Labor Law, and in Group I-1, R-1 and R-2 occupancies, heavy timber shall be allowed where a 1- hour or less fire-resistance rating is required.
d. Not less than the fire-resistance rating required by other sections of this code.
e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
f. Not less than the fire-resistance rating as referenced in Section 704.10.
g. See note g of Table 602.
h. See Section 711.2.4 for additional requirements.
i. Type V construction is not permitted inside fire districts except as provided for in Section D105.1 of Appendix D.
j. See Section 403.2.1 for additional requirements for high-rise buildings and fire-resistance rating of columns in such buildings.

21. TABLE 602 OF 2022 NYC BC CHAPTER 6 TYPES OF CONSTRUCTION, SECTION BC 602 CONSTRUCTION CLASSIFICATION.

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H f	OCCUPANCY GROUP F-1, M, S-1 g,j	OCCUPANCY GROUP A, B, E, F-2, I, R, S-2, U b
X<5c	All	3	2	1
5 < x < 10	IA	3	2	1
	Others	2	1	1
10 ≤ X < 30	IA,IB	2	1	1 d
	IIB,VB	1	0	0
	Others	1	1	1 d
X>30	All	0	0	0

For SI: 1 foot 304.8 mm.
a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
b. Group U when used as accessory to Group R-3 shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet or more for free standing private garages in compliance with Section 406.1, and when the separation distance is 3 feet or more for other freestanding Group U buildings. For free standing private garages where the fire separation distance is less than 5 feet, refer to Section 406.3.4 for required fire-resistance rating for exterior walls.
c. See Section 706.1.1 for party walls.
d. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
e. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
f. For special requirements for Group H occupancies, see Section 415.6.
g. Inside the fire district, exterior load-bearing walls of Type II buildings shall have a fire-resistance rating not less than prescribed below:
X<5 2 hours
5 < x <10 2 hours
10 <X<30 1 hour
X230 As per Table 602.
h. Inside the fire district, exterior nonload-bearing walls of Type II buildings shall have a fire-resistance rating not less than prescribed below: X<5 As per Table 602
5≤ X ≤10 As per Table 602
10<X<30 X230 1 hour
X>30 As per Table 602.
i. For special requirements for Group S aircraft hangars, see Section 412.4.1.
j. Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.

TABLE 601

FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE Vi	
	A	B	A	B	A	B	HT	A	B
Primary structural framef (see Section 202)	3a	2a, j	1j	0	1	0	HT	1	0
Bearing walls									
Exteriore,f,g	3	2	1	0	2	2	2	1	0
Interior	3a	2a	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions									
Exterior			See Table 602						
Nonbearing walls and partitions Interiord	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor constructionh and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	11/2b,c	1b,c	1b,c	0c	1b,c	0	HT	1b,c	0

FOR SI: 1 FOOT = 304.8 MM.
A. ROOF SUPPORTS: FIRE-RESISTANCE RATINGS OF PRIMARY STRUCTURAL FRAME AND BEARING WALLS ARE PERMITTED TO BE REDUCED BY 1 HOUR WHERE SUPPORTING A ROOF ONLY.
B. 1.EXCEPT IN GROUP F-1, H, M AND S-1 OCCUPANCIES, FIRE PROTECTION OF STRUCTURAL MEMBERS IN ROOF CONSTRUCTION SHALL NOT BE REQUIRED, INCLUDING PROTECTION OF PRIMARY STRUCTURAL FRAME MEMBERS WITHIN ANY PORTION OF THE ROOF, ROOF FRAMING AND DECKING WHERE EVERY PART OF THE ROOF CONSTRUCTION IS 20 FEET OR MORE ABOVE ANY FLOOR IMMEDIATELY BELOW. FIRE-RETARDANT- TREATED WOOD MEMBERS SHALL BE ALLOWED TO BE USED FOR SUCH UNPROTECTED MEMBERS.
2. EXCEPT IN GROUP F OCCUPANCIES SUBJECT TO REGULATION UNDER SECTIONS 264(1) AND 264(2) OF THE NEW YORK STATE LABOR LAW, AND IN GROUP I-1, R-1, AND R-2 OCCUPANCIES, IN TYPES I AND II CONSTRUCTION, FIRE-RETARDANT—TREATED WOOD SHALL BE ALLOWED IN BUILDINGS INCLUDING GIRDERS AND TRUSSES AS PART OF THE ROOF CONSTRUCTION WHEN THE BUILDING IS:
i.TYPE II CONSTRUCTION OF ANY HEIGHT; OR
ii. TYPE I CONSTRUCTION TWO STORIES OR LESS; OR WHEN OVER TWO STORIES, THE VERTICAL DISTANCE FROM THE UPPER FLOOR TO THE ROOF IS 20 FEET OR MORE.
C. EXCEPT IN GROUP F OCCUPANCIES SUBJECT TO REGULATION UNDER SECTIONS 264(1) AND 264(2) OF THE NEW YORK STATE LABOR LAW, AND IN GROUP I-1, R-1 AND R-2 OCCUPANCIES, HEAVY TIMBER SHALL BE ALLOWED WHERE A 1-HOUR OR LESS FIRE-RESISTANCE RATING IS REQUIRED.
D. NOT LESS THAN THE FIRE-RESISTANCE RATING REQUIRED BY OTHER SECTIONS OF THIS CODE.
E. NOT LESS THAN THE FIRE-RESISTANCE RATING BASED ON FIRE SEPARATION DISTANCE (SEE TABLE 602).
F. NOT LESS THAN THE FIRE-RESISTANCE RATING AS REFERENCED IN SECTION 704.10.
G. SEE NOTE G OF TABLE 602.
H. SEE SECTION 711.2.4 FOR ADDITIONAL REQUIREMENTS.
I. TYPE V CONSTRUCTION IS NOT PERMITTED INSIDE FIRE DISTRICTS EXCEPT AS PROVIDED FOR IN SECTION D105.1 OF APPENDIX D.
J. SEE SECTION 403.2.1 FOR ADDITIONAL REQUIREMENTS FOR HIGH-RISE BUILDINGS AND FIRE-RESISTANCE RATING OF COLUMNS IN SUCH BUILDINGS.FOR SI: 1 FOOT = 304.8 MM.

HOUSING MAINTENANCE CODE

1. OWNER SHALL FILE REGISTRATION STATEMENT AS PER §27–2097 HMC.
2. OWNER SHALL PROVIDE A SIGN IDENTIFYING OWNER, MANAGEMENT AND SUPERINTENDENT AS PER § 27–2104 HMC.
3. FLOOR SIGNS SHALL BE PLACED AND MAINTAINED ON EACH FLOOR LEVEL AS PER §27–2048 HMC.
4. ALL APARTMENT ENTRANCE DOORS SHALL BE A MINIMUM 3/4 HOUR RATED, SELF CLOSING WITH PEEPHOLES AS PER §27–2041 HMC AND LOCKS AS PER §27–2043 HMC.
5. MIRRORS IN ELEVATORS SHALL BE AS PER §27–2042 HMC.
6. THE BUILDING'S HEATING AND HOT WATER SUPPLY SHALL COMPLY WITH §27–2028 THROUGH § 27–2033 HMC.
7. LIGHTING SHALL BE PROVIDED AS PER §27–2037 THROUGH §27–2040 AND C26-605AC, C26-1203AC AND SECTION 26-35 MDL.
8. RECEPTACLES AND COLLECTION FOR WASTE MATTER SHALL BE PROVIDED AS PER §27–2021 AND §27–2022 HMC.
9. U.S. MAIL SERVICE SHALL BE PROVIDED AS PER §27–2047 HMC.
10. THE BUILDING STREET NUMBER SHALL BE DISPLAYED AS §27–2049 HMC.
11. JANITORIAL SERVICES SHALL BE PROVIDED AS PER §27–2053 AND §27–2054 HMC.
12. OWNER SHALL PAINT ALL PUBLIC PARTS OF A MULTIPLE DWELLING AS PER §27–2013 HMC.
13. INTERIOR OF DWELLING UNITS SHALL BE CLEANED §27–2012 HMC
14. DUTIES OF OWNER SHALL BE AS PER §27–2005 HMC.
15. DUTIES OF TENANTS SHALL BE AS PER §27–2006 AND §27–2007 HMC.
16. OWNER'S RIGHT OF ACCESS SHALL BE AS PER §27–2008 HMC.
17. NOTICE AND REPORTING OF BEDBUG INFESTATION SHALL BE AS PER §27–2018
18. WATER SHALL BE SUPPLIED AS PER §27–2024 AND §27–2025 HMC.
19. THE PLUMBING AND DRAINAGE SYSTEM SHALL BE MAINTAINED AS PER §27–2026 HMC.
20. DRAINAGE OF ROOFS AND COURT YARDS SHALL BE AS PER §27–2027 HMC.
21. NATURAL LIGHT AND VENTILATION SHALL BE PROVIDED AS PER §27–2057 HMC FOR MULTIPLE DWELLINGS.
22. SANITARY FACILITIES IN MULTIPLE DWELLINGS AND LIGHT AND VENTILATION FOR TOILET COMPARTMENTS SHALL BE AS PER §27–2064, §27–2065, §27–2066 AND §27–2067 HMC.
23. KITCHENS AND KITCHENETTES SHALL BE PROVIDED WITH PROPER FACILITIES, EQUIPMENT, LIGHTING, VENTILATION AND FIRE PROTECTION AS PER §27–2070, §27–2071, AND §27–2072 HMC.
24. MINIMUM ROOM SIZES SHALL BE AS PER §27–2074 AND MAXIMUM OCCUPANCY SHALL BE AS PER §27–2075 HMC.

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) NOTES

1. EIFS SHALL BE CONSTRUCTED SUCH THAT IT MEETS THE PERFORMANCE CHARACTERISTICS REQUIRED IN ASTM E 2568.
2. THE UNDERLYING STRUCTURAL FRAMING AND SUBSTRATE SHALL BE DESIGNED AND CONSTRUCTED TO RESIST LOADS AS REQUIRED BY NUC B 2014, CHAPTER 16.
3. EIFS SHALL BE DESIGNED AND CONSTRUCTED TO RESIST WIND AND RAIN IN ACCORDANCE WITH THIS THE MANUFACTURER'S APPLICATION INSTRUCTIONS.
4. EIFS WITH DRAINAGE SHALL HAVE AN AVERAGE MINIMUM DRAINAGE EFFICIENCY OF 90 PERCENT WHEN TESTED IN ACCORDANCE WITH REQUIREMENTS OF ASTM E 2273.
5. EIFS WITH DRAINAGE SHALL HAVE A WATER-RESISTIVE BARRIER COMPLYING WITH SECTION 1404.2 OR ASTM E 2570.
6. INSTALLATION OF EIFS AND EIFS WITH DRAINAGE SHALL BE IN ACCORDANCE WITH THE EIFS MANUFACTURER'S INSTRUCTIONS.
7. EIFS INSTALLATION SPECIAL INSPECTIONS SHALL COMPLY WITH THE PROVISIONS OF NYC BC 2014, CHAPTER 17.

SMOKE DETECTING DEVICES NOTES

1. SMOKE DETECTING DEVICES SHALL CONFORM TO THE 2014 NYC BC SECTION BC 907 FIRE ALARM AND DETECTION SYSTEMS. SYSTEMS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH NFPA 72 AS MODIFIED IN APPENDIX Q AND THE NEW YORK CITY ELECTRICAL CODE.
2. SMOKE DETECTORS WITHIN DWELLING UNITS ARE REQUIRED IN THE FOLLOWING AREAS AS PER SECTION 907.2.8.3: IN SLEEPING AREAS AND IN EVERY ROOM IN THE PATH OF THE MEANS OF EGRESS FROM THE SLEEPING AREA TO THE DOOR LEADING FROM THE DWELLING UNIT.
3. AS PER SECTION 907.2.11.2, REQUIRED SMOKE ALARMS SHALL RECEIVE THEIR PRIMARY POWER FROM A DEDICATED BRANCH CIRCUIT OR THE UNSWITCHED PORTION OF A BRANCH CIRCUIT ALSO USED FOR POWER AND LIGHTING, AND SHALL BE EQUIPPED WITH A BATTERY BACKUP. SMOKE ALARMS SHALL EMIT A SIGNAL WHEN THE BATTERIES ARE LOW. WIRING SHALL BE PERMANENT AND WITHOUT A DISCONNECTING SWITCH OTHER THAN AS REQUIRED FOR OVER- CURRENT PROTECTION. EXCEPTION: SMOKE ALARMS WITH INTEGRAL STROBES SHALL NOT REQUIRE BATTERY BACKUP PROVIDED THAT THE SMOKE ALARMS ARE CONNECTED TO AN EMERGENCY ELECTRICAL SOURCE.
4. ACCESSIBLE AUDIBLE AND VISIBLE ALARMS AND NOTIFICATION APPLIANCES SHALL BE INSTALLED IN ACCORDANCE WITH ICC/ANSI A117.1.
5. AS PER SECTION 901.2, FIRE PROTECTION SYSTEMS SHALL BE INSTALLED, REPAIRED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE 2014 NYC BC AND THE NEW YORK CITY FIRE CODE.
6. AS PER SECTION 901.5 ACCEPTANCE TESTS, FIRE PROTECTION SYSTEMS SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2014 NYC BC AND THE NEW YORK CITY FIRE CODE.

CARBON MONOXIDE DETECTING DEVICES NOTES

1. CARBON MONOXIDE ALARMS AND DETECTORS SHALL CONFORM TO THE 2014 NYC BC SECTION BC 908.7.
2. CARBON MONOXIDE ALARMS OR DETECTORS WITHIN DWELLING UNITS ARE REQUIRED IN THE FOLLOWING AREAS AS PER SECTION 908.7.1.1: OUTSIDE ANY ROOM USED FOR SLEEPING PURPOSES, WITHIN 15 FEET OF THE ENTRANCE TO SUCH ROOM AND IN ANY ROOM USED FOR SLEEPING PURPOSES.
3. AS PER SECTION 908.7.1.1.2, CARBON MONOXIDE ALARMS OR DETECTORS SHALL COMPLY WITH THE POWER SOURCE, INTERCONNECTION, AND ACCEPTANCE TESTING REQUIREMENTS AS REQUIRED FOR SMOKE ALARMS IN ACCORDANCE WITH SECTIONS 907.2.11.2 THROUGH 907.2.11.3.
4. AS PER SECTION 908.7.4 INSTALLATION, CARBON MONOXIDE ALARMS AND DETECTORS SHALL BE LISTED IN ACCORDANCE WITH UL 2034 AND UL 2075.
5. ACCESSIBLE AUDIBLE AND VISIBLE ALARMS AND NOTIFICATION APPLIANCES SHALL BE INSTALLED IN ACCORDANCE WITH ICC/ANSI A117.1.
6. THE MAINTENANCE OF CARBON MONOXIDE DETECTION AND ALARM SYSTEMS AND THE INSTALLATION AND TESTING OF CARBON MONOXIDE DETECTING DEVICES THAT ARE INTERCONNECTED WITH A FIRE ALARM SYSTEM OR MONITORED BY A CENTRAL STATION SHALL BE ENFORCED AS PER ARTICLE 103 OF CHAPTER 1 OF THE GENERAL ADMINISTRATIVE PROVISIONS OF THE 2014 NYC BC.

ROOF ASSEMBLY REFLECTANCE NOTES

1. ROOF COVERING REFLECTANCE SHALL BE PROVIDED AS PER NYC BC 2014, SECTION 1504.9.
2. ROOF COVERINGS ON ROOFS OR SETBACKS WITH SLOPE EQUAL TO OR LESS THAN TWO UNITS VERTICAL IN 12 UNITS HORIZONTAL (17 PERCENT) SHALL HAVE:
A. A MINIMUM INITIAL SOLAR REFLECTANCE OF 0.7 IN ACCORDANCE WITH ASTM C 1549 OR ASTM E 1918, AND A MINIMUM THERMAL EMITTANCE OF 0.75 AS DETERMINED IN ACCORDANCE WITH ASTM C 1371 OR ASTM E 408; OR
B. A MINIMUM SRI OF 78 AS DETERMINED IN ACCORDANCE WITH ASTM E 1980. EXCEPTIONS:
a. TERRACES ON SETBACKS COMPRISING LESS THAN 25 PERCENT OF THE AREA OF THE LARGEST FLOOR PLATE IN THE BUILDING.
b. ANY PORTION OF A ROOF COVERED BY A GREEN ROOF SYSTEM, INCLUDING SUCH A SYSTEM WITH AGRICULTURAL PLANTINGS, IN COMPLIANCE WITH SECTION 1507.16.
c. ANY PORTION OF A ROOF USED AS OUTDOOR RECREATION SPACE BY THE OCCUPANTS OF THE BUILDING THAT IS LANDSCAPED COVERED BY WOOD DECKING OR COVERED WITH A WALKING SURFACE OR OTHER PROTECTIVE SURFACE, PROVIDED THAT SUCH WALKING SURFACE OR PROTECTIVE SURFACE HAS A MINIMUM INITIAL SOLAR REFLECTANCE OF 0.3 AS DETERMINED IN ACCORDANCE WITH ASTM C 1549 OR ASTM E 1918.
d. ANY PORTION OF A ROOF THAT IS UNDER MECHANICAL EQUIPMENT, FLUSH MOUNTED SOLAR PANELS LYING DIRECTLY ON THE ROOF SURFACE, DUCKBOARDING, DECKING, PLATFORM, ROOF TANK, COOLING TOWER OR ANY OTHER ROOFTOP STRUCTURE OR EQUIPMENT EXEMPTED BY RULE BY THE COMMISSIONER.
e. ANY ROOF OR PORTION OF A ROOF COMPOSED OF GLASS, METAL, CLAY OR CONCRETE TILE OR PLASTIC/RUBBER INTENDED TO SIMULATE CLAY OR CONCRETE TILE, WOOD, OR SLATE.
f. ANY PORTION OF A ROOF USED BY A SCHOOL OR DAYCARE CENTER AS A PLAYGROUND FOR CHILDREN
g. ANY ROOF, IF THE AMOUNT OF ROOFTOP SPACE N

WIND LOADS NOTES

1. BUILDINGS, STRUCTURES AND PARTS THEREOF SHALL BE DESIGNED TO WITHSTAND THE MINIMUM WIND LOADS PRESCRIBED IN THE 2014 NYC BC, CHAPTER 16 STRUCTURAL DESIGN, SECTION BC 1609 WIND LOADS. DECREASES IN WIND LOADS SHALL NOT BE MADE FOR THE EFFECT OF SHIELDING BY OTHER STRUCTURES.
2. AS PER SECTION 1609.1.1 DETERMINATION OF WIND LOADS, WIND LOADS ON EVERY BUILDING OR STRUCTURE SHALL BE DETERMINED IN ACCORDANCE WITH CHAPTER 6 OF ASCE 7, WITH THE BASIC WIND SPEED AND THE EXPOSURE CATEGORY DETERMINED IN ACCORDANCE WITH SECTIONS 1609.3 THROUGH 1609.4. WIND LOADS MAY ALSO BE DETERMINED USING PROVISIONS OF THE ALTERNATE METHODS DESCRIBED IN SECTION 1609.6. WIND S HALL BE ASSUMED TO COME FROM ANY HORIZONTAL DIRECTION AND WIND PRESSURES SHALL BE ASSUMED TO ACT NORMAL TO THE SURFACE CONSIDERED.

MECHANICAL SYSTEMS NOTES

1. MECHANICAL APPLIANCES, EQUIPMENT AND SYSTEMS SHALL BE CONSTRUCTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW YORK CITY MECHANICAL CODE AND THE NEW YORK CITY FUEL GAS CODE. MASONRY CHIMNEYS, FIREPLACES AND BARBECUES SHALL COMPLY WITH THE NYC 2014 MECHANICAL CODE AND NYC BC 2014, CHAPTER 21 MASONRY.
2. ALL BATHROOM AND TOILET ROOMS IN DWELLING UNITS TO HAVE MECHANICAL EXHAUST SYSTEM OF MIN. 50 CFM WHEN DESIGNED TO OPERATE INTERMITTENTLY AND MIN. OF 25 CFM WHEN DESIGNED TO OPERATE CONTINUOUSLY DURING NORMAL HOURS OF USE.
3. PUBLIC TOILETS SHALL BE VENTILATED WITH MECHANICAL EXHAUST SYSTEM OF 50/70 CFM RATES PER WATER CLOSET OR URINAL. THE HIGHER RATE SHALL BE PROVIDED WHERE PERIODS OF HEAVY USE ARE EXPECTED TO OCCUR, SUCH AS TOILETS IN THEATERS, SCHOOLS AND SPORTS FACILITIES. THE LOWER RATE SHALL BE PERMITTED WHERE PERIODS OF HEAVY USE ARE NOT EXPECTED.
4. IN DWELLING UNITS, WHEN KITCHEN REQUIRED TO HAVE MECHANICAL EXHAUST SYSTEM AND ALL KITCHENETTES TO BE PROVIDED WITH MIN. OF 100 CFM WHEN DESIGNED TO OPERATE INTERMITTENTLY AND MIN. OF 25 CFM WHEN DESIGNED TO OPERATE CONTINUOUSLY DURING NORMAL HOURS OF USE.
5. DUCT RISERS TO BE FIRE PROTECTED WITH TWO (2) HOUR FIRE RATED CONSTRUCTION ON ALL SIDES.
6. WHERE DUCTS PASS THROUGH FLOOR, FLOOR OPENINGS TO BE CUT TIGHT TO DUCT, AND REMAINING GAP BETWEEN DUCT AND FLOOR CONSTRUCTION TO BE FILLED WITH MINERAL WOOL OR EQUAL.
7. WHEN EACH BATHROOM AND KITCHEN TO BE EQUIPPED WITH ITS OWN INDEPENDENT EXHAUST BLOWER BACKDRAFT DAMPER TO BE PROVIDED OR AS PER MECHANICAL DOCUMENTS.
8. EACH BATHROOM AND KITCHEN/KITCHENETTE OUTLET TO BE EQUIPPED WITH APPROVED FIRE DAMPER WHEN REQUIRED.
9. MINIMUM FRESH AIR INTAKE (F.A.I.) WITH APPROVED FIRE DAMPER TO BE PROVIDED FOR BOILER ROOM AS PER MECHANICAL DOCUMENTS.
10. BATHROOMS CONTAINING BATHTUBS, SHOWERS, SPAS AND SIMILAR BATHING FIXTURES IN OTHER THAN R AND I-1 OCCUPANCIES SHALL BE MECHANICALLY VENTILATED IN ACCORDANCE WITH THE NYC 2014 MECHANICAL CODE, WHETHER OR NOT THEY ARE ALSO PROVIDED WITH NATURAL VENTILATION.
11. AIR INTAKE OPENING LOCATIONS SHALL COMPLY WITH THE FOLLOWING:
· INTAKE OPENINGS SHALL BE LOCATED A MINIMUM OF 10 FEET FROM LOT LINES OR BUILDINGS ON THE SAME LOT.
· FOR BUILDINGS ON LOTS MEASURING LESS THAN 20 FEET IN WIDTH, INTAKE OPENINGS SHALL BE LOCATED AT THE CENTERLINE BETWEEN LOT LINES. WHERE OPENINGS FRONT ON A STREET OR PUBLIC WAY, THE DISTANCE SHALL BE MEASURED TO THE CENTERLINE OF THE STREET OR PUBLIC WAY.
· OUTDOOR INTAKES FOR HIGH-RISE OFFICE BUILDINGS HAVING OCCUPIED FLOORS LOCATED MORE THAN 75 FEET ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS SERVING SPACES ABOVE THE SECOND STORY AND SERVING SPACES GREATER THAN 10,000 SQUARE FEET OF FLOOR AREA SHALL BE LOCATED AT LEAST 20 FEET ABOVE GROUND LEVEL, AT LEAST 30 FEET FROM EXHAUST OUTLETS AND OTHER EXHAUST DISCHARGES, AND AT LEAST 20 FEET FROM AREAS THAT MAY COLLECT VEHICULAR EXHAUST, SUCH AS OFF STREET LOADING BAYS.
· MECHANICAL AND GRAVITY OUTDOOR AIR INTAKE OPENINGS SHALL BE LOCATED NOT LESS THAN 10 FEET HORIZONTALLY FROM ANY HAZARDOUS OR NOXIOUS CONTAMINANT SOURCE.
· INTAKE OPENINGS ON STRUCTURES IN FLOOD HAZARD AREAS SHALL COMPLY WITH APPENDIX G OF THE NYC BC 2014.
· EXCEPTION: GROUP R-3 OCCUPANCIES ARE NOT REQUIRED TO COMPLY WITH ABOVE.
10. AIR INTAKE OPENINGS THAT TERMINATE OUTDOORS SHALL BE PROTECTED WITH CORROSION-RESISTANT SCREENS, LOUVERS OR GRILLES. OPENINGS IN LOUVERS, GRILLES AND SCREENS SHALL BE SIZED IN ACCORDANCE WITH TABLE 401.5, NYC 2014 MECHANICAL CODE AND SHALL BE PROTECTED AGAINST LOCAL WEATHER CONDITIONS. OUTDOOR AIR INTAKE OPENINGS LOCATED IN EXTERIOR WALLS SHALL MEET THE PROVISIONS FOR EXTERIOR WALL OPENING PROTECTIVES IN ACCORDANCE WITH THE NYC BC 2014.
11. FOR HIGH-RISE BUILDINGS, OUTDOOR AIR INTAKES SERVING SPACES ABOVE THE SECOND STORY AND SERVING SPACES GREATER THAN 10,000 SQUARE FEET OF FLOOR AREA SHALL BE LOCATED IN ACCORDANCE WITH SECTION 401.5 OF THE NYC 2014 MECHANICAL CODE. EXCEPTION: GROUP R-2 OCCUPANCY.
12. ENCLOSED PARKING GARAGES. MECHANICAL VENTILATION SYSTEMS FOR ENCLOSED PARKING GARAGES SHALL BE PERMITTED TO OPERATE INTERMITTENTLY WHERE THE SYSTEM IS ARRANGED TO OPERATE AUTOMATICALLY UPON DETECTION OF A CONCENTRATION OF CARBON MONOXIDE.

PLUMBING SYSTEMS NOTES

1. THE 2014 NEW YORK CITY PLUMBING CODE SHALL GOVERN THE ERECTION, INSTALLATION, ALTERATION, REPAIR, RELOCATION, REPLACEMENT, ADDITION TO, USE OR MAINTENANCE OF PLUMBING SYSTEMS. PLUMBING SYSTEMS AND EQUIPMENT SHALL BE CONSTRUCTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW YORK CITY PLUMBING CODE.
2. ALL MATERIALS, FIXTURES, AND APPLIANCES SHALL COMPLY WITH CHAPTER 3 GENERAL REGULATIONS, SECTION PC 303 MATERIALS .
3. ALL GAS-FIRED EQUIPMENT AND ACCESSORY EQUIPMENT SHALL COMPLY WITH THE 2014 NYC MECHANICAL CODE AND THE 2014 NYC FUEL GAS CODE.
4. PLUMBING CONTRACTOR TO EXAMINE PROPOSED LAYOUT WITH REGARD TO EXISTING FIELD CONDITIONS, AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BETWEEN ASSUMED FIELD CONDITIONS AND THOSE ENCOUNTERED DURING CONSTRUCTION. PLUMBING CONTRACTOR SHALL INFORM ARCHITECT OF ANY REVISIONS TO PLAN WHICH SHALL BE NECESSARY (BASED ON CONDITIONS UNCOVERED IN THE FIELD), IN ORDER TO INSTALL ALL FIXTURES, EQUIPMENT AND PIPING IN STRICT ACCORDANCE WITH REQUIREMENTS OF THE 2014 NYC BC, THE 2014 NYC PLUMBING CODE, AND/OR AS PER DESIGNS SHOWN IN THE CONTRACT DOCUMENTS.
5. PLUMBING CONTRACTOR SHALL ARRANGE AND OBTAIN INSPECTIONS AND REQUIRED SIGN-OFFS AS PER SECTION PC 107 INSPECTION AND TESTING, SECTION 107.5 SIGN-OFF OF COMPLETED WORK. REFER TO ARTICLE 116 OF CHAPTER 28 OF THE ADMINISTRATIVE CODE.

DIMENSIONING NOTES

1. ALL WALLS ARE ORTHOGONAL TO THE PROPERTY LINES UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL BE KNOWLEDGEABLE OF WHICH PROPERTY LINE DETERMINES THE ORIENTATION OF EACH WALL, AND SHALL NOTIFY THE ARCHITECT OF ANY CONDITIONS REQUIRING CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
2. PARTITIONS ARE DIMENSIONED TO THE FURNISHED FACE OF THE WALL UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS SHALL HAVE PREFERENCE OVER SCALE. DO NOT SCALE THE DRAWINGS.
4. ALL DIMENSIONS OF EXISTING CONDITIONS ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD BEFORE PROCEEDING WITH THE WORK. THE ARCHITECT SHALL BE NOTIFIED OF ANY CORRECTIONS.
5. WHEN UNDIMENSIONED PARTITIONS APPEAR IN CONJUNCTION WITH DOOR OPENINGS, THE DOOR WIDTH AND DOOR FRAME DETAILS DETERMINE THE LOCATION OF THE ADJACENT WALLS AND FRAMES.
6. ALL ACCESSIBLE DIMENSIONS TO BE PROVIDED TO FINISH WALL, CEILING AND FLOORS.

PARTITION NOTES

1. DEFLECTION FOR ALL PARTITIONS SHALL NOT EXCEED 1/240TH OF THE SPAN MAXIMUM FOR TYPICAL GYPSUM PARTITIONS, OR 1/360 FOR WOOD-CLAD PARTITIONS OR STONE-CLAD PARTITION SYSTEMS.
2. WATER RESISTANT DRYWALL (FOR THE FULL HEIGHT OF THE PARTITION CONSTRUCTION) SHALL BE USED IN TOILETS, SHOWERS, SERVICE ROOMS, ETC. USE STANDARD GYPSUM BOARD FOR CEILING CONSTRUCTION.
3. PENETRATIONS: COORDINATE WITH MECHANICAL CONTRACTOR FOR OPENINGS REQUIRED FOR RETURN AIR IN FULL HEIGHT PARTITIONS.
4. PROVIDE LATERAL BRACING TO STRUCTURE ABOVE FINISHED CEILINGS FOR PARTITIONS EXCEEDING UNSUPPORTED HEIGHTS INDICATED ON DRAWINGS.
5. PROVIDE HORIZONTAL CONTROL JOINTS AT 12'-0' O.C. IN THE VERTICAL DIRECTION UNLESS NOTED OTHERWISE.
6. PROVIDE CONTROL JOINTS IN GYPSUM WALLBOARD CONSTRUCTION SUCH THAT PARTITION OR FURRING RUNS DO NOT EXCEED 30' AND CEILING DIMENSIONS DO NOT EXCEED 50' IN EITHER DIRECTION WITH PERIMETER RELIEF OR 30' WITHOUT PERIMETER RELIEF.
7. PROVIDE VERTICAL CONTROL JOINTS WITH SEALANT IN MASONRY WALLS AS SHOWN ON DRAWINGS, WITH MAXIMUM SPACING OF 25'-0'.
8. COMPLETELY SEAL WITH ACOUSTICAL SEALANT HEADS, BASES, AND ENDS, PLUS ALL PENETRATIONS (INCLUDING BUT NOT LIMITED TO MECHANICAL, ELECTRICAL, AND PLUMBING WORK).
9. PROVIDE SOUND BLANKETS AS INDICATED.

FINISHES & DETAILS NOTES - NYC BC 2014, CHAPTER 8

1. AS PER SECTION BC 803.1.1.2 INTERIOR FLAME SPREAD INDEX REQUIREMENTS BASED ON OCCUPANCY GROUP, INTERIOR WALL AND CEILING FINISH SHALL HAVE A FLAME SPREAD INDEX NOT GREATER THAN THAT FOR THE CLASSIFICATION RATING SPECIFIED IN TABLE 803.1 'INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY' FOR THE GROUP AND LOCATION DESIGNATED.
2. AS PER SECTION BC 803.1.1.3 INTERIOR SMOKE DEVELOPED INDEX REQUIREMENTS BASED ON OCCUPANCY GROUP, EXCEPT WHERE PERMITTED FOR INTERIOR TRIM IN SECTION 806.5, ACCEPTABLE SMOKE-DEVELOPED INDICES SHALL RANGE FROM 0-450 WITH THE FOLLOWING RESTRICTIONS:
EXITS, CORRIDORS .... 25 OR LESS
OCCUPANCY GROUP I .... 50 OR LESS
ROOMS IN WHICH THE NET FLOOR AREA PER OCCUPANT IS 10 SQUARE FEET OR LESS .... 100 OR LESS
3. WHERE INTERIOR FINISH MATERIALS ARE APPLIED ON WALLS, CEILINGS OR STRUCTURAL ELEMENTS REQUIRED TO HAVE A F FIRE-RESISTANCE RATING OR TO BE OF NONCOMBUSTIBLE CONSTRUCTION, THEY SHALL COMPLY WITH THE PROVISIONS OF SECTION BC 803.3.
4. AS PER SECTION BC 803.5 TOXICITY, INTERIOR WALL OR CEILING FINISHES, OTHER THAN TEXTILES, UPON EXPOSURE TO FIRE, SHALL NOT PRODUCE PRODUCTS OF DECOMPOSITION OR COMBUSTION THAT ARE MORE TOXIC IN POINT OF CONCENTRATION THAN THOSE GIVEN OFF BY WOOD OR PAPER WHEN DECOMPOSING OR BURNING UNDER COMPARABLE CONDITIONS AS TESTED IN ACCORDANCE WITH NFPA 269.
5. COMBUSTIBLE FLOORING MATERIALS ARE PERMITTED AS PER SECTION BC 805 COMBUSTIBLE FLOORING MATERIALS IN TYPES I AND II CONSTRUCTION.
6. THERMAL AND ACOUSTICAL INSULATION SHALL COMPLY WITH SECTION BC 807.
7. ACOUSTICAL CEILING SYSTEMS SHALL COMPLY WITH SECTION BC 808.
8. COMBUSTIBLE MATERIALS USED FOR MILLWORK, DOORS, AND TRIM ARE PERMITTED AS PER THE 2014 NYC BC CHAPTER 6 TYPES OF CONSTRUCTION, SECTION BC 603 COMBUSTIBLE MATERIAL IN TYPE I AND II CONSTRUCTION.
9. ALL GLASS FOR INTERIOR USE IN BOTH VERTICAL AND SLOPED APPLICATIONS SHALL COMPLY WITH THE NYC BC 2014, CHAPTER 24 GLASS AND GLAZING.
10. FLOORS AND WALL BASE FINISH MATERIALS IN TOILET, BATHING AND SHOWER ROOM FLOOR FINISH MATERIALS SHALL HAVE A SMOOTH, HARD, NONABSORBENT SURFACE. THE INTERSECTIONS OF SUCH FLOORS WITH WALLS SHALL HAVE A SMOOTH, HARD, NONABSORBENT VERTICAL BASE THAT EXTENDS UPWARD ONTO THE WALLS AT LEAST 4 INCHES. EXCEPTION: OCCUPANCY CLASSES I-1, R-1 AND R-2 SHALL HAVE A VERTICAL BASE THAT EXTENDS UPWARD ONTO WALLS AT LEAST 6 INCHES.

SEISMIC/EARTHQUAKE NOTES

1. THE PROPOSED BUILDING HAS BEEN DESIGNED IN COMPLIANCE WITH THE NEW YORK CITY SEISMIC CODE: LOCAL LAW 17/95.
2. EVERY STRUCTURE, AND PORTION THEREOF, INCLUDING NONSTRUCTURAL COMPONENTS THAT ARE PERMANENTLY ATTACHED TO STRUCTURES AND THEIR SUPPORTS AND ATTACHMENTS, SHALL BE DESIGNED AND CONSTRUCTED TO RESIST THE EFFECTS OF EARTHQUAKE MOTIONS IN ACCORDANCE WITH THE 2014 NYC BC, CHAPTER 16 STRUCTURAL DESIGN, SECTION BC 1613 EARTHQUAKE LOADS, AND ASCE 7-10 (2010 EDITION), EXCLUDING CHAPTER 14 AND APPENDIX 11A. THE SEISMIC DESIGN CATEGORY FOR A STRUCTURE SHALL BE DETERMINED IN ACCORDANCE WITH EITHER SECTION 1613 OR ASCE 7-10 (2010 EDITION).
3. THE PROPOSED BUILDING HAS BEEN DESIGNED WITH STRUCTURAL SEPARATIONS AS PER 2014 NYC BC 1613.7. ALL STRUCTURES SHALL BE SEPARATED FROM ADJACENT STRUCTURES. WHEN A STRUCTURE ADJOINS A PROPERTY LINE NOT COMMON TO A PUBLIC WAY (TYPICALLY SIDE OR REAR LOT LINES), THAT STRUCTURE SHALL ALSO BE SET BACK FROM THE PROPERTY LINE BY AT LEAST 1 INCH FOR EACH 50 FEET OF HEIGHT AND A MINIMUM OF 1 INCH FOR STRUCTURES WITH HEIGHTS LESS THAN 50 FEET. FOR STRUCTURES IN SEISMIC DESIGN CATEGORY D, REFER TO ASCE 7-10 FOR ADDITIONAL REQUIREMENTS.
4. FOR STRUCTURES ADJACENT TO EXISTING UN REINFORCED MASONRY BEARING WALL STRUCTURES, THE STRUCTURAL SEPARATION SHALL BE FILLED WITH A MATERIAL WITH A MINIMUM COMPRESSIVE STRENGTH OF 25 PSI AND A MAXIMUM COMPRESSIVE STRENGTH OF 100 PSI. ADDITIONALLY, WHEN THE ADJACENT WALL IS A PARTY WALL, THE PARTY WALL SHALL BE MADE SECURE BY THE PARTY RESPONSIBLE FOR THE NEW CONSTRUCTION AS PER CHAPTER 33.
5. THE INFILL MATERIAL SHALL BE COVERED ON ALL SIDES AND SHALL MEET THE APPROPRIATE PROVISIONS OF CHAPTER 26. THE COVERING MUST BE OF ADEQUATE STRENGTH TO RESIST THE WIND LOADS FOR CLADDING AS SPECIFIED IN CHAPTER 16 AND SHALL CONFORM TO ALL APPLICABLE PROVISIONS IN CHAPTER 14.
6. WHEN A BUILDING SEPARATION WIDER THAN 5 INCHES IS CREATED PURSUANT TO SECTION 1613.7, SUCH SEPARATION, AT THE ROOF LEVEL OF THE PROPOSED NEW BUILDING, OR AT THE ROOF LEVEL OF AN EXISTING ADJOINING BUILDING WHERE IF THAT BUILDING IS LOWER THAN THE PROPOSED NEW BUILDING, SHALL HAVE A HORIZONTAL COVER/CLOSURE THAT CONFORMS WITH THE FOLLOWING:
a. THE COVER/CLOSURE MATERIAL SHALL BE NON COMBUSTIBLE; AND
EXCEPTION: THE COVER/CLOSURE MATERIAL USED SHALL BE PERMITTED TO BE COMBUSTIBLE MATERIAL IN ACCORDANCE WITH SECTION 1509.9 IF ALL THE MATERIAL ON THE APPROPRIATE ROOF CONFORMS TO THE LIMITATIONS THEREIN, THERE ARE NO MASONRY OPENINGS IN EITHER WALL ABUTTING THE BUILDING SEPARATION, AND BOTH BUILDINGS ARE NON COMBUSTIBLE.
b. THE COVER/CLOSURE SHALL BE CAPABLE OF WITHSTANDING THE ROOF LIVE LOAD OF 30 PSF SECURELY FASTENED TO THE NEW BUILDING, AND BE OF A TYPE THAT WOULD BE CAPABLE OF PREVENTING UNAUTHORIZED OR ACCIDENTAL ACCESS TO THE SPACE.
7. SEISMIC DESIGN REQUIREMENTS FOR MASONRY STRUCTURES AND COMPONENTS SHALL COMPLY WITH THE REQUIREMENTS IN SECTION 1.17 OF TMS 402/ACI 530/ASCE 5 DEPENDING ON THE STRUCTURE'S SEISMIC DESIGN CATEGORY AS DETERMINED IN SECTION 1613 OF THIS CODE.

OTHER AGENCY REQUIREMENTS

508.1- EACH PORTION OF A BUILDING SHALL BE INDIVIDUALLY CLASSIFIED IN ACCORDANCE WITH § 302.1.
EXCEPTIONS:
• OCCUPANCIES SEPARATED IN ACCORDANCE WITH SECTION 510.
• WHERE IDENTIFIED IN TABLE 509, ROOMS OR SPACES SHALL BE TREATED AS INCIDENTAL USES.
• WHERE NOT IDENTIFIED IN TABLE 509, MECHANICAL AND/OR ELECTRICAL EQUIPMENT ROOMS SHALL BE PERMITTED TO BE CLASSIFIED AS THE OCCUPANCY WITHIN WHICH THEY ARE LOCATED, OR AT THE OPTION OF THE APPLICANT, CLASSIFIED AS GROUP F-2 OCCUPANCY IN ACCORDANCE WITH SECTION 306.3.

508.3-NONSEPARATED OCCUPANCIES
PROPOSED MIXED USE BUILDING COMPLIES WITH ALL PROVISIONS OF 508.3

508.3.1 OCCUPANCY CLASSIFICATION.
NONSEPARATED OCCUPANCIES SHALL BE INDIVIDUALLY CLASSIFIED IN ACCORDANCE WITH SECTION 302.1. THE REQUIREMENTS OF THIS CODE SHALL APPLY TO EACH PORTION OF THE BUILDING BASED ON THE OCCUPANCY CLASSIFICATION OF THAT SPACE. IN ADDITION, THE MOST RESTRICTIVE PROVISIONS OF CHAPTER 9 WHICH APPLY TO THE NONSEPARATED OCCUPANCIES SHALL APPLY TO THE TOTAL NONSEPARATED OCCUPANCY AREA. WHERE NONSEPARATED OCCUPANCIES OCCUR IN A HIGH-RISE BUILDING, THE MOST RESTRICTIVE REQUIREMENTS OF SECTION 403 WHICH APPLY TO THE NONSEPARATED OCCUPANCIES SHALL APPLY THROUGHOUT THE HIGH-RISE BUILDING.

508.3.2 ALLOWABLE BUILDING AREA AND HEIGHT.
THE ALLOWABLE BUILDING AREA AND HEIGHT OF THE BUILDING OR PORTION THEREOF SHALL BE BASED ON THE MOST RESTRICTIVE ALLOWANCES FOR THE OCCUPANCY GROUPS UNDER CONSIDERATION FOR THE TYPE OF CONSTRUCTION OF THE BUILDING IN ACCORDANCE WITH SECTION 503.1.
[PROPOSED BUILDING COMPLIES - PROPOSED USES ARE UNLIMITED IN HEIGHT AND AREA AS PER § 503.1]

508.3.3 SEPARATION.
NO SEPARATION IS REQUIRED BETWEEN NONSEPARATED OCCUPANCIES.

EXCEPTIONS:
1. GROUP H-2, H-3, H-4 AND H-5 OCCUPANCIES SHALL BE SEPARATED FROM ALL OTHER OCCUPANCIES IN ACCORDANCE WITH SECTION 508.4.
2. SEPARATED TENANCIES IN ACCORDANCE WITH SECTION 510.10.
3. KITCHENS SHALL BE SEPARATED IN ACCORDANCE WITH SECTION 508.4.4.

KAO-HWA LEE
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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
GENERAL NOTES

G-002C.00

Scale:	As indicated
Date:	12/1/2025 7:27:56 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

ACCESSIBILITY NOTES:

1. ALL MEASUREMENTS TO BE VERIFIED ON FIELD BY GC.
2. ALL SECTIONS IN DIAGRAMS REFERENCE THE ANSI A117.1 2009 WITH NYC MODIFICATIONS U.N.O.

NYC 2022 BUILDING CODE CHAPTER 11 - ACCESSIBILITY NOTES:

1101.3 CHAPTER 11 APPLIES TO ALTERATIONS, INCLUDING MINOR ALTERATIONS BUT EXCLUDING ORDINARY REPAIRS, AND CHANGES OF USE OR OCCUPANCY TO PRIOR CODE BUILDINGS, PORTIONS OF SUCH BUILDINGS, AND SPACES WITHIN SUCH BUILDINGS. THIS SECTION SHALL NOT IMPOSE A REQUIREMENT FOR GREATER ACCESSIBILITY THAN THAT WHICH WOULD BE REQUIRED FOR NEW CONSTRUCTION, NOR SHALL IT REDUCE OR HAVE THE EFFECT OF REDUCING ACCESSIBILITY.

1103.1 ALL SITES, BUILDINGS, STRUCTURES, FACILITIES, ELEMENTS AND SPACES, TEMPORARY OR PERMANENT, SHALL BE ACCESSIBLE TO INDIVIDUALS WITH DISABILITIES.

1104.5 ACCESSIBLE ROUTES SHALL COINCIDE WITH OR BE LOCATED IN THE SAME AREA AS A GENERAL CIRCULATION PATH. WHERE THE CIRCULATION PATH IS INTERIOR, THE ACCESSIBLE ROUTE SHALL ALSO BE INTERIOR. WHERE ONLY ONE ACCESSIBLE ROUTE IS PROVIDED, THE ACCESSIBLE ROUTE SHALL NOT PASS THROUGH KITCHENS, STORAGE ROOMS, RESTROOMS, CLOSETS OR SIMILAR SPACES.

1105.1 IN ADDITION TO ACCESSIBLE ENTRANCES REQUIRED BY § 1105.1.1 THROUGH 1105.1.8, ALL PUBLIC ENTRANCES SHALL BE ACCESSIBLE.

1105.1.7 DOORS AND DOORWAYSAT ENTRANCE(S) TO ACCESSIBLE UNITS AND TYPE B+NYC UNITS, INCLUDING HARDWARE, SHALL COMPLY WITH § 404 OF ICC A117.1. DOORS AND DOORWAYS, INCLUDING HARDWARE, AT ENTRANCE(S) TO TYPE B UNITS SHALL COMPLY WITH § 1003.5 OF ICC A117.1.

1106.1 WHERE PARKING IS PROVIDED, 5% OF THE TOTAL NUMBER OF PARKING SPACES PROVIDED FOR A FACILITY, BUT NOT LESS THAN ONE PARKING SPACE, SHALL BE ACCESSIBLE PARKING SPACES. VAN-ACCESSIBLE PARKING SPACES SHALL BE PROVIDED IN ACCORDANCE WITH 1106.5. ACCESSIBLE PARKING SPACES SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH § 502 OF ICC A117.1.

1106.6 ACCESSIBLE PARKING SPACES SHALL BE LOCATED ON THE SHORTEST ACCESSIBLE ROUTE OF TRAVEL FROM ADJACENT PARKING TO AN ACCESSIBLE BUILDING ENTRANCE.

1106.7 PASSENGER LOADING ZONES.PASSENGER LOADING ZONES SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH ICC A117.1 INCLUDING § 503.

1106.8.1 WHERE VEHICLE CHARGING STATIONS ARE PROVIDED FOR COMMON USE, AT LEAST FIVE PERCENT OF THE TOTAL NUMBER OF ELECTRICAL VEHICLE CHARGING STATIONS PER FACILITY, BUT NOT LESS THAN ONE FOR EACH TYPE OF ELECTRIC VEHICLE CHARGING STATION, SHALL BE ACCESSIBLE.

1107.2 DWELLING UNITS AND SLEEPING UNITS WHICH ARE REQUIRED TO BE ACCESSIBLE UNITS, TYPE B+NYC UNITS, OR TYPE B UNITS SHALL COMPLY WITH CHAPTER 10 OF ICC A117.1.

1107.2.2.5 LAVATORIES SHALL COMPLY WITH § 606 OF ICC A117.1.

1107.2.2.6 MIRRORS ABOVE LAVATORIES SHALL HAVE THE BOTTOM EDGE OF THE REFLECTING SURFACE 40" (1016 MM) MAX. ABOVE THE FLOOR OR GROUND. MEDICINE CABINETS, IF PROVIDED, MUST INCLUDE A STORAGE SHELF NO HIGHER THAN 44 " (1117.6 MM) ABOVE THE FLOOR.

1107.2.2.7.1 THE WATER CLOSET SHALL BE POSITIONED WITH A WALL TO THE REAR AND TO ONE SIDE. THE CENTERLINE OF THE WATER CLOSET SHALL BE 18" (457.2 MM) FROM THE SIDE WALL.

1107.2.2.7.2 CLEARANCE AROUND THE WATER CLOSET SHALL COMPLY WITH SECTIONS 1107.2.2.7.2.1 THROUGH 1107.2.2.7.2.3.

1107.2.2.7.3 GRAB BARS FOR WATER CLOSETS SHALL COMPLY § 609 OF ICC A117.1 AND 1107.2.2.7.3.1 THROUGH 1107.2.2.7.3.2.

1107.2.3 WHERE KITCHENS AND KITCHENETTES ARE PROVIDED IN ATYPE B+NYC DWELLING UNIT OR SLEEPING UNIT, THE PRIMARY KITCHEN OR KITCHENETTE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE KITCHEN REQUIREMENTS OF § 1003.12 AND 1003.3.2 OF ICC A117.1.

1107.2.8 WHERE WASHING MACHINES OR CLOTHES DRYERS ARE PROVIDED WITHIN A TYPE B+NYC DWELLING UNIT OR SLEEPING UNIT, SUCH EQUIPMENT SHALL COMPLY WITH § 611 OF ICC A117.1 AND SHALL BE FRONT LOADING.

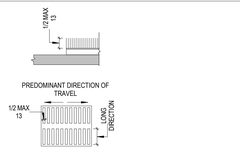
1107.3 ROOMS AND SPACES AVAILABLE TO THE GENERAL PUBLIC OR AVAILABLE FOR COMMONUSE BY RESIDENTS AND SERVINGACCESSIBLE UNITS, TYPE B+NYCUNITS ORTYPE B UNITS SHALL BE ACCESSIBLE.

1107.4 AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ACCESSIBLE BUILDING OR FACILITY ENTRANCES WITH THE REQUIRED ACCESSIBLE ENTRANCE(S) OF EACH ACCESSIBLE UNIT, TYPE B+NYC UNIT,AND TYPE B UNIT WITHIN THE BUILDING OR FACILITY AND WITH THOSE EXTERIOR AND INTERIOR SPACES AND FACILITIES THAT SERVE THE UNITS.

1111.1 REQUIRED ACCESSIBLE ELEMENTS SHALL BE IDENTIFIED BY THE DYNAMIC ACCESSIBILITY SYMBOL AT THE FOLLOWING LOCATIONS:

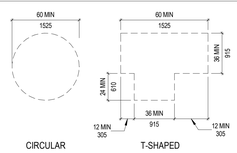
- ACCESSIBLE PARKING SPACES REQUIRED PER 1106.1 AND 1106.2.
- ACCESSIBLE PASSENGER LOADING ZONES.
- ACCESSIBLE ROOMS WHERE MULTIPLE SINGLE-OCCUPANT TOILET ROOMS OR BATHING ROOMS ARE CLUSTERED AT A SINGLE LOCATION.
- ACCESSIBLE ENTRANCES WHERE NOT ALL ENTRANCES ARE ACCESSIBLE.
- ACCESSIBLE CHECK-OUT AISLES WHERE NOT ALL AISLES ARE ACCESSIBLE.
- FAMILYOR ASSISTED-USE TOILET AND BATHING ROOMS.
- ACCESSIBLE DRESSING, FITTING AND LOCKER ROOMS WHERE NOT ALL SUCH ROOMS ARE ACCESSIBLE.
- ACCESSIBLE AREAS OF RESCUE ASSISTANCE.
- EXTERIOR AREAS FOR ASSISTED RESCUE.
- REFUSE DISPOSAL AND REFUSE STORAGE ROOMS.

302 FLOOR SURFACES



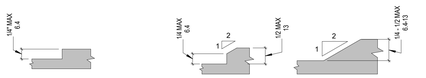
EXPOSED CARPET EDGES MUST BE FASTENED TO THE FLOOR AND PROVIDED WITH A FINISH TRIM COMPLYING W/ § 303.

304 TURNING SPACE



CIRCULAR T-SHAPED

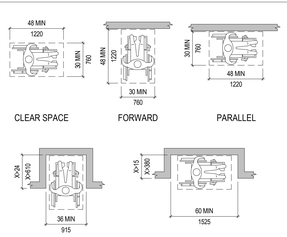
303 CHANGES IN LEVEL



VERTICAL CHANGES IN LEVEL BEVELED CHANGES IN LEVEL

CHANGES IN LEVEL GREATER THAN 1/2" (13mm) SHALL BE CONSIDERED RAMPS COMPLYING W/ § 405 & 406

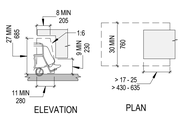
305 CLEAR FLOOR SPACE



CLEAR SPACE FORWARD PARALLEL

ALCOVE FORWARD ALCOVE PARALLEL

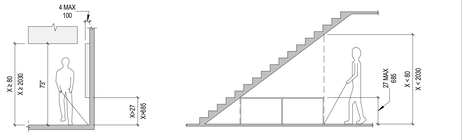
306 KNEE & TOE CLEARANCE



ELEVATION PLAN

ANY ADDITIONAL TOE CLEARANCE GREATER THAN 6" ABOVE THE MINIMUM 9" SHALL NOT BE CONSIDERED TOE CLEARANCE PER § 306.2.4

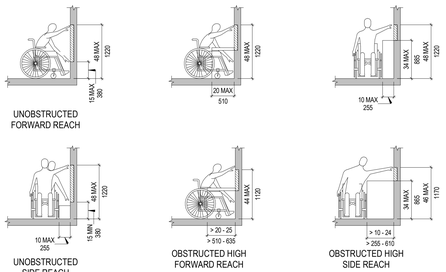
307 PROTRUDING OBJECTS



LIMITS OF PROTRUDING OBJECTS REDUCED VERTICAL CLEARANCE

EXCEPTIONS: HANDRAILS CAN PROTRUDE 4-1/2" (115mm) MAX. INTO CIRCULATION PATHS PER § 307.2. DOOR CLOSERS AND DOOR STOPS SHALL BE PERMITTED TO BE 78" (1980mm) A.F.F. PER § 307.4.

308 REACH RANGES



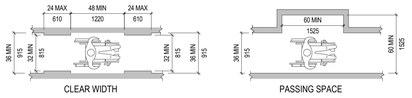
UNOBSTRUCTED FORWARD REACH

UNOBSTRUCTED SIDE REACH OBSTRUCTED HIGH FORWARD REACH OBSTRUCTED HIGH SIDE REACH

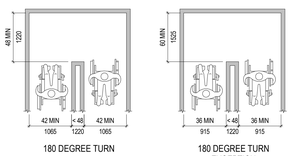
EXCEPTIONS: EXISTING ELEMENTS THAT ARE NOT ALTERED SHALL BE PERMITTED AT 54" (1370mm) A.F.F. ON SIDE REACH PER § 308.3.1. FOR WASHING MACHINES AND CLOTHES DRYERS OBSTRUCTION HEIGHT SHALL BE PERMITTED AT 36" (915mm) A.F.F. PER § 308.3.2.

402/3 ACCESSIBLE ROUTES & WALKING SURFACES

ACCESSIBLE ROUTES CONSIST OF WALKING SURFACES WITH A MAX. SLOPE OF 1:20, DOORS/DOORWAYS, RAMPS, CURB RAMPS, ELEVATORS AND PLATFORM LIFTS. CROSS SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 1:48 PER § 402.

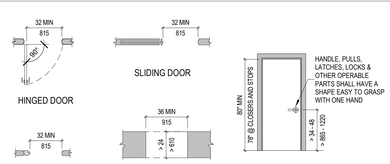


CLEAR WIDTH PASSING SPACE

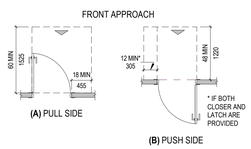


180 DEGREE TURN 180 DEGREE TURN EXCEPTION

404 DOORS AND DOORWAYS



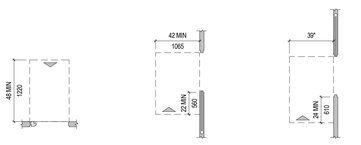
MANUAL SWING DOORS CLEARANCES



(A) PULL SIDE (B) PUSH SIDE (C) PUSH SIDE (E) PUSH SIDE

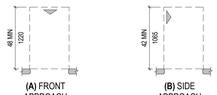
(F) PULL SIDE (G) PUSH SIDE

SLIDING AND FOLDING DOORS CLEARANCES



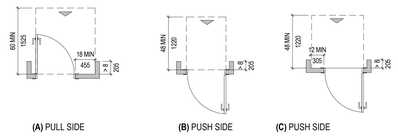
(A) FRONT APPROACH (B) POCKET OR HINGE APPROACH (C) STOP OR LATCH APPROACH

DOORWAYS CLEARANCE



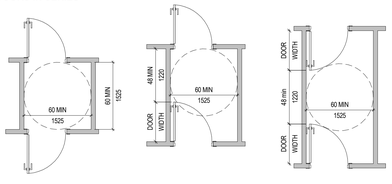
(A) FRONT APPROACH (B) SIDE APPROACH

RECESSED DOORS



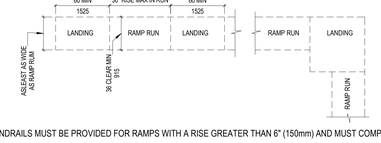
(A) PULL SIDE (B) PUSH SIDE (C) PUSH SIDE

TWO DOORS IN SERIES



405 RAMPS

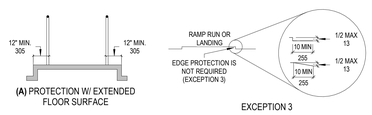
RAMPS SHOULD HAVE A SLOPE GREATER THAN 1:20 BUT NOT STEEPER THAN 1:12. CROSS SLOPE SHALL NOT BE STEEPER THAN 1:48 PER § 405. EXCEPTIONS: IN EXISTING BUILDINGS, RAMPS WITH A STEEPER SLOPE SHALL BE PERMITTED DUE TO SPACE LIMITATIONS BUT NOT STEEPER THAN 1:8. PER § 405.2.



HANDRAILS MUST BE PROVIDED FOR RAMPS WITH A RISE GREATER THAN 6" (150mm) AND MUST COMPLY WITH § 505.

EDGE PROTECTION

PER § 405.9 EDGE PROTECTION MUST BE PROVIDED ON EACH SIDE OF RAMP RUNS AND LANDINGS. EXCEPTIONS: EDGE PROTECTIONS NOT REQUIRED ON 1) CURB RAMPS WITH FLARES AND W/OUT HANDRAILS 2) RAMP LANDINGS SERVING A RUN OR STAIRWAY 3) SIDES OF RAMPS HAVING A VERTICAL DROP OFF OF 1/2" (13mm) MAX WITHIN 10" (255mm) OUTSIDE MINIMUM LANDING AREA 4) RAMP AISLES PROVIDING ACCESS TO SEATS OF AISLE WAYS.

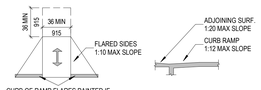


(A) PROTECTION W/ EXTENDED FLOOR SURFACE EXCEPTION 3

(B) PROTECTION W/ CURB (C)PROTECTION W/ BARRIER

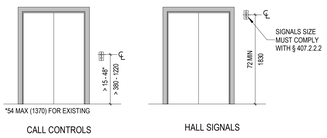
406 CURB RAMPS

DETECTABLE WARNINGS SHALL BE PROVIDED FOR CURB RAMPS COMPLYING WITH § 406.13 AND 705



407 ELEVATORS

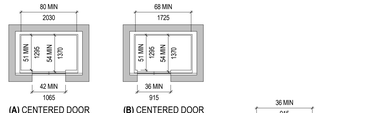
ELEVATORS SHALL BE PROVIDED FOR BUILDINGS WITH 5 STORIES OR MORE IN HEIGHT PER NYC BC § 3002.4 AND ONE MUST ACCOMMODATE AN AMBULANCE STRETCHER PER NYC BC § 3003.3. ALL ELEVATORS SHALL COMPLY WITH § 407 OF ANSI A117.1 2009 AND ASME A17.1/CSA B44. ELEVATORS CONTROLS SHALL HAVE A CLEAR FLOOR SPACE COMPLYING WITH § 305. EXISTING ELEVATORS SHALL NOT COMPLY WITH MINIMUM HEIGHTS OF § 407.2.2.2. AUDIBLE SIGNALS SHALL BE PROVIDED AND COMPLYING WITH § 407.2.2.3



CALL CONTROLS HALL SIGNALS

CAR REQUIREMENTS

IF OTHER ELEVATORS ARE PROVIDED BESIDES THE ELEVATOR-IN-READINESS MUST COMPLY WITH § 407.4

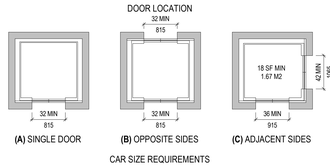


(A) CENTERED DOOR (B) CENTERED DOOR

(C) ANY DOOR (D) ANY DOOR (E) EXISTING

408 LIMITED-USE/LIMITED-APPLICATION ELEVATORS

ALL LIMITED-USE ELEVATORS SHALL COMPLY WITH § 408 OF ANSI A117.1 2009 AND ASME A17.1/CSA B44.

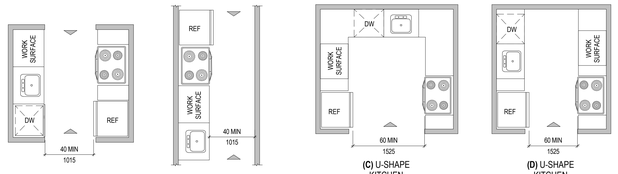


(A) SINGLE DOOR (B) OPPOSITE SIDES (C) ADJACENT SIDES

(A) NEW CONSTRUCTION (A) EXISTING

804 KITCHENS AND KITCHENETTES

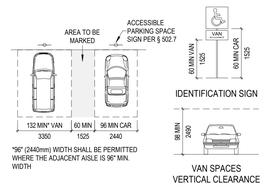
PER § 804.25 EXCEPTION: SPACES THAT DO NOT PROVIDE COOKTOP OR CONVENTIONAL RANGE SHALL NOT REQUIRE TO COMPLY PROVIDED A 40" MIN DISTANCE BETWEEN OPPOSING CABINETS, COUNTERTOPS OR WALLS



(A) PASS-THROUGH KITCHEN (B) PASS-THROUGH KITCHEN (C) U-SHAPE KITCHEN (D) U-SHAPE KITCHEN

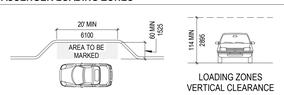
502 PARKING SPACES

PER § 502.5 PARKING SPACES SURFACES SHALL NOT HAVE A SLOPE STEEPER 1:48.



IDENTIFICATION SIGN VAN SPACES VERTICAL CLEARANCE

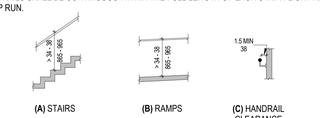
503 PASSENGER LOADING ZONES



LOADING ZONES VERTICAL CLEARANCE

505 HANDRAILS

PER § 505 HANDRAILS SHALL BE PROVIDED ON BOTH SIDES OF STAIRS AND RAMPS. HANDRAILS SHALL BE CONTINUOUS WITHIN THE FULL LENGTH OF EACH STAIR FLIGHT AND RAMP RUN.

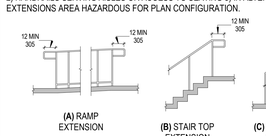


(A) STAIRS (B) RAMPS (C) HANDRAIL CLEARANCE

(A) CIRCULAR (B) NON-CIRCULAR (C) NON-CIRCULAR

HANDRAIL EXTENSIONS

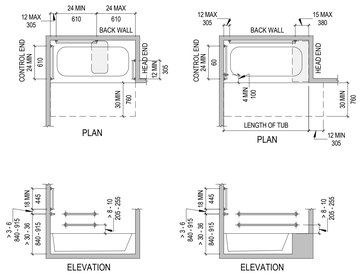
PER § 505.10 HANDRAILS SHALL EXTEND IN THE SAME DIRECTIONS OF STAIR FLIGHTS AND RAMP RUNS. EXCEPTIONS: EXTENSIONS NOT REQUIRED ON 1) INSIDE TURNS OF STAIR RAMPS 2) HANDRAILS SERVING AISLES OR ACCESS TO SEATING 3) IN ALTERATIONS WHEN FULL EXTENSIONS AREA HAZARDOUS FOR PLAN CONFIGURATION.



(A) RAMP EXTENSION (B) STAIR TOP EXTENSION (C) STAIR BOTTOM EXTENSION

607 BATHTUBS

GRAB BARS SHALL BE PROVIDED PER § 607.4. EXCEPTIONS: GRAB BARS SHALL NOT BE PROVIDED ON SINGLE OCCUPANT RESTROOMS ACCESSED THROUGH PRIVATE OFFICE NOT FOR COMMON/PUBLIC USE. L-SHAPED CONTINUOUS GRAB BAR SHALL BE PERMITTED ON CONTROL END WALL WITH EQUIVALENT DIMENSIONS PER § 607.4 W/ PERMANENT SEAT.



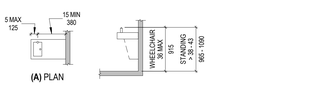
PLAN PLAN

ELEVATOR ELEVATOR

(A) W/OUT PERMANENT SEAT (B) W/ PERMANENT SEAT

602 DRINKING FOUNTAINS

DRINKING FOUNTAINS MUST HAVE A CLEAR SPACE AND CLEARANCES PER § 305.

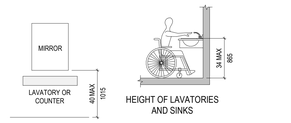


(A) PLAN (B) ELEVATION

603 TOILET AND BATHING ROOMS

DOORS SHALL NOT SWING INTO CLEARANCE FOR ANY FIXTURE. PER § 603.2.2. EXCEPTIONS: DOOR SWING SHALL BE PERMITTED ON FIXTURES CLEARANCES ON 1) SINGLE OCCUPANT TOILET OR BATHING ROOMS 2) INDIVIDUAL USE ROOMS WHERE CLEAR FLOOR SPACE IS PROVIDED BEYOND DOOR SWING.

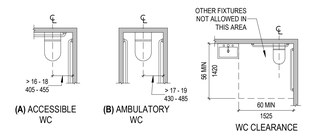
CLEAR FLOOR SPACE COMPLYING W/ § 305.3 (FORWARD APPROACH) SHALL BE PROVIDED AND KNEE AND TOE CLEARANCE SHALL BE PROVIDED PER § 306. EXCEPTIONS: 1) PARALLEL APPROACH SHALL BE PERMITTED FOR KITCHEN SINKS WHEN TOP RANGE IS NOT PROVIDED 2) KNEE AND TOE CLEARANCE SHALL NOT BE PROVIDED FOR SINGLE OCCUPANT TOILETS 3) KNEE AND TOE REQUIREMENTS ARE NOT REQUIRED TO FOR MORE THAN ONE BOWL IN MULTIBOWL SINKS.



HEIGHT OF LAVATORIES AND SINKS

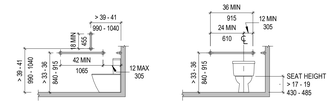
604 WATER CLOSERS AND TOILET COMPARTMENTS

PER § 604.3.2 THE WATER CLOSET CLEARANCE CAN OVERLAP W/ GRAB BARS, PAPER DISPENSERS, SANITARY NAPKINS RECEPTACLES, COAT HOOKS, SHELVES AND OTHER FIXTURES CLEARANCES.



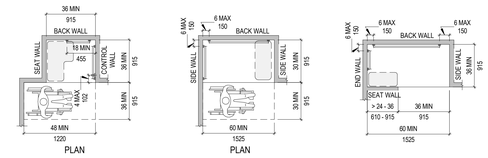
(A) ACCESSIBLE WC (B) AMBULATORY WC WC CLEARANCE

GRAB BARS SHALL COMPLY SHALL BE PROVIDED IN REAR AND SIDE WALLS CLOSEST TO THE WATER CLOSET PER § 604.5. EXCEPTIONS: GRAB BARS SHALL NOT BE PROVIDED ON 1) SINGLE OCCUPANT RESTROOMS ACCESSED THROUGH PRIVATE OFFICE NOT FOR COMMON/PUBLIC USE 2) DETENTION OR CORRECTION FACILITIES.

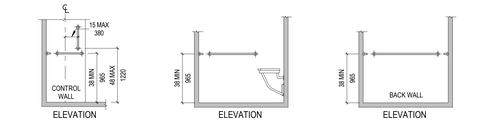


SIDE GRAB BARS REAR GRAB BARS

608 SHOWER COMPARTMENTS



PLAN PLAN



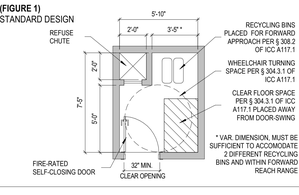
ELEVATION ELEVATION ELEVATION ELEVATION

(A) TRANSFER-TYPE SHOWER (B) ROLL-IN-TYPE SHOWER (C) ALTERNATIVE ROLL-IN-TYPE SHOWER

BUILDINGS BULLETIN 2019-001 - ACCESSIBLE REFUSE ROOM

STANDARD DESIGN. IN MULTIPLE DWELLINGS, REFUSE DISPOSAL, RECYCLABLE, AND STORAGE ROOMS INTENDED FOR THE GENERAL COMMON-USE SHALL COMPLY WITH BULLETIN 2019-001. EACH ROOM MUST COMPLY W/ ICC A117.11, INCLUDING BUT NOT LIMITED TO, § 304 (TURNING SPACE), § 305 (CLEAR FLOOR SPACE), § 309 (OPERABLE PARTS) AND § 404 (DOORS AND DOORWAYS). THE REFUSE AND RECYCLABLE STORAGE ROOM DOOR MAY SWING INTO THE ROOM PROVIDED THAT A CLEAR FLOOR SPACE NOT LESS THAN 30" BY 48" IS PROVIDED WITHIN THE ROOM BEYOND THE ARC OF THE DOOR SWING. SEE FIGURE 1. **ALTERNATIVE DESIGN.** AN ALTERNATIVE DESIGN IS PERMITTED PROVIDED THAT THE CONDITIONS ARE MET PER FIGURE 2.

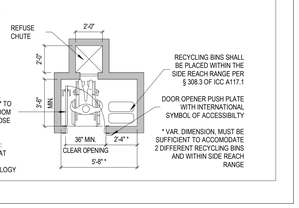
(FIGURE 1)
STANDARD DESIGN



(FIGURE 2)
ALTERNATIVE DESIGN

FIRE-RATED 38" DOOR W/ AUTO. OPENER AND OCCUP. SENSOR** TO MAINTAIN DOOR OPEN WHEN ROOM IS OCCUPIED. DOOR MUST CLOSE IN CASE OF POWER FAILURE.

** THE OCCUP. SENSOR MAY BE:
1. WEIGHT-SENSITIVE FLOOR MAT
2. INFRARED SENSOR
3. OTHER EQUIVALENT TECHNOLOGY



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Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

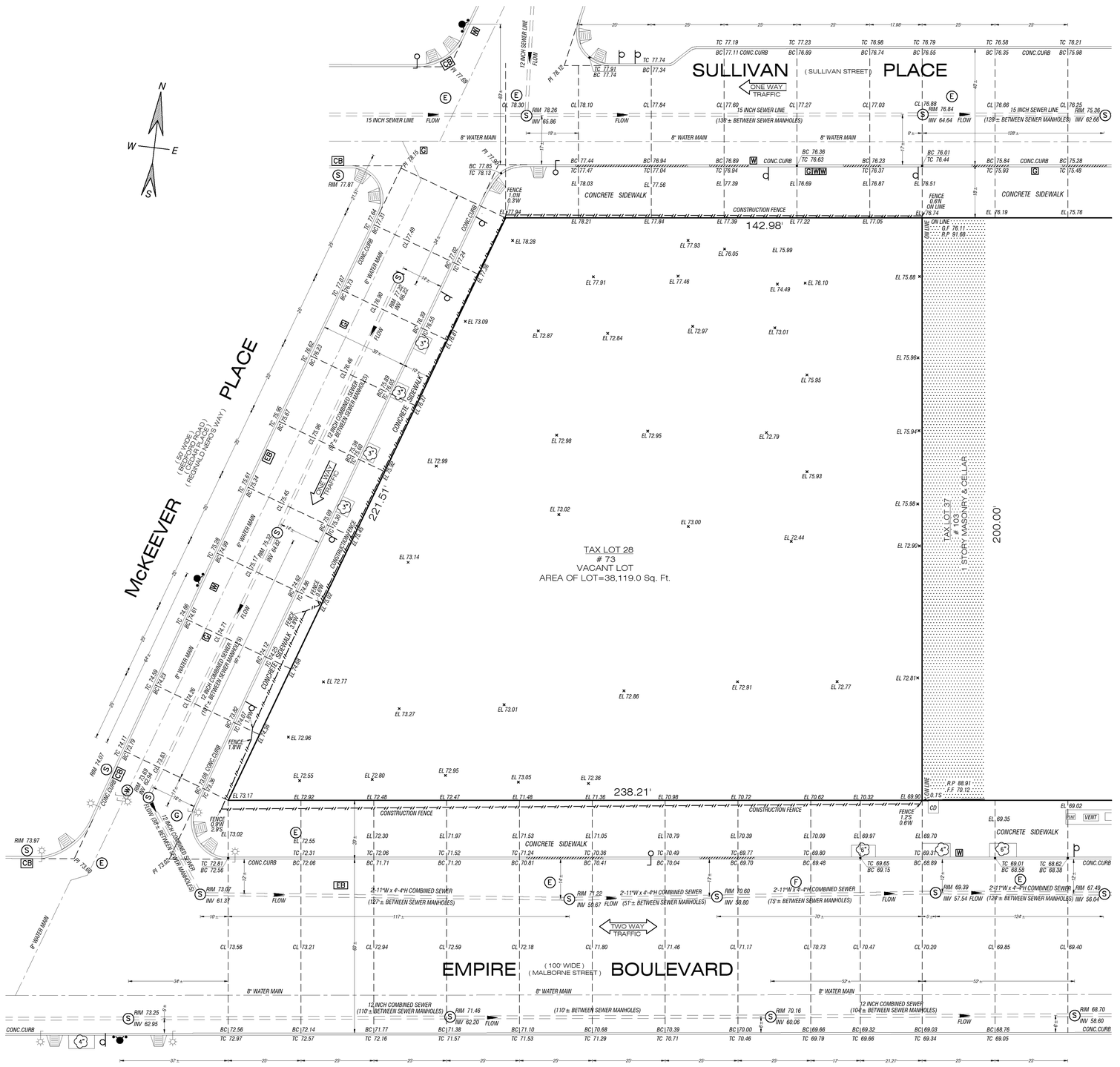
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ACCESSIBILITY NOTES

G-005C.00

Scale: 1/4" = 1'-0"
Date: 12/1/2025 7:27:58 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

JOB # CM 5022 ADDRESS: 73 EMPIRE BOULEVARD



SCALE: 1 INCH = 25 FEET

GENERAL NOTES:

1. This survey was prepared only for the party (parties) and purpose indicated hereon.
2. Property corner monuments or markers were (not) placed as part of this survey.
3. Certifications on this survey map signify that the map was prepared in accordance with the current existing Code of Practice for Land Surveys adopted by the New York State Association of Professional Land Surveyors, Inc. Said certifications are limited to the party (parties) for whom the survey is prepared and are not transferable.
4. The location and nature of underground structures, internal walls and improvements or encroachments not visible to the surveyor are not covered under this certification.
5. Easements of record are only guaranteed if an Abstract of Title is furnished to the surveyor.
6. This is to certify that there are no streams nor natural water courses on the property except as shown on this survey.
7. Elevations refer to NAVD 1988 datum.

CAPTION	ARCHITECTURAL SURVEY				
DATE	REVISIONS				
10-20-2025	ARCHITECTURAL SURVEY UPDATE				
07-02-2025	ARCHITECTURAL SURVEY				
	DATE	BY		DATE	BY
SURVEYED	07-02-2025	V.B,V.J,P.J	DRAWN	07-05-2025	V.B

LEGEND

F.F	FIRST FLOOR ELEVATION
R.P	ROOF PARAPET ELEVATION
G.F	GARAGE FLOOR ELEVATION
TC	TOP OF CURB
BC	BOTTOM OF CURB
CL	CENTERLINE
EL	SPOT ELEVATION
INV	INVERT ELEVATION
CD	CELLAR DOOR
CONC.	CONCRETE
G	GAS MANHOLE
W	WATER MANHOLE
E	ELECTRIC MANHOLE
S	SEWER MANHOLE
F	FIRE DEPARTMENT MANHOLE
W	WATER VALVE
G	GAS VALVE
CB	CATCH BASIN
EB	ELECTRIC BOX
	TRAFFIC LIGHT
	LIGHT POLE
	STREET SIGN
	HYDRANT
	CHAIN LINK FENCE
	CONSTRUCTION FENCE
	DROP CURB
	PEDESTRIAN RAMP
30"	TREE & SIZE

VINCENT TEUTONICO, L.S.
NEW YORK LICENSE 050307

MAP OF SURVEY OF PROPERTY

BOROUGH AND COUNTY OF BROOKLYN
CITY AND STATE OF NEW YORK
TAX MAP: BLOCK 1306, LOT 28

STATEWIDE LAND SURVEYING P.C.
16 FLAGG PLACE
STATEN ISLAND
NY 10304
TEL: 718-751-6871
email: citymapping@yahoo.com

KAO-HWA LEE
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SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ARCHITECTURAL SURVEY

V-001C.00

Scale:
Date: 12/1/2025 7:28:00 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 BLDG C - SUBCELLAR 2 LIFE SAFETY PLAN
3/16" = 1'-0"

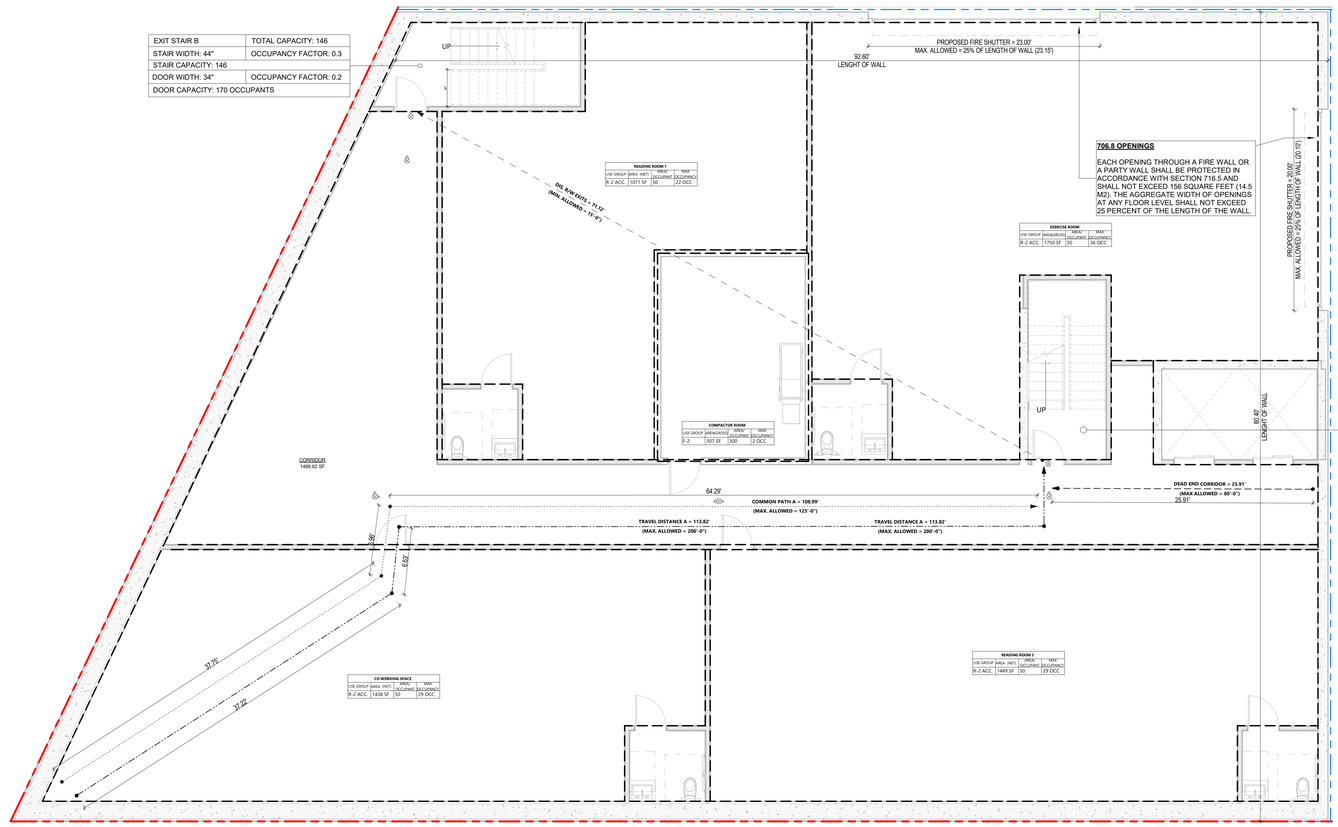
SUB-CELLAR 2 EGRESS STAIRS - BLDG C				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	59	17.7	44"
EGRESS STAIR B	0.3	59	17.7	44"

SUB-CELLAR 2 EGRESS DOORS - BLDG C				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	59	11.8	36"
EGRESS DOOR B	0.2	59	11.8	36"

SUB-CELLAR 2 CORRIDOR CAPACITY - BLDG C				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	118	23.6	60"

SUB-CELLAR 2 OCCUPANT LOAD - BLDG C		
Name	Area	# of Occupants
CO WORKING SPACE	1438 SF	29
EXERCISE ROOM	1750 SF	36
READING ROOM 1	1071 SF	22
READING ROOM 2	1449 SF	29
	5709 SF	116
COMPACTOR ROOM	307 SF	2
	307 SF	2
TOTAL	6016 SF	118

SUB-CELLAR 2 TRAVEL DISTANCE - BLDG C			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	109' - 0"
DEAD END			
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	25' - 11"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2 ACC.	MIN. ALLOWED = 15'-0"	71' - 1"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	113' - 10"



2 BLDG C - SUBCELLAR 1 LIFE SAFETY PLAN
3/16" = 1'-0"

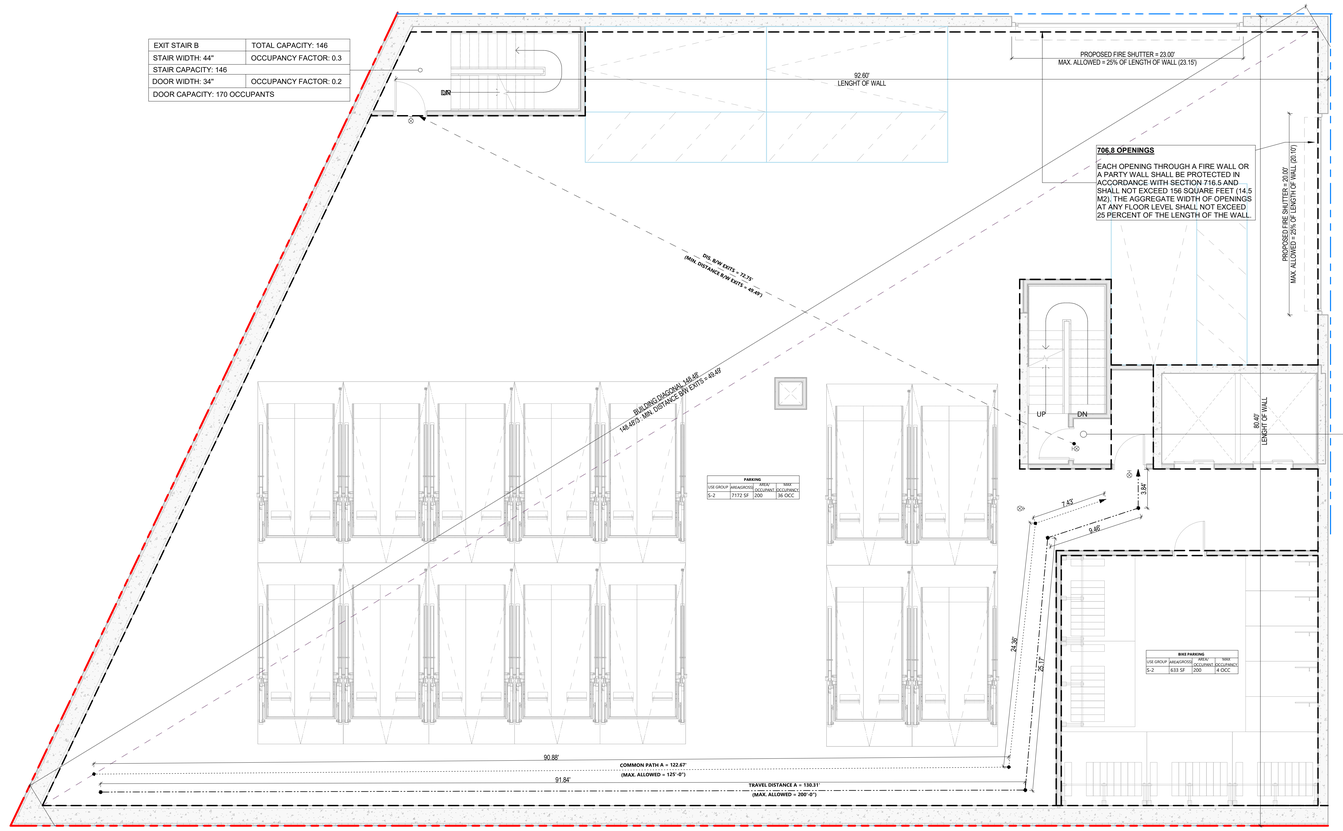
SUB-CELLAR 1 EGRESS STAIRS - BLDG C				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR B	0.3	20	6	44"
EGRESS STAIR A	0.3	20	6	44"

SUB-CELLAR 1 EGRESS DOORS - BLDG C				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	20	4	36"
EGRESS DOOR B	0.2	20	4	36"

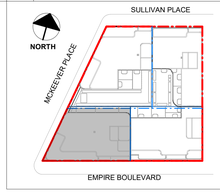
SUB-CELLAR 1 CORRIDOR CAPACITY - BLDG C				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width

SUB-CELLAR 1 OCCUPANT LOAD - BLDG C		
Name	Area	# of Occupants
BIKE PARKING	633 SF	4
PARKING	7172 SF	36
	7805 SF	40
TOTAL	7805 SF	40

SUB-CELLAR 1 TRAVEL DISTANCE - BLDG C			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	S-2	MAX. ALLOWED = 125'-0"	122' - 8"
DIS. B/W EXITS			
DIS. B/W EXITS	S-2	MIN. DISTANCE B/W EXITS = 49.49'	72' - 9"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	S-2	MAX. ALLOWED = 200'-0"	130' - 4"



KEY PLAN
N.T.S.



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DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
SUBCELLAR 1 & 2 LIFE SAFETY PLANS

A-001C.00

Scale: As indicated
Date: 12/1/2025 7:28:13 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 BLDG C - CELLAR LIFE SAFETY PLAN
3/16" = 1'-0"

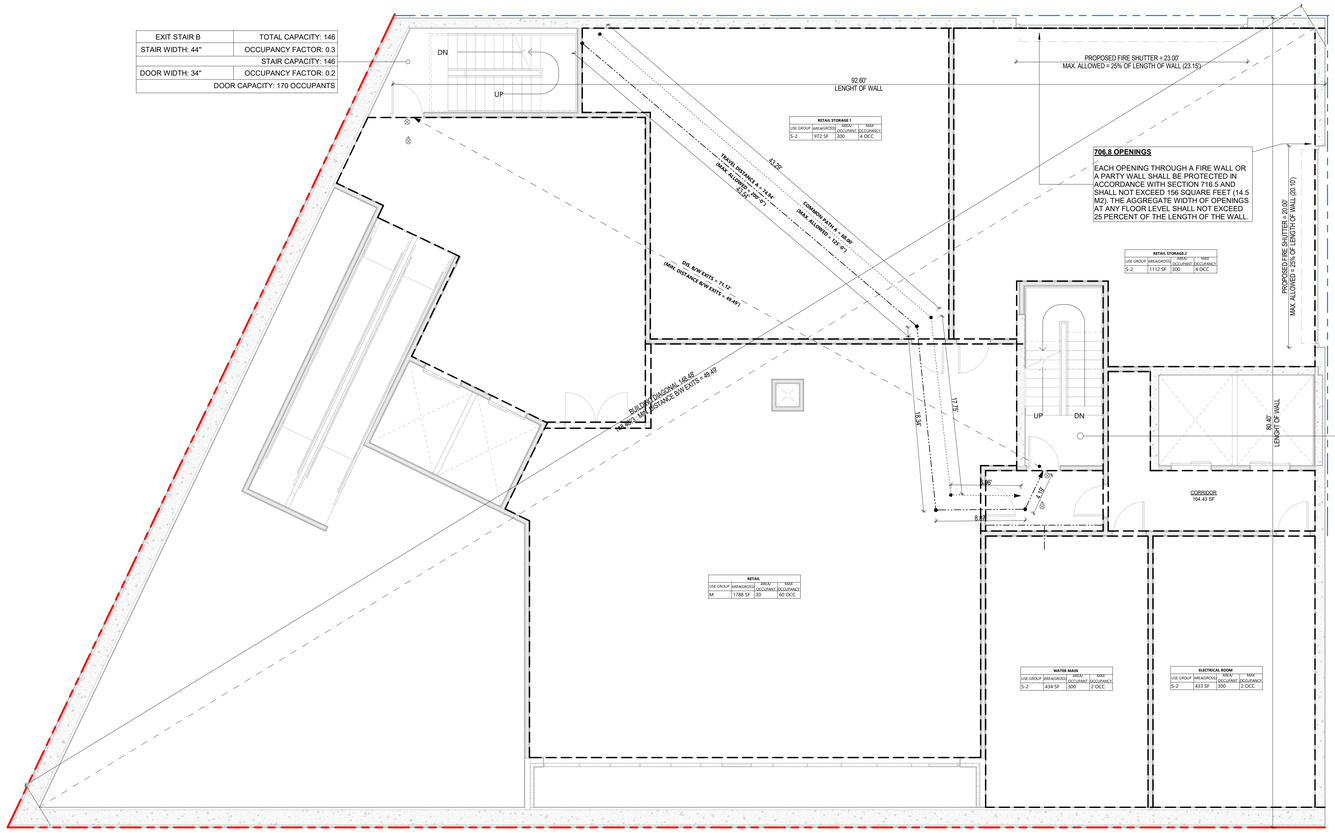
CELLAR EGRESS STAIRS- BLDG C				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	38	11.4	44"
EGRESS STAIR B	0.3	37	11.1	44"

CELLAR EGRESS DOORS - BLDG C				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	38	7.6	36"
EGRESS DOOR B	0.2	37	7.4	36"

CELLAR CORRIDOR CAPACITY - BLDG C				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	72	14.4	60"

CELLAR OCCUPANT LOAD - BLDG C		
Name	Area	# of Occupants
RETAIL	1788 SF	60
RETAIL STORAGE 1	972 SF	4
RETAIL STORAGE 2	1112 SF	4
	3872 SF	68
ELECTRICAL ROOM	433 SF	2
WATER MAIN	434 SF	2
	868 SF	4
TOTAL	4740 SF	72

CELLAR TRAVEL DISTANCE - BLDG C			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	M	MAX. ALLOWED = 125'-0"	68' - 0"
DIS. B/W EXITS			
DIS. B/W EXITS	M	MIN. DISTANCE B/W EXITS = 49.49'	71' - 1"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	M	MAX. ALLOWED = 200'-0"	74' - 11"



2 BLDG C - 1ST FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"

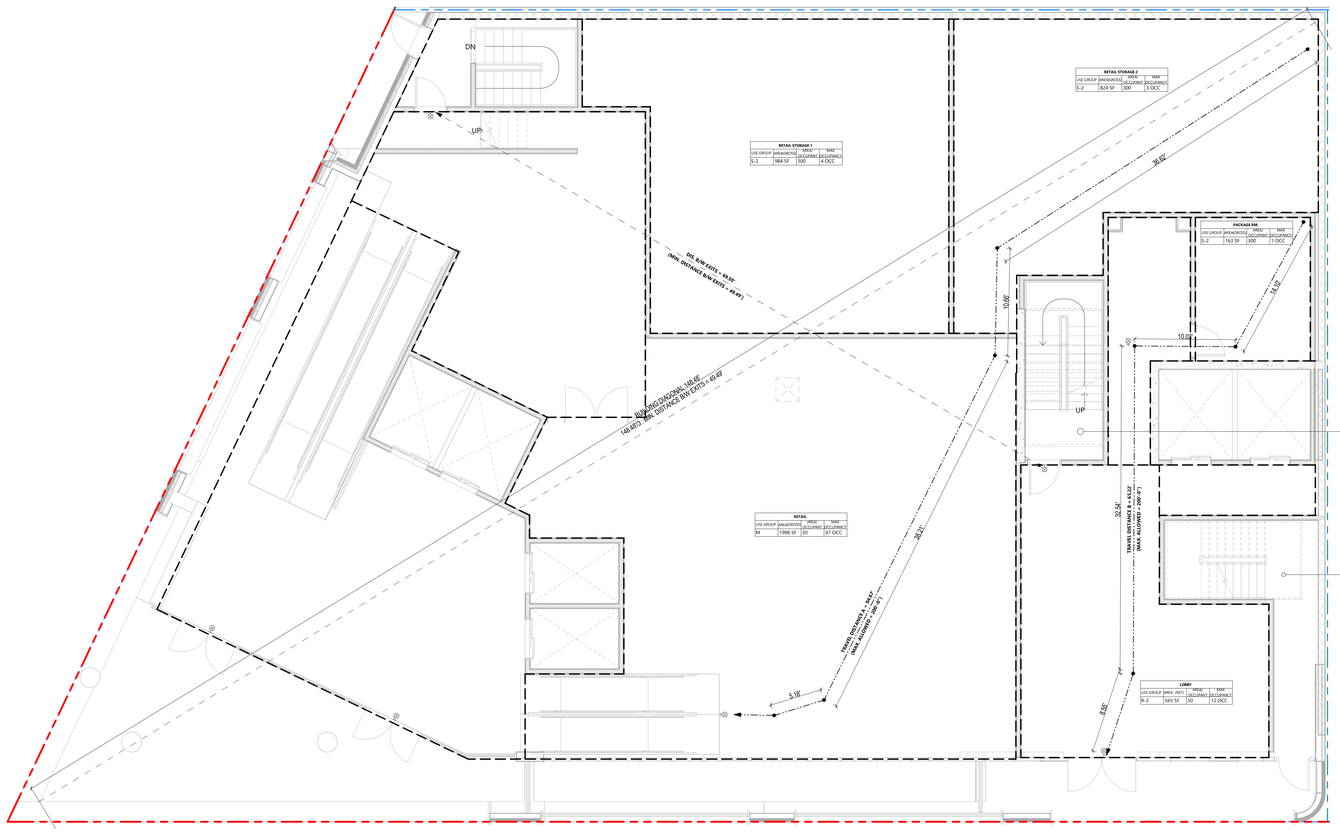
1ST FLOOR EGRESS STAIRS - BLDG C				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	44	13.2	44"
EGRESS STAIR B	0.3	43	12.9	44"

1ST FLOOR EGRESS DOORS - BLDG C				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width

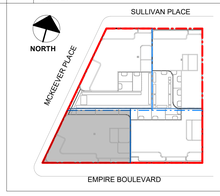
1ST FLOOR CORRIDOR CAPACITY - BLDG C				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width

1ST FLOOR OCCUPANT LOAD - BLDG C		
Name	Area	# of Occupants
RETAIL	1996 SF	67
RETAIL STORAGE 1	984 SF	4
RETAIL STORAGE 2	824 SF	3
	3804 SF	74
LOBBY	565 SF	12
	565 SF	12
PACKAGE RM.	163 SF	1
	163 SF	1
TOTAL	4532 SF	87

1ST FLOOR TRAVEL DISTANCE - BLDG C			
Name	Occupancy Group	Required Distance	Proposed Distance



KEY PLAN
N.T.S.



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SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
CELLAR - 1ST FLOOR LIFE SAFETY PLANS

A-002C.00

Scale:	As indicated
Date:	12/1/2025 7:28:26 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG C - 2ND FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"

2ND FLOOR EGRESS STAIRS - BLDG C				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	44	13.2	44"
EGRESS STAIR B	0.3	43	12.9	44"

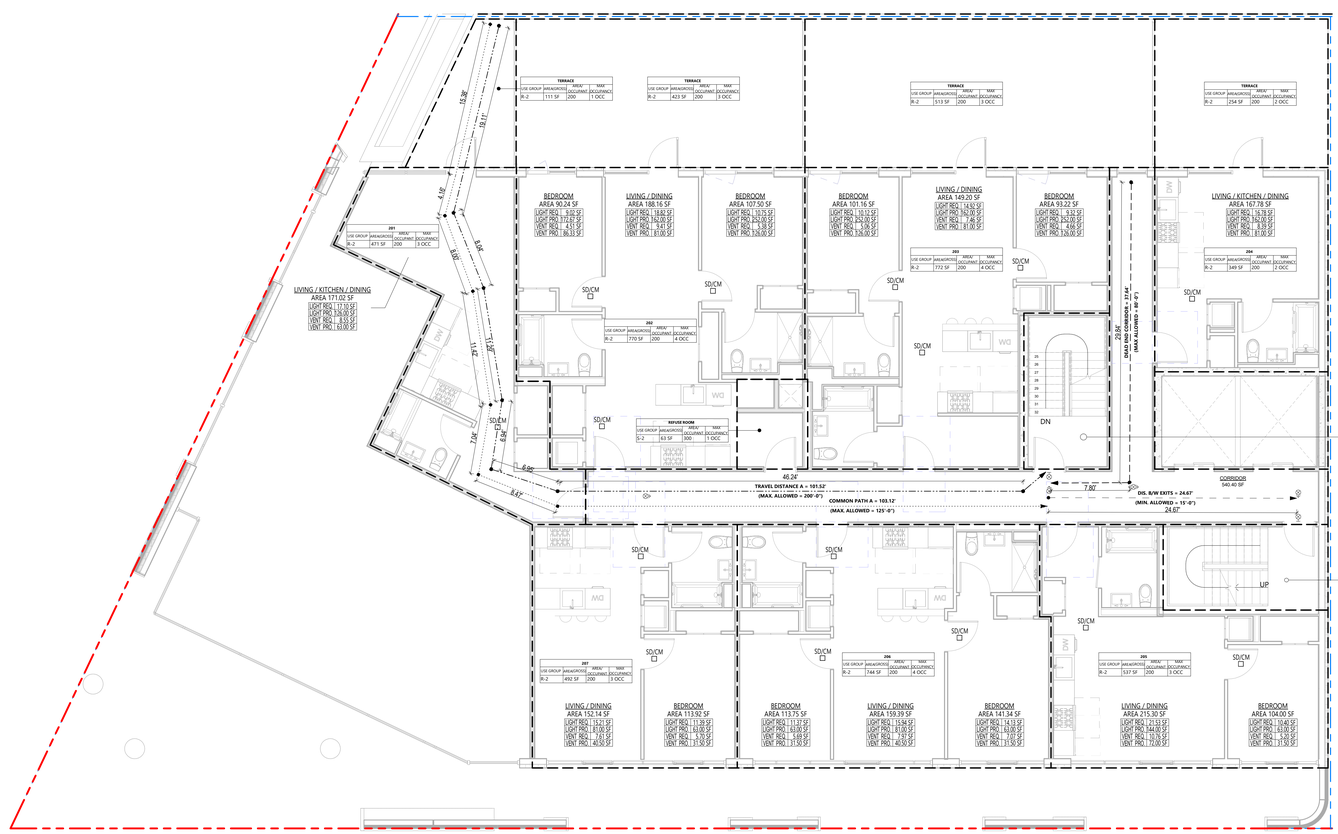
2ND FLOOR EGRESS DOORS - BLDG C				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	17	3.4	36"
EGRESS DOOR B	0.2	16	3.2	36"

2ND FLOOR CORRIDOR CAPACITY - BLDG C				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	33	6.6	60"

2ND FLOOR OCCUPANT LOAD - BLDG C		
Name	Area	# of Occupants
201	471 SF	3
202	770 SF	4
203	772 SF	4
204	349 SF	2
205	537 SF	3
206	744 SF	4
207	492 SF	3
TERRACE	111 SF	1
TERRACE	423 SF	3
TERRACE	513 SF	3
TERRACE	254 SF	2
	5435 SF	32
REFUSE ROOM	63 SF	1
	63 SF	1
TOTAL	5498 SF	33

2ND FLOOR TRAVEL DISTANCE - BLDG C			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	103' - 1"
DEAD END			
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	37' - 8"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	24' - 8"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	101' - 6"

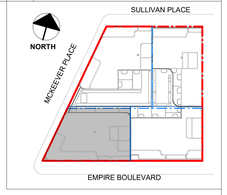
BLDG C - 2ND FL. -LIGHT AND AIR CALCULATION					
Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
02C_2ND FL.					
1207-1796	BEDROOM	11.392429	63.00 SF	5.696215	31.50 SF
1207-1797	LIVING / DINING	15.214299	81.00 SF	7.607149	40.50 SF
1207-1798	BEDROOM	11.374856	63.00 SF	5.687428	31.50 SF
1207-1799	LIVING / DINING	15.939323	81.00 SF	7.969662	40.50 SF
1207-1800	BEDROOM	14.133507	63.00 SF	7.066753	31.50 SF
1207-1801	LIVING / DINING	21.52997	144.00 SF	10.764985	72.00 SF
1207-1802	BEDROOM	10.4	63.00 SF	5.2	31.50 SF
1207-1803	LIVING / KITCHEN / DINING	16.778253	162.00 SF	8.389126	81.00 SF
1207-1804	BEDROOM	9.321528	252.00 SF	4.660764	126.00 SF
1207-1805	LIVING / DINING	14.919792	162.00 SF	7.459896	81.00 SF
1207-1806	BEDROOM	10.116319	252.00 SF	5.05816	126.00 SF
1207-1807	BEDROOM	10.75	252.00 SF	5.375	126.00 SF
1207-1808	LIVING / DINING	18.816078	162.00 SF	9.408039	81.00 SF
1207-1809	BEDROOM	9.023958	172.67 SF	4.511979	86.33 SF
1207-1810	LIVING / KITCHEN / DINING	17.101865	126.00 SF	8.550932	63.00 SF
02C_2ND FL.					
1207-2052	STAIR A	11.75	0.00 SF	5.875	0.00 SF
1207-2053	STAIR B	13.497222	0.00 SF	6.748611	0.00 SF



EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

KEY PLAN
N.T.S.



KAO-HWA LEE
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227 CATHERINE STREET
SOUTH AMBOY, NJ 08879
(609) 216 2975

CLIENT:
THE RABSKY GROUP
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40-12 28th Street
Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

2 BLDG C - 3RD FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"

3RD FLOOR EGRESS STAIRS - BLDG C				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	17	5.1	44"
EGRESS STAIR B	0.3	16	4.8	44"

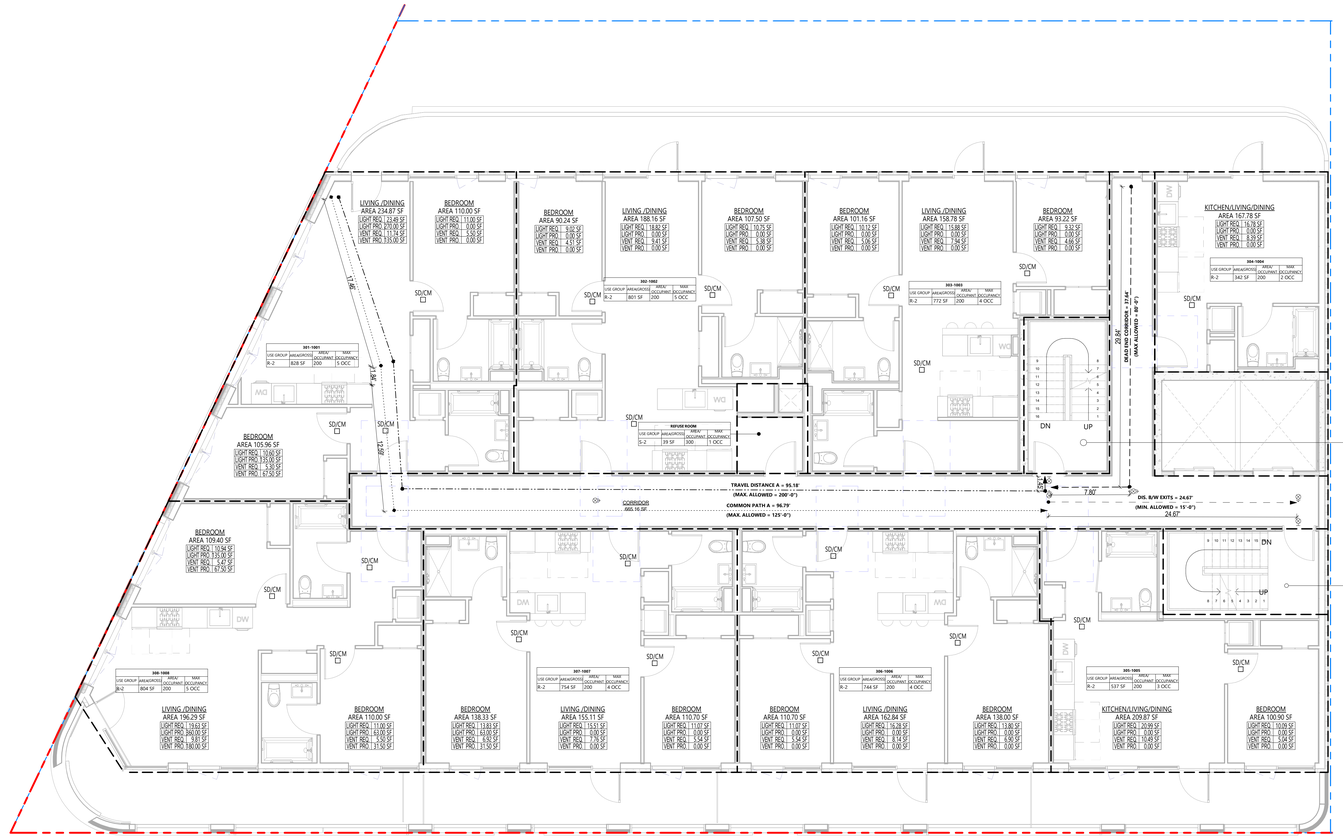
3RD FLOOR EGRESS DOORS - BLDG C				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	17	3.4	36"
EGRESS DOOR B	0.2	16	3.2	36"

3RD FLOOR CORRIDOR CAPACITY - BLDG C				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	33	6.6	60"

3RD FLOOR OCCUPANT LOAD - BLDG C		
Name	Area	# of Occupants
301-1001	828 SF	5
302-1002	801 SF	5
303-1003	772 SF	4
304-1004	342 SF	2
305-1005	537 SF	3
306-1006	744 SF	4
307-1007	754 SF	4
308-1008	804 SF	5
	5581 SF	32
REFUSE ROOM	39 SF	1
	39 SF	1
TOTAL	5620 SF	33

3RD FLOOR TRAVEL DISTANCE - BLDG C			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	96' - 9"
DEAD END			
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	37' - 8"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	24' - 8"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	95' - 2"

BLDG C - 3RD FL. -LIGHT AND AIR CALCULATION					
Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
03C_3RD FL.					
301-1001	BEDROOM	11	0.00 SF	5.5	0.00 SF
301-1001	BEDROOM	10.596478	135.00 SF	5.298239	67.50 SF
301-1001	LIVING /DINING	23.486875	270.00 SF	11.743437	135.00 SF
302-1002	BEDROOM	9.023958	0.00 SF	4.511979	0.00 SF
302-1002	BEDROOM	10.75	0.00 SF	5.375	0.00 SF
302-1002	LIVING /DINING	18.816078	0.00 SF	9.408039	0.00 SF
303-1003	BEDROOM	9.321528	0.00 SF	4.660764	0.00 SF
303-1003	BEDROOM	10.116319	0.00 SF	5.05816	0.00 SF
303-1003	LIVING /DINING	15.877879	0.00 SF	7.93894	0.00 SF
304-1004	KITCHEN/LIVING/DINING	16.778253	0.00 SF	8.389126	0.00 SF
305-1005	KITCHEN/LIVING/DINING	20.986523	0.00 SF	10.493262	0.00 SF
306-1006	BEDROOM	11.070313	0.00 SF	5.535156	0.00 SF
306-1006	BEDROOM	13.800347	0.00 SF	6.900174	0.00 SF
306-1006	LIVING /DINING	16.284245	0.00 SF	8.142123	0.00 SF
307-1007	BEDROOM	13.833333	63.00 SF	6.916667	31.50 SF
307-1007	BEDROOM	11.070313	0.00 SF	5.535156	0.00 SF
307-1007	LIVING /DINING	15.510764	0.00 SF	7.755382	0.00 SF
308-1008	BEDROOM	10.939734	135.00 SF	5.469867	67.50 SF
308-1008	BEDROOM	11.000056	63.00 SF	5.500028	31.50 SF
308-1008	LIVING /DINING	19.62901	360.00 SF	9.814505	180.00 SF
1207-1715	BEDROOM	10.089931	0.00 SF	5.044965	0.00 SF
03C_3RD FL.					
1207-2109	STAIR B	13.497222	0.00 SF	6.748611	0.00 SF
1207-2110	STAIR A	11.75	0.00 SF	5.875	0.00 SF



EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
2ND - 10TH FLOOR
LIFE SAFETY PLANS

A-003C.00

Scale: As indicated
Date: 12/1/2025 7:28:42 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 BLDG C - 11TH FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"

11TH FLOOR EGRESS STAIRS- BLDG C				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	14	4.2	44"
EGRESS STAIR B	0.3	14	4.2	44"

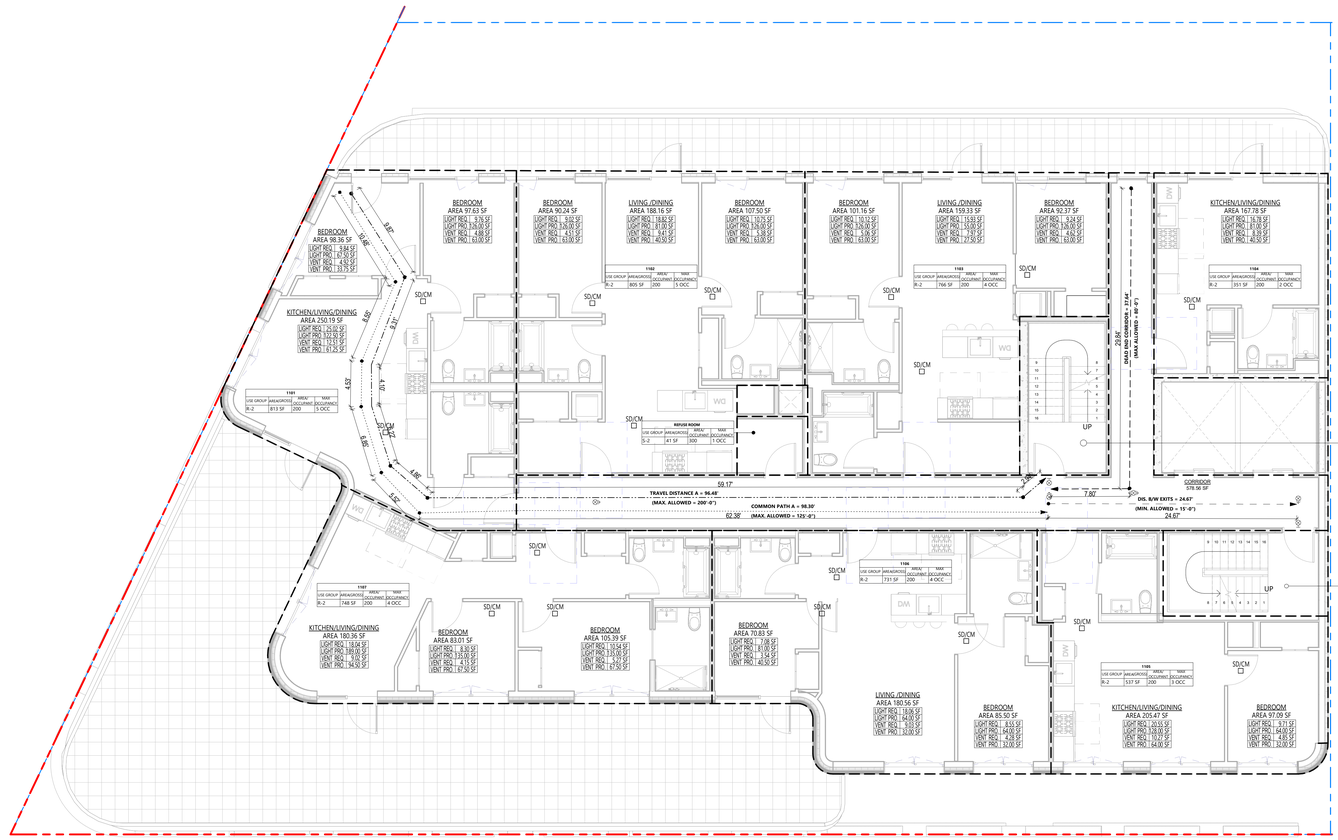
11TH FLOOR EGRESS DOORS - BLDG C				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	14	2.8	36"
EGRESS DOOR B	0.2	13	2.6	36"

11TH FLOOR CORRIDOR CAPACITY - BLDG C				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	28	5.6	60"

11TH FLOOR OCCUPANT LOAD - BLDG C		
Name	Area	# of Occupants
1101	813 SF	5
1102	805 SF	5
1103	766 SF	4
1104	351 SF	2
1105	537 SF	3
1106	731 SF	4
1107	748 SF	4
	4752 SF	27
REFUSE ROOM	41 SF	1
	41 SF	1
TOTAL	4793 SF	28

11TH FLOOR TRAVEL DISTANCE - BLDG C			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	98' - 4"
DEAD END			
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	37' - 8"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	24' - 8"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	96' - 6"

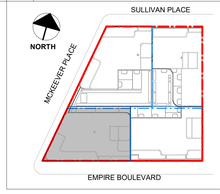
BLDG C - 11TH FL. -LIGHT AND AIR CALCULATION					
Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
11C_11TH FL.					
1101	BEDROOM	9.835893	67.50 SF	4.917947	33.75 SF
1102	BEDROOM	9.023958	126.00 SF	4.511979	63.00 SF
1102	BEDROOM	10.75	126.00 SF	5.375	63.00 SF
1102	LIVING /DINING	18.816078	81.00 SF	9.408039	40.50 SF
1103	BEDROOM	10.116319	126.00 SF	5.05816	63.00 SF
1103	BEDROOM	9.237153	126.00 SF	4.618576	63.00 SF
1103	LIVING /DINING	15.933122	55.00 SF	7.966561	27.50 SF
1104	KITCHEN/LIVING/DINING	16.778253	81.00 SF	8.389126	40.50 SF
1105	KITCHEN/LIVING/DINING	20.54707	128.00 SF	10.273535	64.00 SF
1106	BEDROOM	7.083333	81.00 SF	3.541667	40.50 SF
1106	BEDROOM	8.550347	64.00 SF	4.275174	32.00 SF
1106	LIVING /DINING	18.055948	64.00 SF	9.027974	32.00 SF
1107	BEDROOM	10.538672	135.00 SF	5.269336	67.50 SF
1207-1716	BEDROOM	9.709313	64.00 SF	4.854656	32.00 SF
1207-1717	BEDROOM	9.7625	126.00 SF	4.88125	63.00 SF
1207-1718	BEDROOM	8.300786	135.00 SF	4.150393	67.50 SF
1207-1719	KITCHEN/LIVING/DINING	18.036336	189.00 SF	9.018168	94.50 SF
1207-1720	KITCHEN/LIVING/DINING	25.019177	122.50 SF	12.509588	61.25 SF
11C_11TH FL.					
1207-2112	STAIR A	11.625	0.00 SF	5.8125	0.00 SF
1207-2113	STAIR B	13.497222	0.00 SF	6.748611	0.00 SF



EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

KEY PLAN
N.T.S.



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Interior Designer:
DURUKAN DESIGN
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Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

2 BLDG C - 12TH FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"

12TH FLOOR EGRESS STAIRS- BLDG C				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	13	3.9	44"
EGRESS STAIR B	0.3	13	3.9	44"

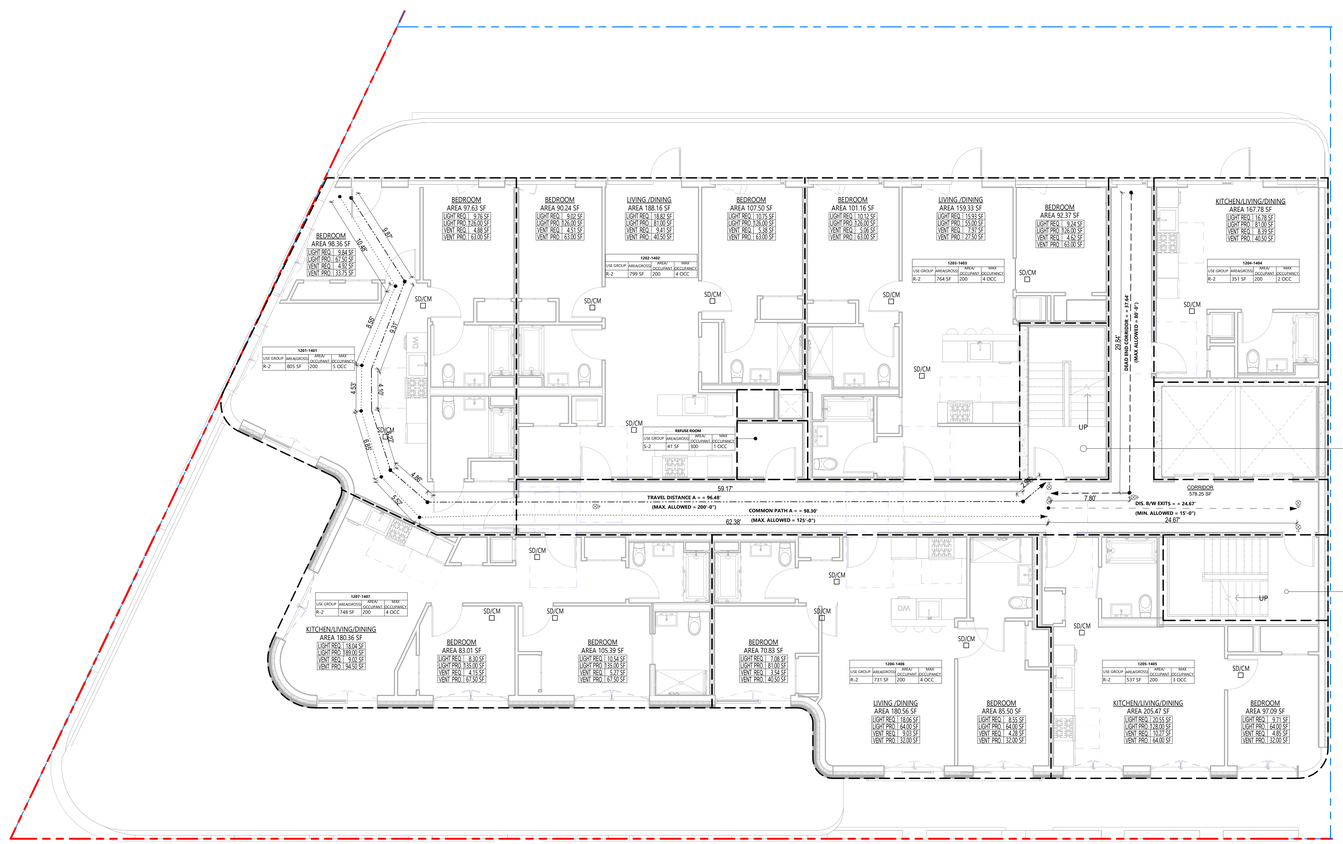
12TH FLOOR EGRESS DOORS - BLDG C				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	14	2.8	36"
EGRESS DOOR B	0.2	13	2.6	36"

12TH FLOOR CORRIDOR CAPACITY - BLDG C				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	27	5.4	60"

12TH FLOOR OCCUPANT LOAD - BLDG C		
Name	Area	# of Occupants
1201-1401	805 SF	5
1202-1402	799 SF	4
1203-1403	764 SF	4
1204-1404	351 SF	2
1205-1405	537 SF	3
1206-1406	731 SF	4
1207-1407	748 SF	4
	4735 SF	26
REFUSE ROOM	41 SF	1
	41 SF	1
TOTAL	4776 SF	27

12TH FLOOR TRAVEL DISTANCE - BLDG C			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A =	R-2	MAX. ALLOWED = 125'-0"	98' - 4"
DEAD END			
DEAD END CORRIDOR =	R-2	MAX ALLOWED = 80'-0"	37' - 8"
DIS. B/W EXITS			
DIS. B/W EXITS =	R-2	MIN. ALLOWED = 15'-0"	24' - 8"
TRAVEL DISTANCE			
TRAVEL DISTANCE A =	R-2	MAX. ALLOWED = 200'-0"	96' - 6"

BLDG C - 12TH-14TH FL. -LIGHT AND AIR CALCULATION					
Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
11C_11TH FL.					
1101	BEDROOM	9.835893	67.50 SF	4.917947	33.75 SF
1102	BEDROOM	9.023958	126.00 SF	4.511979	63.00 SF
1102	BEDROOM	10.75	126.00 SF	5.375	63.00 SF
1102	LIVING /DINING	18.816078	81.00 SF	9.408039	40.50 SF
1103	BEDROOM	10.116319	126.00 SF	5.05816	63.00 SF
1103	BEDROOM	9.237153	126.00 SF	4.618576	63.00 SF
1103	LIVING /DINING	15.933122	55.00 SF	7.966561	27.50 SF
1104	KITCHEN/LIVING/DINING	16.778253	81.00 SF	8.389126	40.50 SF
1105	KITCHEN/LIVING/DINING	20.54707	128.00 SF	10.273535	64.00 SF
1106	BEDROOM	7.083333	81.00 SF	3.541667	40.50 SF
1106	BEDROOM	8.550347	64.00 SF	4.275174	32.00 SF
1106	LIVING /DINING	18.055948	64.00 SF	9.027974	32.00 SF
1107	BEDROOM	10.538672	135.00 SF	5.269336	67.50 SF
1207-1716	BEDROOM	9.709313	64.00 SF	4.854656	32.00 SF
1207-1717	BEDROOM	9.7625	126.00 SF	4.88125	63.00 SF
1207-1718	BEDROOM	8.300786	135.00 SF	4.150393	67.50 SF
1207-1719	KITCHEN/LIVING/DINING	18.036336	189.00 SF	9.018168	94.50 SF
1207-1720	KITCHEN/LIVING/DINING	25.019177	122.50 SF	12.509588	61.25 SF
11C_11TH FL.					
1207-2112	STAIR A	11.625	0.00 SF	5.8125	0.00 SF
1207-2113	STAIR B	13.497222	0.00 SF	6.748611	0.00 SF



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STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
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DOOR CAPACITY: 170 OCCUPANTS	

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
11TH - 14TH FLOOR LIFE SAFETY PLANS

A-004C.00

Scale: As indicated
Date: 12/1/2025 7:28:59 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 BLDG C - ROOF LIFE SAFETY PLAN
3/16" = 1'-0"

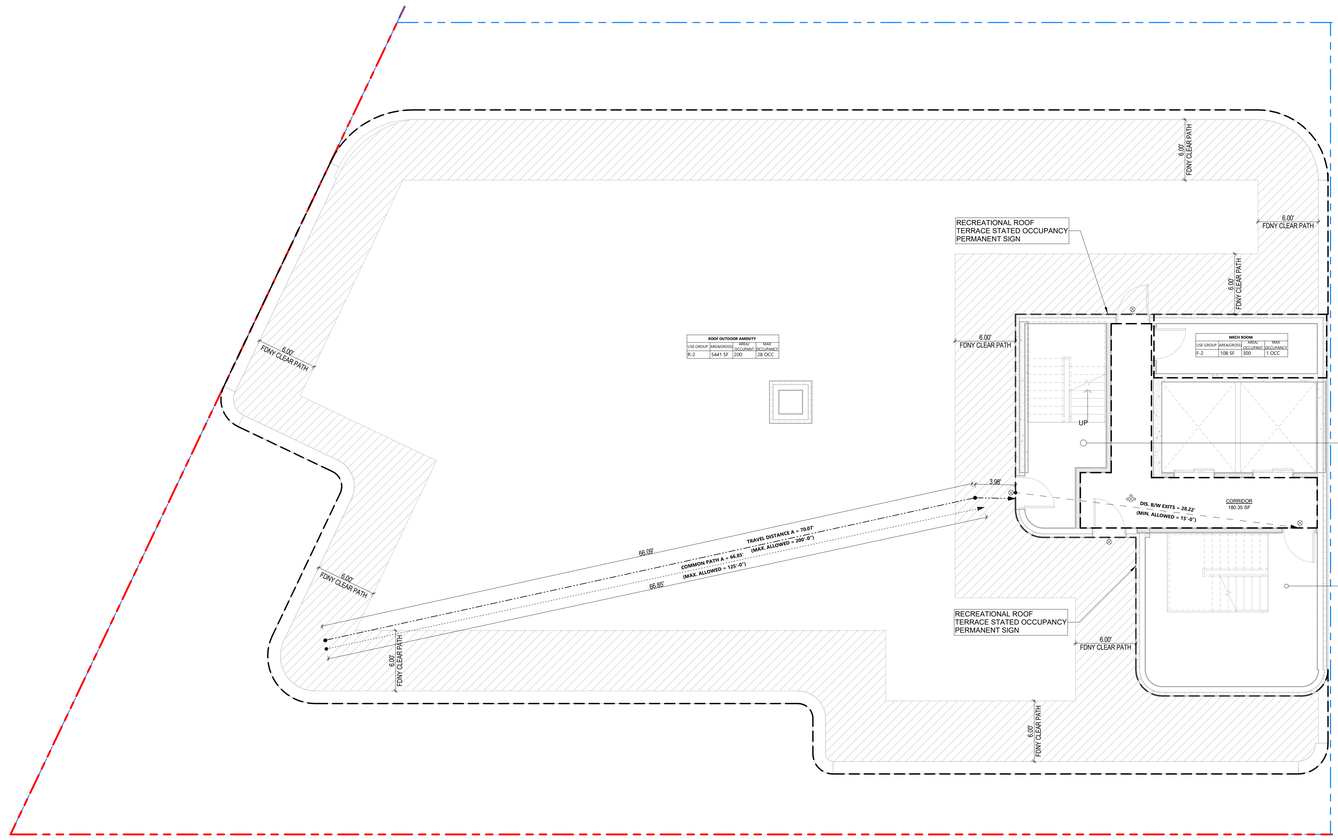
ROOF EGRESS STAIRS- BLDG C				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	15	4.5	44"
EGRESS STAIR B	0.3	14	4.2	44"

ROOF EGRESS DOORS - BLDG C				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	15	3	36"
EGRESS DOOR B	0.2	14	2.8	36"

ROOF CORRIDOR CAPACITY - BLDG C				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	29	5.8	60"

ROOF OCCUPANT LOAD - BLDG C		
Name	Area	# of Occupants
ROOF OUTDOOR AMENITY	5441 SF	28
	5441 SF	28
MECH ROOM	108 SF	1
	108 SF	1
TOTAL	5549 SF	29

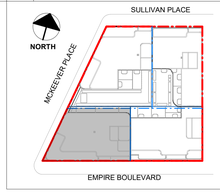
ROOF TRAVEL DISTANCE - BLDG C			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	66' - 10"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2 ACC.	MIN. ALLOWED = 15'-0"	28' - 3"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	70' - 1"



EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

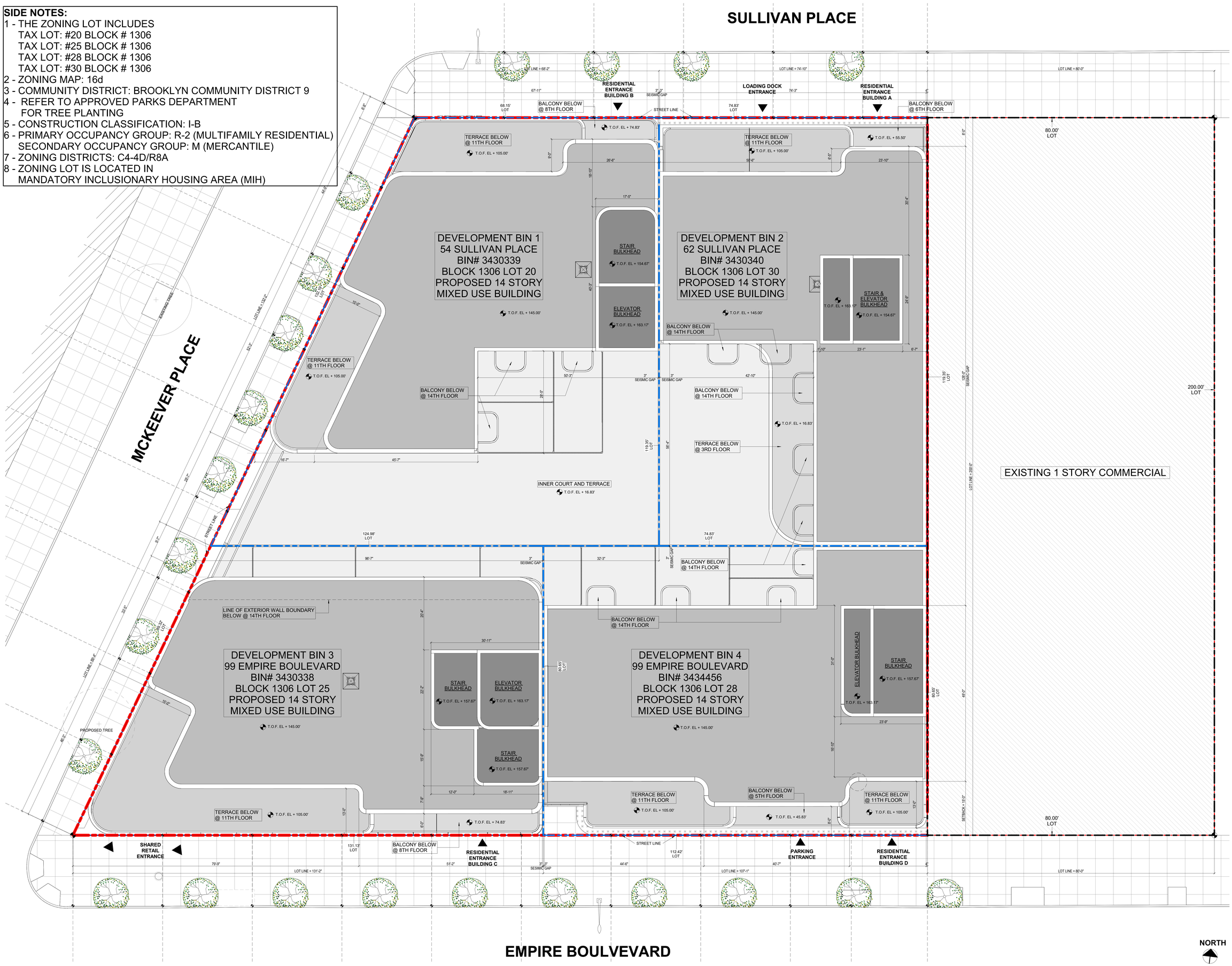
SHEET TITLE
ROOF LIFE SAFETY PLANS

A-005C.00

Scale:	As indicated
Date:	12/1/2025 7:29:06 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 | SITE PLAN - Dependent 2
1/8" = 1'-0"

SIDE NOTES:
1 - THE ZONING LOT INCLUDES
TAX LOT: #20 BLOCK # 1306
TAX LOT: #25 BLOCK # 1306
TAX LOT: #28 BLOCK # 1306
TAX LOT: #30 BLOCK # 1306
2 - ZONING MAP: 16d
3 - COMMUNITY DISTRICT: BROOKLYN COMMUNITY DISTRICT 9
4 - REFER TO APPROVED PARKS DEPARTMENT FOR TREE PLANTING
5 - CONSTRUCTION CLASSIFICATION: I-B
6 - PRIMARY OCCUPANCY GROUP: R-2 (MULTIFAMILY RESIDENTIAL)
SECONDARY OCCUPANCY GROUP: M (MERCANTILE)
7 - ZONING DISTRICTS: C4-4D/R8A
8 - ZONING LOT IS LOCATED IN MANDATORY INCLUSIONARY HOUSING AREA (MIH)



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Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

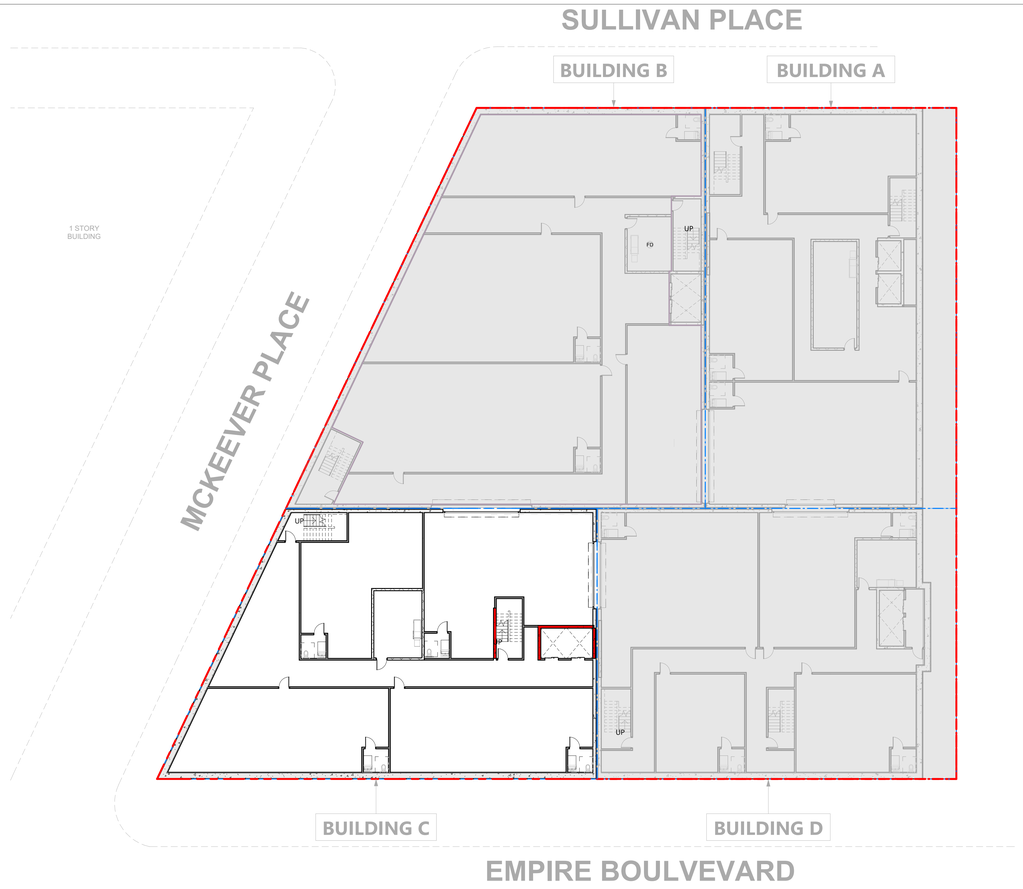
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
SITE PLAN

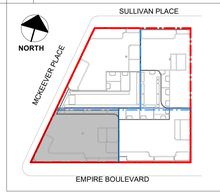
A-006C.00

Scale:	1/8" = 1'-0"
Date:	12/1/2025 7:29:12 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

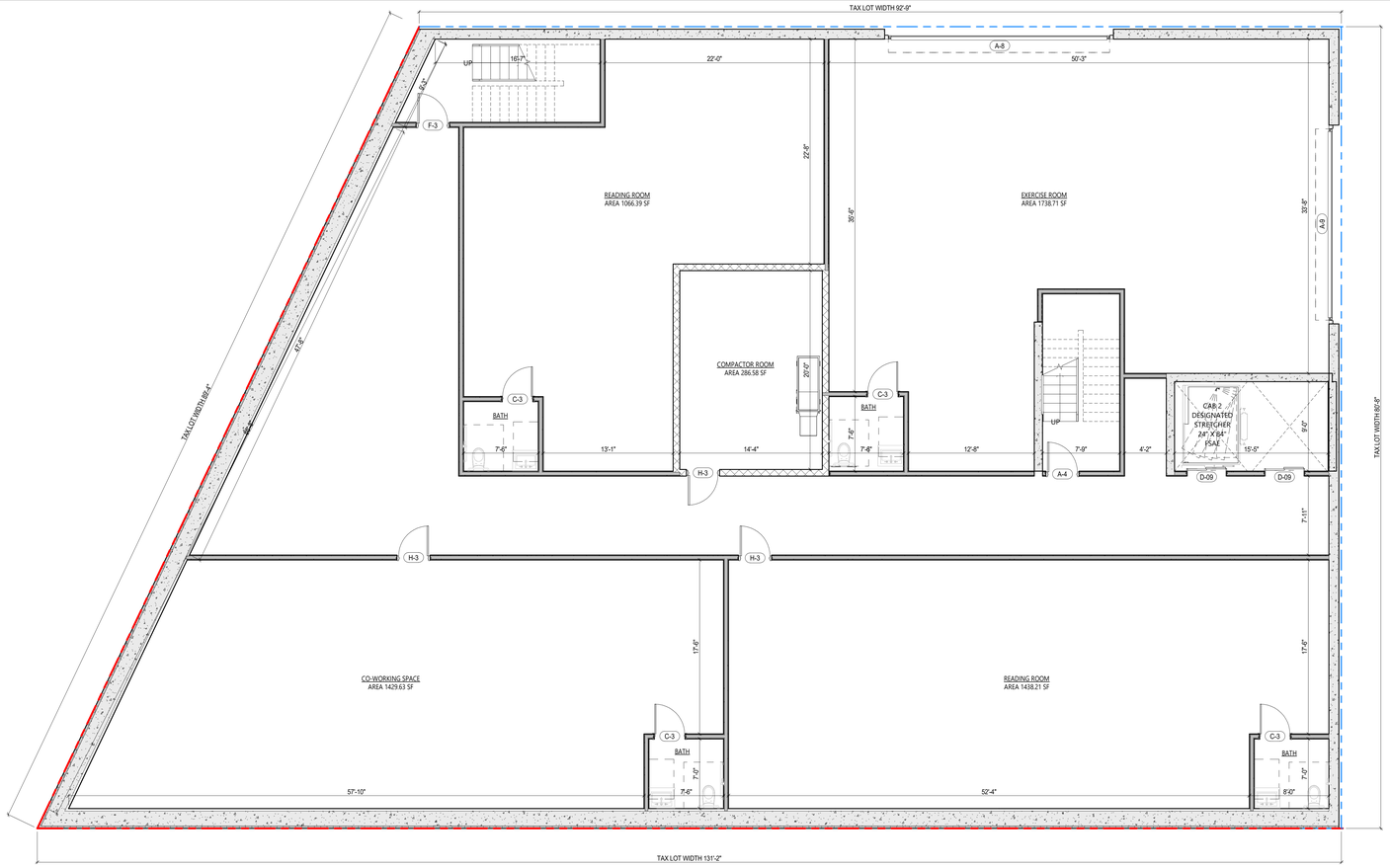
1 | 00 SUBCELLAR 2 OVERALL PLAN
1/16" = 1'-0"



KEY PLAN
N.T.S.



2 | 00C_SUBCELLAR 2 ENLARGED
3/16" = 1'-0"



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

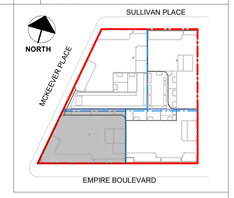
SHEET TITLE
PROPOSED
SUB-CELLAR 02 PLAN

A-100C.00

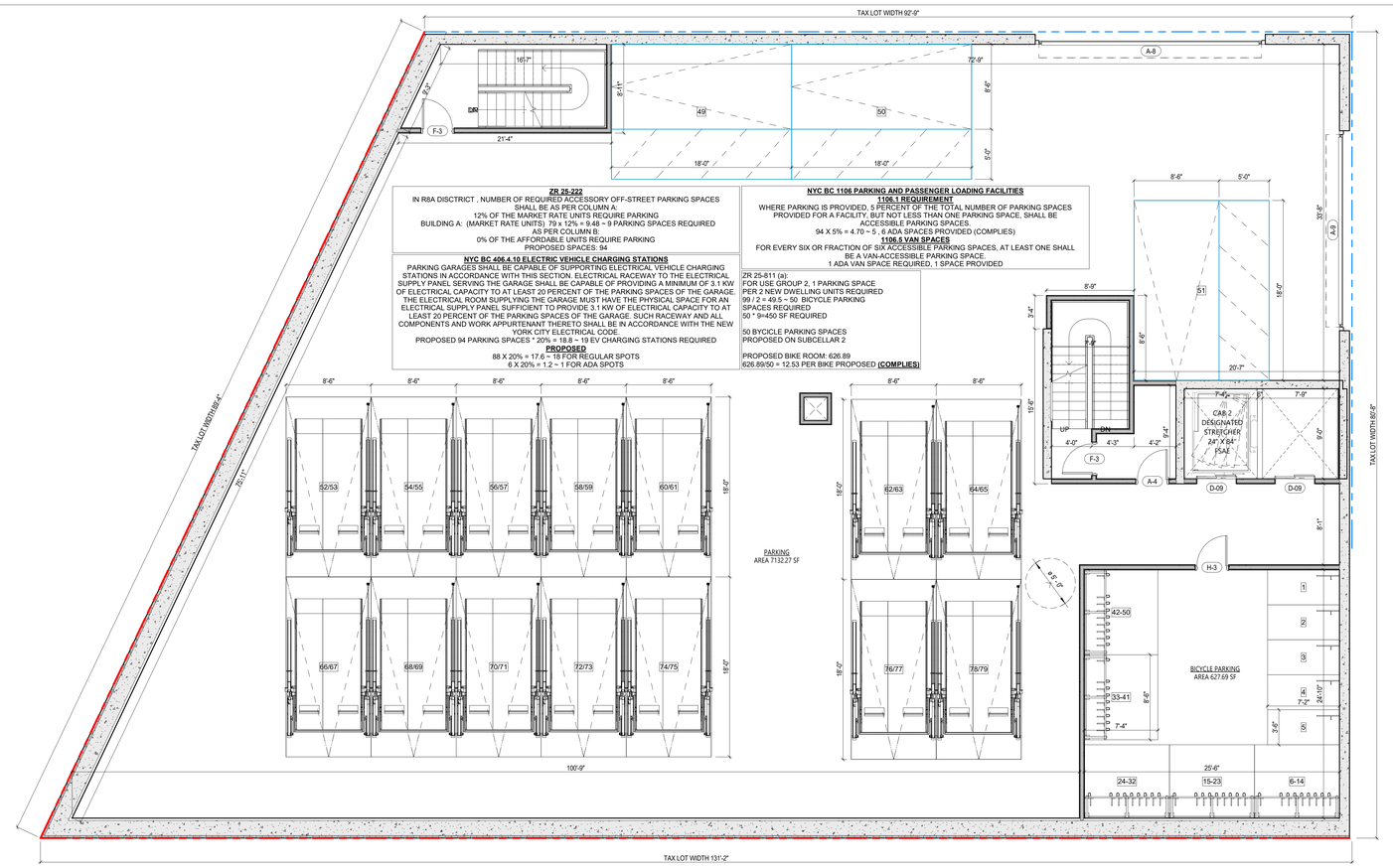
Scale:	As indicated
Date:	12/1/2025 7:29:15 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 | 00 SUBCELLAR 1 OVERALL PLAN
1/16" = 1'-0"

KEY PLAN
N.T.S.



2 | 00C_SUBCELLAR 1 ENLARGED
3/16" = 1'-0"



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

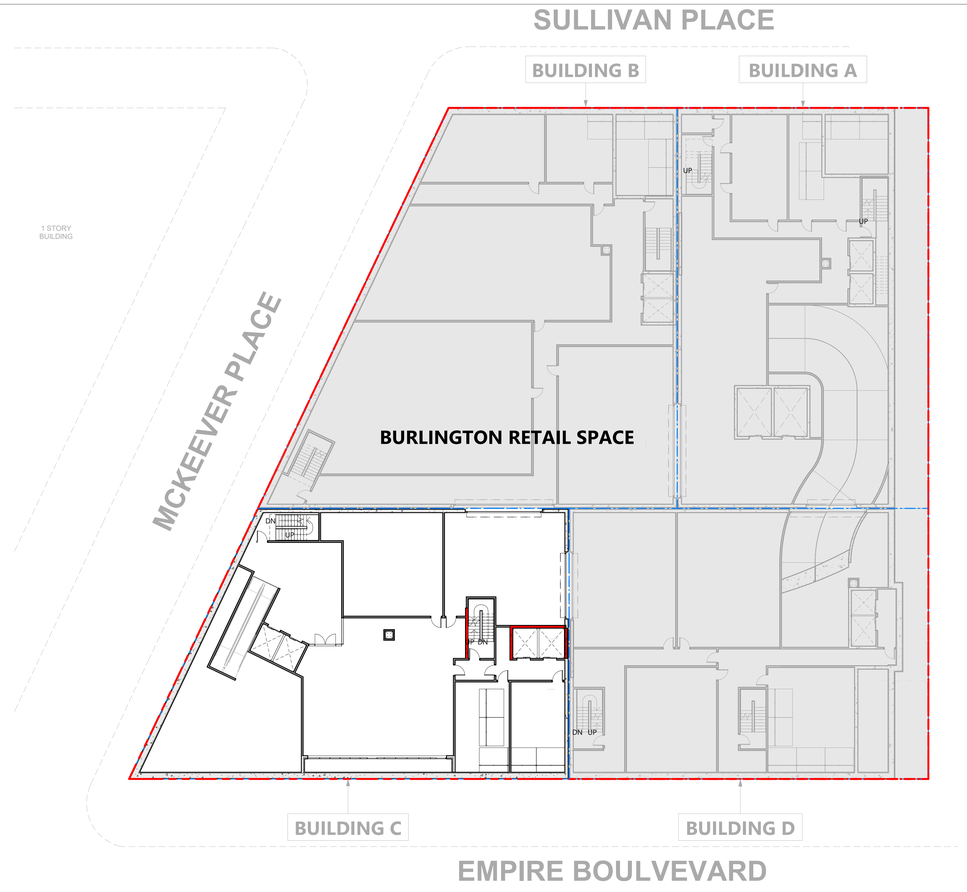
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED
SUB-CELLAR 01 PLAN

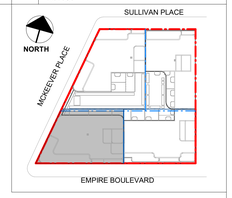
A-101C.00

Scale:	As indicated
Date:	12/1/2025 7:29:18 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

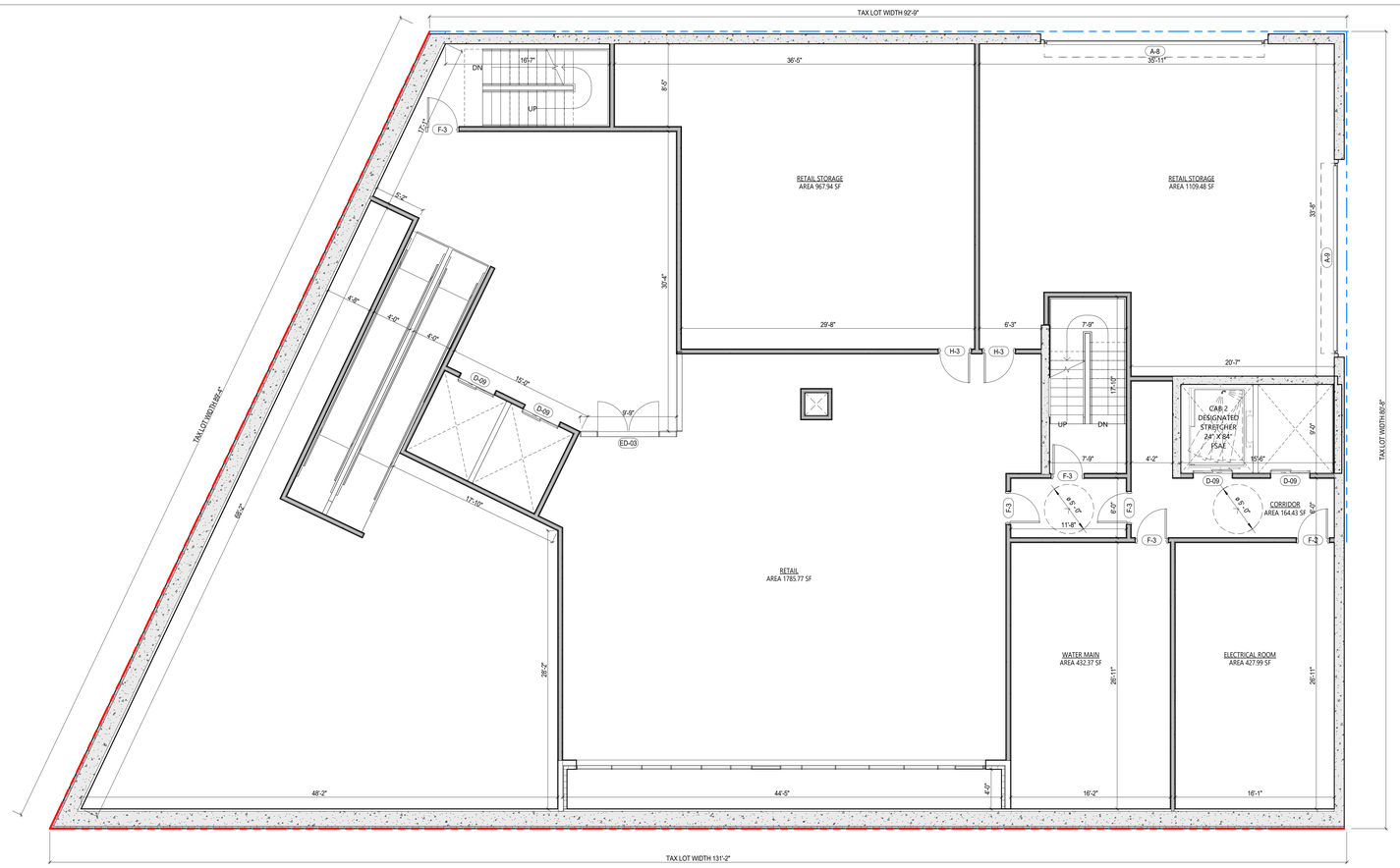
1 | 00C_CELLAR
1/16" = 1'-0"



KEY PLAN
N.T.S.



2 | 00C_CELLAR ENLARGED
3/16" = 1'-0"



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

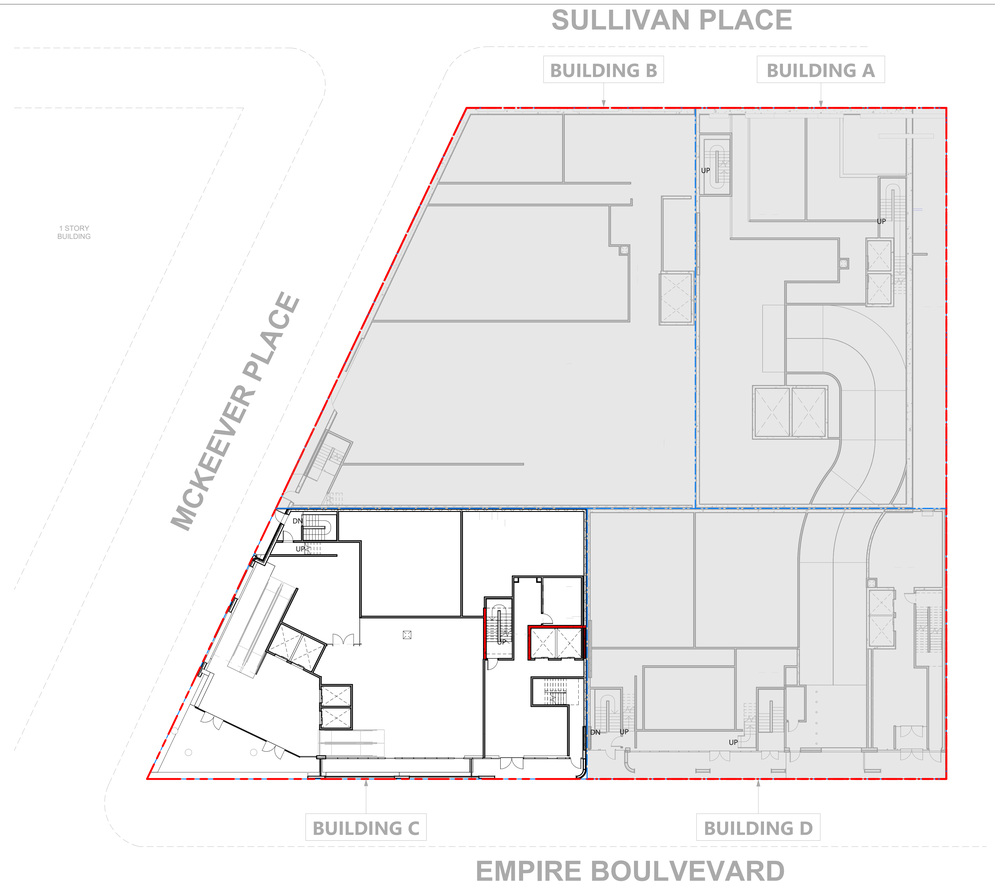
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED CELLAR PLAN

A-102C.00

Scale:	As indicated
Date:	12/1/2025 7:29:22 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 1ST FL. T.O.S LOBBY
1/16" = 1'-0"



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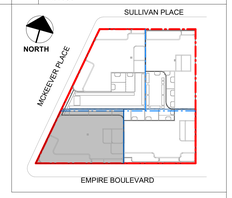
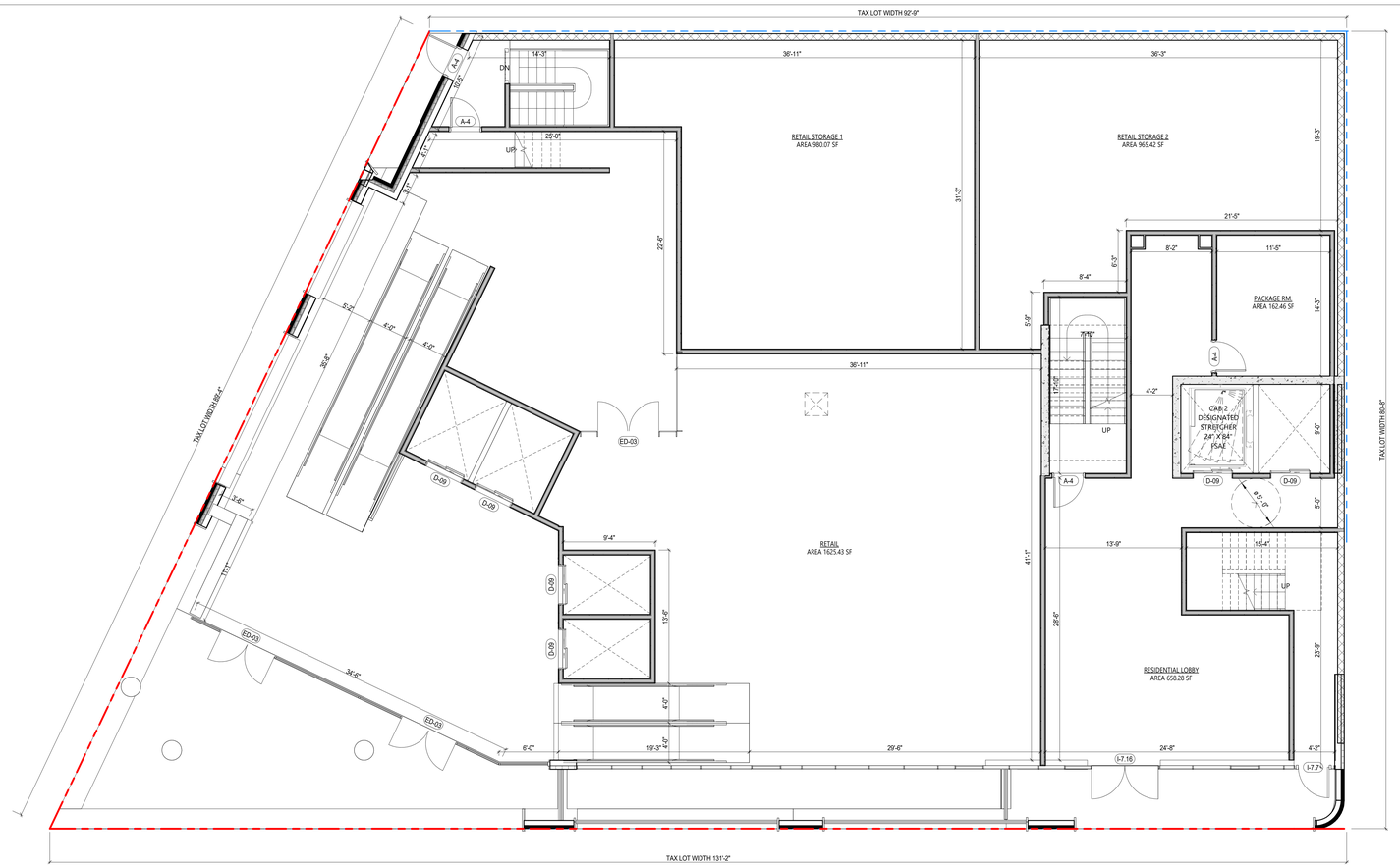


2 01C_1ST FL. ENLARGED
3/16" = 1'-0"



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

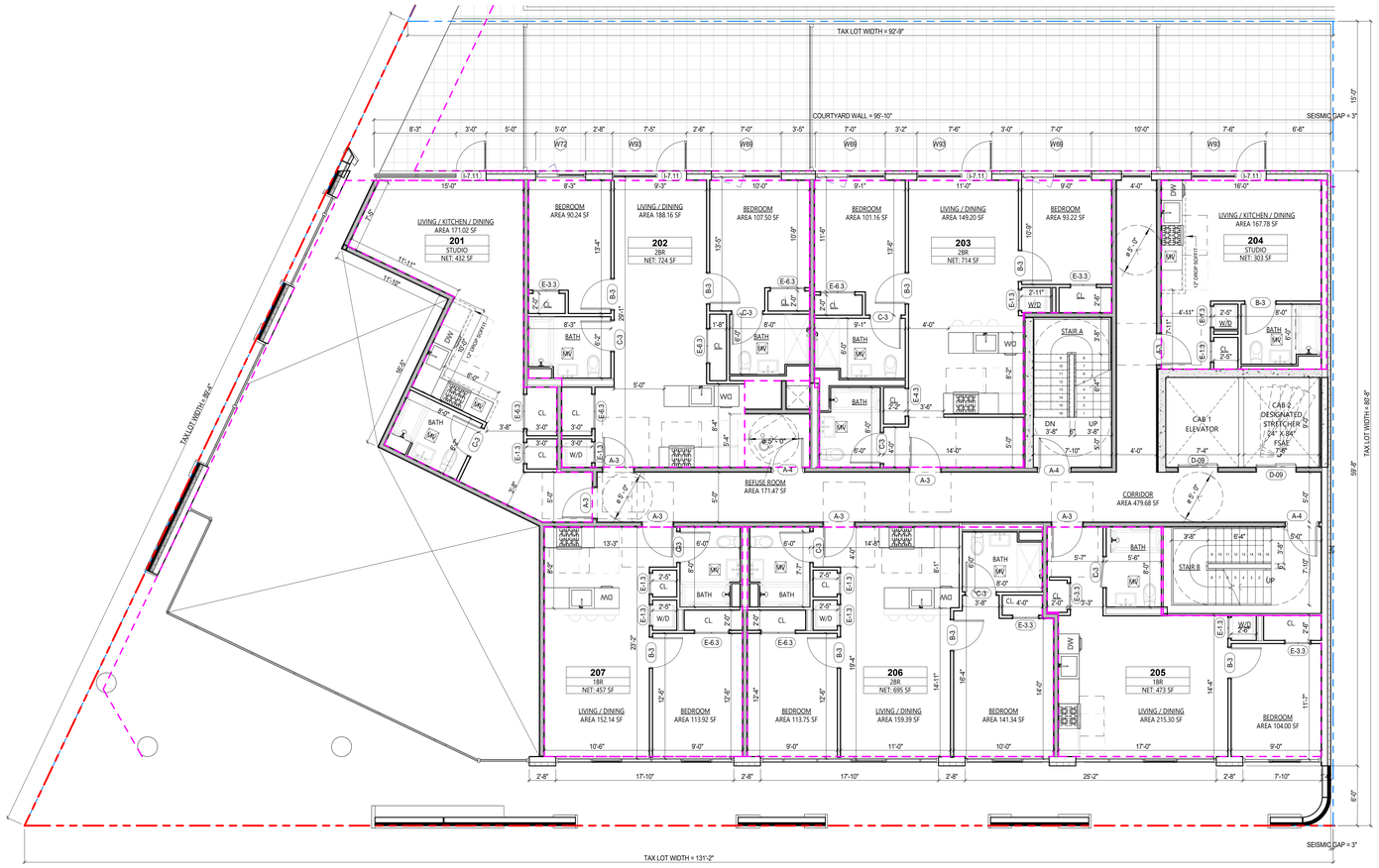
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED 1ST FLOOR PLAN

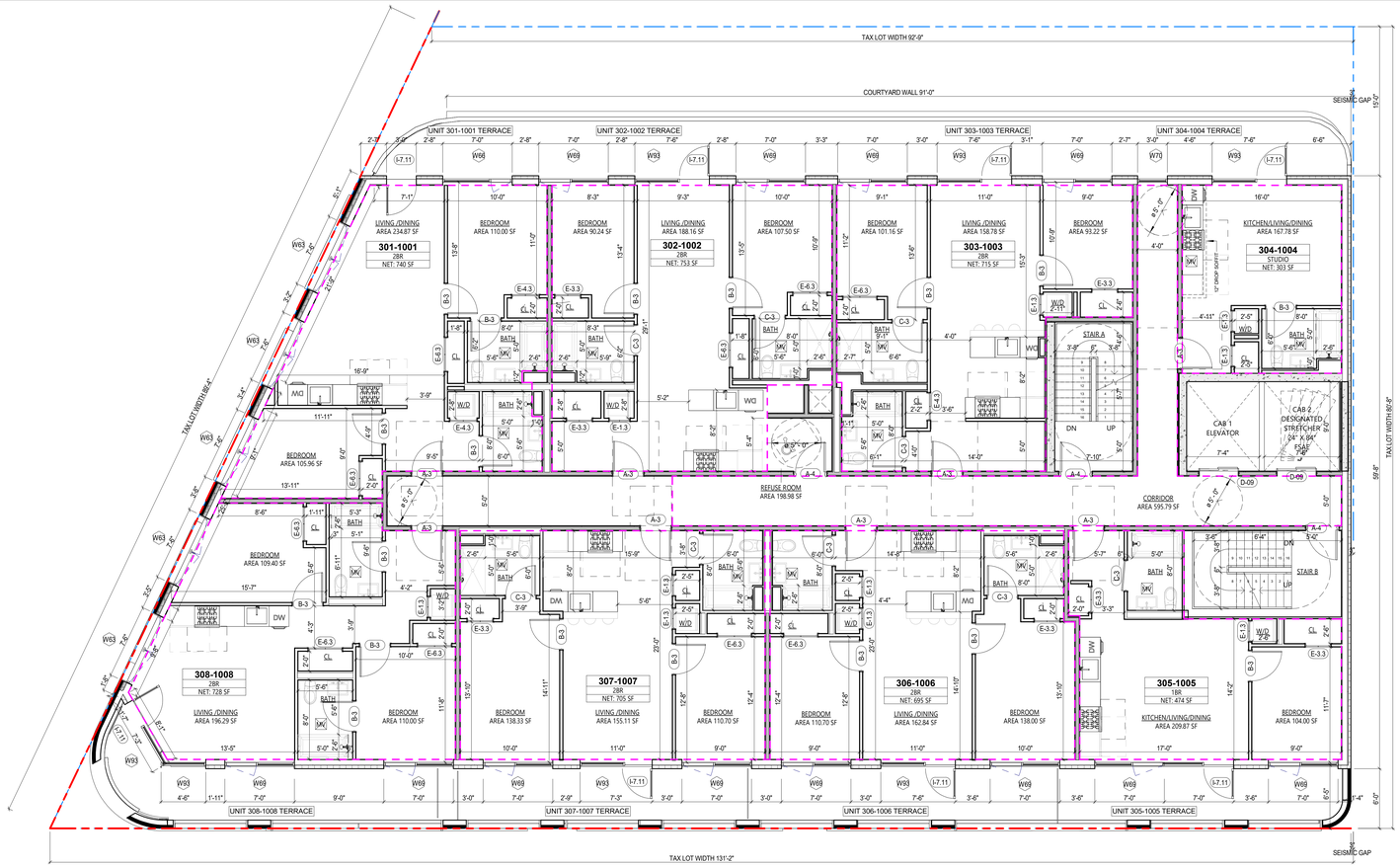
A-103C.00

Scale:	As indicated
Date:	12/1/2025 7:29:25 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 02C_2ND FL.
3/16" = 1'-0"



2 03C_3RD FL.
3/16" = 1'-0"



KEY PLAN
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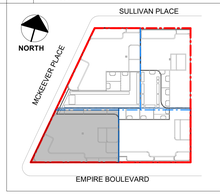

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

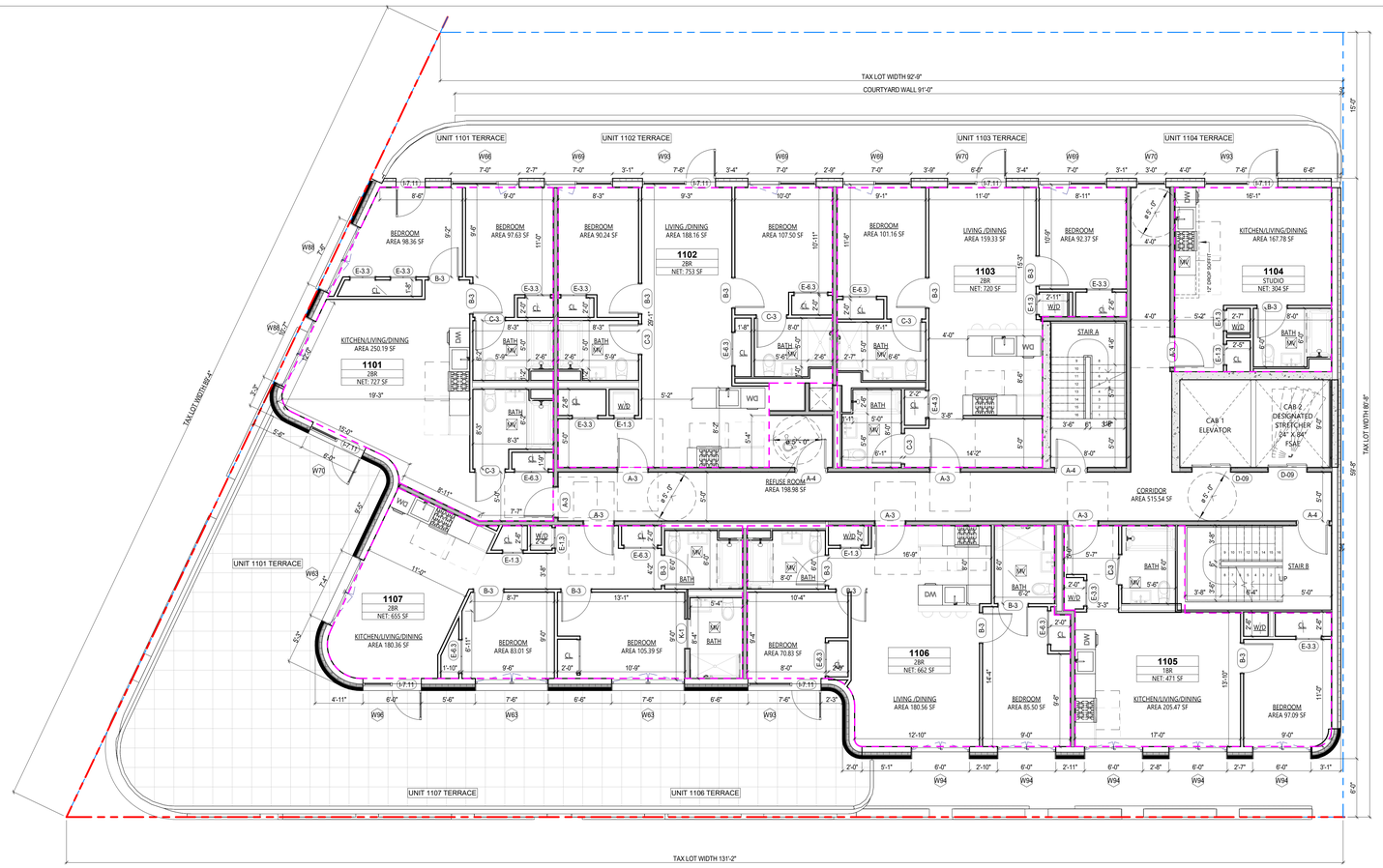
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED 2ND - 10TH FLOOR PLAN

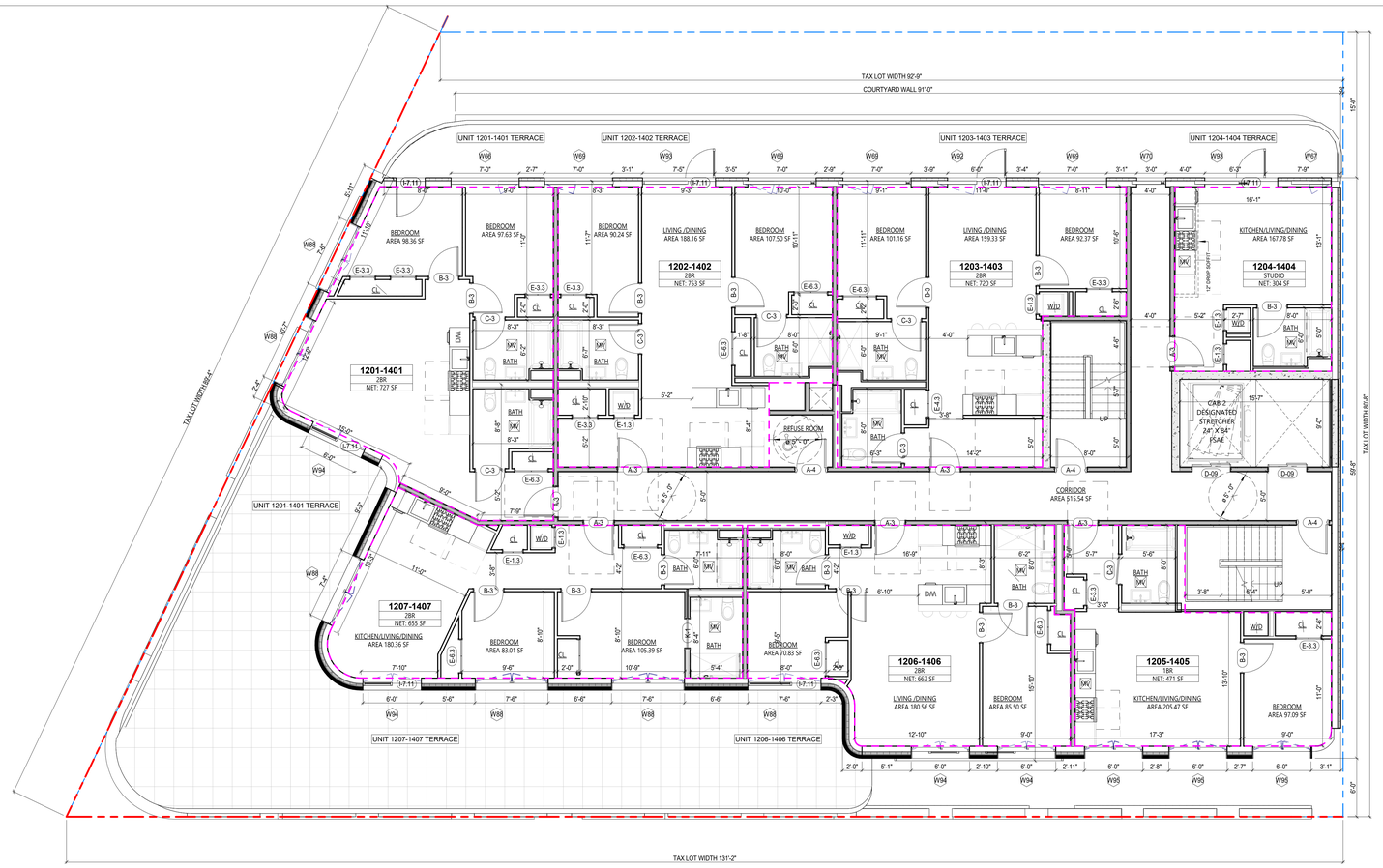
A-104C.00

Scale:	As indicated
Date:	12/1/2025 7:29:30 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 | 11C_11TH FL.
3/16" = 1'-0"



2 | 12C_12TH FL.
3/16" = 1'-0"



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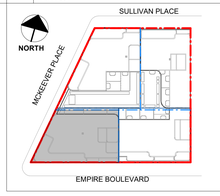

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Interior Designer:
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Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

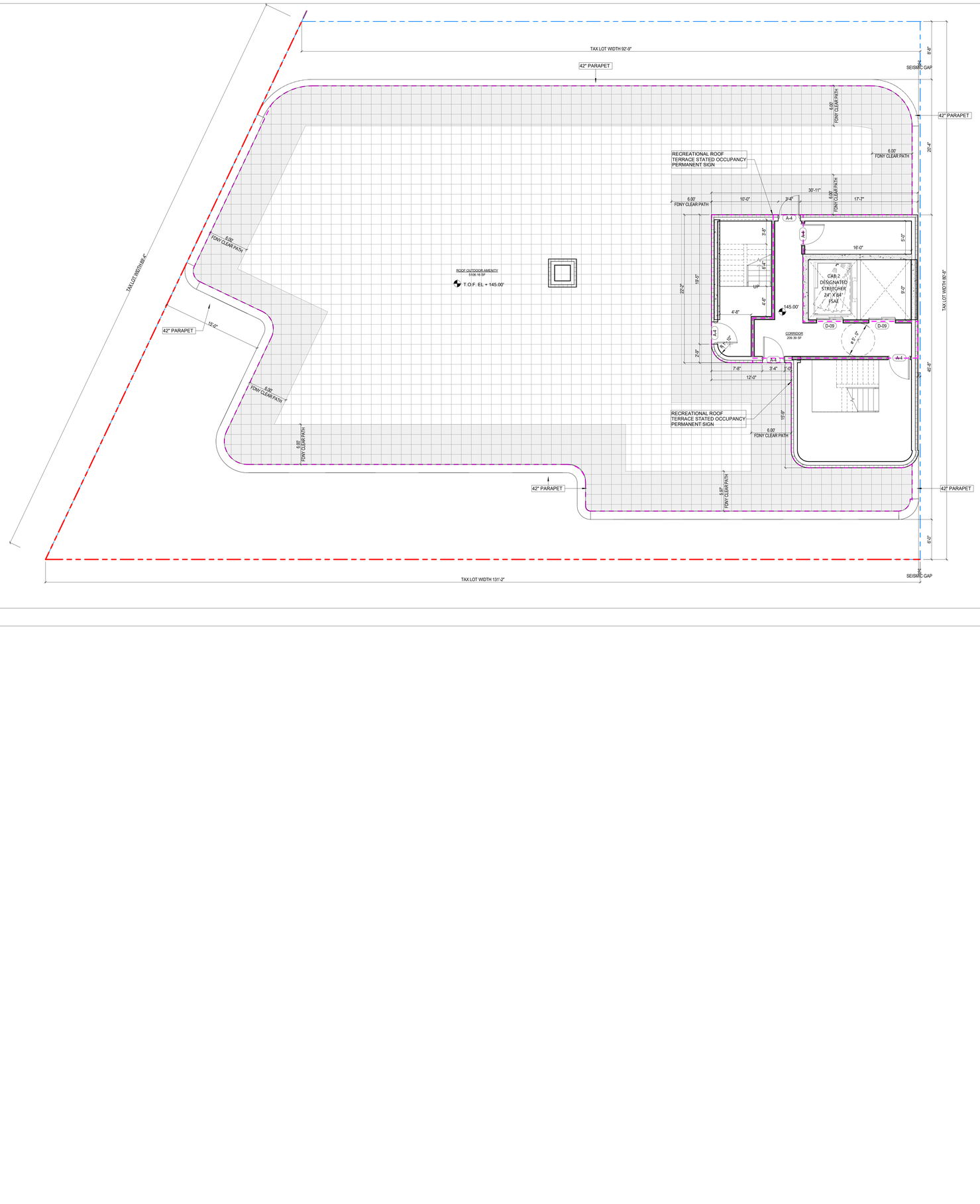
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED 11TH - 14TH FLOOR PLAN

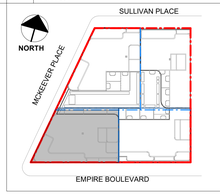
A-105C.00

Scale:	As indicated
Date:	12/1/2025 7:29:35 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 | 15C_ROOF
3/16" = 1'-0"



KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

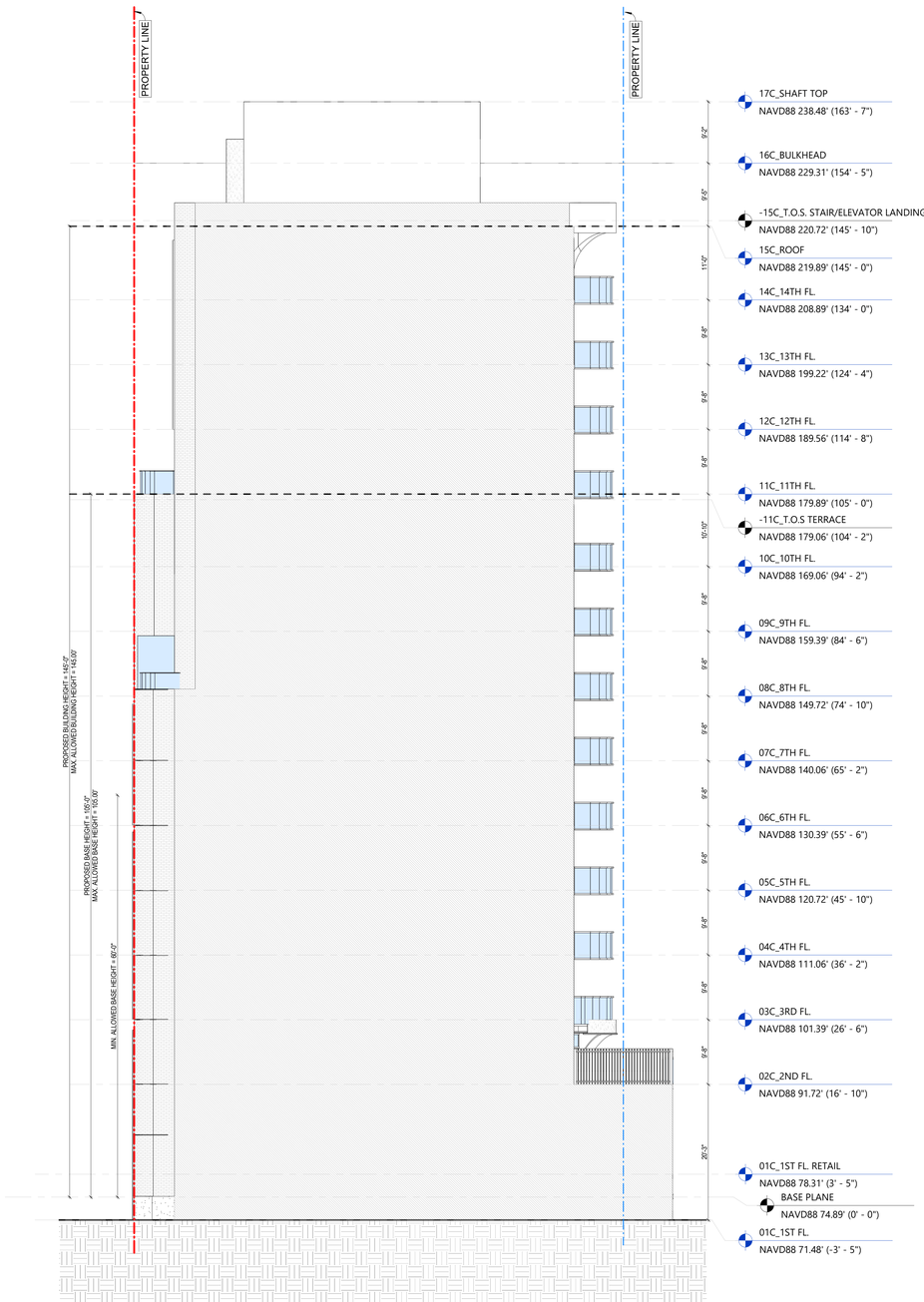
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED ROOF PLAN

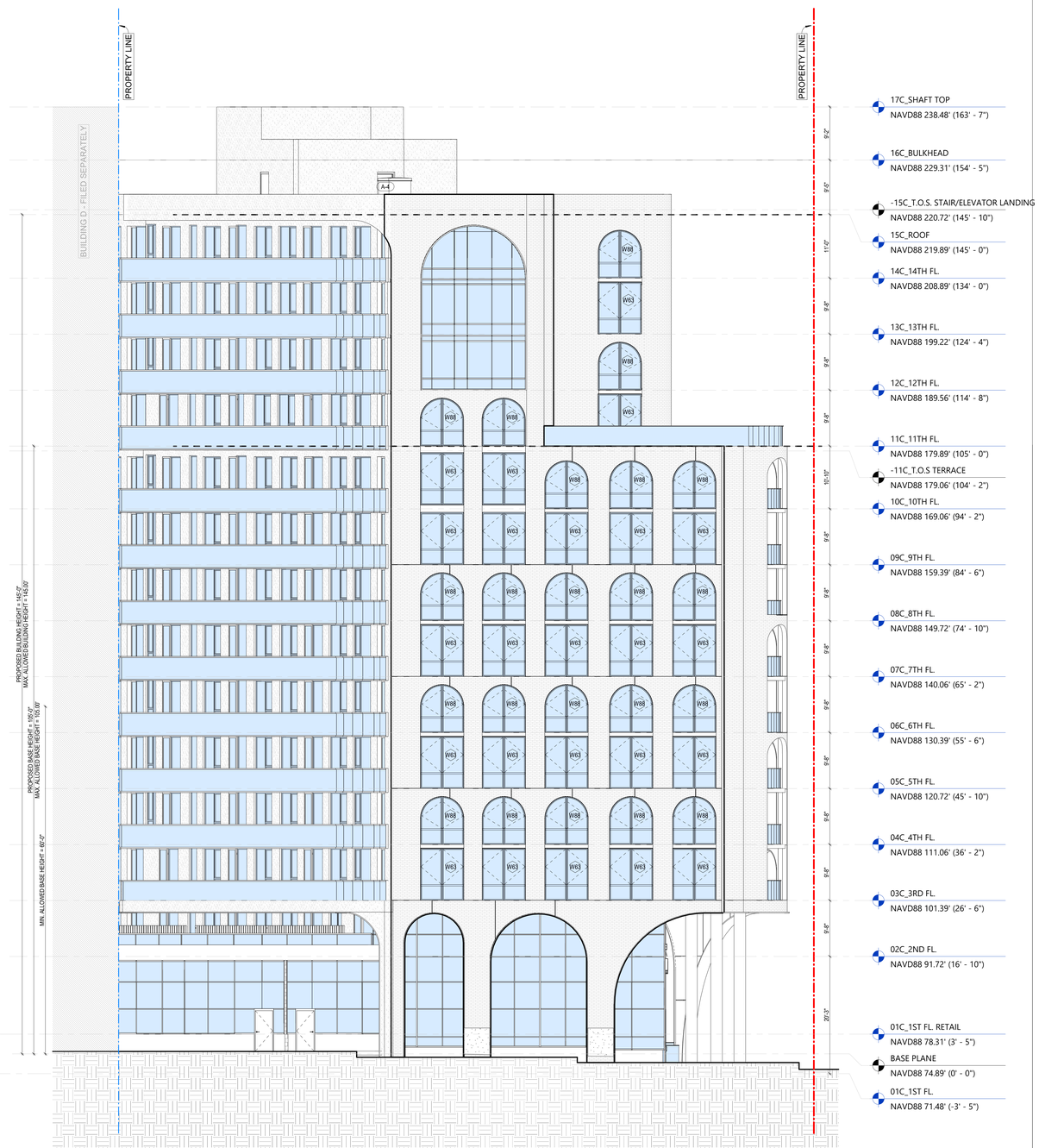
A-106C.00

Scale:	As indicated
Date:	12/1/2025 7:29:37 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

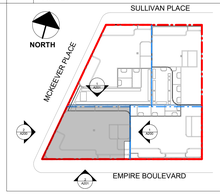
1 BLDG C - EAST ELEVATION
1/8" = 1'-0"



2 BLDG C - WEST ELEVATION
1/8" = 1'-0"



KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

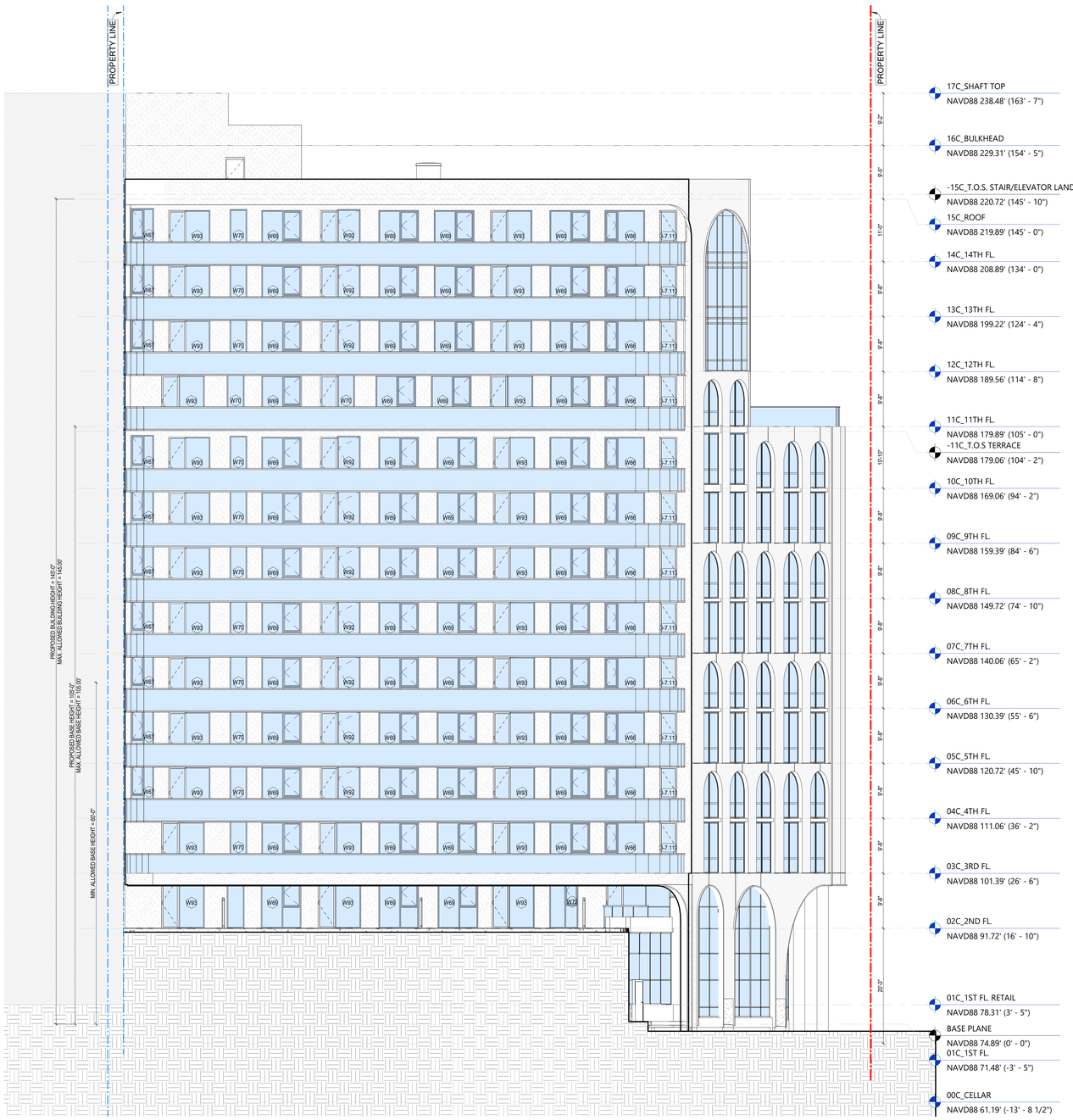
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
EAST & WEST ELEVATION

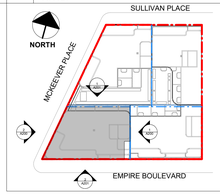
A-200C.00

Scale:	As indicated
Date:	12/1/2025 7:29:46 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG C - NORTH ELEVATION
1/8" = 1'-0"



KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

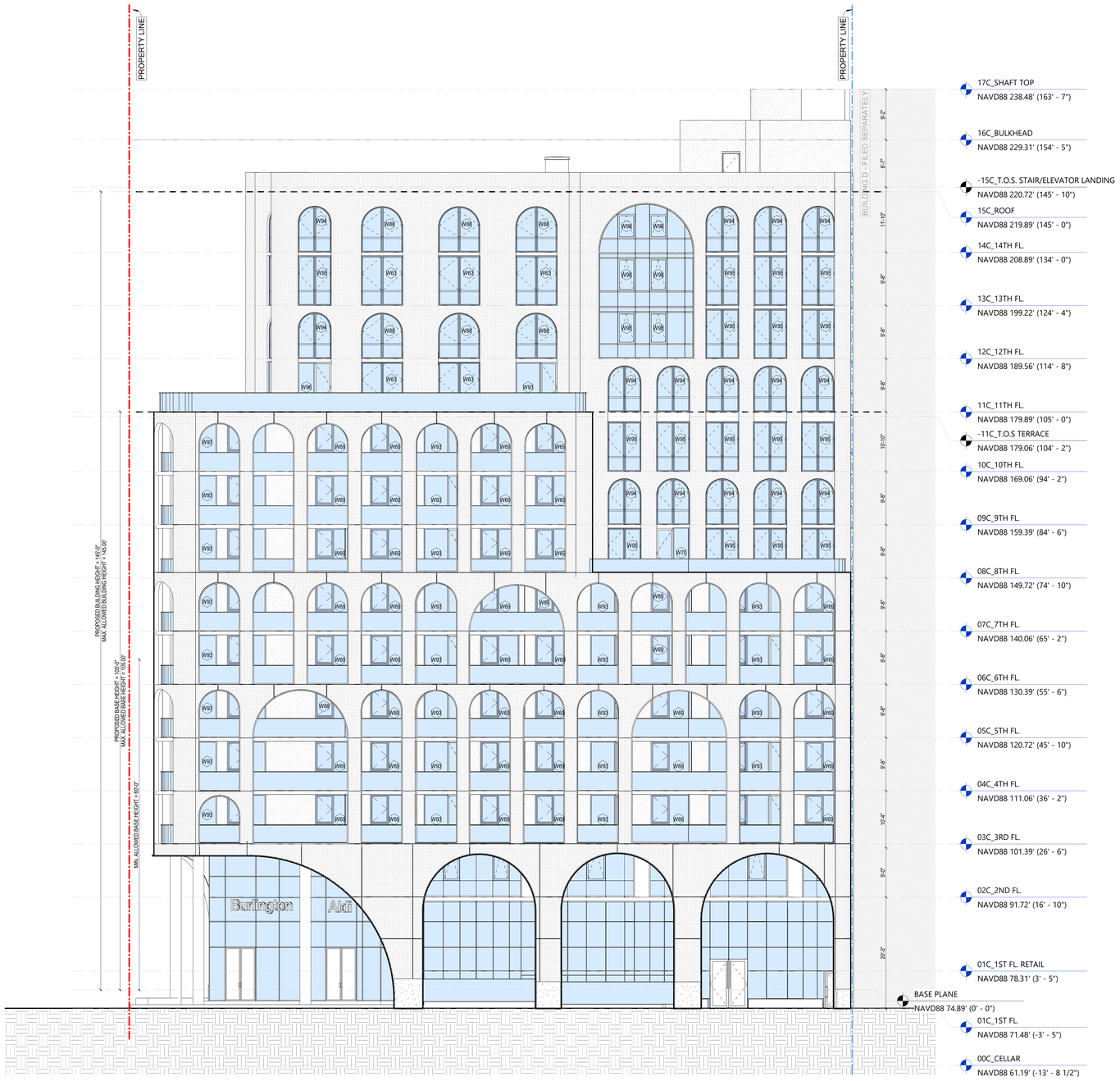
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
NORTH ELEVATION

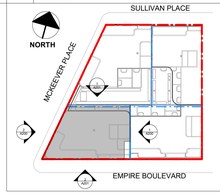
A-201C.00

Scale:	As indicated
Date:	12/1/2025 7:29:51 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 | BLDG C - SOUTH ELEVATION
1/8" = 1'-0"



KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

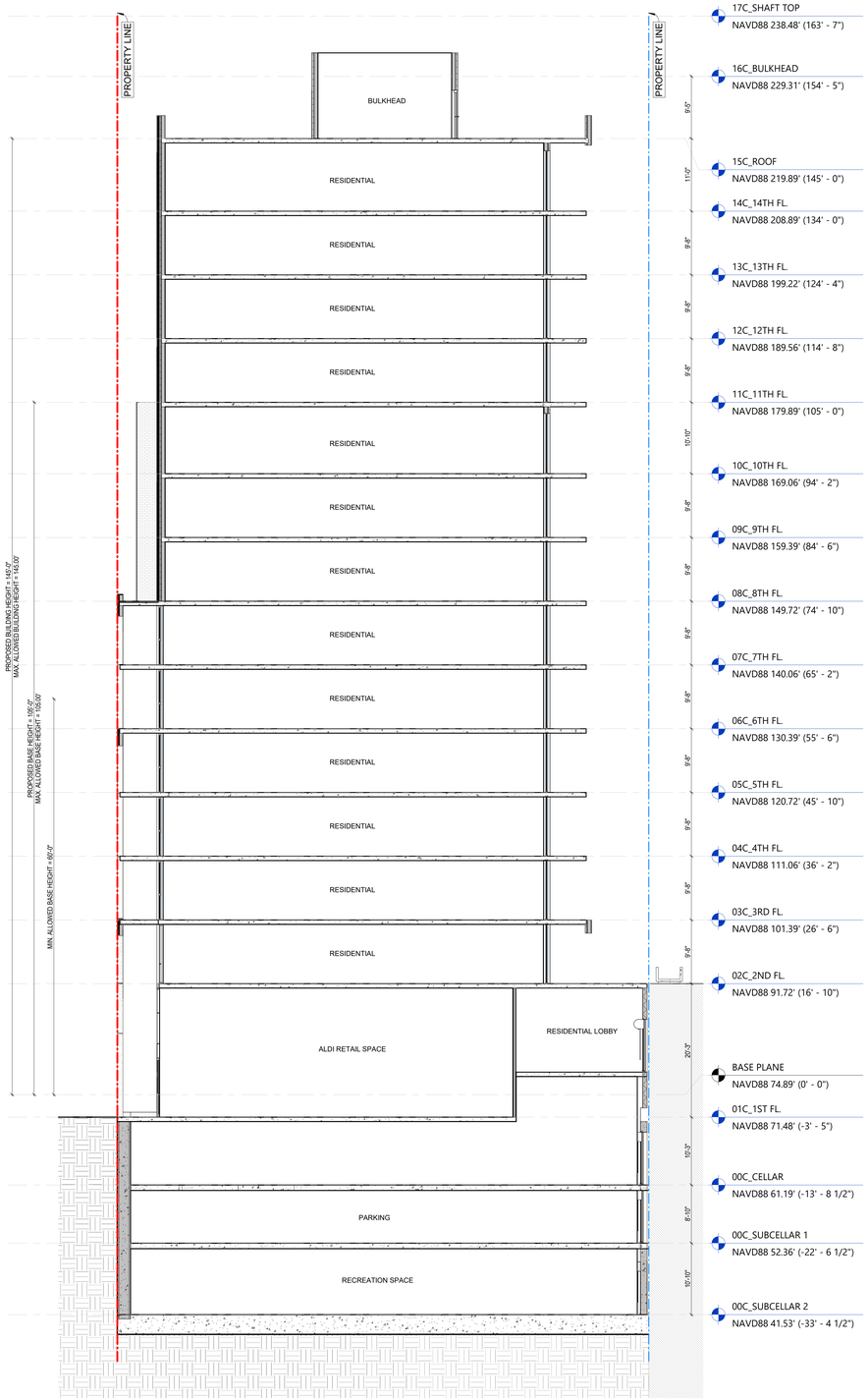
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
SOUTH ELEVATION

A-202C.00

Scale:	As indicated
Date:	12/1/2025 7:29:56 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 LONGITUDINAL SECTION
1/8" = 1'-0"



2 CROSS SECTION
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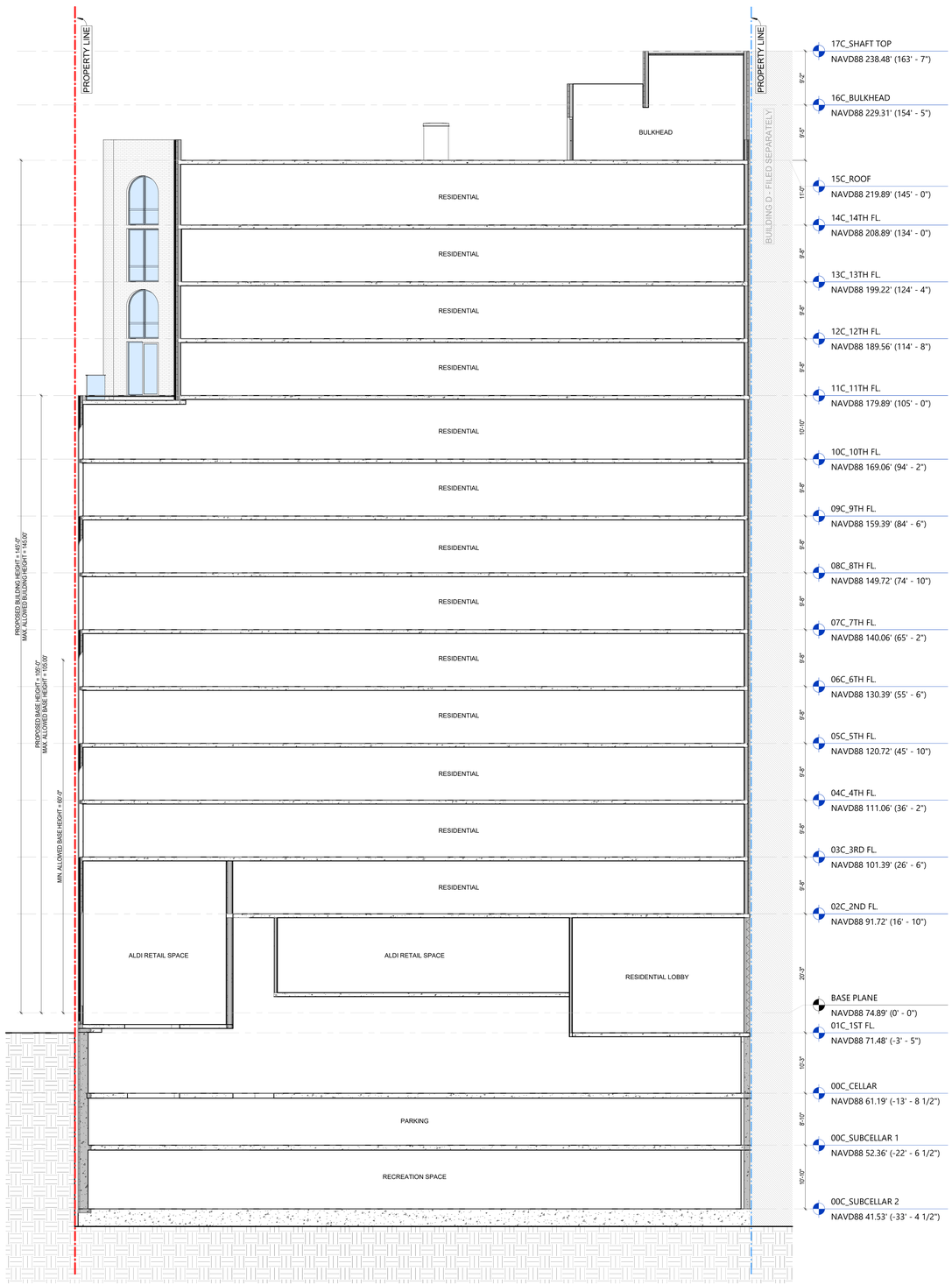
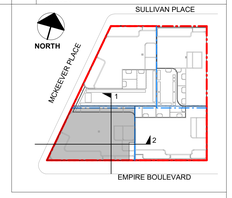


KEY PLAN
N.T.S.



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Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

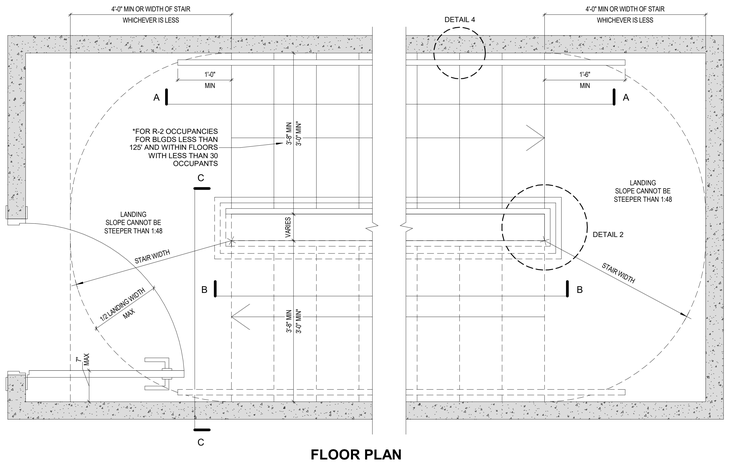
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
BUILDING SECTIONS

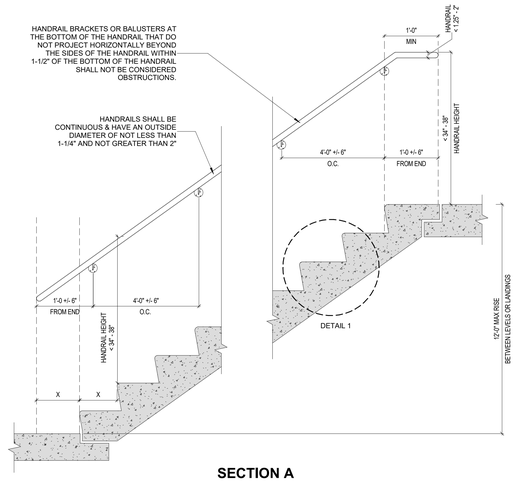
A-300C.00

Scale:	As indicated
Date:	12/1/2025 7:29:59 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

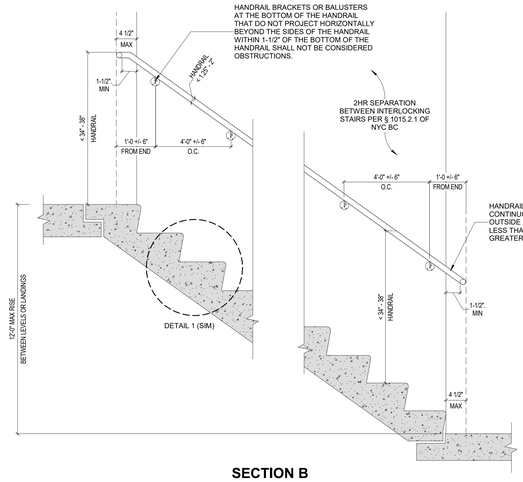
1 U-SHAPE STAIRS DETAILS



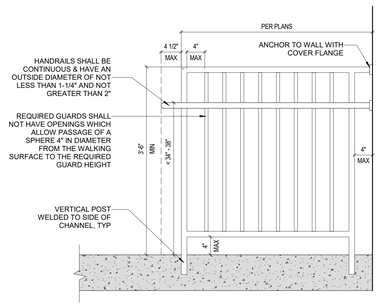
FLOOR PLAN



SECTION A



SECTION B



SECTION C
(ONLY ON 1ST FLOOR)

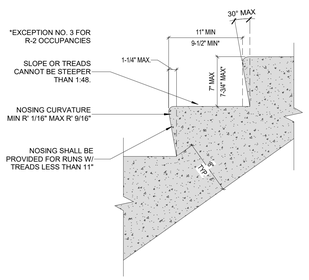
2 TWO INTERLOCKING / SCISSORS STAIRS DETAILS

FLOOR PLAN

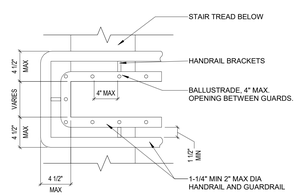
SECTION A

SECTION B

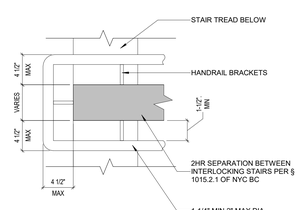
STAIRS DETAILS



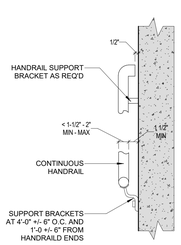
DETAIL 1



DETAIL 2



DETAIL 3

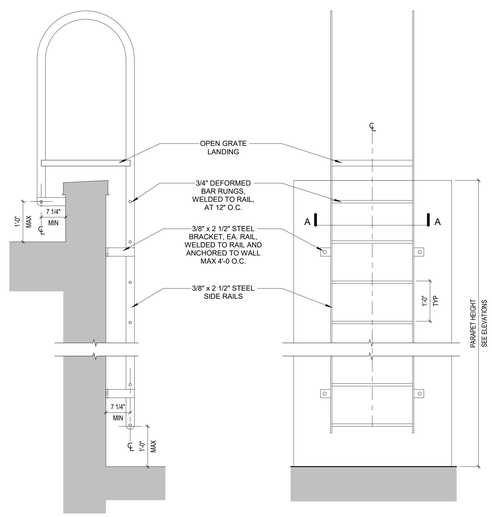


DETAIL 4

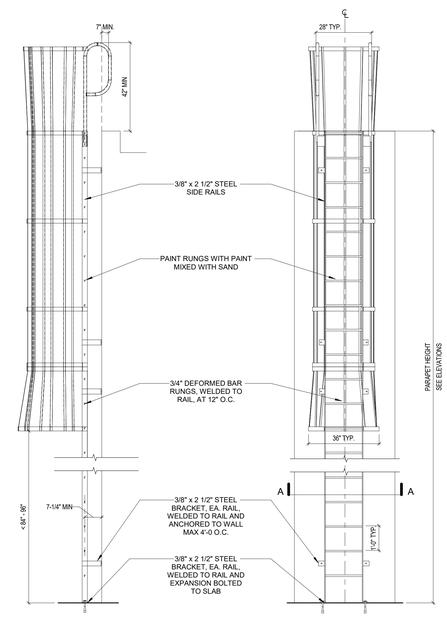
3 ROOF LADDERS

ROOF LADDERS NOTES

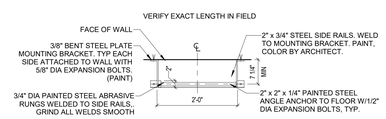
1. PER OSHA 1910.28(B)(9) LADDERS OVER 24 FT HIGH SHALL HAVE A PERSONAL FALL ARREST SYSTEM MEETING OSHA 1926.502(D)
2. ALL LADDERS SHALL MEET OSHA REGULATIONS FOR FIXED LADDERS 29 CFR SECTION 1910.23



ROOF LADDER - STRADDLE



ROOF LADDER - W/ CAGE



SECTION A

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SHEET TITLE
STAIRS DETAILS

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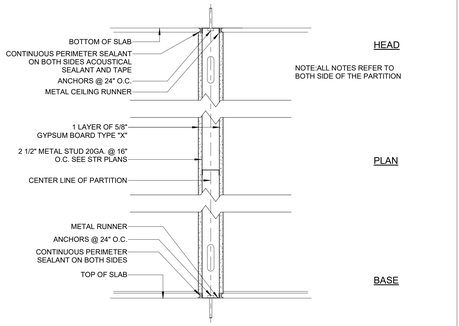
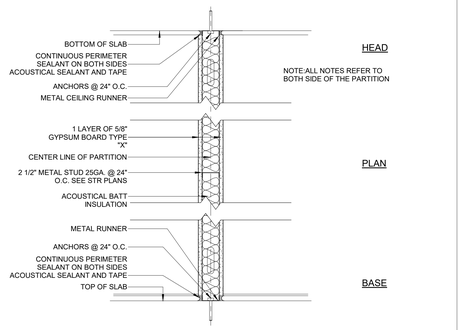


1 INTERIOR PARTITION

FIRE RATING: NON FIRE RATED
STC: NO STC REQUIRED



2 INTERIOR PARTITION

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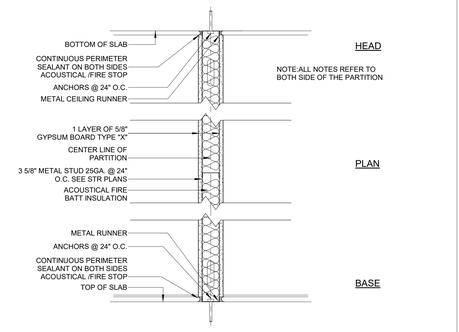
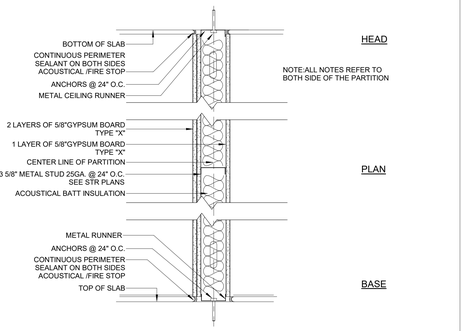
STC: +48 STC



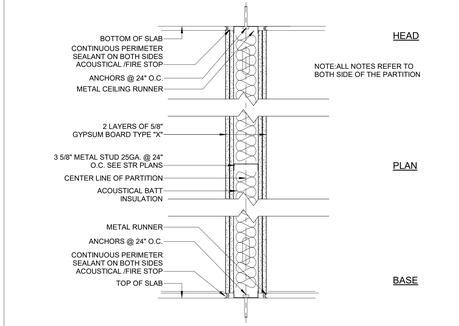
3 INTERIOR PARTITION

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U417 & U465
STC: +48 STC



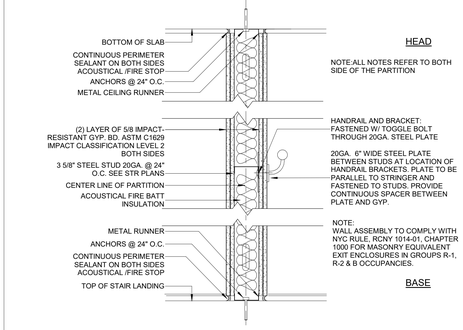
4 INTERIOR PARTITION

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U419
STC: +50 STC



5 INTERIOR PARTITION

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC

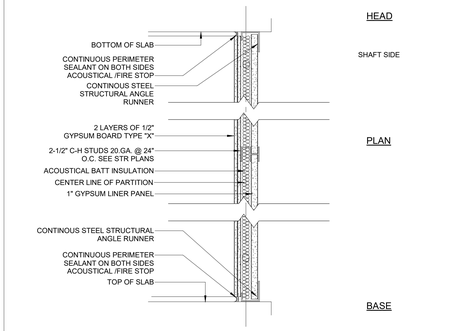


6 EXIT ENCLOUSURE RCNY 1014-01

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC

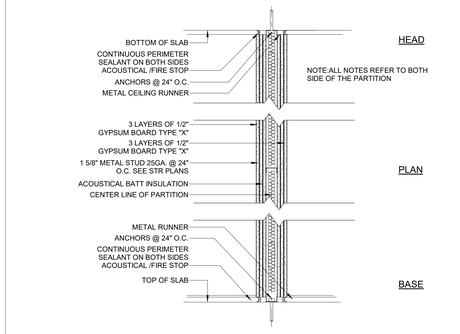
7 ELEVATOR SHAFT

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U415
STC: +50 STC



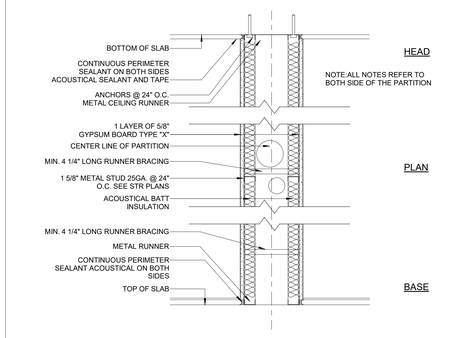
8 MECHANICAL DUCT SHAFT WALL

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U415
STC: +50 STC



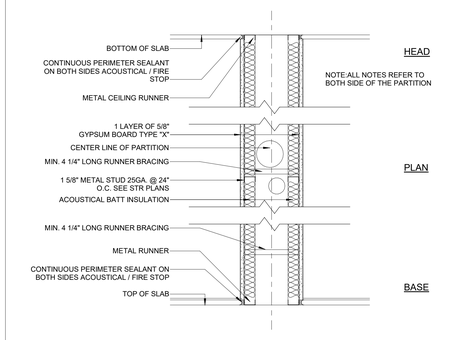
9 INTERIOR PARTITION

FIRE RATING: 3HR
FIRE TEST: UL. DESIGN NO: U455
STC: +50 STC



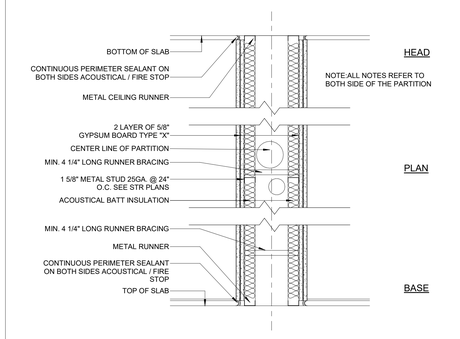
10 PLUMBING CHASE

FIRE RATING:NON FIRE RATED
STC: +48 STC



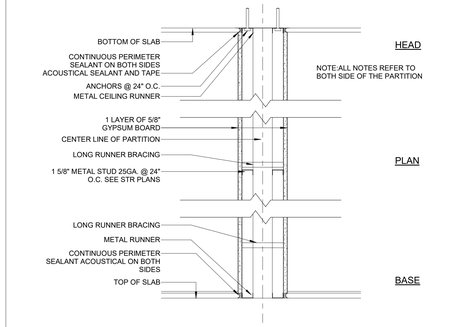
11 PIPE CHASE

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U420
STC: +50 STC



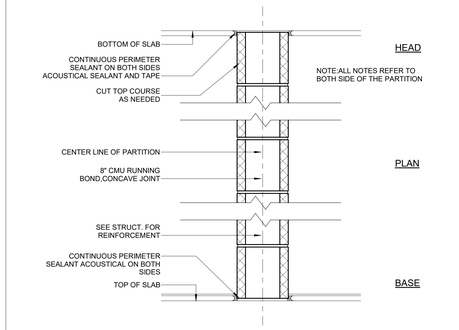
12 PIPE CHASE

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U420
STC: +50 STC



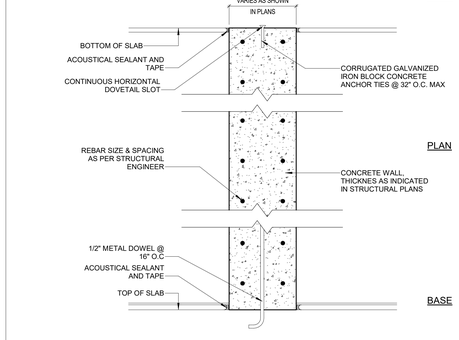
13 POCKET WALL

FIRE RATING: NON FIRE RATED
STC: NO STC REQUIRED



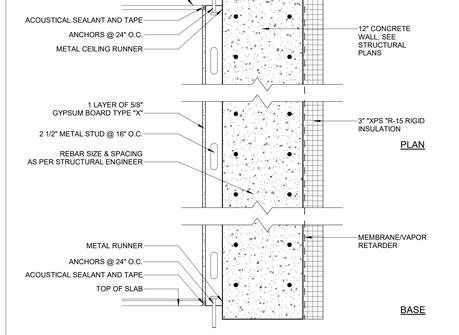
M1 CONCRETE MASONRY WALL

FIRE RATING: NON FIRE RATED
STC: NO STC REQUIRED



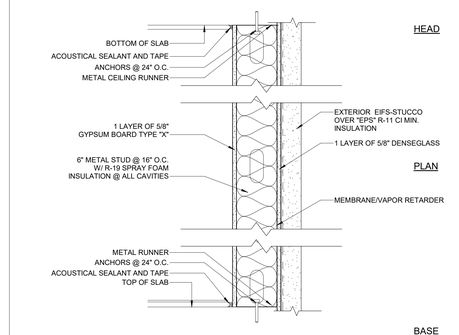
S1 INTERIOR SHEAR WALL

FIRE RATING: 2HR
STC: NO STC REQUIRED



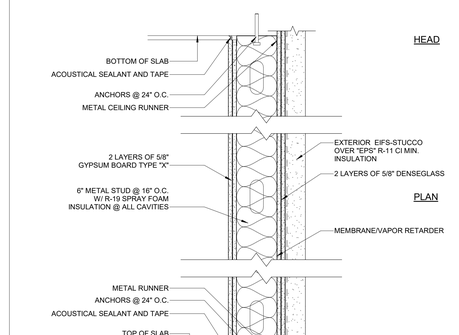
E1 EXTERIOR BASEMENT WALL

FIRE RATING: 2HR
STC: NO STC REQUIRED



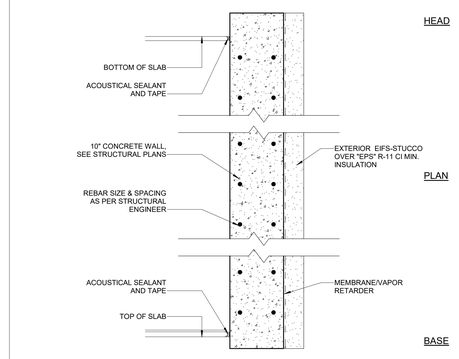
E2 EXTERIOR STUCCO WALL

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U419
STC: +50 STC



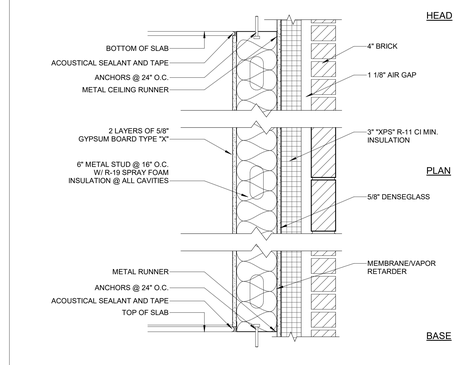
E3 EXTERIOR STUCCO WALL

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC



E4 EXTERIOR STUCCO SHEAR WALL

FIRE RATING: 2HR
STC: +50 STC



E4 EXTERIOR BRICK WALL

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC

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SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
WALL TYPES & DETAILS

A-500C.00

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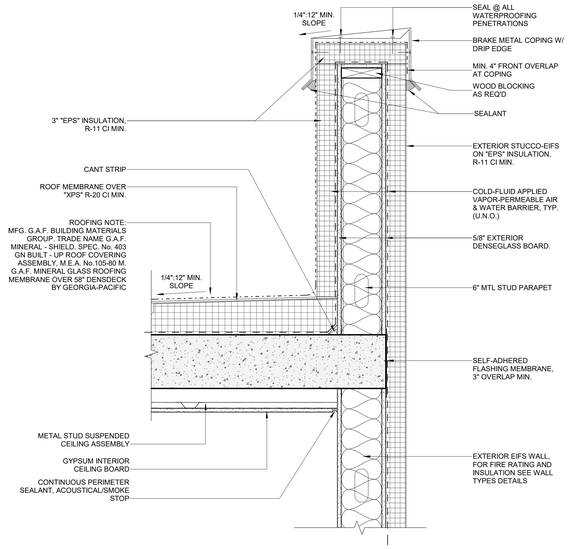
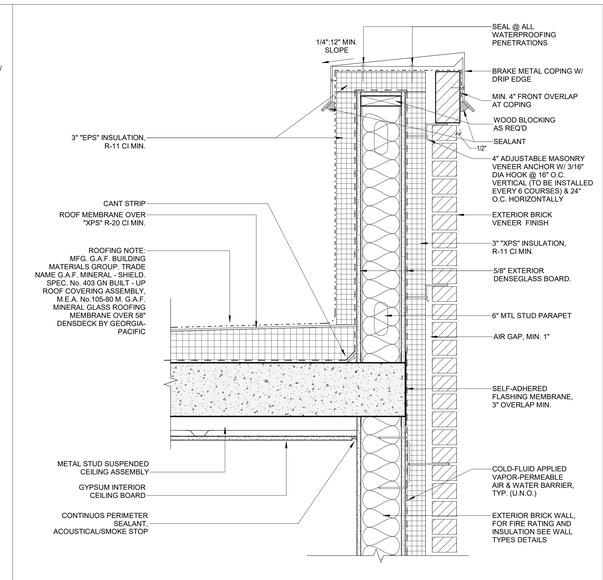
Date:	12/1/2025 7:30:03 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	



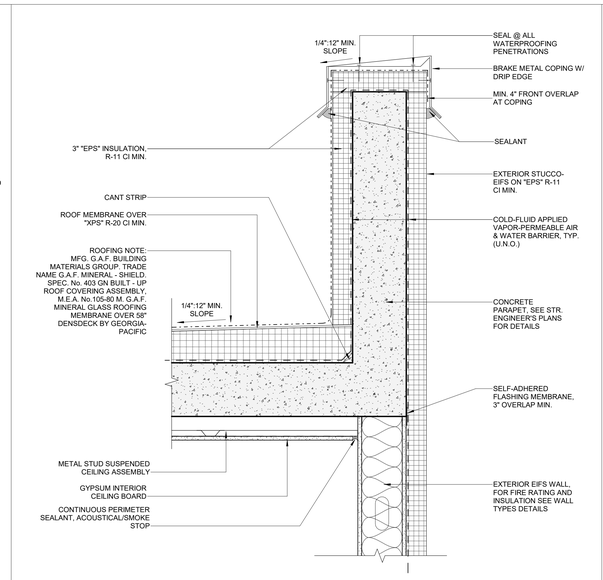
1 EIFS WALL @ STUD PARAPET

SCALE: 1 1/2" = 1'-0"



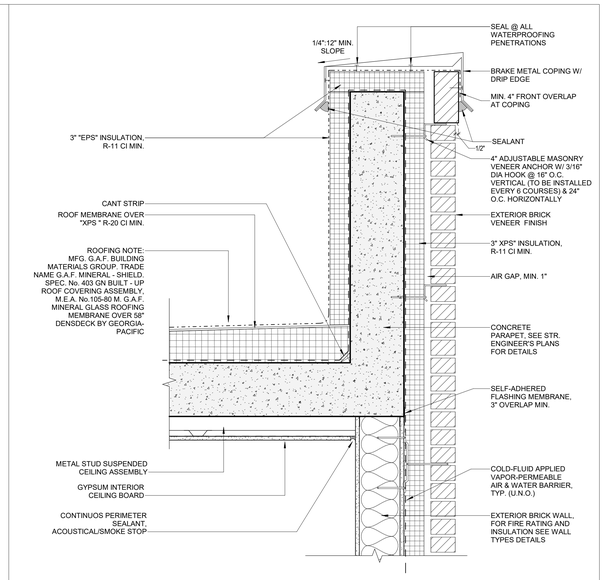
4 BRICK WALL 1HR @ STUD PARAPET

SCALE: 1 1/2" = 1'-0"



7 EIFS WALL @ CONC. PARAPET

SCALE: 1 1/2" = 1'-0"



9 BRICK WALL 1HR @ CONC. PARAPET

SCALE: 1 1/2" = 1'-0"

2 EIFS WALL @ CONC. SLAB

SCALE: 1 1/2" = 1'-0"

5 BRICK WALL 1HR @ CONC. SLAB

SCALE: 1 1/2" = 1'-0"

8 EIFS WALL @ CMU PARAPET

SCALE: 1 1/2" = 1'-0"

10 BRICK WALL 1HR @ CMU PARAPET

SCALE: 1 1/2" = 1'-0"

3 EIFS WALL @ BALCONY

SCALE: 1 1/2" = 1'-0"

6 BRICK WALL 1HR @ BALCONY

SCALE: 1 1/2" = 1'-0"

11 DETAIL @ FOUNDATION WALL

SCALE: 1 1/2" = 1'-0"

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Brooklyn, NY 11225

SHEET TITLE
SECTION DETAILS

A-510C.00

Scale:	1 1/2" = 1'-0"
Date:	12/1/2025 7:30:05 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

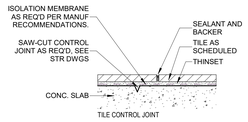
FINISH NOTES:

1. METAL EDGE SHALL BE PROVIDED ON ON SERVICE SIDE OF ALL DOORS.

2. ISOLATION MEMBRANE:
   - FOLLOW MANUF INSTRUCTIONS
   - MIN 4" COVERAGE FROM CRACK IN ANY DIRECTION
   - MIN 1-1/2x TILE SIZE
   - WHERE ANY PORTION OF A TILE SPANS A CRACK, TILE MUST REST COMPLETELY ON ISOLATION MEMBRANE

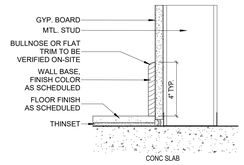
3. SEALANTS ON JOINTS MUST MATCH GROUT COLOR

TILE CONTROL JOINT

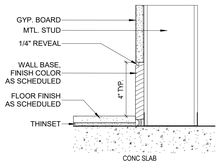


*THIS DETAIL IS NOT TO BE USED WITH BUILDING EXPANSION JOINTS. EXPANSION JOINTS MUST CARRY THRU THE TILE LAYER.

TYP. WALL BASE DETAIL

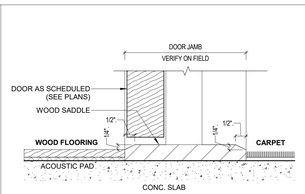


TYP. RECESSED WALL BASE DETAIL

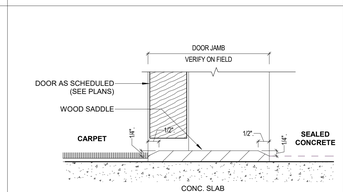


TRANSITION @ DOOR THRESHOLD

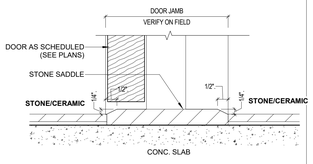
WOOD TO CARPET



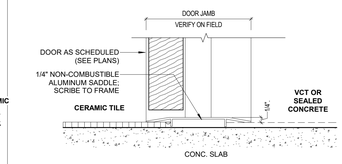
CARPET / SEALED CONCRETE



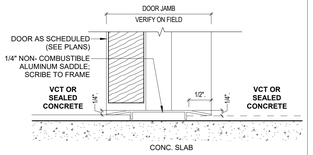
WOOD TO STONE/CERAMIC TILE



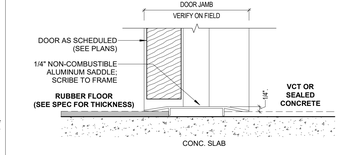
CERAMIC TILE / CARPET



TILE TO TILE



CERAMIC TILE / SEALED CONCRETE

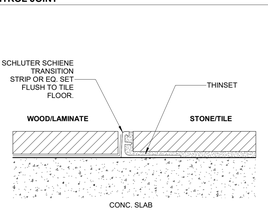


VCT TO VCT/SEALED CONCRETE

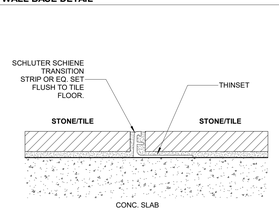
RUBBER / SEALED CONCRETE

TYPICAL TRANSITION

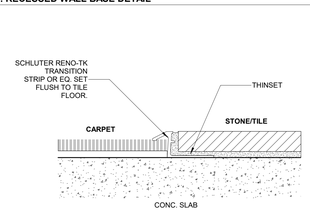
WOOD/LAMINATE TO TILE



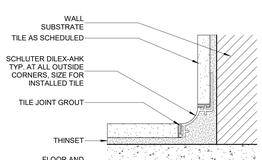
TILE TO TILE



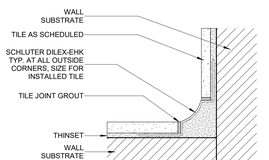
TILE TO CARPET



TILE TO VCT



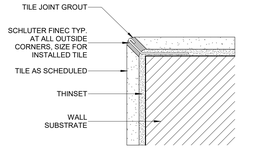
TILE TO CONCRETE



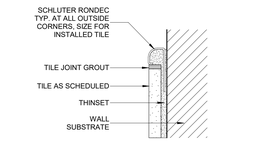
CARPET TO CONCRETE

BATHROOM TILE TRIM

COVE/BASE



INSIDE CORNER



OUTSIDE CORNER

EDGE TRIM

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

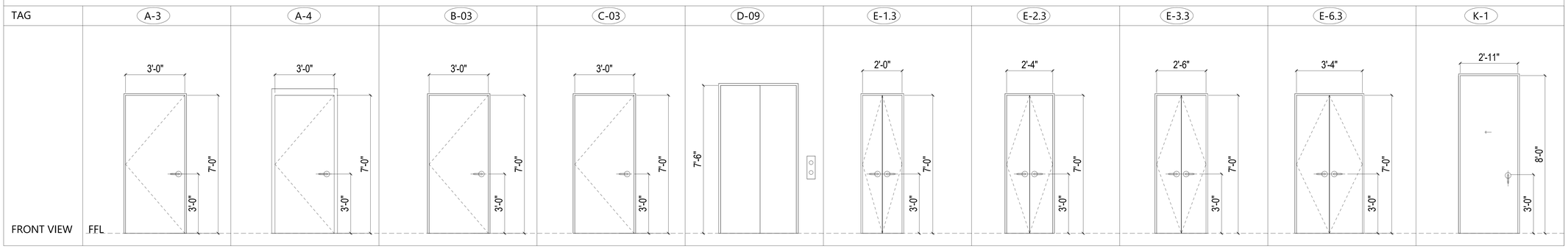
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
FLOOR AND TRANSITION DETAILS

A-701C.00

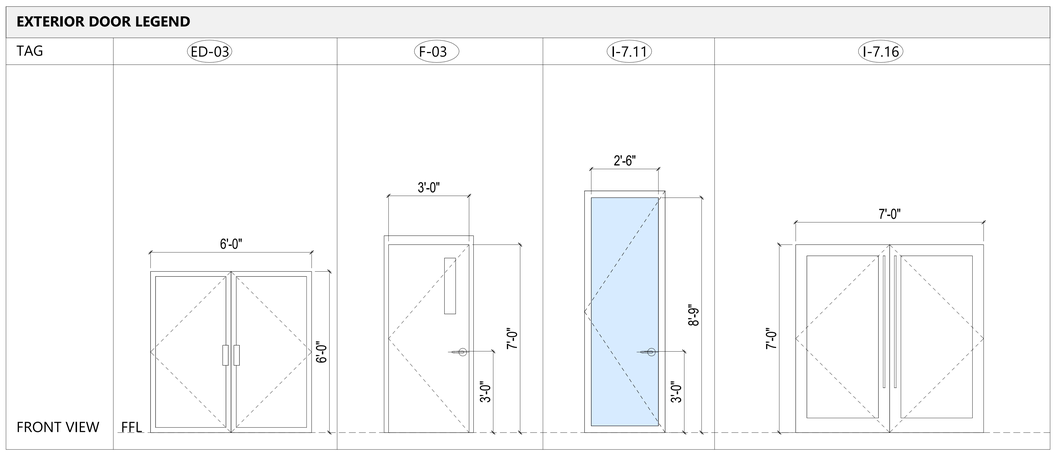
Scale:	As indicated
Date:	12/1/2025 7:30:07 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

INTERIOR DOOR LEGEND

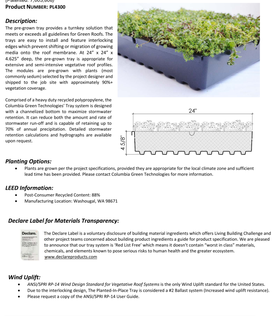


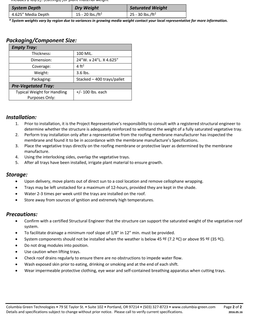
INTERIOR DOOR SCHEDULE - BUILDING C							
TAG	QTY	Operation	TYPE	COMMENTS	Fire Rating	WIDTH	HEIGHT
A-3	78	SINGLE SWING	HINGED DOOR	METAL APARTMENT DOOR 1-1/2 HR HSPF	1.5 HR FPSC	3' - 0"	7' - 0"
A-4	39	SINGLE SWING	HINGED DOOR	METAL APARTMENT DOOR 1-1/2 HR HSPF	1.5 HR FPSC	3' - 0"	7' - 0"
B-3	213	SINGLE SWING	HINGED DOOR	NON-RATED INTERIOR DOOR		3' - 0"	7' - 0"
C-3	109	SINGLE SWING	HINGED DOOR	NON-RATED INTERIOR DOOR		3' - 0"	7' - 0"
D-09	34	SLIDING	ELEVATOR DOOR	SLIDING ELEVATOR DOOR		3' - 8"	7' - 6"
E-1.3	106	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		2' - 0"	7' - 0"
E-3.3	92	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		2' - 6"	7' - 0"
E-4.3	29	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		2' - 8"	7' - 0"
E-6.3	116	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		3' - 4"	7' - 0"
K-1	4	SLIDING	POCKET DOOR	NON-RATED SLIDING INTERIOR DOOR		3' - 0"	8' - 0"

EXTERIOR DOOR LEGEND



EXTERIOR DOOR SCHEDULE - BUILDING C													
TAG	COUNT	Manufacturer	Model	Construction Type	Operation	TYPE	COMMENTS	WIDTH	HEIGHT	U-FACTOR	SHGC	AIR LEAKAGE	VT	Area
ED-03	2	PELLA	LIFESTYLE	METAL	SINGLE SWING	DOUBLE HINGED DOOR	GLAZED DOUBLE DOOR ENTRY	<varies>	9' - 8 1/2"	.25	.24	<0.02 CFM SF	0.4	84.00 SF
F-3	5	PELLA	SUPER 82	METAL	SINGLE SWING	HINGED DOOR	METAL APARTMENT DOOR 1-1/2 HR HSPF	3' - 0"	7' - 0"	N/A	N/A	<0.02 CFM SF	0.56	0.00 SF
I-7.11	79	PELLA	SUPER 82	METAL	SINGLE SWING	SINGLE GLASS	GLAZED BALCONY DOOR	3' - 0"	9' - 0"	.25	.27	<0.02 CFM SF	0.56	2133.00 SF
I-7.16	1	PELLA	SUPER 82	METAL	SWINGING	DOUBLE GLASS DOOR	GLAZED DOUBLE DOOR ENTRY	6' - 9"	9' - 0"	.25	.27	<0.02 CFM SF	0.56	60.76 SF
														2277.76 SF





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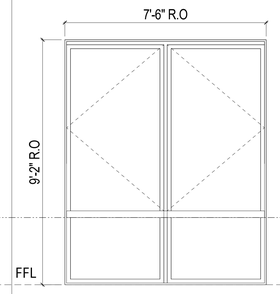
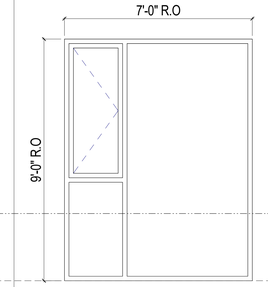
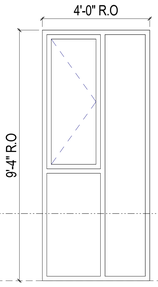
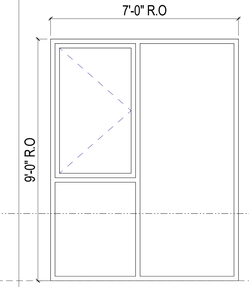
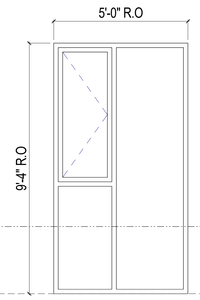
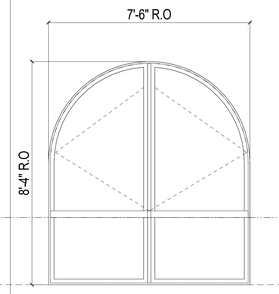
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
DOOR LEGEND & SCHEDULE

A-700C.00

Scale: 1/2" = 1'-0"
Date: 12/1/2025 7:30:11 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

WINDOW LEGEND

TAG	W63	W66	W67	W69	W70	W72	W88
FRONT VIEW							
GLAZING LESS THAN 30" ABOVE FLOOR LEVEL DOES NOT CONTRIBUTE TO NATURAL LIGHT							
2'-6"							
FFL							

WINDOW LEGEND

TAG	W92	W93	W94	W95	W96
FRONT VIEW					
GLAZING LESS THAN 30" ABOVE FLOOR LEVEL DOES NOT CONTRIBUTE TO NATURAL LIGHT					
2'-6"					
FFL					

WINDOW SCHEDULE - BUILDING C													
TAG	COUNT	MANUFACTURER	MODEL	Construction Type	OPERATION	COMMENTS	GLAZING	WIDTH	HEIGHT	U-FACTOR	SHGC	AIR LEAKAGE	VT	TOTAL SF
W63	29	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	7' - 6"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	1957.50 SF
W66	12	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	7' - 0"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	756.00 SF
W67	10	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	4' - 0"	9' - 4"	.26	.33	<0.02 CFM SF	0.56	373.33 SF
W69	106	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	7' - 0"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	6678.00 SF
W70	16	ZEPHYR	SUPER 82	VINYL	FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	3' - 0"	9' - 2"	.26	.33	<0.02 CFM SF	0.56	440.00 SF
W72	1	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	5' - 0"	9' - 4"	.26	.33	<0.02 CFM SF	0.56	46.67 SF
W88	28	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	7' - 6"	4' - 6"	.26	.33	<0.02 CFM SF	0.56	945.00 SF
W92	10	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	4' - 0"	9' - 2"	.26	.33	<0.02 CFM SF	0.56	366.67 SF
W93	60	ZEPHYR	SUPER 82	VINYL	FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	4' - 6"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	2430.00 SF
W94	15	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	6' - 0"	5' - 4"	.26	.33	<0.02 CFM SF	0.56	480.00 SF
W95	16	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	6' - 0"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	864.00 SF
W96	1	ZEPHYR	SUPER 82	VINYL	FIXED	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Non High Altitude	3' - 0"	9' - 0"	.26	.33	<0.02 CFM SF	0.56	27.00 SF
														15364.17 SF

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SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
WINDOW LEGEND & SCHEDULE

A-710C.00

Scale: 1/2" = 1'-0"
Date: 12/1/2025 7:30:14 PM
Drawn by:
Checked by:
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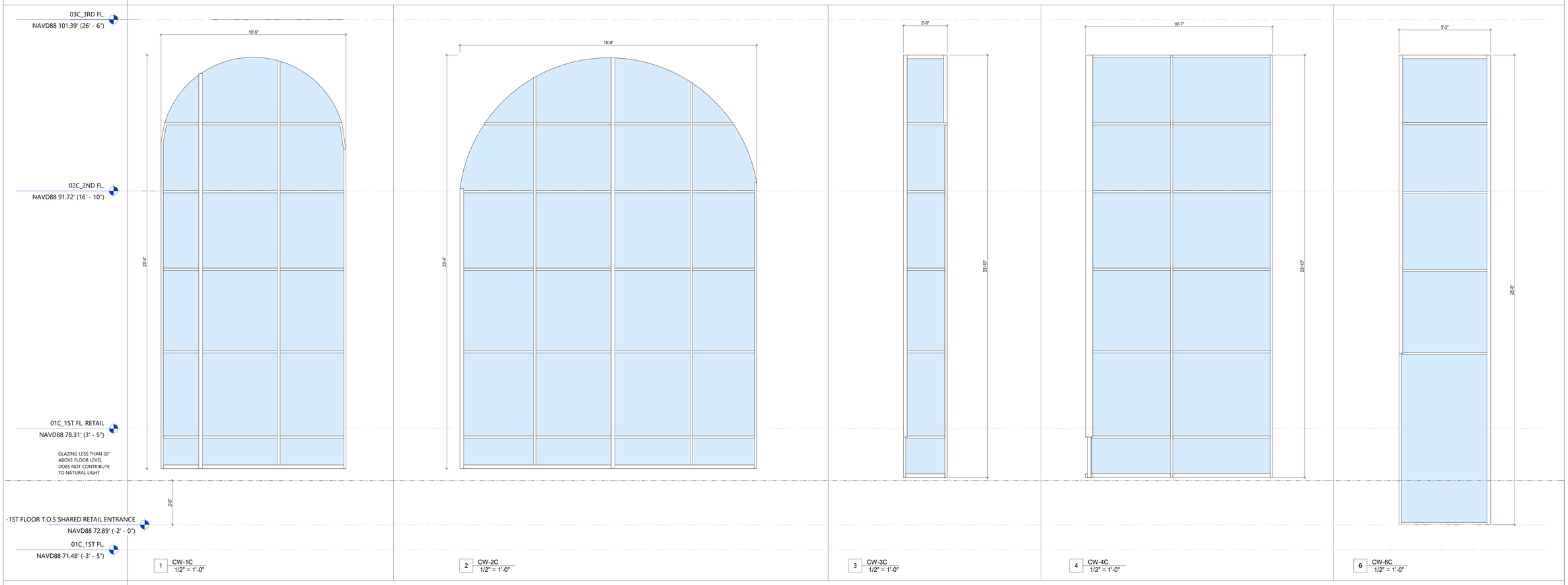

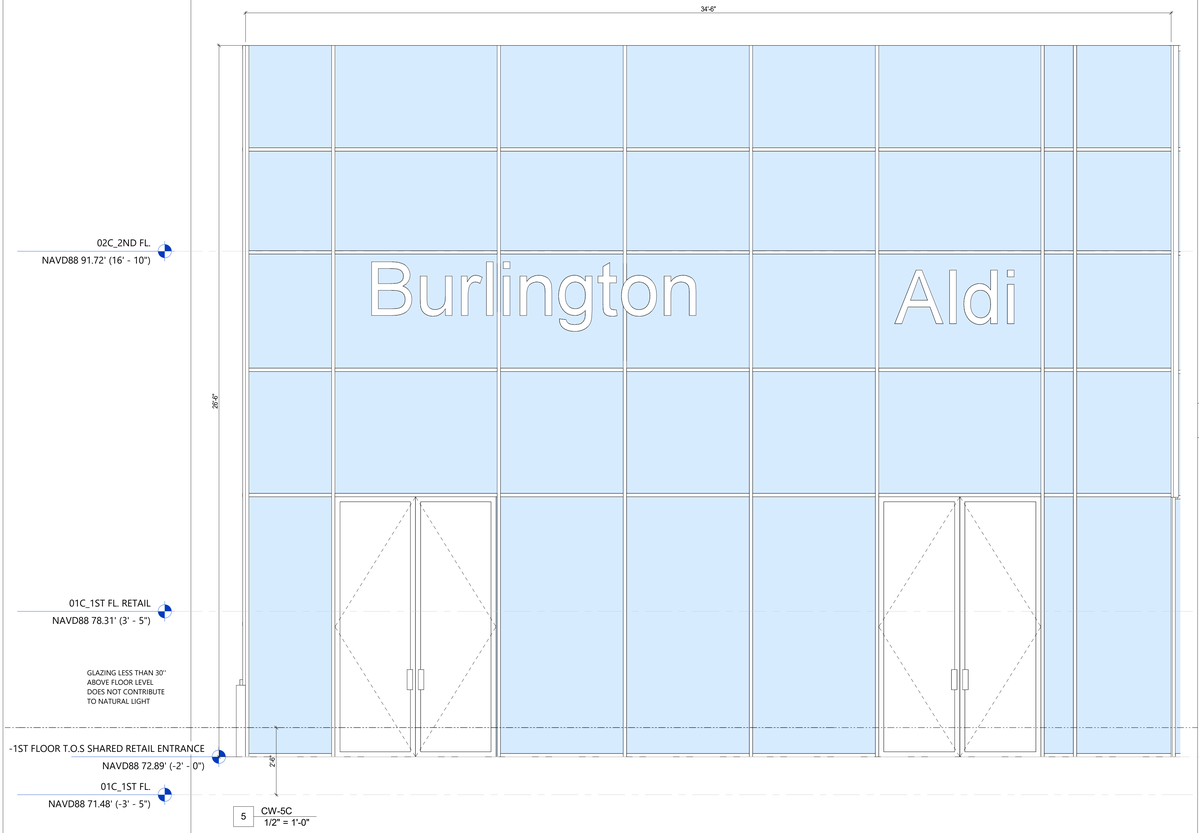

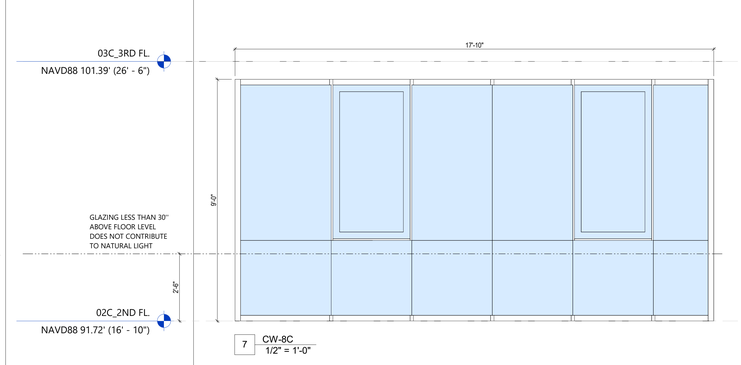

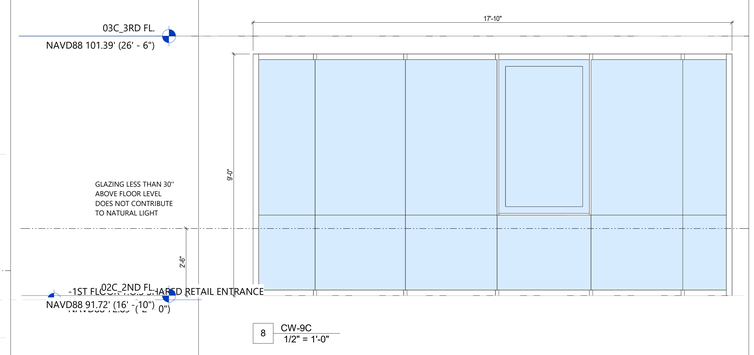

CURTAIN WALL SCHEDULE - BUILDING C				
Mark	Count	Length	Unconnected Height	Area
CW-1C	1	24' - 2 1/2"	23' - 4"	230.39 SF
CW-2C	1	24' - 8"	23' - 4"	358.49 SF
CW-3C	1	2' - 5 1/2"	23' - 10"	58.61 SF
CW-4C	1	10' - 4"	23' - 4"	246.27 SF
CW-5C	1	34' - 5 1/2"	26' - 6"	913.70 SF
CW-6C	1	5' - 2"	26' - 6"	136.92 SF
CW-7C	1	76' - 8"	26' - 10 1/2"	1761.26 SF
CW-8C	1	17' - 10"	9' - 0"	160.50 SF
CW-9C	1	17' - 10"	9' - 0"	160.56 SF
CW-10C	1	8' - 5"	9' - 0"	75.75 SF
CW-11C	1	14' - 1"	9' - 0"	126.75 SF
CW-12C	1	7' - 10"	9' - 0"	70.50 SF
CW-13C	1	20' - 8"	30' - 0"	484.72 SF
CW-14C	1	22' - 3 1/2"	30' - 4"	457.40 SF
				5241.80 SF

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SHEET TITLE
CURTAIN WALL
LEGEND & SCHEDULE

A-711C.00

Scale:	1/2" = 1'-0"
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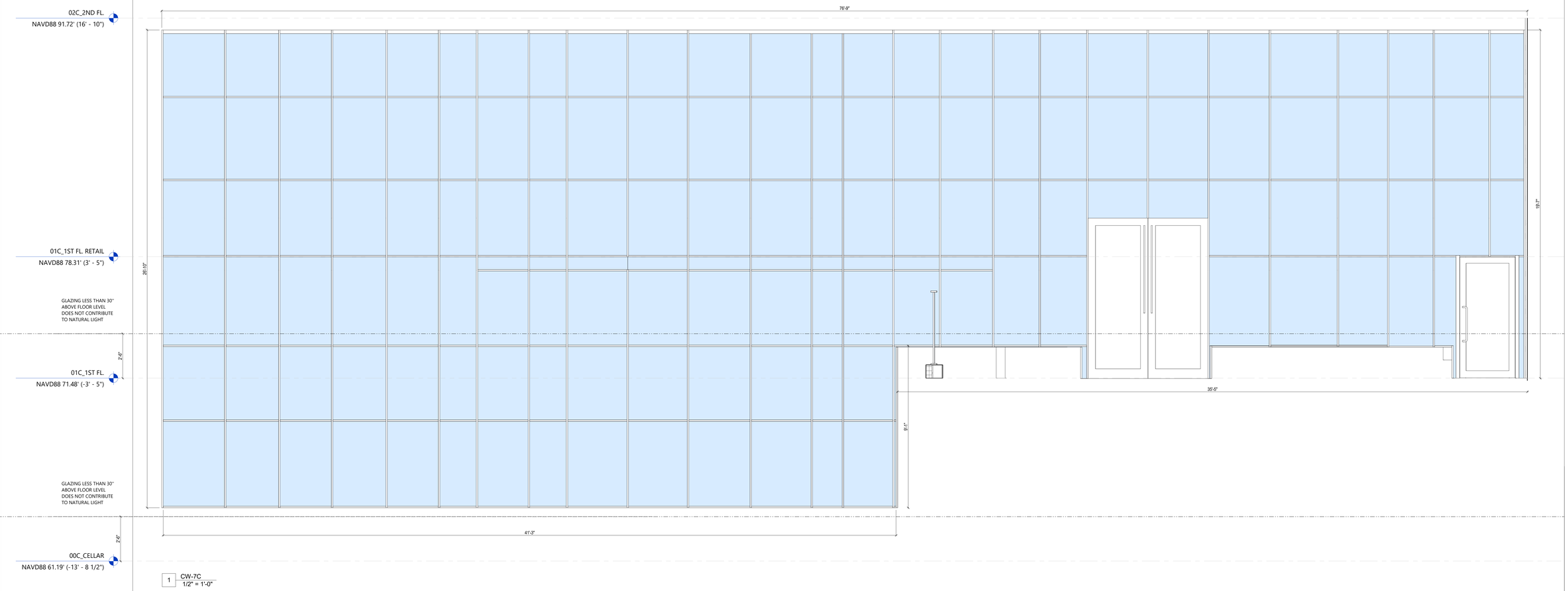
Checked by:	
DOB JOB NUMBER:	



1 CW-7C
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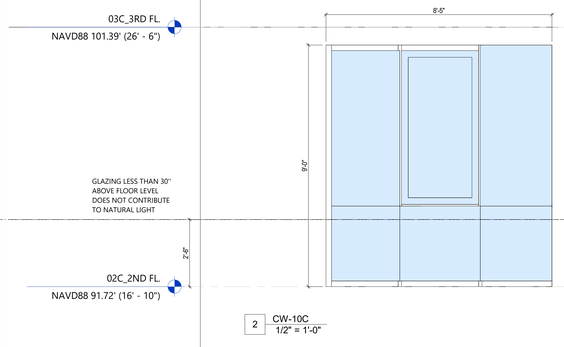
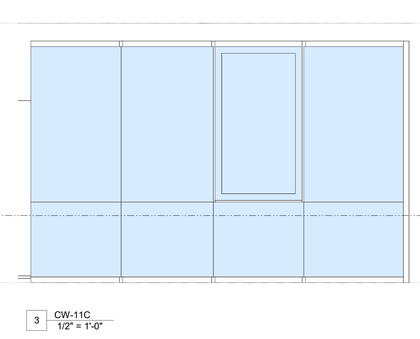
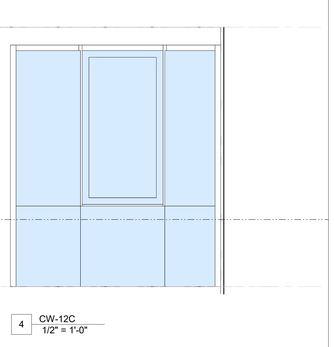


2 CW-10C
1/2" = 1'-0"



3 CW-11C
1/2" = 1'-0"



4 CW-12C
1/2" = 1'-0"

CURTAIN WALL SCHEDULE - BUILDING C

Mark	Count	Length	Unconnected Height	Area
CW-1C	1	24' - 2 1/2"	23' - 4"	230.39 SF
CW-2C	1	24' - 8"	23' - 4"	358.49 SF
CW-3C	1	2' - 5 1/2"	23' - 10"	58.61 SF
CW-4C	1	10' - 4"	23' - 4"	246.27 SF
CW-5C	1	34' - 5 1/2"	26' - 6"	913.70 SF
CW-6C	1	5' - 2"	26' - 6"	136.92 SF
CW-7C	1	76' - 8"	26' - 10 1/2"	1761.26 SF
CW-8C	1	17' - 10"	9' - 0"	160.50 SF
CW-9C	1	17' - 10"	9' - 0"	160.56 SF
CW-10C	1	8' - 5"	9' - 0"	75.75 SF
CW-11C	1	14' - 1"	9' - 0"	126.75 SF
CW-12C	1	7' - 10"	9' - 0"	70.50 SF
CW-13C	1	20' - 8"	30' - 0"	484.72 SF
CW-14C	1	22' - 3 1/2"	30' - 4"	457.40 SF
				5241.80 SF

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55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

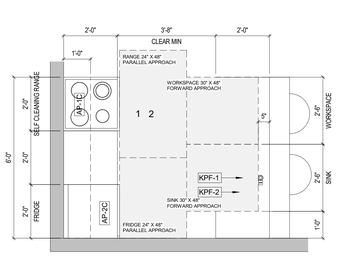
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
CURTAIN WALL
LEGEND & SCHEDULE

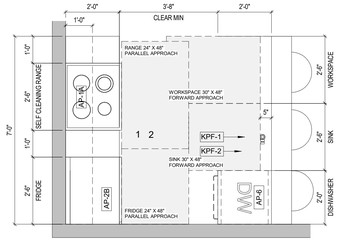
A-712C.00

Scale: 1/2" = 1'-0"
Date: 12/1/2025 7:30:22 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

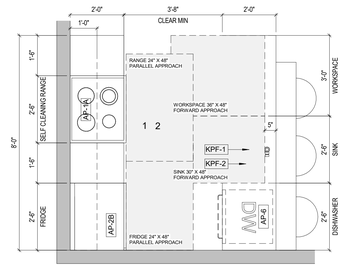
ISLAND OPEN



PLAN 6'-0"



PLAN 7'-0"



PLAN 8'-0"

FIXTURE & APPLIANCE SCHEDULE

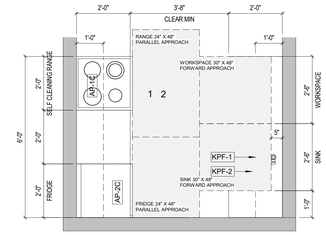
PLUMBING FIXTURES & ACCESSORIES

TAG	TYPE	MANUFACTURER	MODEL	FINISH
KPF-1	KITCHEN FAUCET	BLANCO	LINUS 526375	BLK
KPF-2	KITCHEN SINK	BLANCO	PRECIS ADA SILGRANIT	BLK
PF-2	BATHROOM SINK	KOHLER	VERTICYL L K-8189-0	WHT
PF-3	ADA TOILET	TOTO	ECO ULTRAMAX MS854114EL / MS854114ELR#01	WHT
PF-4	STANDARD TUB	FINE FIXTURES	BTA104	WHT
PF-4R	ADA TUB	AMERICAN STANDARD	2973.102 / 2973.202	WHT
PF-5	SHOWER HANDLE / DIVERTER	HANSGROHE	FINORIS	BLK
PF-5R	ADA SHOWER HANDLE / DIVERTER	SYMMONS	DIA - S3508BTRM-T736-MB	BLK
PF-6	BATHROOM FAUCET	HANSGROHE	FINORIS	BLK
BF-1	TOILET PAPER HOLDER	GATCO	RECESSED T.H.	BLK
BF-1R	RECESSED TOILET PAPER HOLDER / SHELF	HANSGROHE	ADDSTORIS 41772670	BLK
BF-2	VANITY MIRROR			
BF-3	REMOVABLE IN-TUB SEAT	ASI	8358	
	ADA GRAB BARS	KOHLER	K-10540	BLK

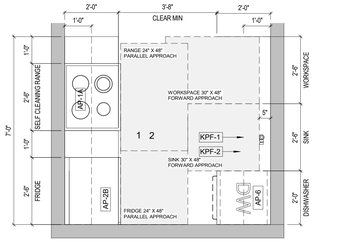
APPLIANCES

AP-1A	30" STOVE TOP	BLOMBERG	DWS51502SS	SS
AP-1B	30" BUILT-IN OVEN	BLOMBERG	DW51600SS	SS
AP-1C	24" STOVE TOP			
AP-2A	30" FRIDGE / FREEZER	BLOMBERG	BRFB1812SSLN	SS
AP-2B	30" FRIDGE / FREEZER ADA	FRIGIDAIRE	FFHT1835VS	SS
AP-2C	24" FRIDGE / FREEZER			
AP-4	STACKABLE WASHER / DRYER UNIT	BLOMBERG	WM72200W + DV17600W	WHT
AP-5	ADA COMBINATION WASHER / DRYER UNIT	BLOMBERG	WMD24400W	WHT
AP-6	DISHWASHER			

U-SHAPE CLOSE



PLAN 6'-0"



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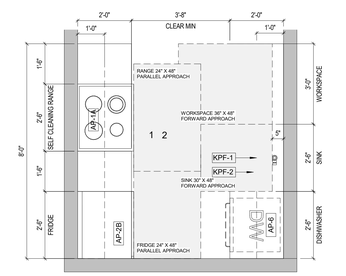
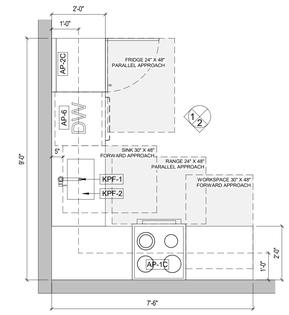


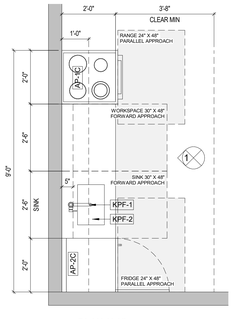
PLAN 8'-0"

L-SHAPE KITCHEN

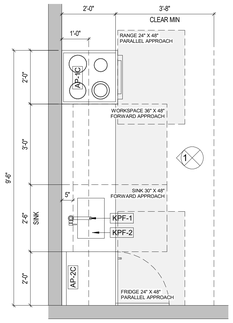


PLAN 9'-0" x 7'-6"

STRAIGHT KITCHEN



PLAN 9'-0"



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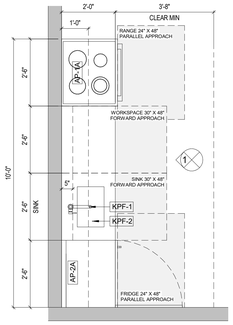
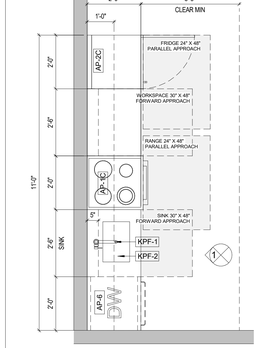
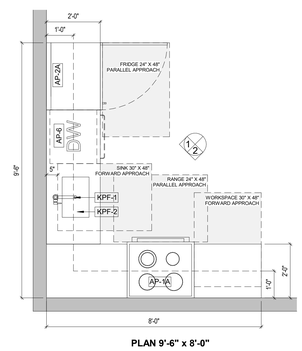


PLAN 10'-0"



PLAN 11'-0"

L-SHAPE KITCHEN



PLAN 9'-6" x 8'-0"

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SIGNATURE & SEAL

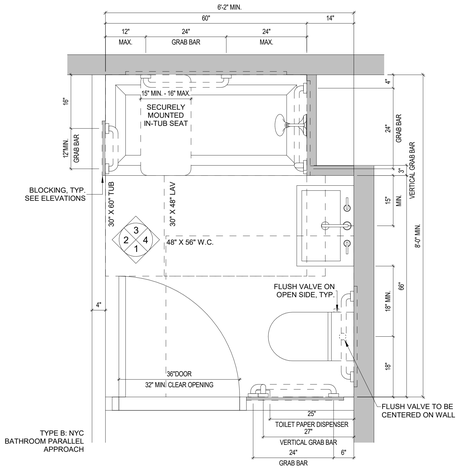
DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

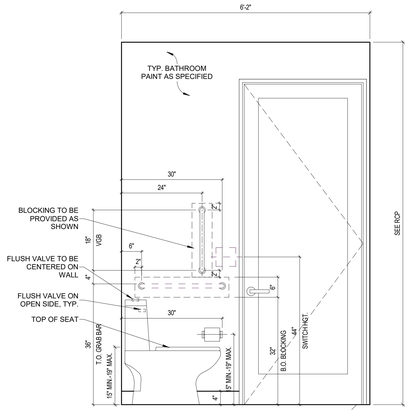
SHEET TITLE
ENLARGED KITCHEN PLANS & ELEVATIONS

A-910C.00

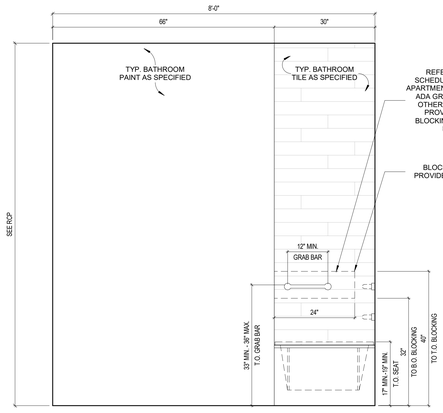
Scale:	As indicated
Date:	12/1/2025 7:30:24 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	



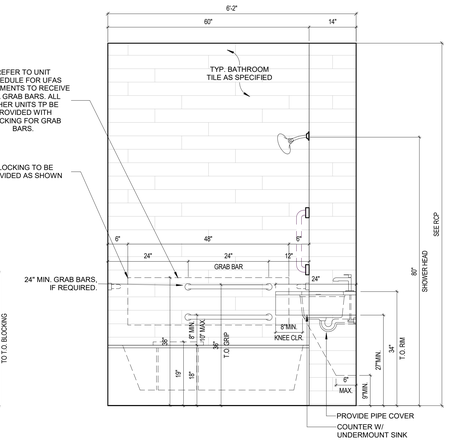
PLANS



ELEVATION 1



ELEVATION 2



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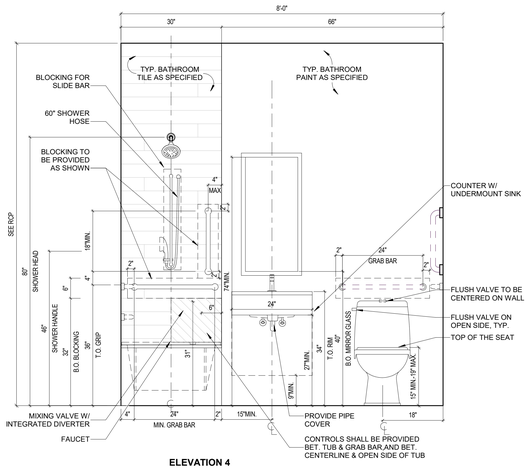

ELEVATION 4

1 BATHROOM TYPE 1A - PLAN

SCALE: 3/4" = 1'-0"

PLANS

ELEVATION 1

ELEVATION 2

ELEVATION 3

ELEVATION 4

2 BATHROOM TYPE 1B - PLAN

SCALE: 3/4" = 1'-0"

PLANS

ELEVATION 1

ELEVATION 2

ELEVATION 3

ELEVATION 4

3 BATHROOM TYPE 2 - PLAN

SCALE: 3/4" = 1'-0"

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00	INITIAL SUBMISSION	12/01/2025

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DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ENLARGED BATHROOM PLANS & ELEVATIONS

A-911C.00

Scale:	3/4" = 1'-0"
Date:	12/1/2025 7:30:26 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

99 EMPIRE BOULEVARD

BROOKLYN, NEW YORK 11225

PROPOSED 14 STORY MIX-USE DEVELOPMENT (RESIDENTIAL & COMMERCIAL)

BLDG D - DRAWING INDEX DOB			
DRAWING NO.	SHEET NO.	REVISION NO.	SHEET TITLE
1	T-001D	.00	TITLE SHEET
2	Z-001D	.00	ZONING ANALYSIS
3	Z-002D	.00	ZONING ANALYSIS
4	Z-003D	.00	ZONING MAPS
5	Z-004D	.00	ZONING DIAGRAMS
6	Z-005D	.00	ZONING DIAGRAMS
7	Z-010D	.00	GROSS FLOOR AREA DIAGRAMS
8	Z-011D	.00	GROSS FLOOR AREA DIAGRAMS
9	Z-020D	.00	FLOOR AREA DEDUCTIONS
10	Z-021D	.00	FLOOR AREA DEDUCTIONS
12	G-001D	.00	PROJECT SUMMARY & BUILDING CODE COMPLIANCE
13	G-004D	.00	MEANS OF EGRESS NOTES
13	G-002D	.00	GENERAL NOTES
14	G-005D	.00	ACCESSIBILITY NOTES
15	V-001D	.00	ARCHITECTURAL SURVEY
16	A-001D	.00	SUBCELLAR 1 & 2 LIFE SAFETY PLANS
17	A-002D	.00	CELLAR & 1ST FL. LIFE SAFETY PLANS
18	A-003D	.00	2ND - 10TH FLOOR LIFE SAFETY PLANS
19	A-004D	.00	11TH - 14TH FLOOR LIFE SAFETY PLANS
20	A-005D	.00	ROOF LIFE SAFETY PLANS
21	A-006D	.00	SITE PLAN

BLDG D - DRAWING INDEX DOB			
DRAWING NO.	SHEET NO.	REVISION NO.	SHEET TITLE
22	A-100D	.00	PROPOSED SUB-CELLAR 02 PLAN
23	A-101D	.00	PROPOSED SUB-CELLAR 01 PLAN
24	A-102D	.00	PROPOSED CELLAR PLAN
25	A-103D	.00	PROPOSED 1ST FLOOR PLAN
26	A-104D	.00	PROPOSED 2ND - 10TH FLOOR PLAN
27	A-105D	.00	PROPOSED 11TH - 14TH FLOOR PLAN
28	A-106D	.00	PROPOSED ROOF PLAN
29	A-200D	.00	EAST & WEST ELEVATION
30	A-201D	.00	NORTH & SOUTH ELEVATION
31	A-300D	.00	BUILDING SECTIONS
32	A-404D	.00	STAIRS DETAILS
33	A-500D	.00	WALL TYPES & DETAILS
34	A-510D	.00	SECTION DETAILS
35	A-701D	.00	FLOOR AND TRANSITION DETAILS
36	A-700D	.00	DOOR LEGEND & SCHEDULE
37	A-710D	.00	WINDOW LEGEND & SCHEDULE
38	A-711D	.00	CURTAIN WALL LEGEND & SCHEDULE
39	A-910D	.00	ENLARGED KITCHEN PLANS & ELEVATIONS
40	A-911D	.00	ENLARGED BATHROOM PLANS & ELEVATIONS

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DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
TITLE SHEET

T-001D.00

Scale:
Date: 12/1/2025 7:32:46 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

ZONING ANALYSIS			
ADDRESS:	67 SOUTH 6TH ST, BROOKLYN, NY 11249		
BLOCK:	2455		
TAX LOT:	27		
ZONING DISTRICT:	C4-4D / R-8A EQUIVALENT		
ZONING MAP:	16d		
COMMUNITY DISTRICT :	BROOKLYN COMMUNITY DISTRICT 9		
INCLUSIONARY HOUSING	MANDATORY AS PER ZR APPENDIX F		
LOT AREA:	38,119.0 SF		
TRANSIT APPROVALS REQUIREMENT	NO TRANSIT APPROVAL IS REQUIRED. THE SITE IS NOT LOCATED WITHIN 200' OF A TRANSIT AUTHORITY		
APPLICABLE ZR SECTION	ITEM	PERMITTED/REQUIRED	PROPOSED
ZR 12-10	DEFINITIONS		
ZR 12-10 FLOOR AREA (c)(15)	FLOOR AREA	FLOOR SPACE WITHIN A FULLY ELECTRIFIED BUILDING OR AN ULTRA LOW ENERGY BUILDING, OF AN AMOUNT EQUIVALENT TO FIVE PERCENT OF THE FLOOR AREA LOCATED WITHIN SUCH BUILDING, AND EXCLUSIVE OF ANY FLOOR SPACE OTHERWISE EXCLUDED FROM FLOOR AREA;	PROPOSED BUILDING IS COMPYING WITH THIS PROVISION. 5% OF FLOOR AREA DEDUCTED, SEE ZONING TABLE ON Z-001
ZR 32-00	APPLICABILITY AND DEFINITIONS		
ZR 32-10	USE ALLOWANCES	IN C4 DISTRICTS, USE GROUP II, IIIB, & VI IS PERMITTED	PROPOSED USES: II(RESIDENTIAL), VI (RETAIL)
ZR 32-30	GROUND FLOOR LEVEL USE AND TRANSPARENCY REQUIREMENTS	GROUND FLOOR LEVEL USES FOR TIER B FRONTAGES ON THE PORTION OF A GROUND FLOOR LEVEL FACING A TIER B STREET FRONTAGE, WITHIN THE MINIMUM QUALIFYING DEPTH, THE UNDERLYING USE REGULATIONS ARE MODIFIED AS FOLLOWS: DWELLING UNITS SHALL NOT BE PERMITTED; USES IN GROUP III SHALL NOT BE PERMITTED; NOT BE PERMITTED; USES LISTED UNDER USE GROUP IV SHALL BE LIMITED TO THOSE LISTED UNDER PUBLIC SERVICE BUILDINGS, AND RENEWABLE ENERGY AND GREEN INFRASTRUCTURE; GUEST ROOMS OR SUITES ASSOCIATED WITH TRANSIENT ACCOMMODATIONS LISTED UNDER USE GROUP V SHALL NOT BE PERMITTED; USES LISTED UNDER USE GROUP VII SHALL BE LIMITED IN SIZE TO 5,000 SQUARE FEET PER ESTABLISHMENT; THE MAXIMUM STREET WALL WIDTH OF ANCILLARY RESIDENTIAL USES OR LOBBIES ACCESSING USES NOT PERMITTED ON THE GROUND FLOOR LEVEL SHALL BE LIMITED TO 50 PERCENT OF THE GROUND FLOOR LEVEL STREET FRONTAGES, OR 50 FEET, WHICHEVER IS GREATER; OFF-STREET PARKING SPACES OR LOADING BERTHS, SHALL NOT BE PERMITTED, EXCEPT THAT: ENTRANCES AND EXITS TO PARKING AND LOADING FACILITIES LOCATED BEYOND THE MINIMUM QUALIFYING DEPTH SHALL BE PERMITTED, SUBJECT TO ANY APPLICABLE CURB CUT REGULATIONS OF THIS SECTION, INCLUSIVE, OR THIS RESOLUTION; FOR BUILDINGS ALONG A TIER B STREET FRONTAGE, AND NO FRONTAGE ALONG ANOTHER STREET WHERE A LOADING BERTH IS PERMITTED, LOADING BERTHS WITH A MAXIMUM STREET WALL WIDTH OF 50 FEET SHALL BE PERMITTED; AND FOR BUILDINGS WITH A STREET WALL WIDTH IN EXCESS OF 100 FEET AND WITH NO FRONTAGE ALONG ANOTHER STREET WHERE PARKING SPACES ARE PERMITTED WITHIN A MINIMUM QUALIFYING DEPTH, PARKING SPACES SHALL BE PERMITTED IN THE STREET WALL PORTION IN EXCESS OF 100 FEET, PROVIDED THAT: THE MAXIMUM STREET WALL WIDTH OF SUCH PARKING SPACES DOES NOT EXCEED 50 FEET; THE FRONTAGE ALLOCATED TO SUCH PARKING SPACES SHALL BE INCLUDED IN THE MAXIMUM PERCENTAGE PERMITTED FOR ANCILLARY RESIDENTIAL USES OR LOBBIES; AND SUCH PARKING SPACES SHALL BE SCREENED IN ACCORDANCE WITH THE PROVISIONS FOR TIER A STREET FRONTAGES SET FORTH IN PARAGRAPH (A) OF SECTION 32-312. PARKING SPACES ACCESSORY TO CERTIFIED TRANSIT STATIONS, AS DEFINED IN SECTION 66-11, SHALL BE PERMITTED WITHOUT RESTRICTION. TRANSPARENCY REQUIREMENTS ALONG THE TIER B STREET FRONTAGE OF A GROUND FLOOR LEVEL, STREET WALLS SHALL BE GLAZED WITH TRANSPARENT MATERIALS, WHICH MAY INCLUDE SHOW WINDOWS, TRANSOM WINDOWS, OR GLAZED PORTIONS OF DOORS. SUCH TRANSPARENT MATERIALS SHALL OCCUPY AT LEAST 50 PERCENT OF THE SURFACE AREA OF SUCH GROUND FLOOR LEVEL STREET WALL BETWEEN A HEIGHT OF TWO FEET AND 12 FEET, OR THE HEIGHT OF THE GROUND FLOOR CEILING, WHICHEVER IS HIGHER, AS MEASURED FROM THE ADJOINING SIDEWALK. TRANSPARENT MATERIALS PROVIDED TO SATISFY SUCH 50 PERCENT REQUIREMENT SHALL NOT BEGIN HIGHER THAN 2 FEET, 6 INCHES, ABOVE THE LEVEL OF THE ADJOINING SIDEWALK, WITH THE EXCEPTION OF TRANSOM WINDOWS, OR PORTIONS OF WINDOWS SEPARATED BY MULLIONS OR OTHER STRUCTURAL DIVIDERS, AND SHALL HAVE A MINIMUM WIDTH OF TWO FEET. HOWEVER, SUCH TRANSPARENCY REQUIREMENTS SHALL NOT APPLY TO PORTIONS OF THE GROUND FLOOR LEVEL OCCUPIED BY ENTRANCES OR EXITS TO PARKING OR LOADING FACILITIES, TO DOORS ACCESSING EMERGENCY EGRESS STAIRWELLS AND PASSAGEWAYS, OR TO COMMUNITY FACILITY BUILDINGS.	BUILDING COMPLIES WITH THIS SECTION: NO DWELLINGS PROPOSED WITHIN 30'-0" ON THE GROUND FLOOR. MAX LOBBY WIDTH IS BELOW 50% OF STREET FRONTAGE SEE A-101 GROUND LEVEL PROVIDED WITH GLAZING OVER 50% SEE A-101
ZR 35-00	APPLICABILITY AND DEFINITIONS		
ZR 35-01	APPLICABILITY OF THIS CHAPTER	THE BULK REGULATIONS OF THIS CHAPTER APPLY TO ANY MIXED BUILDING LOCATED ON ANY ZONING LOT OR PORTION OF A ZONING LOT IN ANY COMMERCIAL DISTRICT IN WHICH SUCH BUILDING IS PERMITTED. THE BULK REGULATIONS OF THIS CHAPTER SHALL ALSO APPLY IN ANY COMMERCIAL DISTRICT WHERE THERE ARE MULTIPLE BUILDINGS ON A SINGLE ZONING LOT AND SUCH ZONING LOT CONTAINS A RESIDENTIAL USE AND EITHER A COMMERCIAL USE OR A COMMUNITY FACILITY USE. IN ADDITION, THE BULK REGULATIONS OF THIS CHAPTER, OR OF SPECIFIED SECTIONS THEREOF, ALSO APPLY IN OTHER PROVISIONS OF THIS RESOLUTION WHERE THEY ARE INCORPORATED BY CROSS-REFERENCE.	
ZR 35-10	GENERAL PROVISIONS	EXCEPT AS OTHERWISE PROVIDED IN THIS CHAPTER, THE PORTIONS OF A BUILDING USED FOR RESIDENTIAL USE ARE SUBJECT TO THE BULK REGULATIONS SET FORTH IN ARTICLE II, CHAPTER 3, AND THE PORTIONS OF A BUILDING USED FOR COMMERCIAL OR COMMUNITY FACILITY USE ARE SUBJECT TO THE BULK REGULATIONS SET FORTH IN ARTICLE III, CHAPTER 3. SPECIAL PROVISIONS APPLYING TO MIXED BUILDINGS OR ZONING LOTS WITH MULTIPLE BUILDINGS SUBJECT TO THE PROVISIONS OF THIS CHAPTER ARE SET FORTH IN SECTIONS 35-20 (APPLICABILITY OF RESIDENCE DISTRICT BULK REGULATIONS), INCLUSIVE, 35-30 (APPLICABILITY OF FLOOR AREA AND OPEN SPACE REGULATIONS), INCLUSIVE, 35-40 (APPLICABILITY OF DENSITY REGULATIONS), INCLUSIVE, 35-50 (MODIFICATION OF YARD REGULATIONS) AND 35-60 (MODIFICATION OF HEIGHT AND SETBACK REGULATIONS), INCLUSIVE.	
ZR 35-20	APPLICABILITY OF RESIDENCE DISTRICT BULK REGULATIONS		
ZR 35-21	GENERAL PROVISIONS	IN THE DISTRICTS INDICATED, THE BULK REGULATIONS SET FORTH IN ARTICLE II, CHAPTER 3 SHALL APPLY TO ALL RESIDENTIAL PORTIONS OF BUILDINGS IN ACCORDANCE WITH THE PROVISIONS AND MODIFICATIONS SET FORTH IN THE REMAINING SECTIONS OF THIS CHAPTER. THE PURPOSE OF THESE MODIFICATIONS IS TO MAKE THE REGULATIONS SET FORTH IN ARTICLE II, CHAPTER 3, APPLICABLE TO COMMERCIAL DISTRICTS.	
ZR 35-23 ZR 34-112	GENERAL PROVISIONS	IN C4-4D DISTRICTS , THE APPLICABLE BULK REGULATIONS ARE THE BULK REGULATIONS FOR THE RESIDENTIAL EQUIVALENT IS R8A	
ZR 35-30	APPLICABILITY OF FLOOR AREA AND OPEN SPACE REGULATIONS		
ZR 35-31	MAXIMUM FLOOR AREA RATIO	THE MAXIMUM FLOOR AREA RATIO PERMITTED FOR A COMMERCIAL OR COMMUNITY FACILITY USE SHALL BE AS SET FORTH IN ARTICLE III, CHAPTER 3, AND THE MAXIMUM FLOOR AREA RATIO PERMITTED FOR A RESIDENTIAL USE SHALL BE AS SET FORTH IN ARTICLE II, CHAPTER 3, EXCEPT AS SET FORTH IN SECTION 35-30. INCLUSIVE. THE TOTAL OF ALL SUCH FLOOR AREA RATIOS SHALL NOT EXCEED THE GREATEST FLOOR AREA RATIO PERMITTED FOR ANY SUCH USE ON THE ZONING LOT, EXCEPT WHERE EXPLICITLY STATED OTHERWISE. SPECIAL RULES FOR CERTAIN AREAS ARE SET FORTH IN SECTION 35-36 (SPECIAL FLOOR AREA RATIO AND RELATED BULK PROVISIONS FOR CERTAIN AREAS).	SEE ZR 23-153 AND ZR 33-121 BELOW FOR RESIDENTIAL AND COMMERCIAL FLOOR AREA REGULATIONS
ZR 33-123	FLOOR AREA RATIO	IN C4-4D DISTRICT THE COMMERCIAL & COMMUNITY FACILITY FLOOR AREA RATIO IS: 6.5 LOT AREA: 38,119 SF 6.5 X 38,119 = 247,773.50 SF	PROPOSED COMMERCIAL ZFA: 0 SF PROPOSED COMMUNITY FACILITY ZFA: 0 SF PROPOSED TOTAL COMMERCIAL/COMMUNITY ZFA: 0 SF OK
ZR 23-22	FLOOR AREA RATIO	IN R8A EQUIVALENT THE MAX RESIDENTIAL FLOOR AREA RATIO FOR QUALIFYING AFFORDABLE HOUSING IS: 7.2 LOT AREA: 38,119 SF 7.2 X 38,119 = 274,456.80 SF	PROPOSED RESIDENTIAL ZFA: 0 SF OK
ZR 35-40 ZR 23-52	MAXIMUM NUMBER OF DWELLING UNITS	MAX RESIDENTIAL FLOOR AREA: 274,456.80 / 680 = 403.61 = MAX 403 DWELLING UNITS	PROPOSED DWELLING UITS IN BUILDING A: 99 PROPOSED DWELLING UITS IN BUILDING B: 99 PROPOSED DWELLING UITS IN BUILDING C: 99 PROPOSED DWELLING UITS IN BUILDING D: 99 PROPOSED TOTAL DWELLING UNITS : 396
ZR 35-50	MODIFICATION OF YARD REGULATIONS		
ZR 35-51	MODIFICATION OF FRONT YARD REQUIREMENTS	IN C4 DISTRICT, NO FRONT YARD SHALL BE REQUIRED.	NO FRONT YARD PROVIDED
ZR 35-52	MODIFICATION OF SIDE YARD REQUIREMENTS	IN C4 DISTRICTS, NO SIDE YARD SHALL BE REQUIRED. HOWEVER, IF ANY OPEN AREA EXTENDING ALONG A SIDE LOT LINE IS PROVIDED AT ANY LEVEL, IT SHALL HAVE A MINIMUM WIDTH OF FIVE FEET	NO SIDE YARD PROVIDED
35-53	MODIFICATION OF REAR YARD REQUIREMENTS	IN C4 DISTRICTS, FOR A RESIDENTIAL PORTION OF A MIXED BUILDING, THE REQUIRED RESIDENTIAL REAR YARD SHALL BE PROVIDED AT THE FLOOR LEVEL OF THE LOWEST STORY USED FOR DWELLING UNITS OR ROOMING UNITS, WHERE ANY WINDOW OF SUCH DWELLING UNITS OR ROOMING UNITS FACES ONTO SUCH REAR YARD. IF THE LEVEL OF SUCH YARD IS AT OR HIGHER THAN THE FIRST STORY, DECKS, PARAPET WALLS, ROOF THICKNESS, SOLAR ENERGY SYSTEMS UP TO FOUR FEET HIGH, VEGETATED ROOFS, AND WEIRS, SHALL BE PERMITTED, PURSUANT TO SECTION 23-41 (PERMITTED OBSTRUCTIONS), INCLUSIVE.	SEE 23-343 (a) (3) FOR THE EXCEPTION
23-343 (a) (3)	REAR YARD EQUIVALENT REQUIREMENTS	NO REAR YARD EQUIVALENT REGULATIONS SHALL APPLY TO ANY ZONING LOT THAT INCLUDES A THROUGH LOT PORTION THAT IS CONTIGUOUS ON ONE SIDE TO TWO CORNER LOT PORTIONS AND SUCH ZONING LOT OCCUPIES THE ENTIRE BLOCK FRONTAGE OF A STREET	PROPOSED ZONING LOT HAS A THROUGH LOT PORTION THAT IS CONTIGUOUS ON ONE SIDE TO TWO CORNER LOT PORTIONS AND SUCH ZONING LOT OCCUPIES THE ENTIRE BLOCK FRONTAGE OF A STREET THEREFORE A REAR YARD EQUIVALENT IS NOT REQUIRED
ZR 35-60	MODIFICATION OF HEIGHT AND SETBACK REGULATIONS		
ZR 35-63	HEIGHT AND SETBACK REQUIREMENTS IN COMMERCIAL DISTRICTS WITH R6 THROUGH R12 EQUIVALENCY	C1 C2 C4 C5 C6 IN COMMERCIAL DISTRICTS MAPPED WITHIN, OR WITH A RESIDENTIAL EQUIVALENT OF R6 THROUGH R12 DISTRICTS, THE STREET WALL LOCATION OF A BUILDING SHALL BE AS SET FORTH IN SECTION 35-631, AND THE HEIGHT AND SETBACK PROVISIONS SHALL BE AS SET FORTH IN SECTION 35-632. ADDITIONAL HEIGHT AND SETBACK PROVISIONS ARE SET FORTH IN SECTION 35-633 AND SECTION 35-64. INCLUSIVE. THE HEIGHT OF ALL BUILDINGS OR OTHER STRUCTURES SHALL BE MEASURED FROM THE BASE PLANE. FOR THE PURPOSES OF THIS SECTION, WHERE BASE PLANES OF DIFFERENT ELEVATIONS APPLY TO DIFFERENT PORTIONS OF A BUILDING OR OTHER STRUCTURE, EACH SUCH PORTION OF THE BUILDING MAY BE CONSIDERED TO BE A SEPARATE BUILDING.	
ZR 35-631	STREET WALL LOCATION	C1 C2 C4 C5 C6 IN THE DISTRICTS INDICATED, THE APPLICABLE STREET WALL LOCATION PROVISIONS OF THIS SECTION SHALL APPLY. SUCH PROVISIONS SHALL APPLY TO THE PORTION OF A STREET WALL LOCATED BELOW THE MAXIMUM BASE HEIGHT AND BEFORE THE REQUIRED SETBACK AS SET FORTH IN SECTION 23-432 (HEIGHT AND SETBACK REQUIREMENTS). (B) PERCENTAGE-BASED RULES AT LEAST 70 PERCENT OF THE AGGREGATE WIDTH OF STREET WALLS SHALL BE LOCATED WITHIN EIGHT FEET OF THE STREET LINE AND SHALL EXTEND TO AT LEAST THE MINIMUM BASE HEIGHT SPECIFIED IN SECTION 23-432, OR THE HEIGHT OF THE BUILDING, WHICHEVER IS LESS. UP TO 30 PERCENT OF THE AGGREGATE WIDTH OF STREET WALLS MAY BE RECESSED BEYOND EIGHT FEET OF THE STREET LINE, PROVIDED THAT ANY SUCH RECESSES DEEPER THAN 10 FEET ALONG A WIDE STREET OR 15 FEET ALONG A NARROW STREET ARE LOCATED WITHIN AN OUTER COURT.	100% OF PROPOSED STREET WALL IS LOCATED WITHIN 8' OF THE PROPERTY LINE
ZR 35-632 ZR 23-432	HEIGHT AND SETBACK REQUIREMENTS	IN R8A EQUIVALENT DISTRICT FOR QUALIFYING AFFORDABLE HOUSING MIN. BASE HEIGHT: 60' MAX. BASE HEIGHT: 105' MAX. BUILDING HEIGHT: 145'	PROPOSED BASE HEIGHT: 105' PROPOSED BUILDING HEIGHT: 145'
ZR 36-20	REQUIRED ACCESSORY OFF-STREET PARKING SPACES FOR COMMERCIAL AND COMMUNITY FACILITY USE		
ZR 36-26	WAIVER FOR MIXED-USE DEVELOPMENTS	IN ALL DISTRICTS, AS INDICATED, THE NON-RESIDENTIAL PARKING REQUIREMENTS OF SECTION 36-20 SHALL BE WAIVED FOR USES LOCATED WITHIN BUILDINGS CONTAINING RESIDENCES ON ANY ZONING LOT (a)WITHIN THE SPECIAL MIXED USE PARKING AREA ; ("(SPECIAL MIXED USE PARKING AREAS" SHALL REFER TO SPECIAL GEOGRAPHIES WHERE UNIQUE PARKING REQUIREMENTS APPLY TO MIXED USE #BUILDINGS# .#SPECIAL MIXED USE PARKING AREAS# SHALL INCLUDE AREAS WITHIN THE BOUNDARIES SHOWN IN APPENDIX I OF THIS RESOLUTION.	THE PROPERTY FALLS UNDER APPENDIX I THEREFORE, THE PARKING IS WAIVED FOR THE COMMERCIAL
ZR 25-222	RESIDETIAL PARKING REQUIREMENTS	**IN R8A DISTRICTS, WITHIN THE OUTER TRANSIT ZONE , FOR DWELLING UNITS CREATED AS PART OF A DEVELOPMENT OR ENLARGEMENT AFTER DECEMBER 5, 2024, THE NUMBER OF REQUIRED ACCESSORY OFF-STREET PARKING SPACES SHALL BE DETERMINED BY MULTIPLYING THE NUMBER OF DWELLING UNITS BY THE APPLICABLE PARKING REQUIREMENT SET FORTH FOR THE APPLICABLE DISTRICT IN COLUMNS A OR B OF THE TABLE. HOWEVER, WHERE THE CALCULATION RESULTS IN A NUMBER OF PARKING SPACES LESS THAN OR EQUAL TO THE NUMBER IN COLUMN C, NO PARKING SPACES SHALL BE REQUIRED FOR RESIDENCES ON THE ZONING LOT.** **AS PER COLUMN A: 12% OF THE MARKET RATE UNITS REQUIRE PARKING** **BUILDING A: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **BUILDING B: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **BUILDING C: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **BUILDING D: (MARKET RATE UNITS): 79 x 12% = 9.48 ~ 9 PARKING SPACES REQUIRED** **TOTAL PARKING REQUIRED = 36 SPACES REQUIRED** **AS PER COLUMN B: 0% OF THE AFFORDABLE UNITS REQUIRE PARKING**	TOTAL NUMBER OF PARKING PROVIDED = 94
ZR 36-70	BICYCLE PARKING		
ZR 36-711	REQUIRED ENCLOSED BICYCLE PARKING SPACES FOR RESIDENTIAL USE	IN R8A DISTRICTS, 1 PARKING SPACE PER 2 NEW DWELLING UNITS REQUIRED BUILDING A: 99/2 = 50 PARKING SPACES REQUIRED BUILDING B: 99/2 = 50 PARKING SPACES REQUIRED BUILDING C: 99/2 = 50 PARKING SPACES REQUIRED BUILDING D: 99/2 = 50 PARKING SPACES REQUIRED	BUILDING A: 50 PARKING SPACES PROVIDED BUILDING B: 50 PARKING SPACES PROVIDED BUILDING C: 50 PARKING SPACES PROVIDED BUILDING D: 50 PARKING SPACES PROVIDED
ZR 36-711 (d)	REQUIRED ENCLOSED BICYCLE PARKING SPACES FOR RCOMMERCIAL USE	FOR GENERAL RETAIL SERVICES, 1 PARKING SPACE PER 10,000 SF REQUIRED. WAIVED IF UNER 5 SPACES REQUIRED BUILDING A: 4999.69 / 10000= .12 ~ 1 BICYCLE PARKING SPACES REQUIRED	PROPOSED COMMERCIAL/COMMUNITY FACILITY BICYCLE PARKING SPACES: 0
ZR 23-00	RESIDENTIAL BULK REGULATIONS		
ZR 23-12	MINIMUM LOT AREA	MIN. LOT AREA: 1700 SF	PROPOSED LOT AREA: 38,119.0 SF
ZR 23-12	MINIMUM LOT WIDTH	MIN. LOT WIDTH: 18'-0"	PROPOSED LOT WIDTH: 200'-0"
ZR-23-362 (a)	LOT COVERAGE	THE MAXIMUM RESIDENTIAL LOT COVERAGE FOR INTERIOR LOTS OR THROUGH LOTS SHALL BE 80 PERCENT AND THE MAXIMUM RESIDENTIAL LOT COVERAGE FOR CORNER LOTS SHALL BE 100 PERCENT.	PROPOSED LOT COVERAGE ON CORNER LOT PORTION IS: 96.84% PROPOSED LOT COVERAGE ON THRUGH LOT PORTION IS: 80%
ZR 23-60	ADDITIONAL DEISGN ELEMENTS		
ZR 23-61 ZR 26-41	STREET TREES AND PLANTING	IN DISTRICTS R1 TO R12, THE FOLLOWING SHALL PROVIDE STREET TREES IN ACCORDANCE WITH SECTION 26-14 (STREET TREE PLANTING: IN ACCORDANCE WITH APPLICABILITY REQUIREMENTS OF UNDERLYING DISTRICT REGULATIONS, ONE STREET TREE, PRE-EXISTING OR NEWLY PLANTED, SHALL BE PROVIDED FOR EVERY 25 FEET OF STREET FRONTAGE OF THE ZONING LOT. FRACTIONS EQUAL TO OR GREATER THAN ONE-HALF RESULTING FROM THIS CALCULATION SHALL BE CONSIDERED TO BE ONE TREE.	TOTAL STREET FRONTAGE : 602.7' 24 TREES REQUIRED EXISTING TREES TO BE PROTECTED ON SITE: 5 PROPOSED TREE TO BE PAID INTO ON-SITE TREE FUNDS = 16 PROPOSED TREE TO BE PAID INTO OFF-SITE TREE FUNDS = 3
23-613	FRONT YARD PLANTING REQUIREMENTS	IN DISTRICTS R1 TO R12, THE AREA OF THE ZONING LOT BETWEEN THE STREET LINE AND ALL STREET WALLS OF THE BUILDING AND THEIR PROLONGATIONS SHALL BE PLANTED AT GROUND LEVEL, OR IN RAISED PLANTING BEDS THAT ARE PERMANENTLY AFFIXED TO THE GROUND, EXCEPT THAT SUCH PLANTINGS SHALL NOT BE REQUIRED AT THE ENTRANCES TO AND EXITS FROM THE BUILDING, WITHIN DRIVEWAYS ACCESSING OFF-STREET PARKING SPACES LOCATED WITHIN, TO THE SIDE, OR REAR OF SUCH BUILDING, IN ANY AREA WHERE THERE IS A PERMITTED OBSTRUCTION	PROVIDED AREA BETWEEN THE STREET LINE AND BUILDING WALL IS PROVIDED WITH PLANTING
ZR 23-62	BALCONIES	IN DISTRICTS R1 TO R12, BALCONIES MAY PROJECT INTO OR OVER ANY OPEN AREAS NOT OCCUPIED BY BUILDINGS AT THAT PARTICULAR LEVEL, PROVIDED THAT: (a) WITHIN ANY YARDS, COURTS, OR OTHER REQUIRED OPEN AREAS, SUCH BALCONY SHALL: (1) NOT PROJECT BY MORE THAN ONE THIRD OF THE DEPTH OF SUCH AREAS SPECIFIED ABOVE, OR A DISTANCE GREATER THAN SEVEN FEET, WHICHEVER IS LESS, AS MEASURED FROM THE PLANE SURFACE OF THE BUILDING WALL FROM WHICH IT PROJECTS; (2) NOT COVER MORE THAN 10 PERCENT OF ANY OPEN AREA REQUIRED PURSUANT TO SECTION 23-30, INCLUSIVE, OR ANY OUTDOOR RECREATION SPACE PROVIDED PURSUANT TO SECTION 23-63; AND (3) HAVE AN AGGREGATE WIDTH, AT THE LEVEL OF ANY STORY, NOT EXCEEDING 50 PERCENT OF THE WIDTH AT THAT LEVEL OF THE PLANE SURFACE OF THE BUILDING WALL FROM WHICH IT PROJECTS; AND (b) WITHIN ANY OPEN AREAS, WHETHER REQUIRED OR NOT, SUCH BALCONY SHALL: (1) BE UNENCLOSED EXCEPT FOR BUILDING WALLS AND PARAPETS, RAILINGS, OR SAFETY GUARDS, WHETHER APPLIED SINGLY, OR IN COMBINATION, PROVIDED THAT: (i) PARAPETS SHALL NOT EXCEED FOUR FEET IN HEIGHT; (ii) RAILINGS SHALL NOT EXCEED 4 FEET, 6 INCHES IN HEIGHT AND SHALL BE AT LEAST 50 PERCENT OPEN FOR THE PORTION THAT EXCEEDS FOUR FEET IN HEIGHT; AND (iii) SAFETY GUARDS SHALL NOT EXCEED 10 FEET IN HEIGHT AND SHALL BE AT LEAST 50 PERCENT TRANSPARENT MATERIALS FOR THE PORTION THAT EXCEEDS FOUR FEET IN HEIGHT. IN ADDITION, WHERE SUCH BALCONY HAS A ROOFED PORTION ABOVE IT, THERE SHALL BE AN OPENING THAT IS NOT LESS THAN 40 PERCENT OF THE HEIGHT BETWEEN THE BOTTOM OF THE ROOF AND THE FINISHED FLOOR LEVEL OF SUCH BALCONY. HOWEVER, SUCH BALCONIES MAY BE RECESSED INTO A BUILDING WALL UP TO A MAXIMUM DEPTH OF SIX FEET PROVIDED THAT AT LEAST 33 PERCENT OF THE PERIMETER OF SUCH BALCONY IS UNENCLOSED EXCEPT FOR A PARAPET, RAILING, OR SAFETY GUARD; AND (2) BE LOCATED AT LEAST 13 FEET ABOVE CURB LEVEL, EXCEPT THAT FOR BUILDINGS CONTAINING RESIDENCES NOT MORE THAN 35 FEET IN HEIGHT, SUCH BALCONY MAY BE LOCATED AT OR HIGHER THAN THE FLOOR LEVEL OF THE SECOND STORY PROVIDED THAT SUCH BALCONY IS LOCATED NOT LOWER THAN SEVEN FEET ABOVE CURB LEVEL OR SEVEN FEET ABOVE NATURAL GRADE, WHICHEVER IS HIGHER.	PROPOSED BALCONIES ARE IN COMPLIANCE OC SECTION 23-62 AND ARE NOT GREATER THAN 50% OF THE TOTAL WALL WIDTH. SEE SHEET A-101

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING ANALYSIS

Z-001D.00

Scale: 12" = 1'-0"
Date: 12/1/2025 7:32:47 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

ZONING FLOOR AREA

NAME	USE GROUP	GFA	DEDUCTIONS	TOTAL	5% ULTRA LOW EN	ZFA	FAR
BUILDING A							
COMMERCIAL							
00A_CELLAR	VI	7692.14 SF	7692.14 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01A_1ST FL. RETAIL	VI	4999.69 SF	4536.25 SF	463.44 SF	23.17 SF	440.27 SF	0.01
		12691.83 SF	12228.39 SF	463.44 SF	23.17 SF	440.27 SF	0.01
RESIDENTIAL							
00A_SUBCELLAR 2	II	7692.14 SF	7692.14 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00A_SUBCELLAR 1	II	7692.14 SF	7692.14 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01A_ 1ST FL.	II	3259.06 SF	579.85 SF	2679.20 SF	133.96 SF	2545.24 SF	0.07
02A_2ND FL.	II	6543.76 SF	3760.04 SF	2783.72 SF	139.19 SF	2644.53 SF	0.07
03A_3RD FL.	II	6543.76 SF	1102.12 SF	5441.64 SF	272.08 SF	5169.56 SF	0.14
04A_4TH FL.	II	5857.40 SF	1102.12 SF	4755.28 SF	237.76 SF	4517.52 SF	0.12
05A_5TH FL.	II	5857.40 SF	1102.12 SF	4755.28 SF	237.76 SF	4517.52 SF	0.12
06A_6TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
07A_7TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
08A_8TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
09A_9TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
10A_10TH FL.	II	5854.42 SF	1102.12 SF	4752.30 SF	237.62 SF	4514.68 SF	0.12
11A_11TH FL.	II	5489.70 SF	1055.47 SF	4434.23 SF	221.71 SF	4212.52 SF	0.11
12A_12TH FL.	II	5489.70 SF	1055.47 SF	4434.23 SF	221.71 SF	4212.52 SF	0.11
13A_13TH FL.	II	5489.70 SF	1891.02 SF	3598.68 SF	179.93 SF	3418.75 SF	0.09
14A_14TH FL.	II	5489.70 SF	1055.47 SF	4434.23 SF	221.71 SF	4212.52 SF	0.11
15A_ROOF	II	569.87 SF	569.87 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		95246.40 SF	34168.41 SF	61077.99 SF	3053.91 SF	58024.08 SF	1.52
BUILDING B							
COMMERCIAL							
00B_CELLAR	VI	11464.06 SF	11464.06 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01B_1ST FL. RETAIL	VI	10084.56 SF	4536.25 SF	5548.32 SF	277.42 SF	5270.90 SF	0.14
		21548.62 SF	16000.31 SF	5548.32 SF	277.42 SF	5270.90 SF	0.14
RESIDENTIAL							
00B_SUBCELLAR 2	II	11464.06 SF	11464.06 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00B_SUBCELLAR 1	II	11464.06 SF	11464.06 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01B_1ST FL.	II	1268.91 SF	451.78 SF	817.14 SF	40.86 SF	776.28 SF	0.02
02B_2ND FL.	II	6494.93 SF	822.24 SF	5672.69 SF	283.63 SF	5389.06 SF	0.14
03B_3RD FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
04B_4TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
05B_5TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
06B_6TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
07B_7TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
08B_8TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
09B_9TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
10B_10TH FL.	II	6488.46 SF	837.98 SF	5650.48 SF	282.52 SF	5367.96 SF	0.14
11B_11TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
12B_12TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
13B_13TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
14B_14TH FL.	II	5419.47 SF	778.55 SF	4640.92 SF	232.05 SF	4408.87 SF	0.12
15B_ROOF	II	692.91 SF	692.91 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		104970.45 SF	34713.13 SF	70257.35 SF	3512.85 SF	66744.50 SF	1.75
BUILDING C							
COMMERCIAL							
00C_CELLAR	VI	8957.70 SF	8957.70 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01C_1ST FL. RETAIL	VI	6555.24 SF	4536.25 SF	2019.00 SF	100.95 SF	1918.05 SF	0.05
		15512.95 SF	13493.95 SF	2019.00 SF	100.95 SF	1918.05 SF	0.05
RESIDENTIAL							
00C_SUBCELLAR 2	II	8957.70 SF	8957.70 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00C_SUBCELLAR 1	II	8957.70 SF	8957.70 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01C_1ST FL.	II	1779.77 SF	551.00 SF	1228.77 SF	61.44 SF	1167.33 SF	0.03
02C_2ND FL.	II	6387.91 SF	673.97 SF	5713.93 SF	285.70 SF	5428.23 SF	0.14
03C_3RD FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
04C_4TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
05C_5TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
06C_6TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
07C_7TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
08C_8TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
09C_9TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
10C_10TH FL.	II	6755.47 SF	841.46 SF	5914.02 SF	295.70 SF	5618.32 SF	0.15
11C_11TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
12C_12TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
13C_13TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
14C_14TH FL.	II	5821.18 SF	731.71 SF	5089.47 SF	254.47 SF	4835.00 SF	0.13
15C_ROOF	II	985.53 SF	985.53 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		104397.11 SF	29784.42 SF	74612.74 SF	3730.62 SF	70882.12 SF	1.86
BUILDING D							
COMMERCIAL							
00D_CELLAR	VI	7848.13 SF	7848.13 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01D_1ST FL. RETAIL	VI	6063.41 SF	4536.25 SF	1527.16 SF	76.36 SF	1450.80 SF	0.04
		13911.54 SF	12384.38 SF	1527.16 SF	76.36 SF	1450.80 SF	0.04
RESIDENTIAL							
00D_SUBCELLAR 2	II	7848.13 SF	7848.13 SF	0.00 SF	0.00 SF	0.00 SF	0.00
00D_SUBCELLAR 1	II	7848.13 SF	7848.13 SF	0.00 SF	0.00 SF	0.00 SF	0.00
01D_1ST FL.	II	1652.78 SF	444.95 SF	1207.84 SF	60.39 SF	1147.45 SF	0.03
02D_2ND FL.	II	6487.73 SF	851.42 SF	5636.31 SF	281.82 SF	5354.49 SF	0.14
03D_3RD FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
04D_4TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
05D_5TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
06D_6TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
07D_7TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
08D_8TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
09D_9TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
10D_10TH FL.	II	6482.23 SF	855.79 SF	5626.44 SF	281.32 SF	5345.12 SF	0.14
11D_11TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
12D_12TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
13D_13TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
14D_14TH FL.	II	6041.76 SF	835.55 SF	5206.20 SF	260.31 SF	4945.89 SF	0.13
15D_ROOF	II	734.87 SF	734.87 SF	0.00 SF	0.00 SF	0.00 SF	0.00
		100596.51 SF	27916.04 SF	72680.47 SF	3634.01 SF	69046.46 SF	1.81
GRAND TOTAL		468875.42 SF	180689.03 SF	288186.47 SF	14409.29 SF	273777.18 SF	7.18

BUILDING D_ TOTAL DEDUCTION BY CODE CATEGORY	
DEDUCTION	TOTAL SF
	0.00 SF
AMENITY	236.24 SF
BULKHEAD	734.87 SF
CELLAR	23544.40 SF
CORRIDOR DEDUCTION	9051.50 SF
MECHANICAL ROOM	124.59 SF
REFUSE ROOM	336.05 SF
SHAFT	2118.75 SF
STAIRS	453.33 SF
Grand total	36599.73 SF

BUILDING D_ DEDUCTION PER ZR 12-10	
DEDUCTION	TOTAL SF
BULKHEAD	734.87 SF
CELLAR	23544.40 SF
MECHANICAL ROOM	124.59 SF
SHAFT	2118.75 SF
STAIRS	453.33 SF
Grand total	26975.94 SF

BUILDING D _ DEDUCTION PER ZR 23-23	
DEDUCTION	TOTAL SF
AMENITY	236.24 SF
CORRIDOR DEDUCTION	9051.50 SF
REFUSE ROOM	336.05 SF
Grand total	9623.79 SF

BUILDING D _ ZFA AFTER ZR 12-10 DEDUCTIONS	
RESIDENTIAL GFA	108,444.64 SF
ZR 12-10 DEDUCTONS	26,975.94 SF
108,444.64 - 26,975.94	81,468.7 SF

LEVEL	A	B	C	D	E	F	G	H
1								
2	201	202	203		205	206	207	208
	2-BR	2-BR	2-BR		1-BR	1-BR	2-BR	STUDIO
	740 SF	740 SF	715 SF		483 SF	484 SF	735 SF	437 SF
3	301	302	303	304	305	306	307	308
	2-BR	2-BR	2-BR	1-BR	1-BR	1-BR	2-BR	STUDIO
	740 SF	740 SF	715 SF	578 SF	483 SF	484 SF	735 SF	435 SF
4	401	402	403	404	405	406	407	435
	2-BR	2-BR	2-BR	1-BR	1-BR	1-BR	2-BR	STUDIO
	740 SF	740 SF	715 SF	578 SF	483 SF	484 SF	735 SF	435 SF
5	501	502	503	504	505	506	507	508
	2-BR	2-BR	2-BR	1-BR	1-BR	1-BR	2-BR	STUDIO
	740 SF	740 SF	715 SF	578 SF	483 SF	484 SF	735 SF	435 SF
6	601	602	603	604	605	606	607	608
	2-BR	2-BR	2-BR	1-BR	1-BR	1-BR	2-BR	STUDIO
	740 SF	740 SF	715 SF	578 SF	483 SF	484 SF	735 SF	435 SF
7	701	702	703	704	705	706	707	708
	2-BR	2-BR	2-BR	1-BR	1-BR	1-BR	2-BR	STUDIO
	740 SF	740 SF	715 SF	578 SF	483 SF	484 SF	735 SF	435 SF
8	801	802	803	804	805	806	807	808
	2-BR	2-BR	2-BR	1-BR	1-BR	1-BR	2-BR	STUDIO
	740 SF	740 SF	715 SF	578 SF	483 SF	484 SF	735 SF	435 SF
9	901	902	903	904	905	906	907	908
	2-BR	2-BR	2-BR	1-BR	1-BR	1-BR	2-BR	STUDIO
	740 SF	740 SF	715 SF	578 SF	483 SF	484 SF	735 SF	435 SF
10	1001	1002	1003	1004	1005	1006	1007	1008
	2-BR	2-BR	2-BR	1-BR	1-BR	1-BR	2-BR	STUDIO
	740 SF	740 SF	715 SF	578 SF	483 SF	484 SF	735 SF	435 SF
11	1101	1102	1103	1104	1105	1106		1108
	2-BR	2-BR	2-BR	2-BR	1-BR	2-BR		STUDIO
	732 SF	720 SF	668 SF	699 SF	484 SF	735 SF		435 SF
12	1201	1202	1203	1204	1205	1206		1208
	2-BR	2-BR	2-BR	2-BR	1-BR	2-BR		STUDIO
	731 SF	709 SF	668 SF	699 SF	484 SF	735 SF		435 SF
13	1301	1302	1303	1304	1305	1306		1308
	2-BR	2-BR	2-BR	2-BR	1-BR	2-BR		STUDIO
	731 SF	709 SF	668 SF	699 SF	484 SF	735 SF		435 SF
14	1401	1402	1403	1404	1405	1406		1408
	2-BR	2-BR	2-BR	2-BR	1-BR	2-BR		STUDIO
	731 SF	709 SF	668 SF	699 SF	484 SF	735 SF		435 SF

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Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

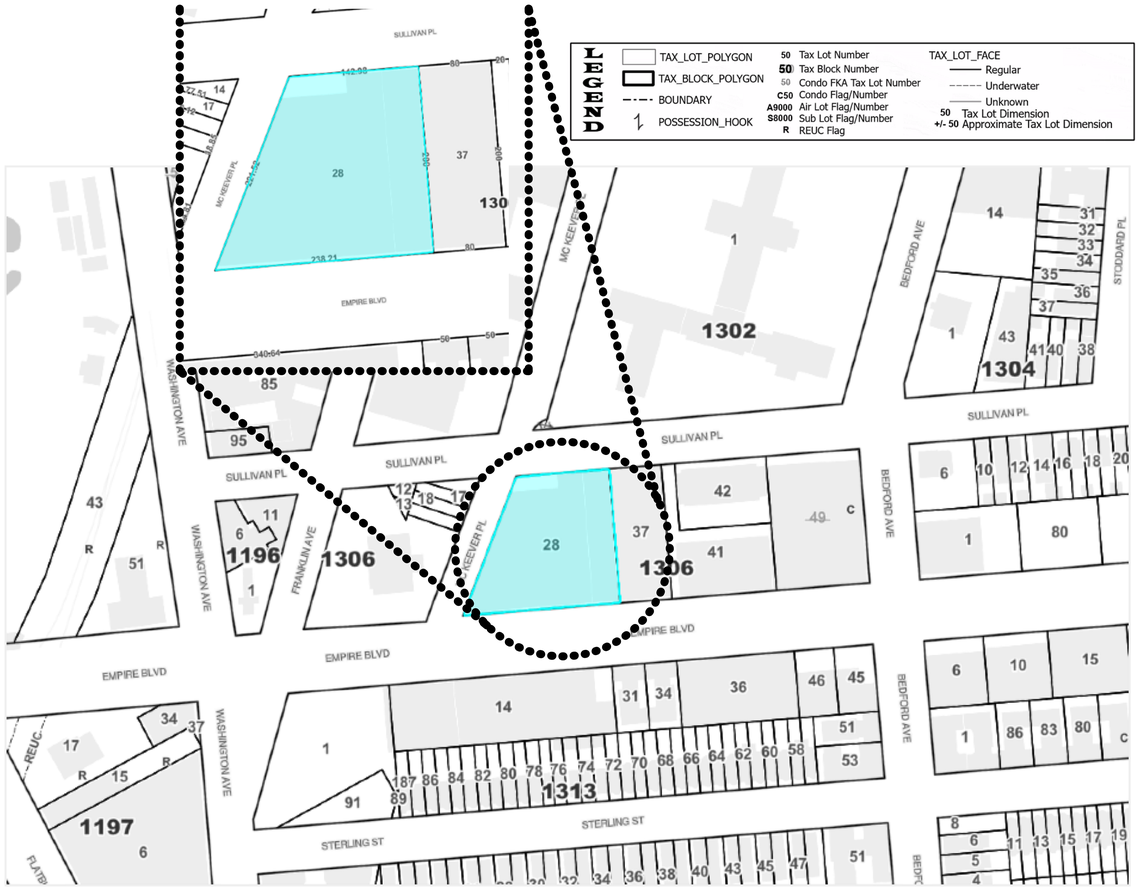
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING ANALYSIS

Z-002D.00

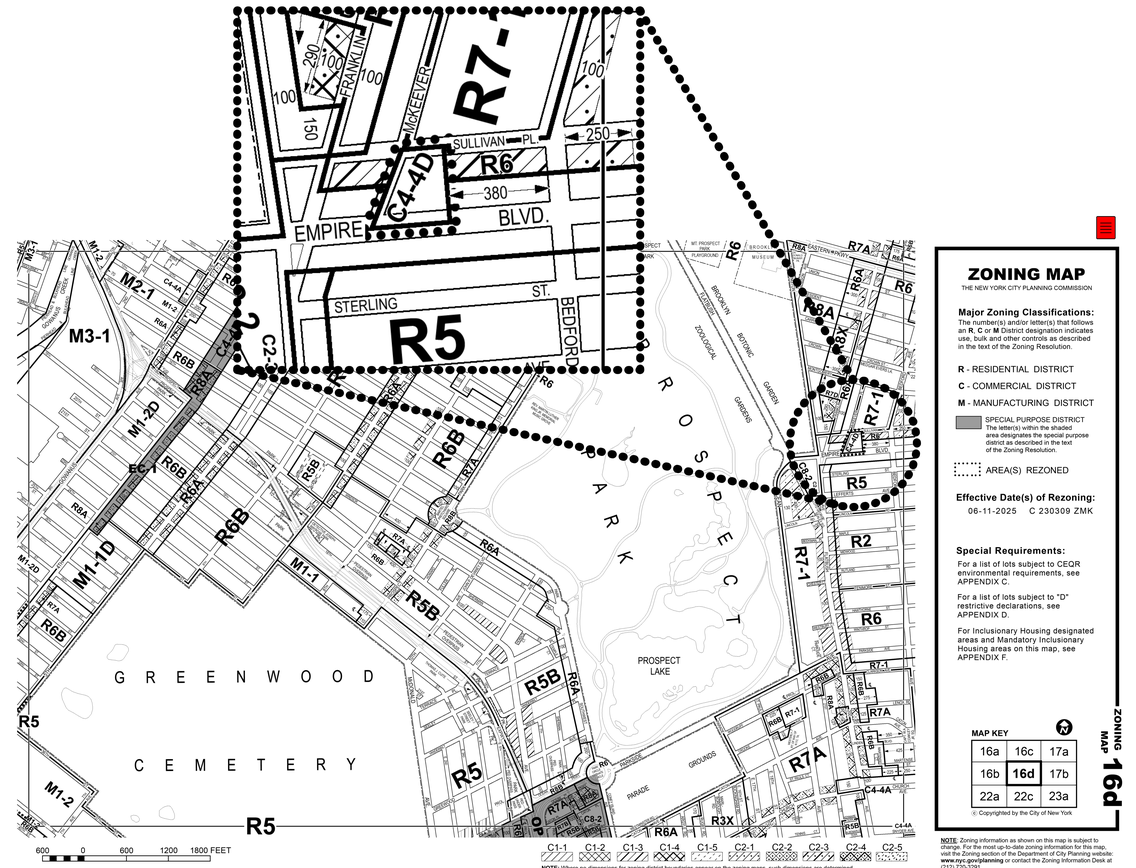
Scale: 12" = 1'-0"
Date: 12/1/2025 7:32:55 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 TAX MAP
N.T.S.



2 FLOOD MAP - ZONE 'X' SEPTEMBER 5, 2007
N.T.S.

3 ZONING MAP
N.T.S.



ZONING MAP
THE NEW YORK CITY PLANNING COMMISSION

Major Zoning Classifications:
The number(s) and/or letter(s) that follows an **R**, **C** or **M** District designation indicates use, bulk and other controls as described in the text of the Zoning Resolution.

R - RESIDENTIAL DISTRICT
C - COMMERCIAL DISTRICT
M - MANUFACTURING DISTRICT
SPECIAL PURPOSE DISTRICT
The letter(s) within the shaded area designates the special purpose district as described in the text of the Zoning Resolution.
AREA(S) REZONED

Effective Date(s) of Rezoning:
06-11-2025 C 230309 ZMK

Special Requirements:
For a list of lots subject to CEQR environmental requirements, see APPENDIX C.
For a list of lots subject to "D" restrictive declarations, see APPENDIX D.
For Inclusionary Housing designated areas and Mandatory Inclusionary Housing areas on this map, see APPENDIX F.

MAP KEY

16a	16c	17a
16b	**16d**	17b
22a	22c	23a

ZONING MAP 16d

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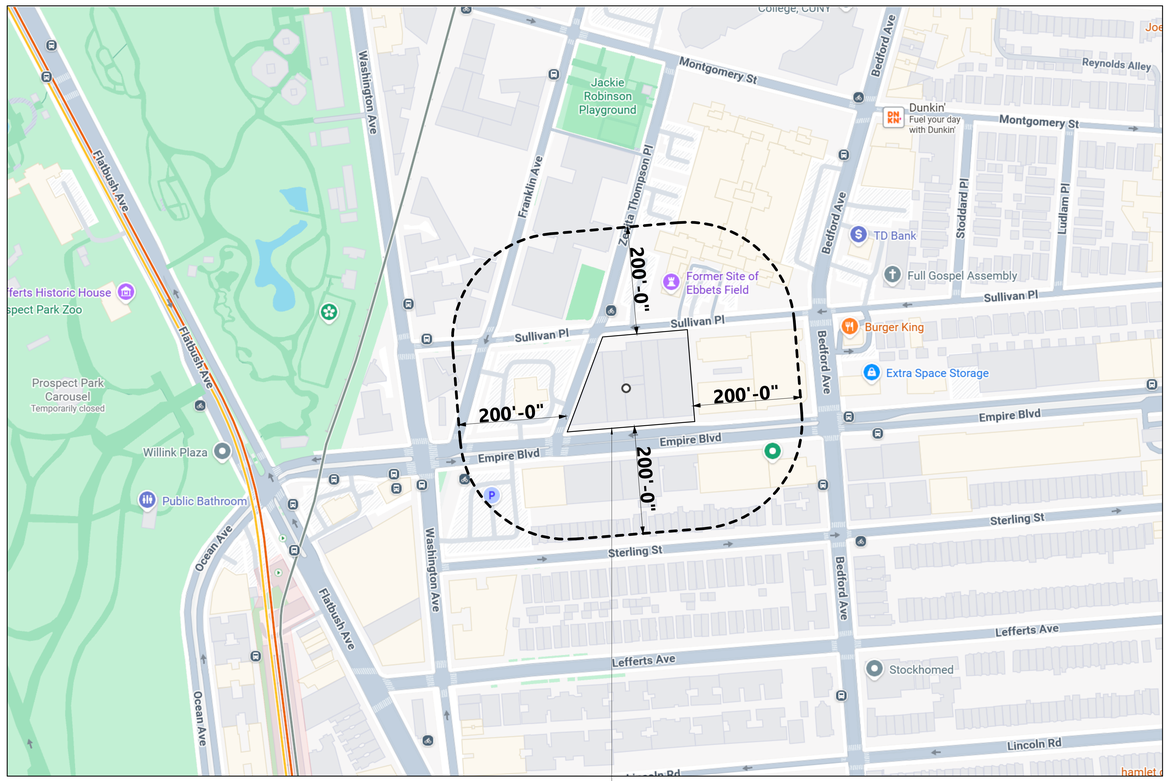
NOTE: Zoning information as shown on this map is subject to change. For the most up-to-date zoning information for this map, visit the Zoning section of the Department of City Planning website: **www.nyc.gov/planning** or contact the Zoning Information Desk at (212) 720-3291.

NOTE: Where no dimensions for zoning district boundaries appear on the zoning maps, such dimensions are determined in Article VII, Chapter 8 (Location of District Boundaries) of the Zoning Resolution.

TRANSIT MAP
1" = 100'-0"



SITE IS NOT LOCATED WITHIN 200' OF A TRANSIT AUTHORITY PROPOERTY

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Brooklyn, NY 11205

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South Amboy, NJ 08879

Structure Engineer:
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40-12 28th Street
Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

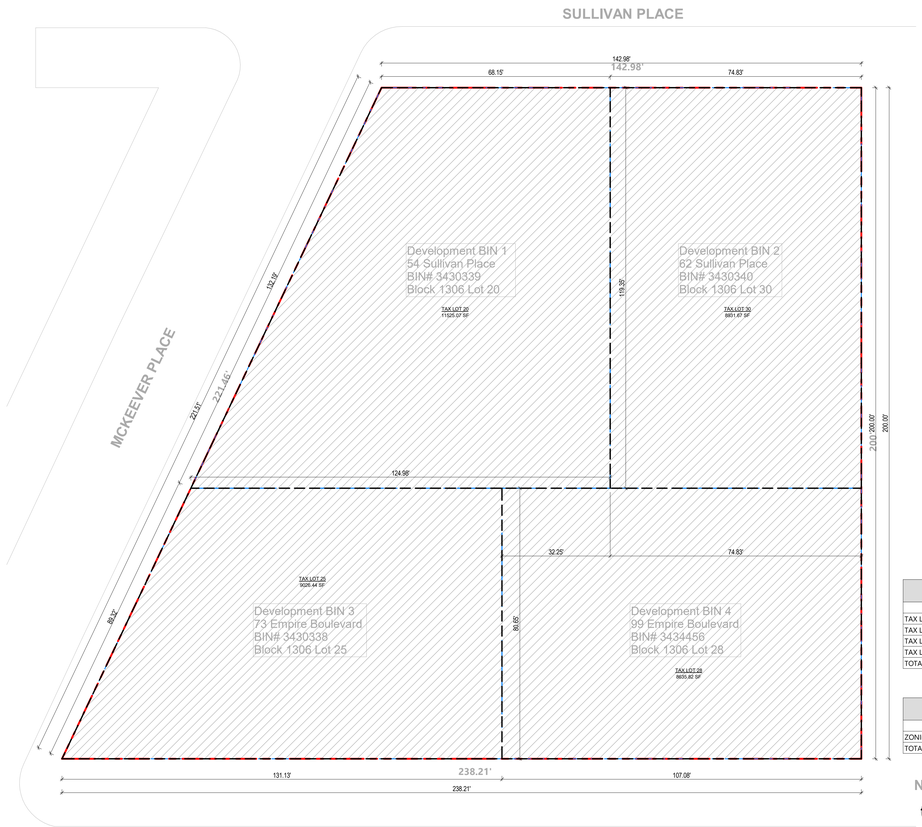
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING MAPS

Z-003D.00

Scale: 1" = 100'-0"
Date: 12/1/2025 7:32:57 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

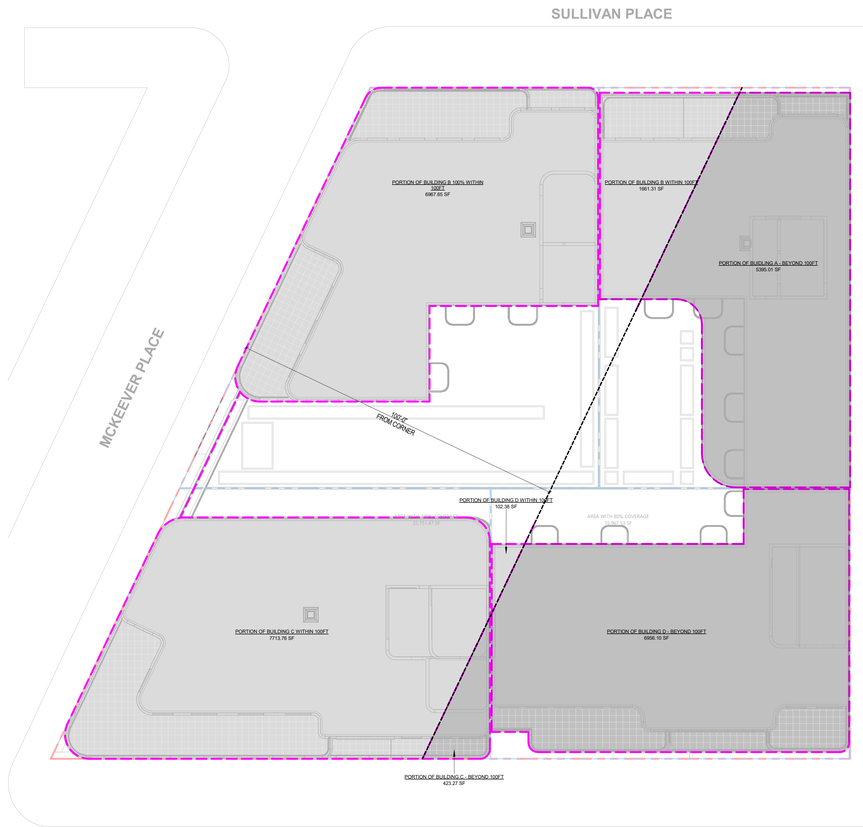
1 LOT AREA & BASE PLANE CALCULATION
1/16" = 1'-0"



TAX LOTS	
Name	SF
TAX LOT 20	11525.07 SF
TAX LOT 30	8931.67 SF
TAX LOT 28	8635.82 SF
TAX LOT 25	9026.44 SF
TOTAL	38119.00 SF

COMBINED LOT AREA	
Name	SF
ZONING LOT COMBINED	38119.00 SF
TOTAL	38119.00 SF

2 LOT COVERAGE CALCULATION
1/16" = 1'-0"

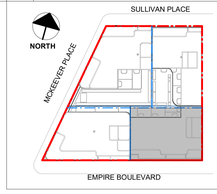


LOT COVERAGE ALLOWED WITHIN 100FT = 100%

AREA SCHEDULE (LOT COVERAGE)	
Name	Area
PORTION OF BUIDLING A - BEYOND 100FT	5395 SF
PORTION OF BUILDING C - BEYOND 100FT	423 SF
PORTION OF BUILDING D - BEYOND 100FT	6956 SF
TOTAL	12774 SF

MAXIMUM PERMITTED LOT COVERAGE: 80% x 15,967.53 = 12,774.02 SF
PROPOSED LOT COVERAGE: (12774 / 15967.53) x 100 = 79.99%

KEY PLAN
N.T.S.



3 PERMITTED OBSTRUCTION CALCULATION
1/16" = 1'-0"

BULKHEAD AREA CALCULATION - BLDG D			
Name	Length	Width	Area
BULKHEAD - BLDG D	0' - 0"	0' - 0"	734 SF
TOTAL			734 SF

4 BLDG D - COURTYARD ANALYSIS DIAGRAM
1/16" = 1'-0"

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00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

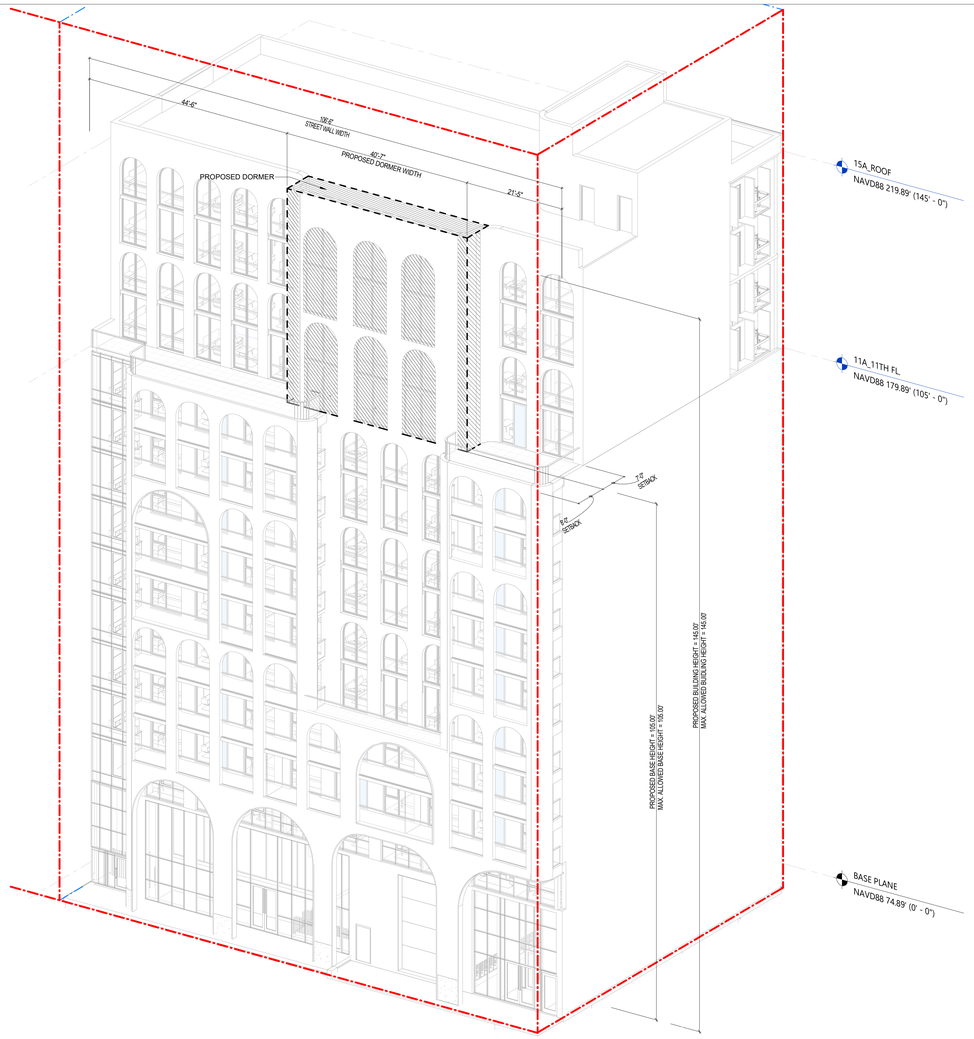
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ZONING DIAGRAMS

Z-004D.00

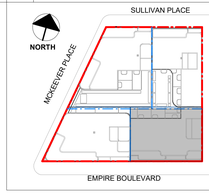
Scale: As indicated
Date: 12/1/2025 7:33:12 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

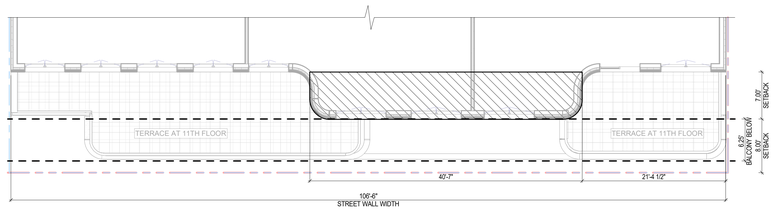
1 3D DIAGRAM - BLDG D



2 DORMER CALCULATIONS - EMPIRE BLVD (SOUTH ELEVATION) - BLDG D
1/8" = 1'-0"

KEY PLAN
N.T.S.





EMPIRE BOULEVARD

2.1 11TH FL. - PARTIAL PLAN
1/8" = 1'-0"

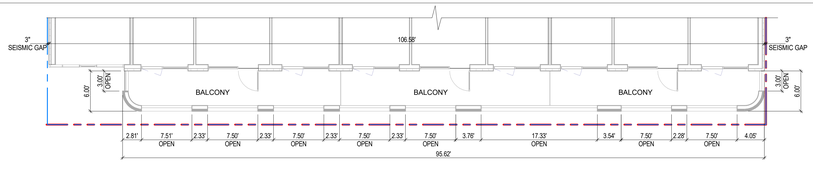
EMPIRE BLVD DORMER CALCULATION

STREET WALL WIDTH = 106'-6"
PERMITTED DORMER = 106'-6" x 40% = 42'-7 3/16"
PROPOSED DORMER = 40'-7"

3 BALCONY CALCULATIONS

BLDG D - BALCONY ENCLOSURE:
OPENINGS: 7.5' (7) + 17.33' + 3' + 3' = 75.83'
PERIMETER OF THE BALCONY: 95.62 + 95.62 + 6' + 6' = 203.24'

75.83' / 203.24 = 0.3731 OR **37.31% OPEN (MIN 33% REQ.)**



EMPIRE BOULEVARD

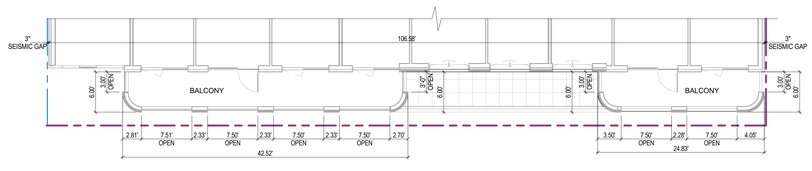
3.1 BLDG D - 3RD TO 4TH PARTIAL FLOOR PLAN
1/8" = 1'-0"

BLDG D - BALCONY ENCLOSURE:
BALCONY 1
OPENINGS: 7.5' (4)' + 3' + 3' = 36'
PERIMETER OF THE BALCONY: 42.52' + 42.52' + 6' + 6' = 97.04'

36' / 97.04' = 0.3709 OR **37.09% OPEN (MIN 33% REQ.)**

BALCONY 2
OPENINGS: 7.5' (2)' + 3' + 3' = 21'
PERIMETER OF THE BALCONY: 24.83' + 24.83' + 6' + 6' = 61.66'

21' / 61.66' = 0.3405 OR **34.05% OPEN (MIN 33% REQ.)**



EMPIRE BOULEVARD

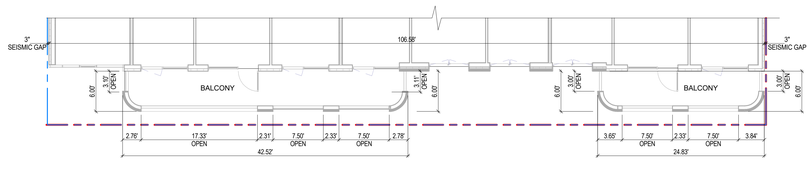
3.2 BLDG D - 5TH, 9TH & 10TH PARTIAL FLOOR PLAN
1/8" = 1'-0"

BLDG D - BALCONY ENCLOSURE:
BALCONY 1
OPENINGS: 7.5' (2) + 17.33' + 3' + 3' = 38.33'
PERIMETER OF THE BALCONY: 42.52' + 42.52' + 6' + 6' = 97.04'

38.33' / 97.04' = 0.3949 OR **39.49% OPEN (MIN 33% REQ.)**

BALCONY 2
OPENINGS: 7.5' (2)' + 3' + 3' = 21'
PERIMETER OF THE BALCONY: 24.83' + 24.83' + 6' + 6' = 61.66'

21' / 61.66' = 0.3405 OR **34.05% OPEN (MIN 33% REQ.)**



EMPIRE BOULEVARD

3.3 BLDG D - 6TH - 8TH PARTIAL FLOOR PLAN
1/8" = 1'-0"

KAO-HWA LEE
ARCHITECTS P.C.

227 CATHERINE STREET
SOUTH AMBOY, NJ 08879
(609) 216 2975

CLIENT:
THE RABSKY GROUP
505 Flushing Ave
Brooklyn, NY 11205

Architect:
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MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

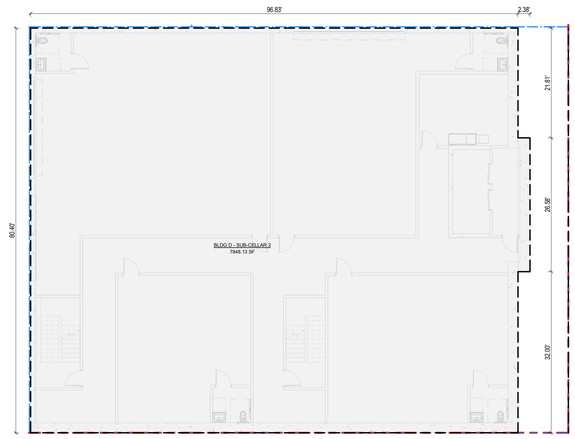
SHEET TITLE
ZONING DIAGRAMS

Z-005D.00

Scale:	As indicated
Date:	12/1/2025 7:33:19 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

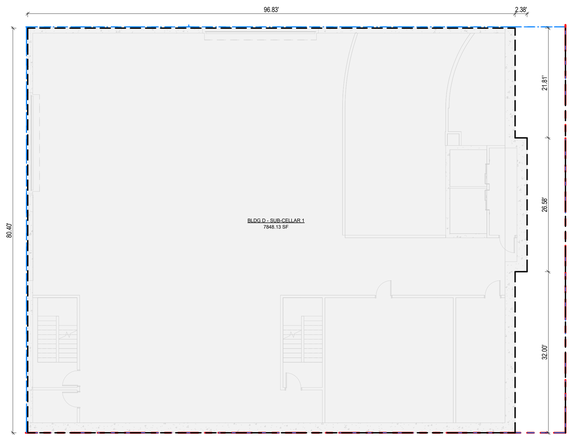
1 BLDG D - SUBCELLAR 2 GROSS FLOOR AREA DIAGRAM
3/32" = 1'-0"

AREA - 00 SUBCELLAR 2 FLOOR - BLDG D	
Name	SF
BLDG D - SUB-CELLAR 2	7848.13 SF
	7848.13 SF



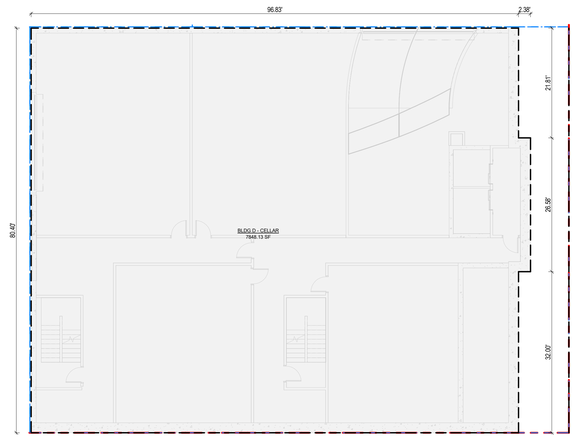
2 BLDG D - SUBCELLAR 1 GROSS FLOOR AREA DIAGRAM
3/32" = 1'-0"

AREA - 00 SUBCELLAR 1 FLOOR - BLDG D	
Name	SF
BLDG D - SUB-CELLAR 1	7848.13 SF
	7848.13 SF

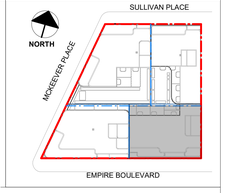


3 BLDG D - CELLAR GROSS FLOOR AREA DIAGRAM
3/32" = 1'-0"

AREA - 00 CELLAR FLOOR - BLDG D	
Name	SF
BLDG D - CELLAR	7848.13 SF
	7848.13 SF



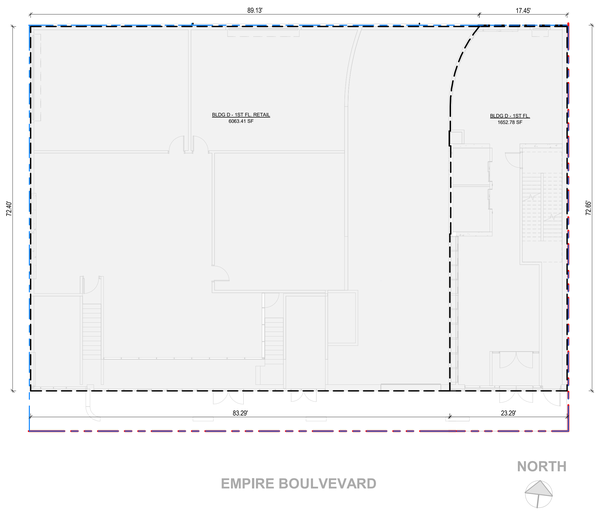
KEY PLAN
N.T.S.



4 BLDG D - 1ST FL. T.O.S LOBBY GROSS FLOOR AREA DIAGRAM
3/32" = 1'-0"

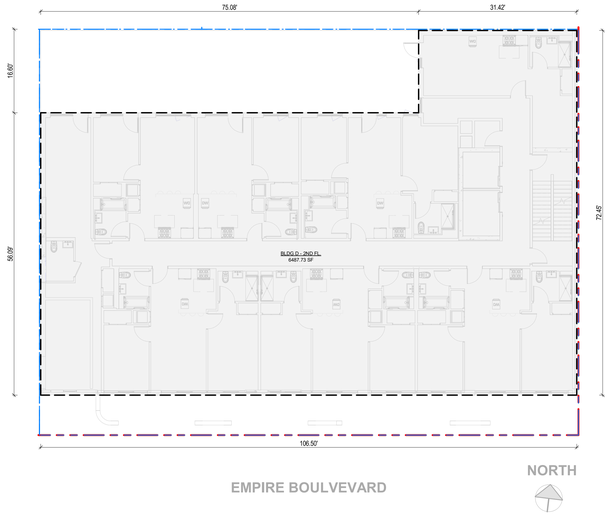
AREA - 1ST FLOOR - BLDG D - RESIDENTIAL	
Name	SF
BLDG D - 1ST FL.	1652.78 SF
	1652.78 SF

AREA - 1ST FLOOR - BLDG D - RETAIL	
Name	SF
BLDG D - 1ST FL. RETAIL	6063.41 SF
	6063.41 SF



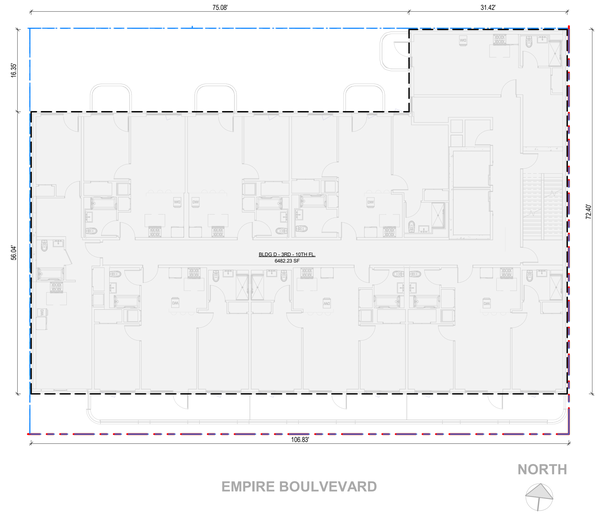
5 BLDG D - 2ND FL. GROSS FLOOR AREA DIAGRAM
3/32" = 1'-0"

AREA - 2ND FLOOR - BLDG D	
Name	SF
BLDG D - 2ND FL.	6487.73 SF
	6487.73 SF



6 BLDG D - 3RD - 10TH FL. GROSS FLOOR AREA DIAGRAM
3/32" = 1'-0"

AREA - 3RD FLOOR - BLDG D	
Name	SF
BLDG D - 3RD - 10TH FL.	6482.23 SF
	6482.23 SF



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DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

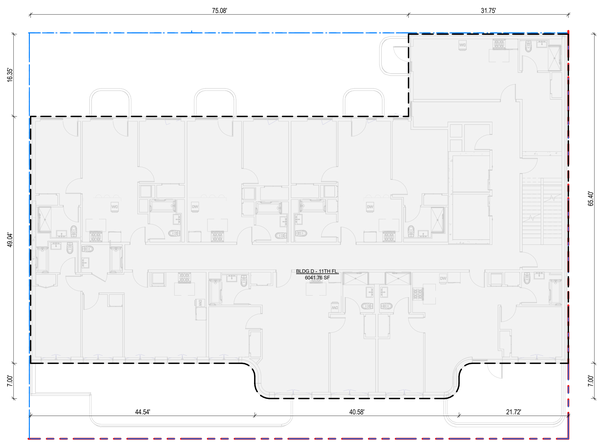
SHEET TITLE
GROSS FLOOR AREA DIAGRAMS

Z-010D.00

Scale:	As indicated
Date:	12/1/2025 7:33:38 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

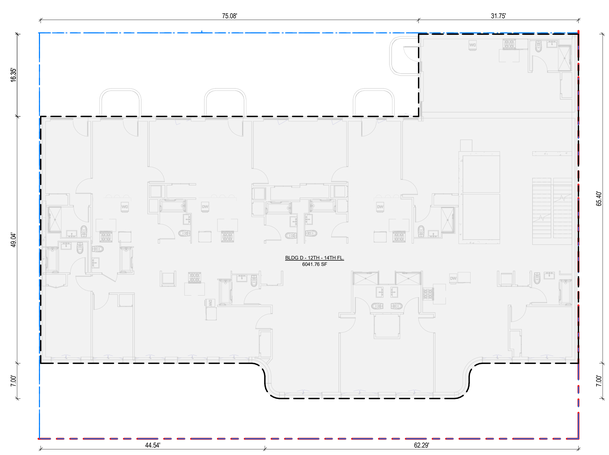
1 BLDG D - 11TH FL. GROSS FLOOR AREA DIAGRAM
3/32" = 1'-0"

AREA - 11TH FLOOR - BLDG D	
Name	SF
BLDG D - 11TH FL.	6041.76 SF
	6041.76 SF



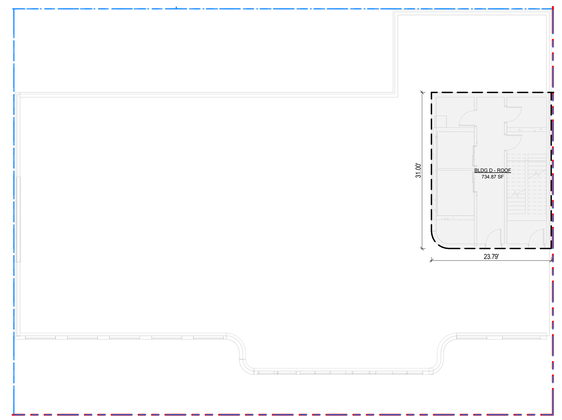
2 BLDG D - 12TH - 14TH FL. GROSS FLOOR AREA DIAGRAM
3/32" = 1'-0"

AREA - 12TH FLOOR - BLDG D	
Name	SF
BLDG D - 12TH - 14TH FL	6041.76 SF
	6041.76 SF

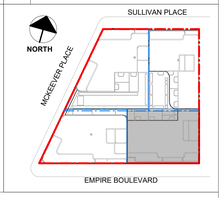


3 BLDG D - ROOF GROSS FLOOR AREA DIAGRAM
3/32" = 1'-0"

AREA - ROOF - BLDG D	
Name	SF
BLDG D - ROOF	734.87 SF
	734.87 SF



KEY PLAN
N.T.S.



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SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
GROSS FLOOR AREA DIAGRAMS

Z-011D.00

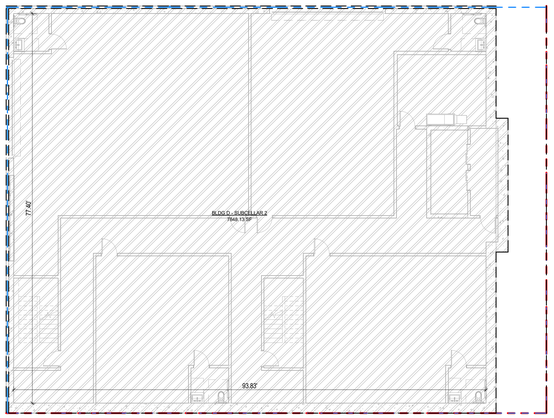
Scale: As indicated
Date: 12/1/2025 7:33:50 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 BLDG D - SUBCELLAR 2 FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 00_SUBCELLAR 2 -...	
DEDUCTION	TOTAL SF
CELLAR	7848.13 SF
Grand total	7848.13 SF

DEDUCTIONS LEGEND

CELLAR

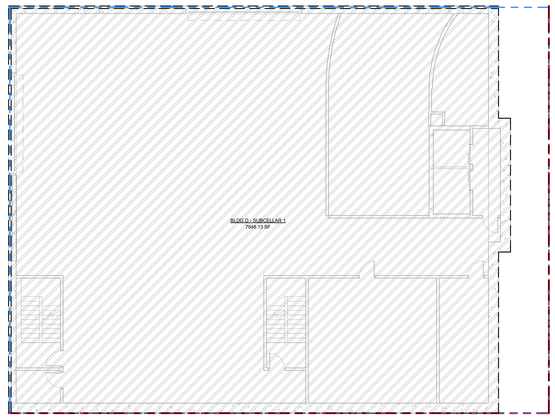


EMPIRE BOULVEVARD

NORTH

2 BLDG D - SUBCELLAR 1 FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 00_SUBCELLAR 1 -...	
DEDUCTION	TOTAL SF
CELLAR	7848.13 SF
Grand total	7848.13 SF



EMPIRE BOULVEVARD

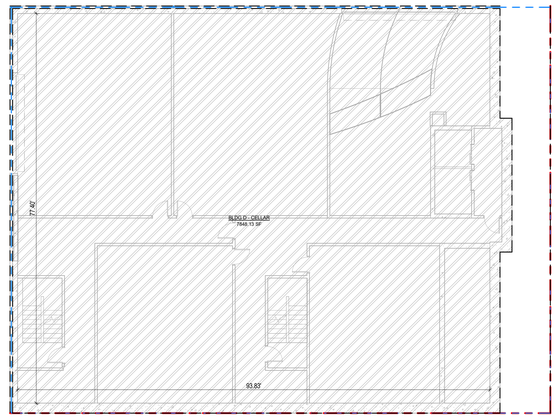
NORTH

3 BLDG D - CELLAR FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 00_CELLAR - BLDG D	
DEDUCTION	TOTAL SF
CELLAR	7848.13 SF
Grand total	7848.13 SF

DEDUCTIONS LEGEND

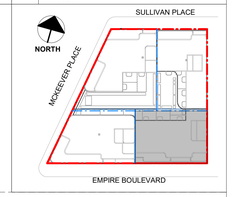
CELLAR



EMPIRE BOULVEVARD

NORTH

KEY PLAN
N.T.S.



4 BLDG D - 1ST FLOOR DEDUCTION PLAN
3/32" = 1'-0"

DEDUCTIONS - 1ST FLOOR - BLDG D	
DEDUCTION	TOTAL SF
AMENITY	236.24 SF
CORRIDOR DEDUCTION	66.00 SF
CORRIDOR DEDUCTION	112.49 SF
STAIRS	15.11 SF
STAIRS	15.11 SF
Grand total	444.95 SF

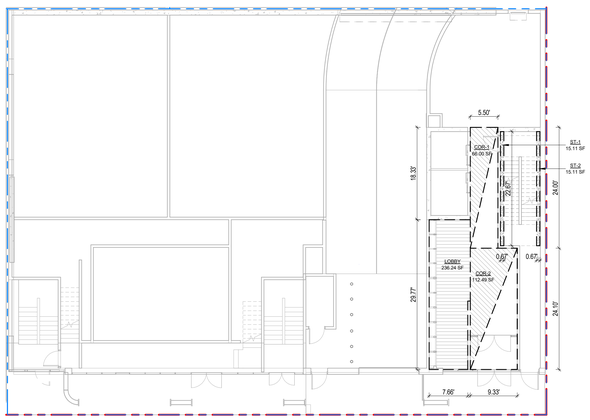
DEDUCTIONS LEGEND

AMENITY

CORRIDOR DEDUCTION

STAIRS

→ 50% Deduction (b) Length of Corridor



EMPIRE BOULVEVARD

NORTH

5 BLDG D - 2ND FL. FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 2ND FLOOR - BLDG D	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	417.36 SF
CORRIDOR DEDUCTION	133.01 SF
CORRIDOR DEDUCTION	57.32 SF
CORRIDOR DEDUCTION	34.18 SF
MECHANICAL ROOM	5.88 SF
MECHANICAL ROOM	5.44 SF

DEDUCTIONS - 2ND FLOOR - BLDG D	
DEDUCTION	TOTAL SF
REFUSE ROOM	24.00 SF
SHAFT	9.99 SF
SHAFT	2.29 SF
SHAFT	2.75 SF
SHAFT	2.29 SF
SHAFT	2.61 SF
SHAFT	21.38 SF
SHAFT	19.97 SF
SHAFT	1.88 SF
SHAFT	9.04 SF

DEDUCTIONS - 2ND FLOOR - BLDG D	
DEDUCTION	TOTAL SF
SHAFT	1.74 SF
SHAFT	2.08 SF
SHAFT	14.68 SF
SHAFT	2.08 SF
SHAFT	1.73 SF
SHAFT	21.54 SF
SHAFT	1.73 SF
SHAFT	2.08 SF
SHAFT	10.50 SF
SHAFT	3.86 SF
SHAFT	4.03 SF

DEDUCTIONS - 2ND FLOOR - BLDG D	
DEDUCTION	TOTAL SF
SHAFT	5.74 SF
STAIRS	15.11 SF
STAIRS	15.11 SF
Grand total	851.42 SF

DEDUCTIONS LEGEND

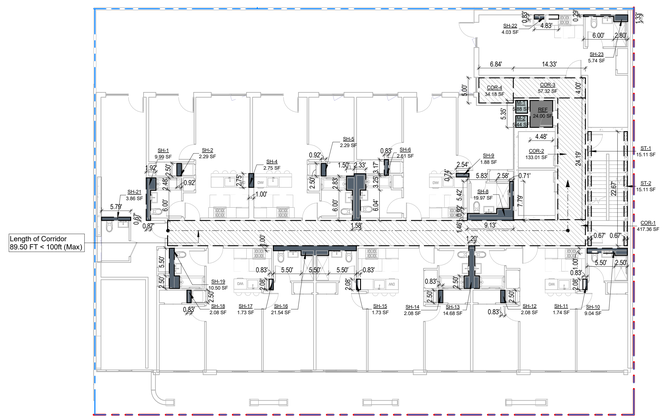
CORRIDOR DEDUCTION → 50% Deduction (b) Length of Corridor

MECHANICAL ROOM

REFUSE ROOM

SHAFT

STAIRS



EMPIRE BOULVEVARD

NORTH

6 BLDG D - 3RD - 10TH FL. FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 3RD FLOOR - BLDG D	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	417.36 SF
CORRIDOR DEDUCTION	133.01 SF
CORRIDOR DEDUCTION	57.32 SF
CORRIDOR DEDUCTION	34.18 SF
MECHANICAL ROOM	5.88 SF
MECHANICAL ROOM	5.44 SF

DEDUCTIONS - 3RD FLOOR - BLDG D	
DEDUCTION	TOTAL SF
REFUSE ROOM	24.00 SF
SHAFT	3.86 SF
SHAFT	9.99 SF
SHAFT	0.83 SF
SHAFT	10.50 SF
SHAFT	2.29 SF
SHAFT	2.75 SF
SHAFT	2.29 SF
SHAFT	3.54 SF
SHAFT	2.08 SF

DEDUCTIONS - 3RD FLOOR - BLDG D	
DEDUCTION	TOTAL SF
SHAFT	1.73 SF
SHAFT	21.54 SF
SHAFT	1.73 SF
SHAFT	21.38 SF
SHAFT	2.61 SF
SHAFT	1.88 SF
SHAFT	19.97 SF
SHAFT	2.08 SF
SHAFT	14.68 SF
SHAFT	2.08 SF
SHAFT	1.74 SF

DEDUCTIONS - 3RD FLOOR - BLDG D	
DEDUCTION	TOTAL SF
SHAFT	9.04 SF
SHAFT	5.74 SF
SHAFT	4.03 SF
STAIRS	15.11 SF
STAIRS	15.11 SF
Grand total	855.79 SF

DEDUCTIONS LEGEND

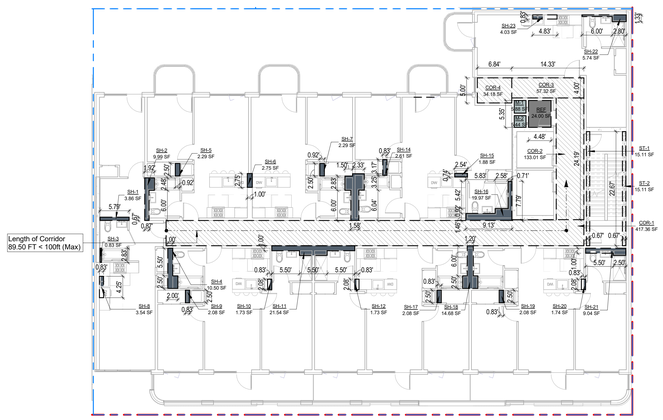
CORRIDOR DEDUCTION → 50% Deduction (b) Length of Corridor

MECHANICAL ROOM

REFUSE ROOM

SHAFT

STAIRS



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00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
FLOOR AREA DEDUCTIONS

Z-020D.00

Scale: As indicated
Date: 12/1/2025 7:34:03 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 BLDG D - 11TH FL. FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 11TH FLOOR - BLDG D	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	394.72 SF
CORRIDOR DEDUCTION	133.01 SF
CORRIDOR DEDUCTION	57.32 SF
CORRIDOR DEDUCTION	34.18 SF
REFUSE ROOM	24.00 SF
SHAFT	5.88 SF

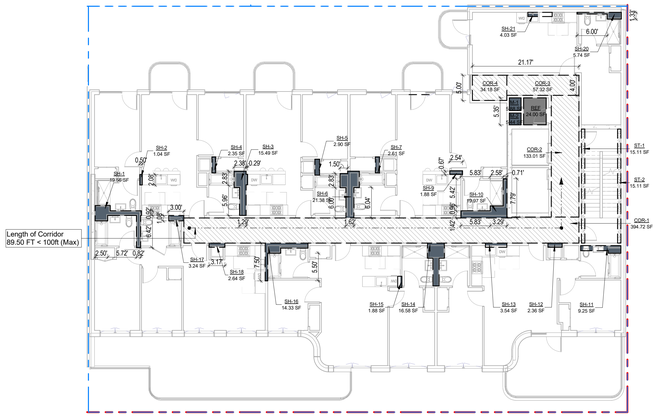
DEDUCTIONS - 11TH FLOOR - BLDG D	
DEDUCTION	TOTAL SF
SHAFT	5.44 SF
SHAFT	19.56 SF
SHAFT	1.04 SF
SHAFT	15.49 SF
SHAFT	2.35 SF
SHAFT	2.90 SF
SHAFT	21.38 SF
SHAFT	2.61 SF
SHAFT	1.88 SF
SHAFT	19.97 SF
SHAFT	9.25 SF

DEDUCTIONS - 11TH FLOOR - BLDG D	
DEDUCTION	TOTAL SF
SHAFT	2.36 SF
SHAFT	3.54 SF
SHAFT	16.58 SF
SHAFT	1.88 SF
SHAFT	14.33 SF
SHAFT	3.24 SF
SHAFT	2.64 SF
SHAFT	5.74 SF
SHAFT	4.03 SF
STAIRS	15.11 SF

DEDUCTIONS - 11TH FLOOR - BLDG D	
DEDUCTION	TOTAL SF
STAIRS	15.11 SF
Grand total	835.55 SF

DEDUCTIONS LEGEND

- CORRIDOR DEDUCTION → 50% Deduction (b) Length of Corridor
- REFUSE ROOM
- SHAFT
- STAIRS



2 BLDG D - 12TH - 14TH FL. FLOOR AREA DEDUCTION
3/32" = 1'-0"

DEDUCTIONS - 12TH FLOOR - BLDG D	
DEDUCTION	TOTAL SF
CORRIDOR DEDUCTION	394.72 SF
CORRIDOR DEDUCTION	133.01 SF
CORRIDOR DEDUCTION	57.32 SF
CORRIDOR DEDUCTION	34.18 SF
REFUSE ROOM	24.00 SF
SHAFT	5.88 SF

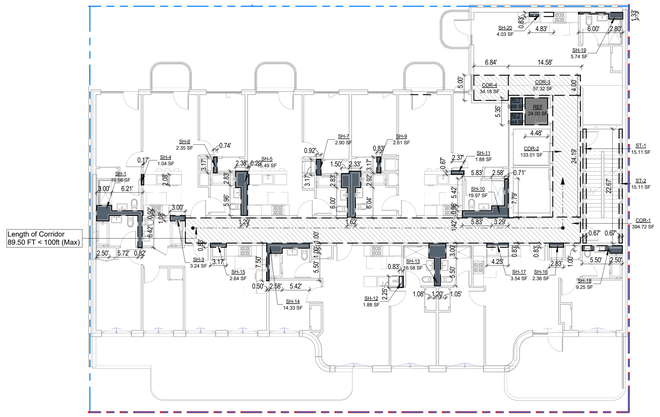
DEDUCTIONS - 12TH FLOOR - BLDG D	
DEDUCTION	TOTAL SF
SHAFT	5.44 SF
SHAFT	19.56 SF
SHAFT	3.24 SF
SHAFT	1.04 SF
SHAFT	15.49 SF
SHAFT	2.35 SF
SHAFT	2.90 SF
SHAFT	21.38 SF
SHAFT	2.61 SF
SHAFT	19.97 SF
SHAFT	1.88 SF

DEDUCTIONS - 12TH FLOOR - BLDG D	
DEDUCTION	TOTAL SF
SHAFT	1.88 SF
SHAFT	16.58 SF
SHAFT	14.33 SF
SHAFT	2.64 SF
SHAFT	2.36 SF
SHAFT	3.54 SF
SHAFT	9.25 SF
SHAFT	5.74 SF
SHAFT	4.03 SF
STAIRS	15.11 SF

DEDUCTIONS - 12TH FLOOR - BLDG D	
DEDUCTION	TOTAL SF
STAIRS	15.11 SF
Grand total	835.55 SF

DEDUCTIONS LEGEND

- CORRIDOR DEDUCTION → 50% Deduction (b) Length of Corridor
- REFUSE ROOM
- SHAFT
- STAIRS

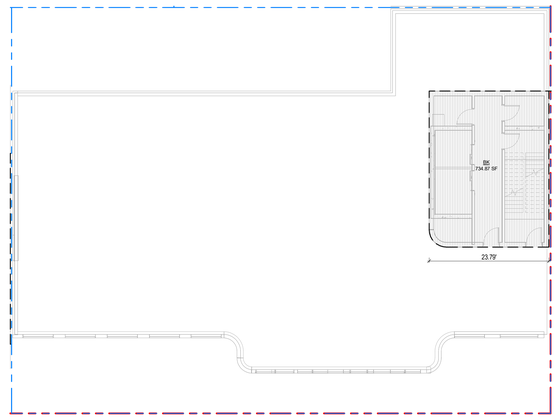


3 BLDG D - 15B_ROOF FLOOR AREA DEDUCTION
3/32" = 1'-0"

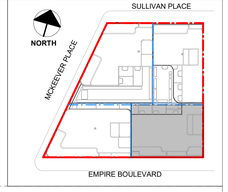
DEDUCTIONS - ROOF - BLDG D	
DEDUCTION	TOTAL SF
BULKHEAD	734.87 SF
Grand total	734.87 SF

DEDUCTIONS LEGEND

- BULKHEAD



KEY PLAN
N.T.S.



BUILDING D_ TOTAL DEDUCTION BY CODE CATEGORY	
DEDUCTION	TOTAL SF
	0.00 SF
AMENITY	236.24 SF
BULKHEAD	734.87 SF
CELLAR	23544.40 SF
CORRIDOR DEDUCTION	9051.50 SF
MECHANICAL ROOM	124.59 SF
REFUSE ROOM	336.05 SF
SHAFT	2118.75 SF
STAIRS	453.33 SF
Grand total	36599.73 SF

BUILDING D _ DEDUCTION PER ZR 12-10	
DEDUCTION	TOTAL SF
BULKHEAD	734.87 SF
CELLAR	23544.40 SF
MECHANICAL ROOM	124.59 SF
SHAFT	2118.75 SF
STAIRS	453.33 SF
Grand total	26975.94 SF

BUILDING D _ DEDUCTION PER ZR 23-23	
DEDUCTION	TOTAL SF
AMENITY	236.24 SF
CORRIDOR DEDUCTION	9051.50 SF
REFUSE ROOM	336.05 SF
Grand total	9623.79 SF

BUILDING D _ ZFA AFTER ZR 12-10 DEDUCTIONS	
RESIDENTIAL GFA	108,444.64 SF
ZR 12-10 DEDUCTONS	26,975.94 SF
108,444.64 - 26,975.94	81,468.7 SF

KAO-HWA LEE
ARCHITECTS P.C.
227 CATHERINE STREET
SOUTH AMBOY, NJ 08879
(609) 216 2975

CLIENT:
THE RABSKY GROUP
505 Flushing Ave
Brooklyn, NY 11205

Architect:
KHO-HWA LEE ARCHITECTS P.C.
227 Catherine Street
South Amboy, NJ 08879

Structure Engineer:
STRUCTURAL ENGINEERING TECHONOLOGIES P.C
40-12 28th Street
Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
FLOOR AREA DEDUCTIONS

Z-021D.00

Scale: As indicated
Date: 12/1/2025 7:34:16 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

ABBREVIATIONS

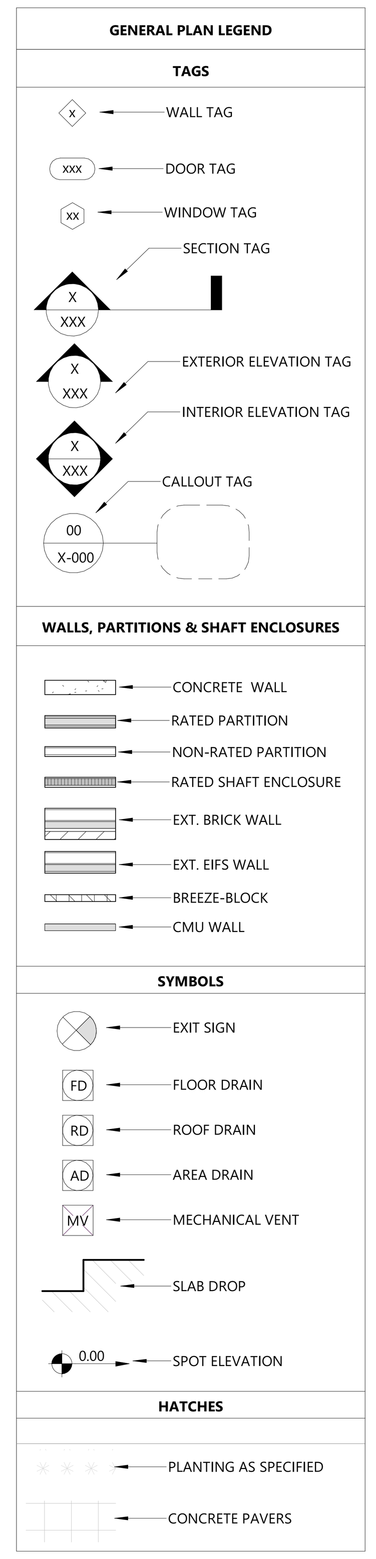
A – ARCHITECTURAL
AD – ADDITION
AL – ALUMINUM
AP – ACCESS PANEL
AT – ATTIC
AV – AIR VENT
B – BUILDING
BM – BENCH MARK
BP – BUILDING PAPER
C – CONCRETE
CA – CEILING ASSEMBLY
CB – CATCH BASIN
CD – CORRIDOR DOOR
CL – CENTER LINE
CMU – CONCRETE MASONRY UNIT
CO – CLEANOUT
CP – COLUMN PIPE
CR – CORNER
CS – COLD STORAGE
CT – CERAMIC TILE
D – DOOR
DB – DOOR BUCK
DF – DIFFUSER
DG – DRAINAGE
DL – DEAD LOAD
DN – DOWNSPOUT
DP – DOWNSPOUT
DR – DRIVEWAY
DW – DOWNSPOUT
E – ELECTRICAL
EC – ELECTRICAL CABINET
ED – EMERGENCY DOOR
EL – ELEVATION
EM – EXPANSION JOINT
EN – ENTRANCE
EP – EDGE PROTECTION
ER – EMERGENCY EXIT
ES – EXIT SIGN
ET – EGRESS
EV – EXHAUST VENT
F – FIXTURE
FA – FIRE ALARM
FB – FIRE BLANKET
FC – FLOOR COVERING
FD – FLOOR DRAIN
FE – FIRE EXTINGUISHER
FF – FINISH FLOOR
FG – FIBER GLASS
FH – FIRE HOSE
FL – FINISH LINE
FM – FIRE MARSHAL
FP – FLOOR PLAN
FS – FLOOR SYSTEM
FT – FLOOR TILE
FV – FLOOR VENT
G – GLAZING
GA – GLAZING ASSEMBLY
GB – GAS BOILER
GC – GENERAL CONTRACTOR
GD – GROUND DRAIN
GF – GRADED FILL
GG – GLASS GUARD
GH – GUARDRAIL
GI – GALVANIZED IRON
GL – GLASS
GM – GUTTER
GP – GROUND PLAN
GR – GRILLE
GS – GLASS SYSTEM
GT – GUTTER
H – HVAC
HA – HEATING AIR
HB – HEAT BARRIER
HC – HEATING COIL
HD – HEAVY DUTY
HE – HEAT EXCHANGER
HF – HIGH FINISH
HG – HEAT GRID
HI – HIGH INTENSITY
HL – HEADER
HM – HEAT MAT
HP – HIGH PRESSURE
HR – HEAT RECOVERY
HS – HEAT SHIELD
HT – HIGH TEMP
I – INTERIOR
IA – INTERIOR ASSEMBLY
IB – INSULATED BOARD
IC – INTERIOR COLUMN
ID – INTERIOR DOOR
IE – INTERIOR ELEVATION
IF – INSULATED FRAME
IG – INTERIOR GLAZING
IH – INSULATION HOLDER
II – INSULATED INTERIOR
IJ – INSULATED JOINT
IL – INTERIOR LIGHTING
IM – INTERIOR METAL
IN – INTERIOR NETTING
IO – INPUT OUTLET
IP – INTERIOR PANEL
IR – INSULATED ROOF
IS – INTERIOR STAIRS
IT – INSULATED TILE
J – JUNCTION
JA – JOINT ASSEMBLY
JB – JUNCTION BOX
JC – JOINT CONNECTION
JD – JOINT DETAIL
JE – JOINT EDGE
JF – JOINT FILLER
JG – JOINT GAP

JH – JOINT HOLDER
JI – JOINT INSULATION
JJ – JOINT JAMB
JK – JOINT KIT
JL – JOINT LINE
JM – JOINT MATERIAL
JN – JOINT NAILING
JO – JOINT OPENING
JP – JOINT PANEL
JR – JOINT REPAIR
JS – JOINT SEALANT
JT – JOINT TREATMENT
K – KITCHEN
KA – KITCHEN ASSEMBLY
KB – KITCHEN CABINET
KC – KITCHEN COUNTER
KD – KITCHEN DOOR
KE – KITCHEN EQUIPMENT
KF – KITCHEN FLOOR
KG – KITCHEN GRID
KH – KITCHEN HOOD
KI – KITCHEN ISLAND
KK – KITCHEN KIT
KL – KITCHEN LAYOUT
KM – KITCHEN MONITOR
KN – KITCHEN NOOK
KO – KITCHEN OUTLET
KP – KITCHEN PANEL
KR – KITCHEN RAIL
KS – KITCHEN SINKKT – KITCHEN TILE
L – LIGHTING
LA – LIGHTING ASSEMBLY
LB – LIGHTING BRACKET
LC – LIGHTING CONTROL
LD – LIGHTING DESIGN
LE – LIGHTING ELEVATION
LF – LIGHTING FIXTURE
LG – LIGHTING GRID
LH – LIGHTING HOLDER
LI – LIGHTING INSTALLATION
LJ – LIGHTING JUNCTION
LK – LIGHTING KIT
LL – LIGHTING LAYOUT
LM – LIGHTING MOUNT
LN – LIGHTING NICHE
LO – LIGHTING OUTLET
LP – LIGHTING PANEL
LQ – LIGHTING QUALITY
LR – LIGHTING RECESS
LS – LIGHTING SWITCH
LT – LIGHTING TYPE
M – MECHANICAL
MA – MECHANICAL ASSEMBLY
MB – MECHANICAL BOX
MC – MECHANICAL CONNECTION
MD – MECHANICAL DUCT
ME – MECHANICAL EQUIPMENT
MF – MECHANICAL FITTING
MG – MECHANICAL GRID
MH – MECHANICAL HEAT
MI – MECHANICAL INSULATION
MJ – MECHANICAL JUNCTION
MK – MECHANICAL KIT
ML – MECHANICAL LAYOUT
MM – MECHANICAL MOUNT
MN – MECHANICAL NOISE
MO – MECHANICAL OUTLET
MP – MECHANICAL PANEL
MQ – MECHANICAL QUALITY
MR – MECHANICAL RECESS
MS – MECHANICAL SUPPORT
MT – MECHANICAL TYPE
N – NORTH
NA – NORTH ARROW
NB – NORTH BOUND
NC – NORTH CORNER
NE – NORTH ELEVATION
NF – NORTH FACING
NG – NORTH GRID
NH – NORTH HEADING
NI – NORTH INDEX
NJ – NORTH JUNCTION
NK – NORTH KIT
NL – NORTH LINE
NM – NORTH MARK
NN – NORTH NODE
NO – NORTH ORIENTATION
NP – NORTH PLAN
NQ – NORTH QUALITY
NR – NORTH REFERENCE
NS – NORTH SIDE
NT – NORTH TILE
O – OPENING
OA – OPENING ASSEMBLY
OB – OPENING BRACKET
OC – OPENING CONNECTION
OD – OPENING DETAIL
OE – OPENING EDGE
OF – OPENING FRAME
OG – OPENING GLASS
OH – OPENING HEIGHT
OI – OPENING INSULATION
OJ – OPENING JOINT
OK – OPENING KIT
OL – OPENING LAYOUT
OM – OPENING MATERIAL
ON – OPENING NICHE
OP – OPENING PANEL
OQ – OPENING QUALITY
OR – OPENING REVEAL
OS – OPENING SIZE
OT – OPENING TYPE
P – PLAN
PA – PLAN ASSEMBLY

PB – PLAN BLOCK
PC – PLAN CONNECTION
PD – PLAN DETAIL
PE – PLAN ELEVATION
PF – PLAN FIXTURE
PG – PLAN GRID
PH – PLAN HEIGHT
PI – PLAN INDEX
PJ – PLAN JUNCTION
PK – PLAN KIT
PL – PLAN LAYOUT
PM – PLAN MARK
PN – PLAN NODE
PO – PLAN ORIENTATION
PP – PLAN PANEL
PQ – PLAN QUALITY
PR – PLAN REFERENCE
PS – PLAN SCALE
PT – PLAN TYPE
Q – QUANTITY
QA – QUANTITY ASSEMBLY
QB – QUANTITY BLOCK
QC – QUANTITY CONTROL
QD – QUANTITY DETAIL
QE – QUANTITY ESTIMATE
QF – QUANTITY FINISH
QG – QUANTITY GRID
QH – QUANTITY HEIGHT
QI – QUANTITY INPUT
QJ – QUANTITY JUNCTION
QK – QUANTITY KIT
QL – QUANTITY LINE
QM – QUANTITY MATERIAL
QN – QUANTITY NODE
QO – QUANTITY OUTPUT
QP – QUANTITY PANEL
QR – QUANTITY REFERENCE
QS – QUANTITY SCALE
QT – QUANTITY TREATMENT
R – ROOF
RA – ROOF ASSEMBLY
RB – ROOF BEAM
RC – ROOF CONNECTION
RD – ROOF DETAIL
RE – ROOF EDGE
RF – ROOF FINISH
RG – ROOF GRID
RH – ROOF HEIGHT
RI – ROOF INSULATION
RJ – ROOF JOINT
RK – ROOF KIT
RL – ROOF LINE
RM – ROOF MATERIAL
RN – ROOF NICHE
RO – ROOF OPENING
RP – ROOF PANEL
RQ – ROOF QUALITY
RR – ROOF REVEAL
RS – ROOF SLOPE
RT – ROOF TREATMENT
S – STRUCTURAL
SA – STRUCTURAL ASSEMBLY
SB – STRUCTURAL BEAM
SC – STRUCTURAL CONNECTION
SD – STRUCTURAL DETAIL
SE – STRUCTURAL EDGE
SF – STRUCTURAL FINISH
SG – STRUCTURAL GRID
SH – STRUCTURAL HEIGHT
SI – STRUCTURAL INSULATION
SJ – STRUCTURAL JOINT
SK – STRUCTURAL KIT
SL – STRUCTURAL LINE
SM – STRUCTURAL MATERIAL
SN – STRUCTURAL NODE
SO – STRUCTURAL OPENING
SP – STRUCTURAL PANEL
SQ – STRUCTURAL QUALITY
SR – STRUCTURAL REVEAL
SS – STRUCTURAL SUPPORT
ST – STRUCTURAL TYPE
T – TILE
TA – TILE ASSEMBLY
TB – TILE BLOCK
TC – TILE CONNECTION
TD – TILE DETAIL
TE – TILE EDGE
TF – TILE FINISH
TG – TILE GRID
TH – TILE HEIGHT
TI – TILE INSULATION
TJ – TILE JOINT
TK – TILE KIT
TL – TILE LINE
TM – TILE MATERIAL
TN – TILE NICHE
TO – TILE OPENING
TP – TILE PANEL
TQ – TILE QUALITY
TR – TILE REVEAL
TS – TILE SIZE
TT – TILE TREATMENT
U – UTILITY
UA – UTILITY ASSEMBLY
UB – UTILITY BOX
UC – UTILITY CONNECTION
UD – UTILITY DETAIL
UE – UTILITY EDGE
UF – UTILITY FIXTURE
UG – UTILITY GRID
UH – UTILITY HEIGHT
UI – UTILITY INSULATION
UJ – UTILITY JOINT
UK – UTILITY KIT

UL – UTILITY LAYOUT
UM – UTILITY MATERIAL
UN – UTILITY NODE
UO – UTILITY OUTLET
UP – UTILITY PANEL
UQ – UTILITY QUALITY
UR – UTILITY REFERENCE
US – UTILITY SIZE
UT – UTILITY TYPE
V – VENTILATION
VA – VENTILATION ASSEMBLY
VB – VENTILATION BOX
VC – VENTILATION CONNECTION
VD – VENTILATION DUCT
VE – VENTILATION EQUIPMENT
VF – VENTILATION FIXTURE
VG – VENTILATION GRID
VH – VENTILATION HEIGHT
VI – VENTILATION INSULATION
VJ – VENTILATION JOINT
VK – VENTILATION KIT
VL – VENTILATION LINE
VM – VENTILATION MATERIAL
VN – VENTILATION NICHE
VO – VENTILATION OUTLET
VP – VENTILATION PANEL
VQ – VENTILATION QUALITY
VR – VENTILATION REVEAL
VS – VENTILATION SIZE
VT – VENTILATION TYPE
W – WALL
WA – WALL ASSEMBLY
WB – WALL BRACE
WC – WALL CONNECTION
WD – WALL DETAIL
WE – WALL EDGE
WF – WALL FINISH
WG – WALL GRID
WH – WALL HEIGHT
WI – WALL INSULATION
WJ – WALL JOINT
WK – WALL KIT
WL – WALL LINE
WM – WALL MATERIAL
WN – WALL NICHE
WO – WALL OPENING
WP – WALL PANEL
WQ – WALL QUALITY
WR – WALL REVEAL
WS – WALL SUPPORT
WT – WALL TYPE
X – SECTION
XA – SECTION ASSEMBLY
XB – SECTION BLOCK
XC – SECTION CONNECTION
XD – SECTION DETAIL
XE – SECTION EDGE
XF – SECTION FINISH
XG – SECTION GRID
XH – SECTION HEIGHT
XI – SECTION INSULATION
XJ – SECTION JOINT
XK – SECTION KIT
XL – SECTION LAYOUT
XM – SECTION MATERIAL
XN – SECTION NODE
XO – SECTION OPENING
XP – SECTION PANEL
XQ – SECTION QUALITY
XR – SECTION REVEAL
XS – SECTION SUPPORT
XT – SECTION TYPE
Y – YARD
YA – YARD ASSEMBLY
YB – YARD BLOCK
YC – YARD CONNECTION
YD – YARD DRAIN
YE – YARD EDGE
YF – YARD FIXTURE
YG – YARD GRID
YH – YARD HEIGHT
YI – YARD INSULATION
YJ – YARD JOINT
YK – YARD KIT
YL – YARD LAYOUT
YM – YARD MATERIAL
YN – YARD NODE
YO – YARD OPENING
YP – YARD PANEL
YQ – YARD QUALITY
YR – YARD REVEAL
YS – YARD SUPPORT
YT – YARD TYPE
Z – ZONE
ZA – ZONE ASSEMBLY
ZB – ZONE BLOCK
ZC – ZONE CONNECTION
ZD – ZONE DETAIL
ZE – ZONE EDGE
ZF – ZONE FINISH
ZG – ZONE GRID
ZH – ZONE HEIGHT
ZI – ZONE INSULATION
ZJ – ZONE JOINT
ZK – ZONE KIT
ZL – ZONE LAYOUT
ZM – ZONE MATERIAL
ZN – ZONE NODE
ZO – ZONE OPENING
ZP – ZONE PANEL
ZQ – ZONE QUALITY
ZR – ZONE REVEAL
ZS – ZONE SUPPORT
ZT – ZONE TYPE

LEGENDS AND SYMBOLS



SPECIAL INSPECTIONS

SPECIAL INSPECTIONS CATEGORIES		
TR-1 ARCHITECTURAL SPECIAL INSPECTIONS		
SPECIAL INSPECTIONS	Code Section	
	2014 BC	2022 BC
STRUCTURAL STEEL - WELDING	BC 1704.3.1	BC 1705.2.1
STRUCTURAL STEEL - DETAILS	BC 1704.3.2	BC 1705.2.2
STRUCTURAL STEEL - HIGH STRENGTH BOLTING	BC 1704.3.3	BC 1705.2.3
STRUCTURAL COLD - FORMED STEEL	BC 1704.3.4	BC 1705.2.6
OPEN-WEB STEEL JOISTS AND JOISTS GIRDERS	N/A	BC 1705.2.7
CONCRETE - CAST-IN-PLACE	BC 1704.4	BC 1705.3
CONCRETE - PRECAST	BC 1704.4	BC 1705.3
CONCRETE - PRESTRESSED	BC 1704.4	BC 1705.3
MASONRY	BC 1704.5	BC 1705.4
WOOD - INSTALLATION OF HIGH-LOAD DIAPHRAGMS	BC 1704.6.1	BC 1705.5.1
WOOD - INSTALLATION OF METAL-PLATE-CONNECTED TRUSSES	BC 1704.6.2	BC 1705.5.2
WOOD - INSTALLATION OF PREFABRICATED I-JOISTS	BC 1704.6.3	BC 1705.5.3
WOOD - SEISMIC RESISTANCE	N/A	BC 1705.5.5
CONSTRUCTION UTILIZING CLT OR SCL, TYPE IV	N/A	BC 1705.5.6
SUBGRADE INSPECTION	BC 1704.7.1	BC 1705.6
SUBSURFACE CONDITIONS - FILL PLACEMENT & IN-PLACE DENSITY	BC 1704.7.2 / 3	BC 1705.6
SUBSURFACE INVESTIGATIONS (BORINGS / TEST PITS)	BC 1704.7.4	BC 1705.6
DEEP FOUNDATION ELEMENTS	BC 1704.7.8	BC 1705.7
PRESTRESSED ROCK AND SOIL ANCHORS...	N/A	BC 1705.8.1
HELICAL PILES (BB # 2014-020)	BC 1704.8.5	BC 1705.9
VERTICAL MASONRY FOUNDATION ELEMENTS	BC 1704.9	BC 1705.19
WALL PANELS, CURTAIN WALLS, AND VENEERS	BC 1704.10	BC 1705.20
DESIGNATED SEISMIC SYSTEM	N/A	BC 1705.12.1
SEISMIC RESISTANCE OF ACCESS FLOORS	N/A	BC 1705.12.2
SEISMIC RESISTANCE OF PLUMBING, MECHANICAL, FUEL GAS & ELECTRICAL COMPONENTS	N/A	BC 1705.12.3
SEISMIC RESISTANCE OF STORAGE RACKS	N/A	BC 1705.12.4
SPRAYED FIRE-RESISTANT MATERIALS	BC 1704.11	BC 1705.14
MASTIC AND INTUMESCENT FIRE-RESISTANT COATINGS	BC 1704.12	BC 1705.15
EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS)	BC 1704.13	DELETED
ALTERNATIVE MATERIALS - OTCR BUILDINGS BULLETIN # _________	BC 1704.14	BC 1705.1.1
COMBUSTIBLE EXTERIOR WALL COVERINGS	N/A	BC 1705.16
SMOKE CONTROL SYSTEMS TESTING	BC 1704.15	BC 1705.18
MECHANICAL SYSTEMS	BC 1704.16	BC 1705.21
FUEL-OIL STORAGE AND FUEL-OIL PIPING SYSTEMS	BC 1704.17	BC 1705.22
HIGH-PRESSURE STEAM PIPING (WELDING)	BC 1704.18	BC 1705.23
HIGH TEMPERATURE HOT WATER PIPING (WELDING)	BC 1704.18	BC 1705.23
HIGH-PRESSURE FUEL-GAS PIPING (WELDING)	BC 1704.19	BC 1705.24
STRUCTURAL STABILITY - ALTERATIONS OF EXISTING BUILDINGS	BC 1704.20.1	BC 1705.25.1
CONSTRUCTION OPERATIONS INFLUENCING ADJACENT STRUCTURES	N/A	BC 1705.25.2
EXCAVATIONS - SHEETING, SHORING, AND BRACING...	BC 1704.20.2	BC 1705.25.3
UNDERPINNING AND ALTERNATE METHODS OF SUPPORT OF BUILDINGS AND & BC1817 ADJACENT...	N/A	BC 1705.25.4
UNDERPINNING	BC 1704.20.3 & BC 1814	DELETED
MECHANICAL DEMOLITION	BC 1704.20.4	BC 1705.25.5.1
RAISING AND MOVING OF A BUILDING	BC 1704.20.5	BC 1705.25.6
TENANT PROTECTION PLAN COMPLIANCE	N/A	BC 1705.26
SOIL PERCOLATION TEST - PRIVATE ON-SITE STORM WATER DRAINAGE DISPOSAL SYSTEMS, AND DETENTION FACILITIES	BC 1704.21.1.2	BC 1705.27.1.2
PRIVATE ON-SITE STORM WATER DRAINAGE DISPOSAL SYSTEMS, AND DETENTION FACILITIES INSTALLATION	BC 1704.21.2	BC 1705.27.2
INDIVIDUAL ON-SITE PRIVATE SEWAGE DISPOSAL SYSTEMS INSTALLATION	BC 1704.22	BC 1705.28
SPRINKLER SYSTEMS	BC 1704.23	BC 1705.29
STANDPIPE SYSTEMS	BC 1704.24	BC 1705.30
HEATING SYSTEMS	BC 1704.25	BC 1705.31
CHIMNEYS AND VENTS	BC 1704.26	BC 1705.32
FIRE-RESISTANT PENETRATIONS AND JOINTS	BC 1704.27	BC 1705.17
ALUMINUM WELDING	BC 1704.28	BC 1705.33
FLOOD ZONE COMPLIANCE (ATTACH FEMA ELEVATION / DRY FLOODPROOFING CERTIFICATE WHERE APPLICABLE)	BC 1704.29 & BC G105	BC 1705.34 & BC G107.2
LUMINOUS EGRESS PATH MARKINGS	BC 1704.30 & BC 1024.8	BC 1705.35 & BC 10.25.8
EMERGENCY AND STANDBY POWER SYSTEMS (GENERATORS)	BC 1704.31	BC 1705.36
POST-INSTALLED ANCHORS (BB#2014-018, 2014-019)	BC 1704.32	BC 1705.37
NON POTABLE WATER SYSTEMS	N/A	BC 1705.38
EXHAUST AND VENT SYSTEMS IN PLENUMS AND DUCTS	N/A	BC 1705.39
SEISMIC ISOLATION SYSTEMS	BC 1707.8	BC 1705.12.5
CONCRETE DESIGN MIX	BC 1905.3 & BC 1913.5	BC 1905.3
CONCRETE SAMPLING AND TESTING	BC 1905.6 & BC 1913.10	BC 1905.6
Progress Inspection Categories	**Code Section**	
PRELIMINARY	28-116.2.1 & BC 110.2	28-116.2.1 & BC 110.2
FOOTING AND FOUNDATION	BC 110.3.1	BC 110.3.1
LOWEST FLOOR ELEVATION	BC 110.3.2	BC 110.3.2
STRUCTURAL WOOD FRAME	BC 110.3.3	BC 110.3.3
FIRE-RESISTANCE RATED CONSTRUCTION	BC 110.3.4	BC 110.3.5
ENERGY CODE COMPLIANCE INSPECTIONS (TR8)	BC 110.3.5	BC 110.3.4
PUBLIC ASSEMBLY EMERGENCY LIGHTING	28-116.2.2	28-116.2.2
FINAL (TR1)	28-116.2.4.2 & BC 110.5	28-114 / 116 & BC 110.5

TR-8 ENERGY CODE PROGRESS INSPECTIONS

The conditional* TR8s listed below are conditional only if the job type is New Building or Alteration-CO New Building with Existing Elements to Remain, except HVAC TR8s that apply to all job types.

Progress Inspections	Table Reference in 1RCNY §5000-01(h) (1)and (2)	Work Type(s)
Air sealing and insulation — testing	(IA7), (IIA7)	GC* (Residential)
Air barrier — visual inspection	(IA6), (IIA6)	AN, SG, GC*, SL**, GR**
Air barrier continuity plan testing	(IIA8)	GC
Electrical motors	(IIC7), (IIC6)	GC, MS
Exterior lighting power	(IIC4)	SG, GC, MS
Fenestration air leakage	(IA4), (IIA4)	GC*
Fenestration and door U-factor and product ratings	(IA3), (IIA3)	GC*
Fenestration areas	(IA5), (IIA5)	GC*
Fireplaces	(IB1), (IIB1)	GC, MS
HVAC-R and service water piping design and insulation	(IB5), (IIB5)	PL, GC, MS, BE*
Insulation placement and R values	(IA2), (IIA2)	SG, GC*, FO, GR
Interior lighting power	(IC2), (IIC3)	GC, MS
Lighting controls	(IIC5)	SG, GC, MS
Lighting in dwelling units	(IIC2)	GC, MS
Maintenance information	(ID1), (IID1)	PL, GC, MS, BE, SL, GR**
Metering	(IC1), (IIC1)	PL, GC, MS
Permanent certificate	(ID2)	PL, GC* (Residential), MS, BE
Protection of exposed foundation insulation	(IA1), (IIA1)	GC, FO
Solar Ready Requirements	(ID3)	GC
Ventilation and air distribution system	(IB2)	MS* (Residential), GC
Vestibules	(IIA9)	GC

FIRE-RESISTANCE-RATED CONSTRUCTION

1. FIRE WALLS, FLOORS, BARRIERS, PARTITIONS, AND SHAFT ENCLOSURES SHALL COMPLY WITH PROVISIONS OF CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODEAND SHALL BE CONTINUOUS THROUGH ANY CONCEALED SPACE IN FLOOR OR ROOF CONSTRUCTION, UNLESS OTHERWISE EXEMPTED BY BC.
2. OPENINGS IN FIRE WALLS, FLOORS, BARRIERS, PARTITIONS, AND SHAFT ENCLOSURES TO COMPLY WITH CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODE.
3. PENETRATIONS IN FIRE WALLS, FLOORS, BARRIERS, PARTITIONS, AND SHAFT ENCLOSURES FOR PIPE SLEEVES, ELECTRIC DEVICES, ETC., SHALL BE PROVIDED WITH UL APPROVED FIRE SAFING MATERIALS TO MEET OR EXCEED THE FIRE RATING OF THE FIRE RATED CONDITION AND SHALL COMPLY WITH CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODE.
4. WHERE PIPES, WIRES, CONDUITS, DUCTS, ETC., PIERCE FIRE PROTECTION OF INDIVIDUALLY ENCASED STRUCTURAL MEMBERS, SUCH PENETRATION SHALL NOT EXCEED 2 PERCENT OF ANY ONE FACE SUCH PROTECTION AND SHALL BE CLOSED OFF WITH CLOSE FITTING METAL ESCUTCHEONS OR PLATES.
5. FIRE BLOCKING: CONCEALED SPACES WITHIN PARTITIONS, WALLS, FLOORS, ROOFS, STAIRS, FURRING PIPE SPACES, COLUMN ENCLOSURES, ETC., SHALL BE FIRE-BLOCKED AND DRAFT-STOPPED IN COMPLIANCE WITH CHAPTER 7 OF THE 2022 NEW YORK CITY BUILDING CODE(EXCEPT WHERE CONCEALED SPACE IS SPRINKLERED OR IS CONSTRUCTED AS A SHAFT).
6. CONDUITS IN FIRE-RATED PARTITIONS SHALL NOT EXCEED 3/4 INCH DIAMETER. OUTLETS IN FIRE RATED PARTITIONS SHALL BE BACKED UP WITH APPROVED MATERIALS TO MEET OR EXCEED THE REQUIRED FIRE RATING OF THE PARTITION.
7. SMOKE/FIRE DAMPERS OR DOORS SHALL BE PROVIDED WHERE DUCTS PENETRATE FIRE RATED WALLS OR CEILING.
8. GAS RISERS NOT PERMITTED WITHIN FIRE RATED WALLS.

NYC FIRE CODE 2022 SECTION 906 & NFPA 10 -FIRE PROTECTION EQUIPMENT

1. EXITS AND EXIT ACCESS DOORS SHALL BE MARKED BY AN APPROVED EXIT SIGN READILY VISIBLE FROM ANY DIRECTION OF EGRESS TRAVEL. THE PATH OF EGRESS TRAVEL TO EXITS AND WITHIN EXITS SHALL BE MARKED BY READILY VISIBLE EXIT SIGNS TO CLEARLY INDICATE THE DIRECTION OF EGRESS TRAVEL IN CASES WHERE THE EXIT OR THE PATH OF EGRESS TRAVEL IS NOT IMMEDIATELY VISIBLE TO THE OCCUPANTS.
2. EXIT SIGNS SHALL BE INTERNALLY LIGHTED, HAVING AN INITIAL BRIGHTNESS OF THE LETTERS OF AT LEAST 25 FOOT-LAMBERTS. LETTERS SHALL BE RED, THE BACKGROUND SHALL BE CLEAR OR WHITE. LETTERS SHALL BE BLOCK LETTERING, AT LEAST 8" HIGH WITH 3/4" STROKES. EXIT LIGHTING SHALL BE ON CIRCUITS THAT ARE SEPARATE FROM ANY OTHER CIRCUITS, TAKEN OFF AHEAD OF THE MAIN SWITCH.
3. EXIT DOORS SHALL BE READILY OPERABLE AT ALL TIMES FROM THE SIDE WHICH EGRESS IS TO BE MADE. DOORS MAY BE GIVEN A LOCKING FUNCTION IN THE DIRECTION OPPOSITE EGRESS TRAVEL TO PREVENT ACCESS FROM THE OUTDOORS AT STREET LEVEL.
4. PROVIDE EXIT SIGNS AND DIRECTION EXIT SIGNS WITH A MINIMUM 6" HIGH BY 3/4" STROKE BLOCK LETTERS ON A CONTRASTING BACKGROUND.
5. WHENEVER A SPACE IS OCCUPIED, EXIT SIGNS SHALL BE LIGHTED SO THEY ARE CLEARLY VISIBLE.
6. EXIT SIGNS SHALL BE ELECTRICALLY ILLUMINATED. TWO LAMPS SHALL BE ENERGIZED FROM SEPARATE CIRCUITS. ILLUMINATION SHALL NORMALLY BE PROVIDED BY THE PREMISES WIRING SYSTEM. IN THE EVENT OF FAILURE OF THIS SYSTEM, ILLUMINATION SHALL BE AUTOMATICALLY PROVIDED FROM AN EMERGENCY SYSTEM. EMERGENCY LIGHTING SHALL GIVE A VALUE OF ONE FOOT CANDLE AT FLOOR LEVEL. VERIFY IF ILLUMINATED SIGN ARE TO HAVE BATTERY BACKUP.
7. EXIT PATH LIGHTING SHALL BE PROVIDED FOR ANY STAIRWAY, HALLWAY, EXIT PASSAGEWAY OR EGRESS TO A PUBLIC WAY ANYTIME THE BUILDING IS OCCUPIED. EMERGENCY LIGHTING SHALL BE PROVIDED GIVING LIGHT VALUE OF ONE FOOT CANDLE AT THE FLOOR LEVEL.

FIRE DEPARTMENT NOTES

1. CONTRACTOR SHALL SUBMIT SPRINKLER PLANS AND OBTAIN APPROVAL PRIOR TO INSTALLATION.
2. CONTRACTOR SHALL SUBMIT FIRE ALARM PLANS AND OBTAIN APPROVAL PRIOR TO INSTALLATION.

SEISMIC STRUCTURAL SEPARATION CALCULATION

STRUCTURES SEPARATED FROM ADJACENT STRUCTURES:
AT LEAST 1" FOR EACH 50 FEET OF HEIGHT AND A MINIMUM OF 1".
PROPOSED BUILDING HEIGHT = 145.0'
NEW BUILDING STRUCTURE SEPARATION REQUIRED = 145.0'/50' = 2.9'
NEW BUILDING STRUCTURE SEPARATION PROPOSED = 3" > 2.9" (COMPLIES)

PROPOSED BUILDING SEISMIC EVALUATION

STRUCTURAL OCCUPANCY/RISK CATEGORY: II
SEISMIC DESIGN CATEGORY: B

GENERAL CODE COMPLIANCE NOTES

1. **CODE COMPLIANCE:** ALL WORK SHALL BE DONE AND PERFORMED ACCORDING TO THE RULES, REGULATIONS, AND REQUIREMENTS OF THE NYC BUILDING CODE.
2. **PROPERTY MAINTENANCE**: THE PROPERTY OWNER IS RESPONSIBLE FOR THE ONGOING SAFETY AND UPKEEP OF THE BUILDING AND ITS FACILITIES AS OUTLINED IN ARTICLES 301 THROUGH 304 OF THE NYC BUILDING CODE.
3. **NOTIFICATION**: PROVIDE WRITTEN NOTICE TO THE COMMISSIONER AT LEAST 24 BUT NO MORE THAN 48 HOURS BEFORE COMMENCING WORK (BC 3304.3.1). NOTIFY ADJOINING LOT OWNERS AFFECTED BY FOUNDATION, EARTHWORK, OR DEMOLITION WORK AT LEAST TEN DAYS PRIOR TO STARTING (BC 3304.3.2).
4. **LICENSED CONTRACTOR**: ALL CONSTRUCTION MUST BE PERFORMED BY A LICENSED CONTRACTOR. PERMITS MUST BE OBTAINED FROM THE APPROPRIATE NYC DEPARTMENT OF BUILDINGS BOROUGH OFFICE.
5. **INSURANCE AND PERMITS**: BEFORE STARTING WORK, THE CONTRACTOR MUST FILE ALL REQUIRED INSURANCE CERTIFICATES WITH THE DEPARTMENT OF BUILDINGS AND SECURE ALL NECESSARY PERMITS, LICENSES, AND FEES.
6. **WORK OVERSIGHT**: THE CONTRACTOR IS RESPONSIBLE FOR DIRECTING AND SUPERVISING THE CONSTRUCTION WORK, INCLUDING MANAGING METHODS, TECHNIQUES, SEQUENCES, AND COORDINATION AMONG TRADES.
7. **SITE FAMILIARIZATION**: THE CONTRACTOR MUST VISIT THE SITE TO ASSESS POTENTIAL CONSTRUCTION CHALLENGES.
8. **VERIFICATION OF CONDITIONS**: VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS ON-SITE BEFORE STARTING WORK. REPORT ANY DISCREPANCIES BETWEEN DRAWINGS AND ACTUAL CONDITIONS TO THE ARCHITECT.
9. **PUBLIC AND WORKER SAFETY**: ENSURE SAFETY FOR THE PUBLIC AND CONSTRUCTION WORKERS. PROVIDE BARRIERS, MAINTAIN CLEAR FIRE EXITS, AND BARRICADE ANY UNSAFE CONDITIONS.
10. **PROTECTION AND REPAIRS**: PROTECT EXISTING CONSTRUCTION AND EQUIPMENT. REPAIR OR REPLACE ANY DAMAGE CAUSED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.
11. **DEBRIS MANAGEMENT**: CLEAN UP CONSTRUCTION DEBRIS DAILY AND DISPOSE OF MATERIALS LEGALLY OFF-SITE. ON-SITE STORAGE OR BURIAL OF DEBRIS IS NOT PERMITTED.
12. **WORK LAYOUT**: LAYOUT WORK AND PROVIDE NECESSARY DIMENSIONS FOR OTHER TRADES (PLUMBING, ELECTRICAL, ETC.).
13. **SUBCONTRACTOR COMPLIANCE**: PLUMBING, ELECTRICAL, AND OTHER SUBCONTRACTOR WORK MUST BE PERFORMED BY LICENSED PROFESSIONALS AND MUST COMPLY WITH NYC CODES. SUBCONTRACTORS ARE RESPONSIBLE FOR ARRANGING INSPECTIONS AND OBTAINING SIGN-OFFS.
14. **DESIGN DEVIATIONS**: NO DEVIATIONS FROM DESIGN DRAWINGS ARE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE ARCHITECT.
15. **DIMENSIONAL ACCURACY**: CHECK AND VERIFY ALL DIMENSIONS, NOTES, AND WORK ON-SITE BEFORE STARTING. REPORT ANY DISCREPANCIES TO THE ARCHITECT AND RELY ONLY ON WRITTEN DIMENSIONS.
16. **UNSPECIFIED ITEMS**: IF DRAWINGS AND NOTES DO NOT ADDRESS SPECIFIC ITEMS, CONSULT THE GENERAL CONTRACTOR FOR GUIDANCE. INCLUDE A CONTINGENCY FACTOR TO ENSURE A COMPLETE SYSTEM IF NO CONSULTATION IS MADE.
17. **SITE REPAIRS**: REPAIR OR REPLACE ANY DAMAGED SIDEWALKS, CURBS, OR ROADWAYS AS DIRECTED BY RELEVANT NYC AGENCIES.
18. **PLAN APPROVAL**: ALL PLANS MUST BE REVIEWED, COMMENTED ON, AND APPROVED BY THE BUILDING DEPARTMENT AND OTHER CITY AGENCIES BEFORE CONSTRUCTION BEGINS.
19. **ARCHITECT'S ROLE**: THE ARCHITECT OF RECORD IS NOT RESPONSIBLE FOR SUPERVISING CONSTRUCTION. SITE VISITS AND REPORTS BY THE ARCHITECT ARE FOR PROGRESS DOCUMENTATION AND GENERAL CONTRACTOR USE ONLY.
20. **ADDITIONAL INSTRUCTIONS**: THE ARCHITECT MAY ISSUE FURTHER DRAWINGS, DETAILS, OR INSTRUCTIONS RELATED TO DESIGN VARIATIONS, OMISSIONS, OR SUBSTITUTIONS. THE CONTRACTOR MUST CORRECT ANY DEFECTS OR FAULTS AT THEIR OWN COST.
21. **CERTIFIED DRAWINGS**: ELEVATOR OPENINGS MUST BE CERTIFIED BY THE ELEVATOR SUBCONTRACTOR BEFORE FORMING. REQUIRED MODIFICATIONS MUST BE APPROVED BY THE ARCHITECT BEFORE PROCEEDING.
22. **CONSULTATION**: CONSULT THE ARCHITECT IF DIMENSIONS, DETAILS, OR DESIGN INTENT ARE UNCLEAR.
23. **COMPLIANCE**: ALL CONSTRUCTION MUST COMPLY WITH FEDERAL, STATE, AND LOCAL CODES, ORDINANCES, RULES, AND REGULATIONS REGARDING LABOR AND MATERIALS.
24. **CONTRACTOR ACCOUNTABILITY**: EACH CONTRACTOR IS RESPONSIBLE FOR THEIR WORK AND MUST REPORT DISCREPANCIES IN PLANS OR DETAILS TO THE ARCHITECT.
25. **MATERIAL STANDARDS**: MATERIALS, ASSEMBLIES, AND CONSTRUCTION METHODS MUST MEET NYC BUILDING CODE REQUIREMENTS.
26. **INSPECTION REPORTS**: MATERIALS AND METHODS REGULATED BY THE CODE BUT NOT LISTED MUST BE SUBJECT TO INSPECTION. SIGNED COPIES OF ALL TEST AND INSPECTION REPORTS MUST BE FILED THROUGH THE ARCHITECT WITH THE DEPARTMENT OF BUILDINGS.
27. **BORING DIAGRAM**: FILE A BORING DIAGRAM BEFORE STARTING CONSTRUCTION, AS PER BC 1802.
28. **PERMIT POSTING**: PERMITS MUST BE POSTED IN A VISIBLE LOCATION FOR PUBLIC INSPECTION THROUGHOUT THE DURATION OF THE WORK AND UNTIL THE PERMIT EXPIRES.
29. **FIRE FIGHTING EQUIPMENT**: PROVIDE FIRE FIGHTING EQUIPMENT AS REQUIRED BY THE FIRE DEPARTMENT.
30. **EXIT ACCESSIBILITY**: ENSURE ALL EXITS REMAIN ACCESSIBLE AND UNOBSTRUCTED, ARE INTERNALLY ILLUMINATED, AND ARE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
31. **EXIT ILLUMINATION**: MAINTAIN AT LEAST 2 FOOT CANDLES OF ILLUMINATION AT THE FLOOR LEVEL IN EXITS AT ALL TIMES.

SMOKE DETECTING DEVICES NOTES

1. **INSTALLATION STANDARDS**: SMOKE AND CARBON MONOXIDE DETECTORS MUST BE INSTALLED PER THE HOUSING MAINTENANCE CODE, MULTIPLE DWELLING LAW, NYC BUILDING CODE, AND NYC ELECTRICAL CODE.
2. **DETECTOR REQUIREMENTS**: EACH DWELLING UNIT MUST HAVE AN APPROVED CARBON MONOXIDE AND SMOKE DETECTOR DEVICE, POWERED DIRECTLY FROM THE BUILDING'S WIRING WITH NO SWITCHES IN THE CIRCUIT (BC 28-908.7.1.1).
3. **COMBINED DETECTORS**: COMBINED SMOKE AND CARBON MONOXIDE DETECTORS ARE ACCEPTABLE IF THEY MEET THE REQUIREMENTS OF THE ADMINISTRATIVE CODE AND APPLICABLE RULES.
4. **DETECTOR PLACEMENT**: INSTALL DETECTORS WITHIN 15 FEET OF SLEEPING ROOM ENTRANCES, WALL OR CEILING MOUNTED, AND INDICATED ON PLANS AS PER NFPA #78/80.
5. **MAINTENANCE AND TESTING**: MAINTAIN AND TEST CARBON MONOXIDE DETECTION SYSTEMS ACCORDING TO ARTICLE 103 OF CHAPTER 1 OF THE GENERAL ADMINISTRATIVE PROVISIONS OF THE 2014 NYC BC, INCLUDING SYSTEMS INTERCONNECTED WITH A FIRE ALARM OR MONITORED BY A CENTRAL STATION.

ACCESSIBILITY

BUILDINGS AND FACILITIES SHALL BE DESIGNED AND CONSTRUCTED TO BE ACCESSIBLE IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE 2022 NEW YORK CITY BUILDING CODE AND ICC/ANSI A117.1-2009 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES, UNIFORM FEDERAL ACCESSIBILITY STANDARDS FOR ACCESSIBLE DESIGN AND HUD FAIR HOUSING ACT PUBLISHED ON MARCH 6, 1991.

SAFETY DURING CONSTRUCTION

ALL CONSTRUCTION SHALL CONFORM TO THE RULES AND REGULATIONS OF THE 2022 NEW YORK CITY BUILDING CODE.

ENERGY NOTES

ALL BUILDING MECHANICAL, SERVICE WATER HEATING AND ELECTRICAL SYSTEMS AND ASSOCIATED CONTROLS SHALL BE COMMISSIONED, IN ACCORDANCE WITH SECTION C408 OF THE 2020 NYC ECC.

DATUM NOTE

UNLESS OTHERWISE NOTED, ELEVATIONS INDICATED IN THESE DRAWINGS REFER TO NAVD 88 DATUM

OTHER AGENCY REQUIREMENTS

GENERAL NOTES

1. THE BUILDING IS WITHIN 200 FT OF ANY FACILITY INFRASTRUCTURE OR PROPERTY UNDER THE JURISDICTION OF THE NEW YORK CITY TRANSIT AUTHORITY, THE METROPOLITAN TRANSPORTATION AUTHORITY OR THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY. THEREFORE, BC 3304.3.5 AND AC 28-104.10 ARE APPLICABLE.

GENERAL BUILDING DATA

ALL CONSTRUCTION SHALL CONFORM TO THE RULES AND REGULATIONS OF THE 2022 NEW YORK CITY BUILDING CODE.

ADDRESS:	99 EMPIRE BOULEVARD, 11225
BLOCK:	1306
TAX LOT(S):	28
ZONING LOT AREA:	38,119.00 SF
DEVELOPMENT SITE LOT AREA:	8,635.82 SF
ZONING DISTRICT:	C4-4D/R8A EQUIVALENT
ZONING MAP:	16d
NO. OF STORIES:	14 STORIES MIXED USE DEVELOPMENT (RESIDENTIAL & COMMERCIAL)
ZONING USE GROUPS:	II,VI
PRIMARY OCCUPANCY:	R-2 (MULTI-FAMILY RESIDENTIAL)
SECONDARY OCCUPANCY GROUP:	M (MERCANTILE)
PRIMARY STRUCTURAL SYSTEM:	CONCRETE (CIP)
CONSTRUCTION CLASS:	I-B
HIGH RISE BUILDING:	YES
SITE SAFETY PROJECT:	YES
FLOOD ZONE:	ZONE 'X'
LANDMARK:	NO

JOB DESCRIPTION & SCOPE OF WORK

CONSTRUCTION OF A NEW 14 STORY AFFORDABLE HOUSING BUILDING (MIH) WITH 99 UNITS, TYPE-1B CONSTRUCTION

APPLICABLE BUILDING CODE

CODE
2022 NEW YORK CITY BUILDING CODE
2022 NEW YORK CITY FIRE CODE
2022 NEW YORK CITY PLUMBING CODE
2022 NEW YORK CITY MECHANICAL CODE
2022 NEW YORK CITY FUEL GAS CODE
2022 NEW YORK CITY ENERGY CODE
2010 ADA STANDARDS
2011 NEW YORK CITY ELECTRICAL CODE
ANSI A117.1 - 2009
NYC HOUSING MAINTENANCE CODE
NYC MULTIPLE DWELLING LAW
NYC LOCAL LAW
NYC TITLE 1 RCNY
FAIR HOUSING ACT
ALL WORK IS TO COMPLY WITH CODES BELOW AND ITS APPLICBLE REFERNCE SUBCODES AND AMENDMENTS

SECTION BC 403 HIGH-RISE BUILDINGS

403.1 APPLICABILITY
HIGH-RISE BUILDINGS SHALL COMPLY WITH SECTIONS 403.2 THROUGH 403.8.

EXCEPTION: THE PROVISIONS OF SECTIONS 403.2 THROUGH 403.8 SHALL NOT APPLY TO THE FOLLOWING BUILDINGS AND STRUCTURES:

1. AIR TRAFFIC CONTROL TOWERS IN ACCORDANCE WITH SECTION 412.3.
2. BUILDINGS OCCUPIED ENTIRELY BY GROUP R-3 CLASSIFICATION.
3. OPEN PARKING GARAGES IN ACCORDANCE WITH SECTION 406.5.
4. THE PORTION OF A BUILDING CONTAINING A GROUP A-5 OCCUPANCY IN ACCORDANCE WITH SECTION 303.6.
5. SPECIAL INDUSTRIAL OCCUPANCIES IN ACCORDANCE WITH SECTION 503.1.1.
6. BUILDINGS WITH:
   6.1. A GROUP H-1 OCCUPANCY;
   6.2. A GROUP H-2 OCCUPANCY IN ACCORDANCE WITH SECTION 415.8, 415.9.2, 415.9.3 OR 426.1; OR
   6.3. A GROUP H-3 OCCUPANCY IN ACCORDANCE WITH SECTION 415.8.

403.2 CONSTRUCTION
THE CONSTRUCTION OF HIGH-RISE BUILDINGS SHALL COMPLY WITH THE PROVISIONS OF SECTIONS 403.2.1 THROUGH 403.2.4.

403.2.1 TYPES OF CONSTRUCTION
THE FOLLOWING MODIFICATIONS TO THE MINIMUM FIRE-RESISTANCE RATING OF THE BUILDING ELEMENTS IN TABLE 601 SHALL BE AS FOLLOWS:

1. HIGH RISE BUILDINGS 420 FEET (128 M) OR GREATER IN BUILDING HEIGHT SHALL BE CONSTRUCTED OF TYPE IA CONSTRUCTION.

2. FOR HIGH RISE BUILDINGS NOT GREATER THAN 420 FEET (128 M) IN BUILDING HEIGHT, AND CONSTRUCTED TO MEET THE FIRE-RESISTANCE RATING REQUIREMENTS OF TYPE IB OR IIA CONSTRUCTION, THE REQUIRED FIRE-RESISTANCE RATING OF COLUMNS SUPPORTING FLOORS SHALL BE CONSTRUCTED TO MEET TYPE IA CONSTRUCTION.

403.2.2 SEISMIC CONSIDERATIONS
FOR SEISMIC CONSIDERATIONS, SEE CHAPTER 16.

403.2.3 STRUCTURAL INTEGRITY OF INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES
FOR ALL HIGH-RISE BUILDINGS, EXIT ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES SHALL COMPLY WITH SECTIONS 403.2.3.1 THROUGH 403.2.3.4.

EXCEPTION: WHERE FIRE-RESISTANCE RATING IS NOT REQUIRED BY THIS CODE FOR THE ENCLOSURE OR PORTIONS THEREOF.

403.2.3.1 WALL ASSEMBLY
THE WALL ASSEMBLIES MAKING UP THE ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES SHALL MEET OR EXCEED SOFT BODY IMPACT CLASSIFICATION LEVEL 2 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

403.2.3.2 WALL ASSEMBLY MATERIALS
THE FACE OF THE WALL ASSEMBLIES MAKING UP THE ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND ELEVATOR HOISTWAY ENCLOSURES THAT ARE NOT EXPOSED TO THE INTERIOR OF THE ENCLOSURES FOR INTERIOR EXIT STAIRWAYS OR ELEVATOR HOISTWAY ENCLOSURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH ONE OF THE FOLLOWING METHODS:

1. THE WALL ASSEMBLY SHALL INCORPORATE NO FEWER THAN TWO LAYERS OF IMPACT-RESISTANT CONSTRUCTION BOARD EACH OF WHICH MEETS OR EXCEEDS HARD BODY IMPACT CLASSIFICATION LEVEL 2 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

2. THE WALL ASSEMBLY SHALL INCORPORATE NO FEWER THAN ONE LAYER OF IMPACT-RESISTANT CONSTRUCTION MATERIAL THAT MEETS OR EXCEEDS HARD BODY IMPACT CLASSIFICATION LEVEL 3 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

3. THE WALL ASSEMBLY INCORPORATES MULTIPLE LAYERS OF ANY MATERIAL, TESTED IN TANDEM, THAT MEETS OR EXCEEDS HARD BODY IMPACT CLASSIFICATION LEVEL 3 AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M.

403.2.3.3 CONCRETE AND MASONRY WALLS
CONCRETE OR MASONRY WALLS SHALL BE DEEMED TO SATISFY THE REQUIREMENTS OF SECTIONS 403.2.3.1 AND 403.2.3.2.

403.2.3.4 OTHER WALL ASSEMBLIES
ANY OTHER WALL ASSEMBLY THAT PROVIDES IMPACT RESISTANCE EQUIVALENT TO THAT REQUIRED BY SECTIONS 403.2.3.1 AND 403.2.3.2 FOR HARD BODY IMPACT CLASSIFICATION LEVEL 3, AS MEASURED BY THE TEST METHOD DESCRIBED IN ASTM C 1629/C 1629M, SHALL BE PERMITTED.

403.2.4 SPRAYED FIRE-RESISTANT MATERIALS (SFRM)
THE BOND STRENGTH OF THE SFRM INSTALLED THROUGHOUT THE BUILDING SHALL BE IN ACCORDANCE WITH TABLE 403.2.4.

UP TO 420 FEET - 430 PSF
GREATER THAN 420 FEET - 1,000 PSF

FOR SI: 1 FOOT = 304.8 MM, 1 POUND PER SQUARE FOOT (PSF) = 0.0479 KW/M2.
A. ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS.

403.3 AUTOMATIC SPRINKLER SYSTEM
BUILDINGS AND STRUCTURES SHALL BE EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 AND A SECONDARY WATER SUPPLY WHERE REQUIRED BY SECTION 403.3.3.

403.3.1 NUMBER OF SPRINKLER RISERS AND SYSTEM DESIGN
EACH SPRINKLER SYSTEM ZONE IN BUILDINGS THAT ARE MORE THAN 300 FEET (91 440 MM) IN BUILDING HEIGHT SHALL BE SUPPLIED BY NO FEWER THAN TWO RISERS. EACH RISER SHALL SUPPLY SPRINKLERS ON ALTERNATE FLOORS. IF MORE THAN TWO RISERS ARE PROVIDED FOR A ZONE, SPRINKLERS ON ADJACENT FLOORS SHALL NOT BE SUPPLIED FROM THE SAME RISER.

403.3.1.1 RISER LOCATION
SPRINKLER RISERS SHALL BE PLACED IN INTERIOR EXIT STAIRWAYS AND RAMPS THAT ARE REMOTELY LOCATED IN ACCORDANCE WITH SECTION 1007.1.

403.3.2 WATER SUPPLY TO REQUIRED FIRE PUMPS
REQUIRED FIRE PUMPS SHALL BE PROVIDED WITH WATER SUPPLIES IN ACCORDANCE WITH SECTION 905.2 AND NFPA 14 AS MODIFIED BY APPENDIX Q OF THIS CODE.

403.3.3 SECONDARY ON-SITE WATER SUPPLY
A SECONDARY ON-SITE WATER SUPPLY EQUAL TO THE HYDRAULICALLY CALCULATED SPRINKLER DEMAND, INCLUDING THE HOSE STREAM REQUIREMENT, SHALL BE PROVIDED FOR HIGH-RISE BUILDINGS IN SEISMIC DESIGN CATEGORY C OR D AS DETERMINED BY THIS CODE, AND IN ANY HIGH-RISE BUILDING WITH OCCUPIED FLOORS LOCATED MORE THAN 500 FEET (152 M) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS. THE SECONDARY ON-SITE WATER SUPPLY SHALL HAVE A DURATION OF NOT LESS THAN 30 MINUTES AS DETERMINED BY THE OCCUPANCY HAZARD CLASSIFICATION IN ACCORDANCE WITH NFPA 13 AS MODIFIED BY APPENDIX Q OF THIS CODE.

403.3.4 FIRE PUMP ROOM
FIRE PUMPS SHALL BE LOCATED IN ROOMS PROTECTED IN ACCORDANCE WITH SECTION 913.2.1.

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CLIENT:
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Structure Engineer:
STRUCTURAL ENGINEERING TECHONOLOGIES P.C
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Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROJECT SUMMARY & BUILDING CODE COMPLIANCE

G-001D.00

Scale:	12" = 1'-0"
Date:	12/1/2025 7:34:23 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

MEANS OF EGRESS

SECTION BC 1003 GENERAL MEANS OF EGRESS

1003.1 APPLICABILITY
THE GENERAL REQUIREMENTS SPECIFIED IN SECTIONS 1003 THROUGH 1015 SHALL APPLY TO ALL THREE ELEMENTS OF THE MEANS OF EGRESS SYSTEM, IN ADDITION TO THOSE SPECIFIC REQUIREMENTS FOR THE EXIT ACCESS, THE EXIT AND THE EXIT DISCHARGE DETAILED ELSEWHERE IN THIS CHAPTER.

1003.2 CEILING HEIGHT
THE MEANS OF EGRESS SHALL HAVE A CEILING HEIGHT OF NOT LESS THAN 7 FEET, 6 INCHES (2286 MM).
EXCEPTIONS:
1. CEILINGS THAT ARE PERMITTED TO BE LESS THAN 7 FEET, 6 INCHES (2286 MM) IN ACCORDANCE WITH SECTION 1208.2.
2. CEILINGS OF DWELLING UNITS AND SLEEPING UNITS WITHIN RESIDENTIAL OCCUPANCIES IN ACCORDANCE WITH SECTION 1208.2.
3. ALLOWABLE PROJECTIONS IN ACCORDANCE WITH SECTION 1003.3.
4. STAIR HEADROOM IN ACCORDANCE WITH SECTION 1011.3.
5. DOOR HEIGHT IN ACCORDANCE WITH SECTION 1010.1.3.
6. RAMP HEADROOM IN ACCORDANCE WITH SECTION 1012.5.2.
7. THE CLEAR HEIGHT OF FLOOR LEVELS IN VEHICULAR AND PEDESTRIAN TRAFFIC AREAS OF PUBLIC AND PRIVATE PARKING GARAGES IN ACCORDANCE WITH SECTION 406.4.1.
8. AREAS ABOVE AND BELOW MEZZANINE FLOORS IN ACCORDANCE WITH SECTION 505.2.

1003.3 PROTRUDING OBJECTS
PROTRUDING OBJECTS ON CIRCULATION PATHS SHALL COMPLY WITH THE REQUIREMENTS OF SECTIONS 1003.3.1 THROUGH 1003.3.4.

1003.3.3 HORIZONTAL PROJECTIONS
EXCEPTION: HANDRAILS ARE PERMITTED TO PROTRUDE 41/2 INCHES (114.3 MM) FROM THE WALL.

1003.4 FLOOR SURFACE
WALKING SURFACES OF THE MEANS OF EGRESS SHALL HAVE A SLIP-RESISTANT SURFACE AND BE SECURELY ATTACHED.

1003.5 ELEVATION CHANGE
WHERE CHANGES IN ELEVATION OF LESS THAN 12 INCHES (304.8 MM) EXIST IN THE MEANS OF EGRESS, SLOPED SURFACES SHALL BE USED. WHERE THE SLOPE IS GREATER THAN ONE UNIT VERTICAL IN 20 UNITS HORIZONTAL (5-PERCENT SLOPE), RAMPS COMPLYING WITH SECTION 1012 SHALL BE USED. WHERE THE DIFFERENCE IN ELEVATION IS 6 INCHES (152.4 MM) OR LESS, THE RAMP SHALL BE EQUIPPED WITH HANDRAILS OR FLOOR FINISH MATERIALS THAT CONTRAST WITH ADJACENT FLOOR FINISH MATERIALS.
EXCEPTIONS: AT LOCATIONS THAT ARE NOT REQUIRED TO BE ACCESSIBLE BY CHAPTER 11:
1. A SINGLE STEP WITH A MAXIMUM RISER HEIGHT OF 7 INCHES (177.8 MM) IS PERMITTED FOR BUILDINGS WITH OCCUPANCIES IN GROUPS F, H, R-2, R-3, S AND U AT EXTERIOR DOORS.
2. A STEP WITH A SINGLE RISER OR A STAIR WITH TWO RISERS AND A TREAD IS PERMITTED WHERE THE RISERS AND TREADS COMPLY WITH SECTION 1011.5, THE MINIMUM DEPTH OF THE TREAD IS 13 INCHES (330 MM) AND NOT LESS THAN ONE HANDRAIL COMPLYING WITH SECTION 1014 IS PROVIDED WITHIN 30 INCHES (762 MM) OF THE CENTERLINE OF THE NORMAL PATH OF EGRESS TRAVEL ON THE STEP OR STAIR.
3. A STEP IS PERMITTED IN AISLES SERVING SEATING THAT HAS A DIFFERENCE IN ELEVATION LESS THAN 12 INCHES (304.8 MM) PROVIDED THAT THE RISERS AND TREADS COMPLY WITH SECTION 1029.13 AND THE AISLE IS PROVIDED WITH A HANDRAIL COMPLYING WITH SECTION 1029.15.
4. THROUGHOUT A STORY IN A GROUP I-2 OCCUPANCY, ANY CHANGE IN ELEVATION IN PORTIONS OF THE MEANS OF EGRESS THAT SERVE NONAMBULATORY PERSONS SHALL BE BY MEANS OF A RAMP OR SLOPED WALKWAY.

1003.6 MEANS OF EGRESS CONTINUITY
THE PATH OF EGRESS TRAVEL ALONG A MEANS OF EGRESS SHALL NOT BE INTERRUPTED BY A BUILDING ELEMENT OTHER THAN A MEANS OF EGRESS COMPONENT AS SPECIFIED IN THIS CHAPTER. OBSTRUCTIONS SHALL NOT BE PLACED IN THE MINIMUM WIDTH OR REQUIRED CAPACITY OF A MEANS OF EGRESS COMPONENT EXCEPT PROJECTIONS PERMITTED BY THIS CHAPTER. THE MINIMUM WIDTH OR REQUIRED CAPACITY OF A MEANS OF EGRESS SYSTEM SHALL NOT BE DIMINISHED ALONG THE PATH OF EGRESS TRAVEL.

1003.7 ELEVATORS, ESCALATORS AND MOVING WALKS
ELEVATORS, ESCALATORS AND MOVING WALKS SHALL NOT BE USED AS A COMPONENT OF A REQUIRED MEANS OF EGRESS FROM ANY OTHER PART OF THE BUILDING.

SECTION BC 1004 OCCUPANT LOAD

1004.1 DESIGN OCCUPANT LOAD
IN DETERMINING MEANS OF EGRESS REQUIREMENTS, THE NUMBER OF OCCUPANTS FOR WHOM MEANS OF EGRESS FACILITIES SHALL BE PROVIDED SHALL BE ESTABLISHED BY THE LARGEST NUMBER COMPUTED IN ACCORDANCE WITH SECTION 1004.1.3, UNLESS OTHERWISE PERMITTED BY SECTION 1004.1.3.1, 1004.1.3.2 OR 1004.2.

TABLE 1004.1.3 MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR
ACCESSORY STORAGE AREAS, MECHANICAL EQUIPMENT ROOM	300 GROSS
AGRICULTURAL BUILDING	300 GROSS
AIRCRAFT HANGARS	500 GROSS
ASSEMBLY	
GAMING FLOORS (KENO, SLOTS, ETC.)	11 GROSS
EXHIBIT GALLERY AND MUSEUM	30 NET
ASSEMBLY WITH FIXED SEATS	SEE SECTION 1004.3
ASSEMBLY WITHOUT FIXED SEATS	
CONCENTRATED (CHAIRS ONLY—NOT FIXED)	7 NET
DANCE FLOOR	5 NET
DANCE FLOOR (BALLROOM)	10 NET
STANDING SPACE	5 NET
UNCONCENTRATED (TABLES AND CHAIRS)	15 NET
BOWLING CENTERS, ALLOW 5 PERSONS FOR EACH LANE INCLUDING 15 FEET OF RUNWAY, AND FOR ADDITIONAL AREAS	7 NET
BUSINESS AREAS, INCLUDING ACCESSORY AREAS ON TERRACES AND ROOFTOPS	100 GROSSb, d
COURTROOMS — OTHER THAN FIXED SEATING AREAS	40 NET
DAY CARE:	
AGE UNDER 6 MONTHS	50 NET
AGE 6 MONTHS — 2 YEARS	40 NET
AGE 2 YEARS — 6 YEARS	30 NET
AGE ABOVE 6 YEARS	50 NET
DORMITORIES	50 GROSS
EDUCATIONAL	
CLASSROOM AREA	20 NET
SHOPS AND OTHER VOCATIONAL ROOM AREAS	50 NET
KINDERGARTEN, AND PRE-KINDERGARTEN	30 NET
EXERCISE ROOMS	50 GROSS
GYMNASIUMS	15 NET
GROUP H-5 FABRICATION AND MANUFACTURING AREAS	200 GROSS
INDUSTRIAL AREAS	100 GROSS
INSTITUTIONAL AREAS	
INPATIENT TREATMENT AREAS	240 GROSS
OUTPATIENT AREAS	100 GROSS
SLEEPING AREAS	120 GROSS
KITCHENS, COMMERCIAL	200 GROSS
LIBRARY	
READING ROOMS	50 NET
STACK AREA	100 GROSS
LOCKER ROOMS	50 GROSS
MALL BUILDINGS - COVERED AND OPEN	SEE SECTION 402.8.2
MERCANTILE	
AREAS ON OTHER FLOORS	60 GROSS
BASEMENT AND GRADE FLOOR AREAS	30 GROSS
STORAGE, STOCK, SHIPPING AREAS	300 GROSS
PARKING GARAGES	200 GROSS
PASSENGER TERMINAL	
BAGGAGE CLAIM	20 GROSS
BAGGAGE HANDLING	300 GROSS
CONCOURSE	100 GROSS
PASSENGER TERMINAL OR PLATFORM	1.5 X C*
WAITING AREA (STANDING)	15 GROSS
WAITING AREAS (SEATED)	5 NET
RESIDENTIAL	
WITHIN DWELLING UNITS	200 GROSS
ROOFTOP AND TERRACE ACCESSORY TO GROUPS R-2 AND R-3	200 GROSSb, c, d
INDOOR RESIDENTIAL AMENITY SPACES ACCESSORY TO GROUP R-2 (CONCENTRATED)	15 NET
INDOOR RESIDENTIAL AMENITY SPACES ACCESSORY TO GROUP R-2 (UNCONCENTRATED)	50 NET
SKATING RINKS, SWIMMING POOLS	
RINK AND POOL	50 GROSS
DECKS	15 GROSS
STAGES AND PLATFORMS	15 NET FOR PERFORMING AREA AND 50 NET REMAINING AREA
WAREHOUSES	500 GROSS

Assembly Code

C*-CAPACITY OF ALL PASSENGER VEHICLES THAT CAN BE UNLOADED SIMULTANEOUSLY.
FOR SI: 1 SQUARE FOOT = 0.0929 M2, 1 FOOT = 304.8 MM.*

a. FLOOR AREA IN SQUARE FEET PER OCCUPANT.
b. FOR THE PURPOSES OF OCCUPANT LOAD CALCULATION, PERMANENT FIXTURES AND AMENITIES SUCH AS SHRUBS, DECORATIVE POOLS, NON-WALKABLE PAVING SURFACES, ETC. MAY BE DEDUCTED FROM THE TOTAL FLOOR AREA.
c. A ROOFTOP OR TERRACE IN GROUP R-2 OR R-3 OCCUPANCIES THAT IS PROVIDED FOR THE INCIDENTAL, RECREATIONAL USE BY THE RESIDENTIAL TENANTS RESIDING IN THE SAME RESIDENTIAL BUILDING.
d. WHERE THE MAXIMUM OCCUPANT LOAD OF THE ROOFTOP OR TERRACE EXCEEDS 74 PERSONS BASED ON OCCUPANT LOAD CALCULATIONS, A PLACE OF ASSEMBLY CERTIFICATE OF OPERATION IS REQUIRED PURSUANT TO SECTION 28-117.1 OF THE ADMINISTRATIVE CODE AND ITEM 1 OF SECTION 303.7 OF THIS CODE.
e. TO BE USED ONLY WHEN THE OCCUPANT LOAD FOR THE FUNCTION OF THE SPACE IS NOT LISTED ELSEWHERE IN TABLE 1004.1.3.

SECTION BC 1005 MEANS OF EGRESS SIZING

1005.1 GENERAL
ALL PORTIONS OF THE MEANS OF EGRESS SYSTEM SHALL BE SIZED IN ACCORDANCE WITH THIS SECTION.
1005.2 MINIMUM WIDTH BASED ON COMPONENT
THE MINIMUM WIDTH, IN INCHES (MM), OF ANY MEANS OF EGRESS COMPONENTS SHALL BE NOT LESS THAN THAT SPECIFIED FOR SUCH COMPONENT, ELSEWHERE IN THIS CODE.
1005.3 REQUIRED CAPACITY BASED ON OCCUPANT LOAD
THE REQUIRED CAPACITY, IN INCHES (MM), OF THE MEANS OF EGRESS FOR ANY ROOM, AREA, SPACE OR STORY SHALL BE NOT LESS THAN THAT DETERMINED IN ACCORDANCE WITH SECTIONS 1005.3.1 AND 1005.3.2.
1005.3.1 STAIRWAYS
THE CAPACITY, IN INCHES, OF MEANS OF EGRESS STAIRWAYS SHALL BE CALCULATED BY MULTIPLYING THE OCCUPANT LOAD SERVED BY SUCH STAIRWAYS BY A MEANS OF EGRESS CAPACITY FACTOR OF 0.3 INCH (7.6 MM) PER OCCUPANT. WHERE STAIRWAYS SERVE MORE THAN ONE STORY, ONLY THE OCCUPANT LOAD OF EACH STORY CONSIDERED INDIVIDUALLY SHALL BE USED IN CALCULATING THE REQUIRED CAPACITY OF THE STAIRWAYS SERVING THAT STORY.
EXCEPTIONS:
1. FACILITIES WITH SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO USE THE CAPACITY FACTORS IN TABLE 1029.6.2 INDICATED FOR STEPPED AISLES FOR EXIT ACCESS OR EXIT STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS PROVIDED WITH A SMOKE CONTROL SYSTEM COMPLYING WITH SECTION 909.
2. FACILITIES WITH OUTDOOR SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO THE CAPACITY FACTORS IN SECTION 1029.6.3 INDICATED FOR STEPPED AISLES FOR EXIT ACCESS OR EXIT STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS OPEN TO THE OUTDOORS.
1005.3.2 OTHER EGRESS COMPONENTS
THE CAPACITY, IN INCHES, OF MEANS OF EGRESS COMPONENTS OTHER THAN STAIRWAYS SHALL BE CALCULATED BY MULTIPLYING THE OCCUPANT LOAD SERVED BY SUCH COMPONENT BY A MEANS OF EGRESS CAPACITY FACTOR OF 0.2 INCH (5.1 MM) PER OCCUPANT.
EXCEPTIONS:
1. FACILITIES WITH SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO USE THE CAPACITY FACTORS IN TABLE 1029.6.2 INDICATED FOR LEVEL OR RAMPED AISLES FOR MEANS OF EGRESS COMPONENTS OTHER THAN STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS PROVIDED WITH A SMOKE CONTROL SYSTEM COMPLYING WITH SECTION 909.
2. FACILITIES WITH OUTDOOR SMOKE-PROTECTED ASSEMBLY SEATING SHALL BE PERMITTED TO THE CAPACITY FACTORS IN SECTION 1029.6.3 INDICATED FOR LEVEL OR RAMPED AISLES FOR MEANS OF EGRESS COMPONENTS OTHER THAN STAIRWAYS WHERE THE ENTIRE PATH FOR MEANS OF EGRESS FROM THE SEATING TO THE EXIT DISCHARGE IS OPEN TO THE OUTDOORS.

1005.4 CONTINUITY
THE MINIMUM WIDTH OR REQUIRED CAPACITY OF THE MEANS OF EGRESS REQUIRED FROM ANY STORY OF A BUILDING SHALL NOT BE REDUCED ALONG THE PATH OF EGRESS TRAVEL UNTIL ARRIVAL AT THE PUBLIC WAY.

1005.5 DISTRIBUTION OF MINIMUM WIDTH AND REQUIRED CAPACITY
WHERE MORE THAN ONE EXIT, OR ACCESS TO MORE THAN ONE EXIT, IS REQUIRED, THE MEANS OF EGRESS SHALL BE CONFIGURED SUCH THAT THE LOSS OF ANY ONE EXIT, OR ACCESS TO ONE EXIT, SHALL NOT REDUCE THE AVAILABLE CAPACITY OR WIDTH TO LESS THAN 50 PERCENT OF THE REQUIRED CAPACITY OR WIDTH.

1005.6 EGRESS CONVERGENCE
WHERE THE MEANS OF EGRESS FROM STORIES ABOVE AND BELOW CONVERGE AT AN INTERMEDIATE LEVEL, THE CAPACITY OF THE MEANS OF EGRESS FROM THE POINT OF CONVERGENCE SHALL BE NOT LESS THAN THE LARGEST MINIMUM WIDTH OR THE SUM OF THE REQUIRED CAPACITIES FOR THE STAIRWAYS OR RAMPS SERVING THE TWO ADJACENT STORIES, WHICHEVER IS LARGER.

1005.7 ENCROACHMENT
ENCROACHMENTS INTO THE REQUIRED MEANS OF EGRESS WIDTH SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THIS SECTION.

1005.7.1 DOORS
DOORS, WHEN FULLY OPENED, SHALL NOT REDUCE THE REQUIRED WIDTH BY MORE THAN 7 INCHES (177.8 MM). DOORS IN ANY POSITION SHALL NOT REDUCE THE REQUIRED WIDTH BY MORE THAN ONE-HALF.
EXCEPTIONS:
1. SURFACE-MOUNTED LATCH RELEASE HARDWARE SHALL BE EXEMPT FROM INCLUSION IN THE 7-INCH (177.8 MM) MAXIMUM ENCROACHMENT WHERE BOTH OF THE FOLLOWING CONDITIONS EXIST:
   1. THE HARDWARE IS MOUNTED TO THE SIDE OF THE DOOR FACING AWAY FROM THE ADJACENT WALL WHERE THE DOOR IS IN THE OPEN POSITION.
   2. THE HARDWARE IS MOUNTED NOT LESS THAN 34 INCHES (865 MM) NOR MORE THAN 48 INCHES (1220 MM) ABOVE THE FINISHED FLOOR.
2. THE RESTRICTIONS ON DOOR SWING SHALL NOT APPLY TO DOORS WITHIN INDIVIDUAL DWELLING UNITS AND SLEEPING UNITS OF GROUP R-2 OCCUPANCIES AND WITHIN INDIVIDUAL DWELLING UNITS OF GROUP R-3 OCCUPANCIES.

1005.7.2 OTHER PROJECTIONS
HANDRAIL PROJECTIONS SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1014.8. OTHER NONSTRUCTURAL PROJECTIONS SUCH AS TRIM AND SIMILAR DECORATIVE FEATURES SHALL BE PERMITTED TO PROJECT INTO THE REQUIRED WIDTH NOT MORE THAN 11/2 INCHES (38.1 MM) ON EACH SIDE.
EXCEPTION: PROJECTIONS ARE PERMITTED IN CORRIDORS WITHIN GROUP I-2 IN ACCORDANCE WITH SECTION 407.4.3.

1005.7.3 PROTRUDING OBJECTS
PROTRUDING OBJECTS SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF SECTION 1003.3.

SECTION BC 1006 NUMBER OF EXITS AND EXIT ACCESS DOORWAYS

1006.2 EGRESS FROM SPACES
ROOMS, AREAS OR SPACES, INCLUDING MEZZANINES, WITHIN A STORY OR BASEMENT SHALL BE PROVIDED WITH THE NUMBER OF EXITS OR ACCESS TO EXITS IN ACCORDANCE WITH THIS SECTION.

SECTION BC 1006 NUMBER OF EXITS AND EXIT ACCESS DOORWAYS

1006.2 EGRESS FROM SPACES
ROOMS, AREAS OR SPACES, INCLUDING MEZZANINES, WITHIN A STORY OR BASEMENT SHALL BE PROVIDED WITH THE NUMBER OF EXITS OR ACCESS TO EXITS IN ACCORDANCE WITH THIS SECTION.

TABLE 1006.2.1 SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Sprinkler System (feet)		With Sprinkler System (feet)
		Occupant Load		
		OL ≤ 30	OL > 30	
Ac, Ef, M	74	76	75	75a
B	74	100	75	100a
F	49	75	75	100a
H-1, H-2, H-3	3	NP	NP	25b
H-4b, H-5b, I-1, I-3, I-4	10	NP	NP	75a
I-2d	See Section 407	NP	NP	75a
R-1	20	NP	NP	75a
R-2	20g	NP	NP	125a
S	29	100	75e	100a
U	74	100	75	75a

Assembly Code

FOR SI: 1 FOOT = 304.8 MM.
NP = NOT PERMITTED.

a. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2. SEE SECTION 903 FOR OCCUPANCIES WHERE AUTOMATIC SPRINKLER SYSTEMS ARE PERMITTED IN ACCORDANCE WITH SECTION 903.3.1.2.
b. GROUP H OCCUPANCIES EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.2.5.
c. FOR A ROOM OR SPACE USED FOR ASSEMBLY PURPOSES HAVING FIXED SEATING, SEE SECTION 1029.8.
d. FOR THE TRAVEL DISTANCE LIMITATIONS IN GROUP I-2, SEE SECTION 407.4.
e. THE LENGTH OF COMMON PATH OF EGRESS TRAVEL DISTANCE IN A GROUP S-2 OPEN PARKING GARAGE SHALL BE NOT MORE THAN 100 FEET (30 480 MM).
f. DAY CARE MAXIMUM OCCUPANT LOAD IS 10.
g. ROOMS, AREAS, OR SPACES THAT ARE ACCESSORY TO A GROUP R-2 OCCUPANCY MAY HAVE A MAXIMUM OCCUPANT LOAD OF 49.

1006.3.1 EGRESS BASED ON OCCUPANT LOAD
EACH STORY OR OCCUPIED ROOF DESIGNED FOR HUMAN OCCUPANCY OR USE SHALL HAVE THE MINIMUM NUMBER OF EXITS, OR ACCESS TO EXITS, AS SPECIFIED IN TABLE 1006.3.1. A SINGLE EXIT OR ACCESS TO A SINGLE EXIT SHALL BE PERMITTED IN ACCORDANCE WITH SECTION 1006.3.2. THE REQUIRED NUMBER OF EXITS, OR EXIT ACCESS STAIRWAYS OR RAMPS PROVIDING ACCESS TO EXITS, FROM ANY SUCH STORY OR OCCUPIED ROOF SHALL BE MAINTAINED UNTIL ARRIVAL AT THE EXIT DISCHARGE OR A PUBLIC WAY.

TABLE 1006.3.1
MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS PER STORY

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

Assembly Code

1006.3.2 SINGLE EXITS
A SINGLE EXIT OR ACCESS TO A SINGLE EXIT SHALL BE PERMITTED FROM ANY STORY OR OCCUPIED ROOF DESIGNED FOR HUMAN OCCUPANCY OR USE WHERE ONE OF THE FOLLOWING CONDITIONS EXISTS:
1. THE OCCUPANT LOAD, NUMBER OF DWELLING UNITS AND EXIT ACCESS TRAVEL DISTANCE DO NOT EXCEED THE VALUES IN TABLE 1006.3.2.
2. ROOMS, AREAS AND SPACES COMPLYING WITH SECTION 1006.2.1 WITH EXITS THAT DISCHARGE DIRECTLY TO THE EXTERIOR AT THE LEVEL OF EXIT DISCHARGE ARE PERMITTED TO HAVE ONE EXIT OR ACCESS TO A SINGLE EXIT.
3. OPEN OR ENCLOSED PARKING GARAGES WHERE VEHICLES ARE MECHANICALLY PARKED SHALL BE PERMITTED TO HAVE ONE EXIT PROVIDED SUCH EXIT SHALL NOT BE A VEHICLE RAMP.
4. GROUP R-3 OCCUPANCIES SHALL BE PERMITTED TO HAVE ONE EXIT OR ACCESS TO A SINGLE EXIT.
5. INDIVIDUAL SINGLE-STORY OR MULTISTORY DWELLING UNITS SHALL BE PERMITTED TO HAVE A SINGLE EXIT OR ACCESS TO A SINGLE EXIT FROM THE DWELLING UNIT PROVIDED THAT BOTH OF THE FOLLOWING CRITERIA ARE MET:
   1. THE DWELLING UNIT COMPLIES WITH SECTION 1006.2.1 AS A SPACE WITH ONE MEANS OF EGRESS.
   2. EITHER THE EXIT FROM THE DWELLING UNIT DISCHARGES DIRECTLY TO THE EXTERIOR AT THE LEVEL OF EXIT DISCHARGE, OR THE EXIT ACCESS OUTSIDE THE DWELLING UNIT'S ENTRANCE DOOR PROVIDES ACCESS TO NOT LESS THAN TWO APPROVED INDEPENDENT EXITS.
6. BUILDINGS OF OCCUPANCY GROUP R-2 WHERE ALL OF THE FOLLOWING CONDITIONS ARE MET:
   1. THE BUILDING DOES NOT EXCEED FOUR STORIES;
   2. THE BUILDING CONTAINS NOT MORE THAN THREE DWELLING UNITS PER STORY;
   3. THE BUILDING IS OF CONSTRUCTION TYPE I OR II;
   4. THE BUILDING DOES NOT EXCEED 2,500 SQUARE FEET (232.3 M2) PER STORY;
   5. EACH DWELLING UNIT HAS AT LEAST ONE WINDOW FACING THE STREET, OR FACING A LAWFUL YARD WITH OPEN, UNOBSTRUCTED, AND DIRECT ACCESS TO THE STREET. SUCH YARD OR DIRECT ACCESS SHALL BE A MINIMUM WIDTH EQUAL TO 25 PERCENT OF THE VERTICAL DISTANCE FROM THE WINDOWSILL OF THE HIGHEST OPERABLE WINDOW, FACING SUCH YARD OR DIRECT ACCESS, TO THE GRADE OF SUCH YARD OR DIRECT ACCESS DIRECTLY BELOW SUCH WINDOW, BUT SHALL IN NO CASE BE LESS THAN 36 INCHES (914.4 MM) WIDE;
   6. THE STAIRWAY EXTENDS TO THE ROOF SURFACE THROUGH A STAIRWAY BULKHEAD COMPLYING WITH SECTION 1509.2, PROVIDED THE ROOF HAS A SLOPE NOT STEEPER THAN 20 DEGREES (0.35 RAD), OR THE STAIRWAY IS CONSTRUCTED AGAINST THE STREET WALL, WITH ONE WINDOW FACING THE STREET AT EACH LANDING AND ACCESS TO THE ROOF IS PROVIDED VIA A SCUTTLE WITH A STATIONARY, NONCOMBUSTIBLE ACCESS LADDER;
   7. THE STAIRWAY IS ENCLOSED IN 2-HOUR FIRE-RATED WALLS WITH ALL EXIT DOORS LEADING INTO THE STAIRWAY HAVING AT LEAST 11/2-HOUR FIRE RATING; AND
   8. THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.2.
7. BUILDINGS OF OCCUPANCY GROUP R-2 OF CONSTRUCTION TYPE I OR II NOT EXCEEDING SIX STORIES AND NOT EXCEEDING 2,000 SQUARE FEET (185.8 M2) PER STORY.

TABLE 1006.3.2
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT

STORY	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER FLOOR	MAXIMUM TRAVEL DISTANCE (feet)
FIRST STORY ABOVE GRADE PLANE OR CELLAR	A, Bb, Ec, Fb, M, U, Sb	49	75
	H-2, H-3	3	25
	H-4, H-5, I, Re	10	75
	Sa	29	100
SECOND STORY ABOVE GRADE PLANE	B, F, M, Sa	29	75
	R-2d,e	NA	50
THIRD STORY ABOVE GRADE PLANE	R-2d,e	NA	50

Assembly Code

FOR SI: 1 FOOT = 304.8 MM.
NP = NOT PERMITTED.
NA = NOT APPLICABLE.

a. FOR THE REQUIRED NUMBER OF EXITS FOR OPEN OR ENCLOSED PARKING GARAGES, SEE SECTION 1006.3.2, ITEM 3.
b. GROUP B, F AND S OCCUPANCIES IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 SHALL HAVE A MAXIMUM TRAVEL DISTANCE OF 100 FEET.
c. DAY CARE OCCUPANCIES SHALL HAVE A MAXIMUM OCCUPANT LOAD OF 10.
d. MAXIMUM FOUR DWELLING UNITS PER FLOOR.
e. BUILDINGS CLASSIFIED AS OCCUPANCY GROUP R-2 EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2 AND PROVIDED WITH EMERGENCY ESCAPE AND RESCUE OPENINGS IN ACCORDANCE WITH SECTION 1030.
f. LIMITED TO THE CELLAR CLOSEST TO GRADE PLANE.

1006.3.2.1 MIXED OCCUPANCIES
WHERE ONE EXIT, OR EXIT ACCESS STAIRWAY OR RAMP PROVIDING ACCESS TO EXITS AT OTHER STORIES, IS PERMITTED TO SERVE INDIVIDUAL STORIES, MIXED OCCUPANCIES SHALL BE PERMITTED TO BE SERVED BY SINGLE EXITS PROVIDED EACH INDIVIDUAL OCCUPANCY COMPLIES WITH THE APPLICABLE REQUIREMENTS OF TABLE 1006.3.2 FOR THAT OCCUPANCY. WHERE APPLICABLE, CUMULATIVE OCCUPANT LOADS FROM ADJACENT OCCUPANCIES SHALL BE CONSIDERED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1004.1. IN EACH STORY OF A MIXED OCCUPANCY BUILDING, THE MAXIMUM NUMBER OF OCCUPANTS SERVED BY A SINGLE EXIT SHALL BE SUCH THAT THE SUM OF THE RATIOS OF THE CALCULATED NUMBER OF OCCUPANTS OF THE SPACE DIVIDED BY THE ALLOWABLE NUMBER OF OCCUPANTS INDICATED IN TABLE 1006.3.2 FOR EACH OCCUPANCY DOES NOT EXCEED ONE. WHERE DWELLING UNITS ARE LOCATED ON A STORY WITH OTHER OCCUPANCIES, THE ACTUAL NUMBER OF DWELLING UNITS DIVIDED BY FOUR PLUS THE RATIO FROM THE OTHER OCCUPANCY DOES NOT EXCEED ONE.

1006.4 OPEN OR ENCLOSED PARKING GARAGES
OPEN OR ENCLOSED PARKING GARAGES SHALL NOT HAVE LESS THAN TWO EXITS FROM EACH PARKING TIER. AN UNENCLOSED VEHICLE RAMP CONSTRUCTED IN ACCORDANCE WITH SECTION 1012.1 MAY SERVE AS ONE OF THE REQUIRED EXITS WHEN PROVIDED WITH PEDESTRIAN FACILITIES ALONG THE RAMP. SUCH RAMPS SERVING AS PART OF A NONASSESSABLE MEANS OF EGRESS IN OPEN OR ENCLOSED PARKING GARAGES THREE STORIES OR LESS IN HEIGHT AND SERVING NOT MORE THAN ONE LEVEL BELOW GRADE IS PERMITTED TO COMPLY WITH SECTION 1012.2, EXCEPTION 2.
EXCEPTION: ONE EXIT SHALL BE PERMITTED IN PARKING GARAGES COMPLYING WITH ITEM 3 OF SECTION 1006.3.2.

SECTION BC 1007 EXIT AND EXIT ACCESS DOORWAY CONFIGURATION

1007.1 GENERAL
EXITS, EXIT ACCESS DOORWAYS, AND EXIT ACCESS STAIRWAYS AND RAMPS SERVING SPACES, INCLUDING INDIVIDUAL BUILDING STORIES, SHALL BE SEPARATED IN ACCORDANCE WITH THE PROVISIONS OF THIS SECTION.

1007.1.1 TWO EXITS OR EXIT ACCESS DOORWAYS
ASSEMBLY
WHERE TWO EXITS, EXIT ACCESS DOORWAYS, EXIT ACCESS STAIRWAYS OR RAMPS, OR ANY COMBINATION THEREOF, ARE REQUIRED FROM ANY PORTION OF THE EXIT ACCESS, THEY SHALL BE PLACED A DISTANCE APART EQUAL TO NOT LESS THAN ONE-HALF OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE BUILDING OR AREA TO BE SERVED MEASURED IN A STRAIGHT LINE BETWEEN THEM. STAIRS SHARING ANY COMMON WALL, FLOOR, CEILING, SCISSOR STAIR ASSEMBLY, OR OTHER ENCLOSURE SHALL BE COUNTED AS ONE EXIT STAIRWAY.

EXCEPTIONS:
1. CORRIDOR MEASUREMENTS. WHERE INTERIOR EXIT STAIRWAYS OR RAMPS ARE INTERCONNECTED BY A 1-HOUR FIRE-RESISTANCE-RATED CORRIDOR CONFORMING TO THE REQUIREMENTS OF SECTION 1020, THE REQUIRED EXIT SEPARATION SHALL BE MEASURED ALONG THE SHORTEST DIRECT LINE OF TRAVEL WITHIN THE CORRIDOR.
2. REMOTE LOCATION IN SPRINKLERED BUILDINGS. WHERE A BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2, THE SEPARATION DISTANCE SHALL BE NOT LESS THAN ONE-THIRD OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE AREA SERVED.
3. GROUP R-2 OCCUPANCIES. IN GROUP R-2 OCCUPANCIES, WHERE STAIRS ARE ENCLOSED IN WALLS HAVING AT LEAST A 2-HOUR FIRE RESISTANCE RATING AND CONSTRUCTED OF MASONRY OR MASONRY EQUIVALENT IN ACCORDANCE WITH DEPARTMENT RULES:
   A. THE EXIT DOORS TO SUCH STAIRS SHALL BE PLACED A DISTANCE APART EQUAL TO NO LESS THAN 15 FEET (4572 MM); AND
   B. SUCH STAIRS SHALL BE PERMITTED TO SHARE COMMON WALLS, FLOORS, CEILINGS OR SCISSOR STAIRS ASSEMBLIES OR OTHER ENCLOSURES PROVIDED THAT THE CONSTRUCTION SEPARATING THE STAIRS IS ALSO OF AT LEAST A 2-HOUR FIRE-RESISTANCE RATING AND CONSTRUCTED OF MASONRY OR MASONRY EQUIVALENT IN ACCORDANCE WITH DEPARTMENT RULES.
   C. THE EXIT DOORS TO SUCH STAIRS SHALL BE PLACED A DISTANCE APART EQUAL TO NO LESS THAN 15 FEET (4572 MM); AND
   D. SUCH STAIRS SHALL BE PERMITTED TO SHARE COMMON WALLS, FLOORS, CEILINGS OR SCISSOR STAIRS ASSEMBLIES.

1007.1.1.1 MEASUREMENT POINT
THE SEPARATION DISTANCE REQUIRED IN SECTION 1007.1.1 SHALL BE MEASURED IN ACCORDANCE WITH THE FOLLOWING:
1. THE SEPARATION DISTANCE TO EXIT OR EXIT ACCESS DOORWAYS SHALL BE MEASURED TO THE CENTER POINT OF THE REQUIRED DOORWAY.
2. THE SEPARATION DISTANCE TO EXIT ACCESS STAIRWAYS SHALL BE MEASURED TO THE CENTER POINT OF THE CLOSEST RISER.
3. THE SEPARATION DISTANCE TO EXIT ACCESS RAMPS SHALL BE MEASURED TO THE CENTER POINT OF THE START OF THE RAMP RUN.

1007.1.2 THREE OR MORE EXITS OR EXIT ACCESS DOORWAYS
WHERE ACCESS TO THREE OR MORE EXITS IS REQUIRED, NOT LESS THAN TWO EXIT OR EXIT ACCESS DOORWAYS SHALL BE ARRANGED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 1007.1.1. ADDITIONAL REQUIRED EXIT OR EXIT ACCESS DOORWAYS SHALL BE ARRANGED A REASONABLE DISTANCE APART SO THAT IF ONE BECOMES BLOCKED, THE OTHERS WILL BE AVAILABLE.

1007.1.3 REMOTENESS OF EXIT ACCESS STAIRWAYS OR RAMPS
WHERE TWO EXIT ACCESS STAIRWAYS OR RAMPS PROVIDE THE REQUIRED MEANS OF EGRESS TO EXITS AT ANOTHER STORY, THE REQUIRED SEPARATION DISTANCE SHALL BE MAINTAINED FOR ALL PORTIONS OF SUCH EXIT ACCESS STAIRWAYS OR RAMPS..

SECTION BC 1016 EXIT ACCESS

1016.1 GENERAL
THE EXIT ACCESS SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF SECTIONS 1003 THROUGH 1015. EXIT ACCESS ARRANGEMENT SHALL COMPLY WITH SECTIONS 1016 THROUGH 1021.
1016.2 EGRESS THROUGH INTERVENING SPACES
EGRESS THROUGH INTERVENING SPACES SHALL COMPLY WITH THIS SECTION.
1. EXIT ACCESS THROUGH AN ENCLOSED ELEVATOR LOBBY IS PERMITTED. ACCESS TO NOT LESS THAN ONE OF THE REQUIRED EXITS SHALL BE PROVIDED WITHOUT TRAVEL THROUGH THE ENCLOSED ELEVATOR LOBBIES REQUIRED BY SECTION 3006. WHERE THE PATH OF EXIT ACCESS TRAVEL PASSES THROUGH AN ENCLOSED ELEVATOR LOBBY, THE LEVEL OF PROTECTION REQUIRED FOR THE ENCLOSED ELEVATOR LOBBY IS NOT REQUIRED TO BE EXTENDED TO THE EXIT UNLESS DIRECT ACCESS TO AN EXIT IS REQUIRED BY OTHER SECTIONS OF THIS CODE.
2. EGRESS FROM A ROOM OR SPACE SHALL NOT PASS THROUGH ADJOINING OR INTERVENING ROOMS OR AREAS, EXCEPT WHERE SUCH ADJOINING ROOMS OR AREAS AND THE AREA SERVED ARE ACCESSORY TO ONE OR THE OTHER, ARE NOT A GROUP H OCCUPANCY AND PROVIDE A DISCERNIBLE PATH OF EGRESS TRAVEL TO AN EXIT.
   EXCEPTION: MEANS OF EGRESS ARE NOT PROHIBITED THROUGH ADJOINING OR INTERVENING ROOMS OR SPACES IN A GROUP H, S OR F OCCUPANCY WHERE THE ADJOINING OR INTERVENING ROOMS OR SPACES ARE THE SAME OR A LESSER HAZARD OCCUPANCY GROUP.
3. AN EXIT ACCESS SHALL NOT PASS THROUGH A ROOM THAT CAN BE LOCKED TO PREVENT EGRESS.
4. MEANS OF EGRESS FROM DWELLING UNITS OR SLEEPING AREAS SHALL NOT LEAD THROUGH OTHER SLEEPING AREAS, TOILET ROOMS OR BATHROOMS.
5. EGRESS SHALL NOT PASS THROUGH KITCHENS, STORAGE ROOMS, CLOSETS OR SPACES USED FOR SIMILAR PURPOSES.
   EXCEPTIONS:
6. MEANS OF EGRESS ARE NOT PROHIBITED THROUGH A KITCHEN AREA SERVING ADJOINING ROOMS CONSTITUTING PART OF THE SAME DWELLING UNIT OR SLEEPING UNIT.
7. MEANS OF EGRESS ARE NOT PROHIBITED THROUGH STOCKROOMS IN GROUP M WHERE ALL OF THE FOLLOWING ARE MET:
   1. THE STOCK IS OF THE SAME HAZARD CLASSIFICATION AS THAT FOUND IN THE MAIN RETAIL AREA.
   2. NOT MORE THAN 50 PERCENT OF THE EXIT ACCESS IS THROUGH THE STOCKROOM.
   3. THE STOCKROOM IS NOT SUBJECT TO LOCKING FROM THE EGRESS SIDE.
   4. THERE IS A DEMARCATED, MINIMUM 44-INCH (1117.6 MM) WIDE AISLE DEFINED BY FULL- OR PARTIAL-HEIGHT FIXED WALLS OR SIMILAR CONSTRUCTION THAT WILL MAINTAIN THE REQUIRED WIDTH AND LEAD DIRECTLY FROM THE RETAIL AREA TO THE EXIT WITHOUT OBSTRUCTIONS.

1016.2.1 MULTIPLE TENANTS
WHERE MORE THAN ONE TENANT OCCUPIES ANY ONE FLOOR OF A BUILDING OR STRUCTURE, EACH TENANT SPACE, DWELLING UNIT AND SLEEPING UNIT SHALL BE PROVIDED WITH ACCESS TO THE REQUIRED EXITS WITHOUT PASSING THROUGH ADJACENT TENANT SPACES, DWELLING UNITS AND SLEEPING UNITS.
EXCEPTION: THE MEANS OF EGRESS FROM A SMALLER TENANT SPACE SHALL NOT BE PROHIBITED FROM PASSING THROUGH A LARGER ADJOINING TENANT SPACE WHERE THE FOLLOWING CONDITIONS ARE MET:
1. SUCH ROOMS OR SPACES OF THE SMALLER TENANT OCCUPY LESS THAN 10 PERCENT OF THE AREA OF THE LARGER TENANT SPACE THROUGH WHICH THEY PASS;
2. THE LARGER TENANT IS A GROUP M OCCUPANCY AND THE SMALLER TENANT SPACE IS OF THE SAME OR SIMILAR OCCUPANCY GROUP;
3. A DISCERNIBLE PATH OF EGRESS TRAVEL IS PROVIDED FROM THE SMALLER TENANT SPACE TO AN EXIT;
4. THE MEANS OF EGRESS INTO THE ADJOINING SPACE IS NOT SUBJECT TO LOCKING FROM THE EGRESS SIDE OF THE SMALLER TENANT SPACE; AND
5. THE SMALLER TENANT SPACE SERVES THE SAME OCCUPANTS, CUSTOMERS, OR PATRONS AS THE LARGER TENANT SPACE.

1016.3 INTERVENING PUBLIC HALL IN GROUP R-2 OCCUPANCIES
BUILDINGS IN OCCUPANCY GROUP R-2 SHALL COMPLY WITH THE INTERVENING PUBLIC HALL REQUIREMENTS IN ACCORDANCE WITH SECTIONS 1016.3.1 AND 1016.3.2.
1016.3.1 GROUP R-2 NONHIGH-RISE OCCUPANCIES
IN BUILDINGS IN OCCUPANCY GROUP R-2 NOT SUBJECT TO SECTION 403, A DOOR FROM A DWELLING UNIT SHALL OPEN INTO AN INTERVENING PUBLIC HALL. SUCH PUBLIC HALL SHALL BE CONSTRUCTED AS A PUBLIC CORRIDOR IN ACCORDANCE WITH SECTION 1020. OPENING PROTECTIVES IN ACCORDANCE WITH EXCEPTION 3 OF SECTION 707.6 SHALL NOT BE PERMITTED.
EXCEPTIONS:
1. NO INTERVENING PUBLIC HALL SHALL BE REQUIRED FOR ANY OF THE FOLLOWING:
2. A BUILDING THAT IS BOTH THREE STORIES OR LESS IN HEIGHT, AND CONTAINS TWO OR FEWER DWELLING UNITS PER STORY; OR
3. A BUILDING THAT COMPLIES WITH ITEM 6 OF SECTION 1006.3.2.
4. NO INTERVENING PUBLIC HALL SHALL BE REQUIRED WHERE THE DOORS OPENING TO THE APARTMENTS ARE SMOKE AND DRAFT CONTROLLED DOORS COMPLYING WITH UL 1784 WITHOUT ARTIFICIAL BOTTOM SEALS, IN ACCORDANCE WITH SECTIONS 716.5 AND 716.5.7.3 OF THIS CODE, AND THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1 OF THIS CODE. THIS EXCEPTION SHALL NOT APPLY TO ANY BUILDING THAT COMPLIES WITH ITEM 7 OF SECTION 1006.3.2 OF THIS CODE WHERE THERE IS MORE THAN ONE APARTMENT PER STORY.

1016.3.2 GROUP R-2 HIGH-RISE OCCUPANCIES
IN HIGH-RISE BUILDINGS IN OCCUPANCY GROUP R-2, ALL DOORS FROM A DWELLING UNIT SHALL OPEN INTO AN INTERVENING PUBLIC HALL. SUCH PUBLIC HALL SHALL BE CONSTRUCTED AS A PUBLIC CORRIDOR IN ACCORDANCE WITH SECTION 1020. OPENING PROTECTIVES IN ACCORDANCE WITH EXCEPTION 3 OF SECTION 707.6 SHALL NOT BE PERMITTED. SUCH PUBLIC HALL SHALL PROVIDE ACCESS TO AT LEAST TWO EXITS.
EXCEPTION: WHERE THE ONLY DWELLING UNITS ON A STORY OF A BUILDING ARE THE UPPER STORIES OF MULTISTORY (DUPLEX) DWELLING UNITS;
1. ANY PUBLIC HALLS SHALL BE PERMITTED TO PROVIDE ACCESS TO ONLY ONE EXIT; OR
2. NO SUCH PUBLIC HALL SHALL BE REQUIRED WHERE SMOKE AND DRAFT CONTROLLED DOORS COMPLYING WITH UL 1784 WITHOUT ARTIFICIAL BOTTOM SEALS, IN ACCORDANCE WITH SECTIONS 716.5 AND 716.5.7.3 OF THIS CODE, ARE PROVIDED. THIS EXCEPTION SHALL NOT BE CONSTRUED TO EFFECT, ALTER, OR CHANGE ANY REQUIREMENT OF THIS CODE TO PROVIDE TWO MEANS OF EGRESS FROM EACH APARTMENT ON EACH STORY.

SECTION BC 1017 EXIT ACCESS TRAVEL DISTANCE

1017.1 GENERAL
TRAVEL DISTANCE WITHIN THE EXIT ACCESS PORTION OF THE MEANS OF EGRESS SYSTEM SHALL BE IN ACCORDANCE WITH THIS SECTION.

1017.2 LIMITATIONS
EXIT ACCESS TRAVEL DISTANCE SHALL NOT EXCEED THE VALUES GIVEN IN TABLE 1017.2.

TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCEa

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A	See Section 1029.7	
E, F-1, M, R, S-1	150	200b
B	200	300c
F-2, S-2, U	200	250c
H-1	Not Permitted	75d
H-2	Not Permitted	100d
H-3	Not Permitted	150d
H-4	Not Permitted	175d
H-5	Not Permitted	200c
I-1, I-2, I-3, I-4	Not Permitted	200c

FOR SI: 1 FOOT = 304.8 MM. Assembly Code

a. SEE THE FOLLOWING SECTIONS FOR MODIFICATIONS TO EXIT ACCESS TRAVEL DISTANCE REQUIREMENTS:
   SECTION 402.8: FOR THE DISTANCE LIMITATION IN MALLS.
   SECTION 404.9: FOR THE DISTANCE LIMITATION THROUGH AN ATRIUM SPACE.
   SECTION 407.4: FOR THE DISTANCE LIMITATION IN GROUP I-2.
   SECTIONS 408.6.1 AND 408.8.1: FOR THE DISTANCE LIMITATIONS IN GROUP I-3.
   SECTION 411.4: FOR THE DISTANCE LIMITATION IN SPECIAL AMUSEMENT BUILDINGS.
   SECTION 412.7: FOR THE DISTANCE LIMITATIONS IN AIRCRAFT MANUFACTURING FACILITIES.
   SECTION 407.4.2: FOR THE DISTANCE LIMITATION IN GROUP I-2 HOSPITAL SUITES.
   SECTION 1006.2.2.2: FOR THE DISTANCE LIMITATION IN REFRIGERATION MACHINERY ROOMS.
   SECTION 1006.2.2.3: FOR THE DISTANCE LIMITATION IN REFRIGERATED ROOMS AND SPACES.
   SECTION 1006.3.2: FOR BUILDINGS WITH ONE EXIT.
   SECTION 1029.7: FOR INCREASED LIMITATION IN ASSEMBLY SEATING.
   SECTION 3103.4: FOR TEMPORARY STRUCTURES.
   SECTION 3104.9: FOR PEDESTRIAN WALKWAYS.
b. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2. SEE SECTION 903 FOR OCCUPANCIES WHERE SPRINKLER SYSTEMS ARE PERMITTED IN ACCORDANCE WITH SECTION 903.3.1.2.
c. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1.
   GROUP H OCCUPANCIES EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.2.5.1.

1017.2.1 EXTERIOR EGRESS BALCONY INCREASE
EXIT ACCESS TRAVEL DISTANCES SPECIFIED IN TABLE 1017.2 SHALL BE INCREASED UP TO AN ADDITIONAL 100 FEET (30 480 MM) PROVIDED THE LAST PORTION OF THE EXIT ACCESS LEADING TO THE EXIT OCCURS ON AN EXTERIOR EGRESS BALCONY CONSTRUCTED IN ACCORDANCE WITH SECTION 1021. THE LENGTH OF SUCH BALCONY SHALL BE NOT LESS THAN THE AMOUNT OF THE INCREASE TAKEN.

1017.3 MEASUREMENT
EXIT ACCESS TRAVEL DISTANCE SHALL BE MEASURED FROM THE MOST REMOTE POINT WITHIN A STORY ALONG THE NATURAL AND UNOBSTRUCTED PATH OF HORIZONTAL AND VERTICAL EGRESS TRAVEL TO THE ENTRANCE TO AN EXIT.
EXCEPTIONS:
1. IN OPEN PARKING GARAGES, EXIT ACCESS TRAVEL DISTANCE IS PERMITTED TO BE MEASURED TO THE CLOSEST RISER OF AN EXIT ACCESS STAIRWAY OR THE CLOSEST SLOPE OF AN EXIT ACCESS RAMP.
2. IN BUILDINGS OF GROUP A-5 WITH OPEN-AIR SEATING SERVED BY EXIT ACCESS STAIRWAYS AND RAMPS, EXIT ACCESS TRAVEL DISTANCE IS PERMITTED TO BE MEASURED TO THE CLOSEST RISER OF AN EXIT ACCESS STAIRWAY OR THE CLOSEST SLOPE OF AN EXIT ACCESS RAMP.
3. EXIT ACCESS TRAVEL DISTANCE IN ASSEMBLY OCCUPANCIES SHALL BE MEASURED IN ACCORDANCE WITH SECTION 1029.

1017.3.1 EXIT ACCESS STAIRWAYS AND RAMPS
TRAVEL DISTANCE ON EXIT ACCESS STAIRWAYS OR RAMPS SHALL BE INCLUDED IN THE EXIT ACCESS TRAVEL DISTANCE MEASUREMENT. THE MEASUREMENT ALONG STAIRWAYS SHALL BE MADE ON A PLANE PARALLEL AND TANGENT TO THE STAIR TREAD NOSINGS IN THE CENTER OF THE STAIR AND LANDINGS. THE MEASUREMENT ALONG RAMPS SHALL BE MADE ON THE WALKING SURFACE IN THE CENTER OF THE RAMP AND LANDINGS.

SECTION BC 1018 AISLES

1018.1 GENERAL
AISLES AND AISLE ACCESSWAYS SERVING AS A PORTION OF THE EXIT ACCESS IN THE MEANS OF EGRESS SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION. AISLES OR AISLE ACCESSWAYS SHALL BE PROVIDED FROM ALL OCCUPIED PORTIONS OF THE EXIT ACCESS THAT CONTAIN SEATS, TABLES, FURNISHINGS, DISPLAYS AND SIMILAR FIXTURES OR EQUIPMENT. THE MINIMUM WIDTH OR REQUIRED CAPACITY OF AISLES SHALL BE UNOBSTRUCTED.
EXCEPTION: ENCROACHMENTS COMPLYING WITH SECTION 1005.7.
1018.2 AISLES IN ASSEMBLY SPACES
AISLES AND AISLE ACCESSWAYS SERVING A ROOM OR SPACE USED FOR ASSEMBLY PURPOSES SHALL COMPLY WITH SECTION 1029.

1018.3 AISLES IN GROUPS B AND M
IN GROUP B AND M OCCUPANCIES, THE MINIMUM CLEAR AISLE WIDTH SHALL BE DETERMINED BY SECTION 1005 FOR THE OCCUPANT LOAD SERVED, BUT SHALL BE NOT LESS THAN 36 INCHES (914.4 MM).
EXCEPTION: NONPUBLIC AISLES SERVING LESS THAN 50 PEOPLE AND NOT REQUIRED TO BE ACCESSIBLE BY CHAPTER 11 NEED NOT EXCEED 28 INCHES (711.2 MM) IN WIDTH.

1018.4 AISLE ACCESSWAYS IN GROUP M
AN AISLE ACCESSWAY SHALL BE PROVIDED ON NOT LESS THAN ONE SIDE OF EACH ELEMENT WITHIN THE MERCHANDISE PAD. THE MINIMUM CLEAR WIDTH FOR AN AISLE ACCESSWAY NOT REQUIRED TO BE ACCESSIBLE SHALL BE 30 INCHES (762 MM). THE REQUIRED CLEAR WIDTH OF THE AISLE ACCESSWAY SHALL BE MEASURED PERPENDICULAR TO THE ELEMENTS AND MERCHANDISE WITHIN THE MERCHANDISE PAD. THE 30-INCH (762 MM) MINIMUM CLEAR WIDTH SHALL BE MAINTAINED TO PROVIDE A PATH TO AN ADJACENT AISLE OR AISLE ACCESSWAY. THE COMMON PATH OF EGRESS TRAVEL SHALL NOT EXCEED 30 FEET (9144 MM) FROM ANY POINT IN THE MERCHANDISE PAD.
EXCEPTION: FOR AREAS SERVING NOT MORE THAN 50 OCCUPANTS, THE COMMON PATH OF EGRESS TRAVEL SHALL NOT EXCEED 75 FEET (22 860 MM).

SECTION BC 1019 EXIT ACCESS STAIRWAYS AND RAMPS

1019.1 GENERAL
EXIT ACCESS STAIRWAYS AND RAMPS SERVING AS AN EXIT ACCESS COMPONENT IN A MEANS OF EGRESS SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION. THE NUMBER OF STORIES CONNECTED BY EXIT ACCESS STAIRWAYS AND RAMPS SHALL INCLUDE BASEMENTS, BUT NOT MEZZANINES.

1019.2 ALL OCCUPANCIES
EXIT ACCESS STAIRWAYS AND RAMPS THAT SERVE FLOOR LEVELS WITHIN A SINGLE STORY ARE NOT REQUIRED TO BE ENCLOSED.

1019.3 OCCUPANCIES OTHER THAN GROUPS H, I-2 AND I-3
IN OTHER THAN GROUP H, I-2 AND I-3 OCCUPANCIES, EXIT ACCESS STAIRWAYS OR RAMPS SHALL BE ENCLOSED WITH A SHAFT ENCLOSURE CONSTRUCTED IN ACCORDANCE WITH SECTION 713.
EXCEPTION: IN OTHER THAN GROUP H, I-2 AND I-3 OCCUPANCIES, EXIT ACCESS STAIRWAYS OR RAMPS THAT COMPLY WITH ONE OF THE FOLLOWING CONDITIONS NEED NOT BE ENCLOSED:
1. A MAXIMUM OF 50 PERCENT OF THE EXIT ACCESS STAIRWAYS AND RAMPS THAT SERVE ONLY TWO CONSECUTIVE STORIES NEED NOT BE ENCLOSED, PROVIDED EACH SUCH INTERCONNECTED STORY HAS ACCESS TO THE MINIMUM NUMBER OF APPROVED INDEPENDENT EXITS AS REQUIRED BY SECTION 1006, AND IN NO CASE BE LESS THAN TWO MEANS OF EGRESS. SUCH INTERCONNECTED STORIES SHALL NOT BE OPEN TO OTHER STORIES. UNENCLOSED EXIT ACCESS STAIRWAYS AND RAMPS SHALL BE REMOTELY LOCATED IN ACCORDANCE WITH SECTION 1007.
2. IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, EXIT ACCESS STAIRWAYS AND RAMPS THAT SERVE BETWEEN ONLY THE FIRST AND SECOND STORIES ABOVE GRADE, PROVIDED THE FIRST AND SECOND STORIES HAVE ACCESS TO THE MINIMUM NUMBER OF APPROVED INDEPENDENT EXITS AS REQUIRED BY SECTION 1006, AND IN NO CASE BE LESS THAN TWO MEANS OF EGRESS. SUCH INTERCONNECTED STORIES SHALL NOT BE OPEN TO OTHER STORIES. UNENCLOSED EXIT ACCESS STAIRWAYS AND RAMPS SHALL BE REMOTELY LOCATED IN ACCORDANCE WITH SECTION 1007.
3. IN GROUP R-1, R-2 OR R-3 OCCUPANCIES THAT ARE FULLY SPRINKLERED IN ACCORDANCE WITH SECTION 903.3.1.1, 903.3.1.2 OR 903.3.1.3, EXIT ACCESS STAIRWAYS AND RAMPS CONNECTING FOUR STORIES OR LESS AND CONTAINED WITHIN AN INDIVIDUAL RESIDENTIAL DWELLING UNIT.
4. EXIT ACCESS STAIRWAYS AND RAMPS IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, WHERE THE AREA OF THE VERTICAL OPENING BETWEEN STORIES DOES NOT EXCEED TWICE THE HORIZONTAL PROJECTED AREA OF THE STAIRWAY OR RAMP AND THE OPENING IS PROTECTED BY A DRAFT CURTAIN AND CLOSELY SPACED SPRINKLERS IN ACCORDANCE WITH NFPA 13 AS MODIFIED BY APPENDIX Q. IN OTHER THAN GROUP B AND M OCCUPANCIES, THIS PROVISION IS LIMITED TO OPENINGS THAT DO NOT CONNECT MORE THAN FOUR STORIES.
5. EXIT ACCESS STAIRWAYS AND RAMPS WITHIN AN ATRIUM COMPLYING WITH THE PROVISIONS OF SECTION 404.
6. EXIT ACCESS STAIRWAYS AND RAMPS IN OPEN PARKING GARAGES THAT SERVE ONLY THE PARKING GARAGE.
7. EXIT ACCESS STAIRWAYS AND RAMPS SERVING OPEN-AIR SEATING IN BUILDINGS OF GROUP A-5, WHERE ALL PORTIONS OF THE MEANS OF EGRESS ARE ESSENTIALLY OPEN TO THE OUTSIDE.
8. EXIT ACCESS STAIRWAYS AND RAMPS SERVING THE BALCONY, GALLERY OR PRESS BOX AND THE MAIN ASSEMBLY FLOOR IN OCCUPANCIES SUCH AS THEATERS, PLACES OF RELIGIOUS WORSHIP, AUDITORIUMS AND SPORTS FACILITIES.
1019.4 GROUP I-2 AND I-3 OCCUPANCIES
IN GROUP I-2 AND I-3 OCCUPANCIES, FLOOR OPENINGS BETWEEN STORIES CONTAINING EXIT ACCESS STAIRWAYS OR RAMPS ARE REQUIRED TO BE ENCLOSED WITH A SHAFT ENCLOSURE CONSTRUCTED IN ACCORDANCE WITH SECTION 713.
EXCEPTION: IN GROUP I-3 OCCUPANCIES, EXIT ACCESS STAIRWAYS OR RAMPS CONSTRUCTED IN ACCORDANCE WITH SECTION 408 ARE NOT REQUIRED TO BE ENCLOSED.

SECTION BC 1020 CORRIDORS

1020.1 CONSTRUCTION
CORRIDORS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THIS SECTION. INTERIOR CORRIDOR WALLS REQUIRED TO BE FIRE-RESISTANCE RATED SHALL COMPLY WITH SECTION 708 FOR FIRE PARTITIONS. PUBLIC CORRIDOR WALLS SHALL COMPLY WITH SECTION 707 FOR FIRE BARRIERS.

1020.1.1 INTERIOR CORRIDORS
INTERIOR CORRIDORS SHALL BE FIRE-RESISTANCE RATED IN ACCORDANCE WITH TABLE 1020.1.1.
EXCEPTIONS:
1. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS IN AN OCCUPANCY IN GROUP E WHERE EACH ROOM THAT IS USED FOR INSTRUCTION HAS NOT LESS THAN ONE DOOR OPENING DIRECTLY TO THE EXTERIOR AND ROOMS FOR ASSEMBLY PURPOSES HAVE NOT LESS THAN ONE-HALF OF THE REQUIRED MEANS OF EGRESS DOORS OPENING DIRECTLY TO THE EXTERIOR. EXTERIOR DOORS SPECIFIED IN THIS EXCEPTION ARE REQUIRED TO BE AT GROUND LEVEL.
2. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS CONTAINED WITHIN A DWELLING UNIT OR SLEEPING UNIT IN AN OCCUPANCY IN GROUP R.
3. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS IN OPEN PARKING GARAGES.
4. A FIRE-RESISTANCE RATING IS NOT REQUIRED FOR CORRIDORS IN AN OCCUPANCY IN GROUP B THAT IS A SPACE REQUIRING ONLY A SINGLE MEANS OF EGRESS COMPLYING WITH SECTION 1006.2.
5. CORRIDORS ADJACENT TO THE EXTERIOR WALLS OF BUILDINGS SHALL BE PERMITTED TO HAVE UNPROTECTED OPENINGS ON UNRATED EXTERIOR WALLS WHERE UNRATED WALLS ARE PERMITTED BY TABLE 602 AND UNPROTECTED OPENINGS ARE PERMITTED BY TABLE 705.8.
6.

TABLE 1020.1.1
INTERIOR CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY INTERIOR CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		WITHOUT SPRINKLER SYSTEM	WITH SPRINKLER SYSTEMc
H-1, H-2, H-3	ALL	NOT PERMITTED	1
H-4, H-5	GREATER THAN 30	NOT PERMITTED	1
A, B, E, F, M, S, U	GREATER THAN 30	1	0
R	GREATER THAN 10	1d	0
I-2a, I-4	ALL	NOT PERMITTED	0
I-1, I-3	ALL	NOT PERMITTED	1b

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a. FOR REQUIREMENTS FOR OCCUPANCIES IN GROUP I-2, SEE SECTIONS 407.2 AND 407.3.
b. FOR A REDUCTION IN THE FIRE-RESISTANCE RATING FOR OCCUPANCIES IN GROUP I-3, SEE SECTION 408.8.
c. BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2 WHERE ALLOWED.
d. INTERIOR CORRIDORS WITHIN DWELLING OR SLEEPING UNITS IN GROUP R OCCUPANCIES PURSUANT TO SECTION 1020.1.1, EXCEPTION 2 SHALL NOT REQUIRE FIRE-RESISTANCE RATING.

1020.1.2 PUBLIC CORRIDORS
PUBLIC CORRIDORS SHALL BE FIRE-RESISTANCE RATED IN ACCORDANCE WITH TABLE 1020.1.2.

TABLE 1020.1.2
PUBLIC CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	REQUIRED FIRE-RESISTANCE RATING (hours)
H-1, H-2, H-3	2
H-4, H-5	1
A, E, F, M, S, U	1
B	1a
R (Noncombustible)	1c
R (Combustible)	2b
I-1, I-2, I-3, I-4	1

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a. PUBLIC CORRIDORS NEED NOT BE FIRE RATED IN HIGH-RISE BUILDINGS IN OCCUPANCY GROUP B EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, WHERE SUCH BUILDING IS PROVIDED WITH SMOKEPROOF ENCLOSURES IN STAIRWAYS IN ACCORDANCE WITH SECTION 403.5.4.
b. PUBLIC CORRIDORS IN BUILDINGS NOT EXCEEDING TWO STORIES IN HEIGHT, OR THAT ARE THREE STORIES IN HEIGHT AND OCCUPIED BY NOT MORE THAN ONE FAMILY ON EACH STORY, MAY BE CONSTRUCTED WITH 1-HOUR FIRE-RESISTANCE RATING.
c. CORRIDORS SERVING ACCESSORY ROOMS OR SPACES IN GROUP R-2 OCCUPANCIES PURSUANT TO SECTION 1004.1.1.2.3 SHALL BE CONSTRUCTED WITH FIRE BARRIERS WITH 1-HOUR FIRE-RESISTANCE RATING, AND 2-HOUR FIRE-RESISTANCE RATING WHERE THE DEAD-END DISTANCE EXCEEDS 40 FEET (12 192 MM) IN LENGTH.

1020.2 WIDTH AND CAPACITY
THE REQUIRED CAPACITY OF CORRIDORS SHALL BE DETERMINED AS SPECIFIED IN SECTION 1005, BUT THE MINIMUM WIDTH SHALL BE NOT LESS THAN THAT SPECIFIED IN TABLE 1020.2.
EXCEPTION: IN GROUP I-2 OCCUPANCIES, CORRIDORS ARE NOT REQUIRED TO HAVE A CLEAR WIDTH OF 96 INCHES (2438.4 MM) IN AREAS WHERE THERE WILL NOT BE STRETCHER OR BED MOVEMENT FOR ACCESS TO CARE OR AS PART OF THE DEFEND-IN-PLACE STRATEGY.

TABLE 1020.2
MINIMUM CORRIDOR WIDTH

OCCUPANCY	MINIMUM WIDTH (inches)
ANY FACILITIES NOT LISTED BELOW	44
ACCESS TO AND UTILIZATION OF MECHANICAL, PLUMBING OR ELECTRICAL SYSTEMS OR EQUIPMENT	24
WITH AN OCCUPANT LOAD OF 50 OR LESS, EXCEPT AS OTHERWISE REQUIRED BY CHAPTER 11	36
WITHIN A DWELLING UNIT, IN OCCUPANCY GROUPS I-1 AND R-1, EXCEPT AS OTHERWISE REQUIRED BY SECTION 1107	36
WITHIN A DWELLING UNIT, IN OCCUPANCY GROUPS R-2 AND R-3, EXCEPT AS OTHERWISE REQUIRED BY SECTION 1107	30
IN GROUP E SERVING CLASSROOMS	66
IN CORRIDORS AND AREAS SERVING STRETCHER TRAFFIC IN OCCUPANCIES WHERE PATIENTS RECEIVE OUTPATIENT MEDICAL CARE THAT CAUSES THE PATIENTS TO BE INCAPABLE OF SELF-PRESERVATION	72
GROUP I-2 IN AREAS WHERE REQUIRED FOR BED MOVEMENT	96

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1020.3 OBSTRUCTION
THE MINIMUM WIDTH OR REQUIRED CAPACITY OF CORRIDORS SHALL BE UNOBSTRUCTED.
EXCEPTION: ENCROACHMENTS COMPLYING WITH SECTION 1005.7.

1020.4 DEAD ENDS
WHERE MORE THAN ONE EXIT OR EXIT ACCESS DOORWAY IS REQUIRED, THE EXIT ACCESS SHALL BE ARRANGED SUCH THAT THERE ARE NO DEAD ENDS IN CORRIDORS MORE THAN 20 FEET (6096 MM) IN LENGTH.
EXCEPTIONS:
1. IN OCCUPANCIES IN GROUP I-3 OF CONDITION 2, 3 OR 4, THE DEAD END IN A CORRIDOR SHALL NOT EXCEED 50 FEET (15 240 MM).
2. IN OCCUPANCIES IN GROUPS B, E, F, I-1, M, R-1, S AND U, WHERE THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, THE LENGTH OF THE DEAD-END CORRIDORS SHALL NOT EXCEED 50 FEET (15 240 MM).
3. DEAD-END LENGTH NOT EXCEEDING 2.5 TIMES THE LEAST WIDTH OF THE DEAD-END CORRIDOR.
4. IN OCCUPANCIES IN GROUP R-2, THE DEAD END IN A CORRIDOR SHALL NOT EXCEED 40 FEET (12 192 MM). HOWEVER, WHERE THE CORRIDORS ARE COMPLETELY ENCLOSED IN CONSTRUCTION HAVING A 2-HOUR FIRE-RESISTANCE RATING WITH ALL DOORS OPENING INTO THE CORRIDOR BEING SELF-CLOSING AND HAVING A FIRE-RESISTANCE RATING OF 11/2 HOURS, THE LENGTH OF DEAD-END CORRIDOR SHALL NOT EXCEED 80 FEET (24 384 MM).

SECTION BC 1022 EXITS

1022.1 GENERAL
EXITS SHALL COMPLY WITH SECTIONS 1022 THROUGH 1027 AND THE APPLICABLE REQUIREMENTS OF SECTIONS 1003 THROUGH 1015. AN EXIT SHALL NOT BE USED FOR ANY PURPOSE THAT INTERFERES WITH ITS FUNCTION AS A MEANS OF EGRESS. ONCE A GIVEN LEVEL OF EXIT PROTECTION IS ACHIEVED, SUCH LEVEL OF PROTECTION SHALL NOT BE REDUCED UNTIL ARRIVAL AT THE EXIT DISCHARGE. EXITS SHALL BE CONTINUOUS FROM THE POINT OF ENTRY INTO THE EXIT TO THE EXIT DISCHARGE.
EXCEPTION: INTERIOR EXIT STAIRWAYS WITH DOORS THAT ARE AUTOMATIC-CLOSING BY SMOKE DETECTION PURSUANT TO THE EXCEPTION SET FORTH IN SECTION 713.7 MAY BE USED FOR TRAVEL BETWEEN FLOORS AND THIS USE SHALL NOT BE DEEMED TO INTERFERE WITH FUNCTION AS A MEANS OF EGRESS.

1022.2 EXTERIOR EXIT DOORS
BUILDINGS OR STRUCTURES USED FOR HUMAN OCCUPANCY SHALL HAVE NOT LESS THAN ONE EXTERIOR DOOR THAT MEETS THE REQUIREMENTS OF SECTION 1010.1.1.

1022.2.1 DETAILED REQUIREMENTS
EXTERIOR EXIT DOORS SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF SECTION 1010.1.

1022.2.2 ARRANGEMENT
EXTERIOR EXIT DOORS SHALL LEAD DIRECTLY TO THE EXIT DISCHARGE OR THE PUBLIC WAY.

SECTION BC 1023 INTERIOR EXIT STAIRWAYS AND RAMPS

1023.1 GENERAL
INTERIOR EXIT STAIRWAYS AND RAMPS SERVING AS AN EXIT COMPONENT IN A MEANS OF EGRESS SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION. INTERIOR EXIT STAIRWAYS AND RAMPS SHALL BE ENCLOSED AND LEAD DIRECTLY TO THE EXTERIOR OF THE BUILDING OR SHALL BE EXTENDED TO THE EXTERIOR OF THE BUILDING WITH AN EXIT PASSAGEWAY CONFORMING TO THE REQUIREMENTS OF SECTION 1024, EXCEPT AS PERMITTED IN SECTION 1028.1. AN INTERIOR EXIT STAIRWAY OR RAMP SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN AS A MEANS OF EGRESS AND A CIRCULATION PATH.

1023.2 CONSTRUCTION
ENCLOSURES FOR INTERIOR EXIT STAIRWAYS AND RAMPS SHALL BE CONSTRUCTED AS FIRE BARRIERS IN ACCORDANCE WITH SECTION 707 OR HORIZONTAL ASSEMBLIES CONSTRUCTED IN ACCORDANCE WITH SECTION 711, OR BOTH. INTERIOR EXIT STAIRWAY AND RAMP ENCLOSURES SHALL HAVE A FIRE-RESISTANCE RATING OF NOT LESS THAN 2 HOURS WHERE CONNECTING FOUR STORIES OR MORE AND NOT LESS THAN 1 HOUR WHERE CONNECTING LESS THAN FOUR STORIES. THE NUMBER OF STORIES CONNECTED BY THE INTERIOR EXIT STAIRWAYS OR RAMPS SHALL INCLUDE ANY BASEMENTS, BUT NOT ANY MEZZANINES. INTERIOR EXIT STAIRWAYS AND RAMPS SHALL HAVE A FIRE-RESISTANCE RATING NOT LESS THAN THE FLOOR ASSEMBLY PENETRATED, BUT NEED NOT EXCEED 2 HOURS. IN GROUP R-1 AND R-2 OCCUPANCIES, WHERE INTERIOR EXIT STAIRWAYS AND RAMPS ARE REQUIRED TO HAVE A FIRE-RESISTANCE RATING OF 2 HOURS, SUCH ENCLOSURES SHALL BE CONSTRUCTED OF MASONRY OR MASONRY EQUIVALENT. WALL ASSEMBLIES CONSTITUTING MASONRY EQUIVALENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH DEPARTMENT RULES.
EXCEPTIONS:
1. INTERIOR EXIT STAIRWAYS AND RAMPS IN GROUP I-3 OCCUPANCIES IN ACCORDANCE WITH THE PROVISIONS OF SECTION 408.3.8.
2. INTERIOR EXIT STAIRWAYS WITHIN AN ATRIUM ENCLOSED IN ACCORDANCE WITH SECTION 404.6.

1023.3 TERMINATION
INTERIOR EXIT STAIRWAYS AND RAMPS SHALL TERMINATE AT AN EXIT DISCHARGE OR A PUBLIC WAY.
EXCEPTION: A COMBINATION OF INTERIOR EXIT STAIRWAYS, INTERIOR EXIT RAMPS AND EXIT PASSAGEWAYS, CONSTRUCTED IN ACCORDANCE WITH SECTIONS 1023.2, 1023.3.1 AND 1024, RESPECTIVELY, AND FORMING A CONTINUOUS PROTECTED ENCLOSURE, SHALL BE PERMITTED TO EXTEND AN INTERIOR EXIT STAIRWAY OR RAMP TO THE EXIT DISCHARGE OR A PUBLIC WAY.

1023.3.1 EXTENSION
WHERE INTERIOR EXIT STAIRWAYS AND RAMPS ARE EXTENDED TO AN EXIT DISCHARGE OR A PUBLIC WAY BY AN EXIT PASSAGEWAY, THE INTERIOR EXIT STAIRWAY AND RAMP SHALL BE SEPARATED FROM THE EXIT PASSAGEWAY BY A FIRE BARRIER CONSTRUCTED IN ACCORDANCE WITH SECTION 707 OR A HORIZONTAL ASSEMBLY CONSTRUCTED IN ACCORDANCE WITH SECTION 711, OR BOTH. THE FIRE-RESISTANCE RATING SHALL BE NOT LESS THAN THAT REQUIRED FOR THE INTERIOR EXIT STAIRWAY AND RAMP. A FIRE DOOR ASSEMBLY COMPLYING WITH SECTION 716.5 SHALL BE INSTALLED IN THE FIRE BARRIER TO PROVIDE A MEANS OF EGRESS FROM THE INTERIOR EXIT STAIRWAY AND RAMP TO THE EXIT PASSAGEWAY. OPENINGS IN THE FIRE BARRIER OTHER THAN THE FIRE DOOR ASSEMBLY ARE PROHIBITED. PENETRATIONS OF THE FIRE BARRIER ARE PROHIBITED.
EXCEPTIONS:
1. PENETRATIONS OF THE FIRE BARRIER IN ACCORDANCE WITH SECTION 1023.5 SHALL BE PERMITTED.
2. SEPARATION BETWEEN AN INTERIOR EXIT STAIRWAY OR RAMP AND THE EXIT PASSAGEWAY EXTENSION SHALL NOT BE REQUIRED WHERE THERE ARE NO OPENINGS INTO THE EXIT PASSAGEWAY EXTENSION.

1023.4 OPENINGS
INTERIOR EXIT STAIRWAY AND RAMP OPENING PROTECTIVES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 716. OPENINGS IN INTERIOR EXIT STAIRWAYS AND RAMPS OTHER THAN UNPROTECTED EXTERIOR OPENINGS SHALL BE LIMITED TO THOSE NECESSARY FOR EXIT ACCESS TO THE ENCLOSURE FROM NORMALLY OCCUPIED SPACES AND FOR EGRESS FROM THE ENCLOSURE. ELEVATORS SHALL NOT OPEN INTO INTERIOR EXIT STAIRWAYS AND RAMPS.

1023.5 PENETRATIONS
PENETRATIONS INTO OR THROUGH INTERIOR EXIT STAIRWAYS AND RAMPS ARE PROHIBITED EXCEPT FOR EQUIPMENT AND DUCTWORK NECESSARY FOR INDEPENDENT VENTILATION OR PRESSURIZATION, HYDRONIC PIPING AND RELATED HEATING EQUIPMENT LIMITED TO SERVING THE INTERIOR EXIT STAIRWAY OR RAMP IN WHICH SUCH PIPING AND EQUIPMENT IS LOCATED, SPRINKLER PIPING, STANDPIPES, ELECTRICAL RACEWAY FOR FIRE DEPARTMENT COMMUNICATION SYSTEMS AND ELECTRICAL RACEWAY SERVING THE INTERIOR EXIT STAIRWAY AND RAMP AND TERMINATING AT A STEEL BOX NOT EXCEEDING 16 SQUARE INCHES (0.010 M2). SUCH PENETRATIONS SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 714. THERE SHALL NOT BE PENETRATIONS OR COMMUNICATION OPENINGS, WHETHER PROTECTED OR NOT, BETWEEN ADJACENT INTERIOR EXIT STAIRWAYS AND RAMPS.
EXCEPTION: MEMBRANE PENETRATIONS SHALL BE PERMITTED ON THE OUTSIDE OF THE INTERIOR EXIT STAIRWAY AND RAMP. SUCH PENETRATIONS SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 714.3.2.

1023.6 VENTILATION
EQUIPMENT AND DUCTWORK FOR INTERIOR EXIT STAIRWAY AND RAMP VENTILATION AS PERMITTED BY SECTION 1023.5 SHALL COMPLY WITH ONE OF THE FOLLOWING ITEMS:
1. SUCH EQUIPMENT AND DUCTWORK SHALL BE LOCATED EXTERIOR TO THE BUILDING AND SHALL BE DIRECTLY CONNECTED TO THE INTERIOR EXIT STAIRWAY AND RAMP BY DUCTWORK ENCLOSED IN CONSTRUCTION AS REQUIRED FOR SHAFTS.
2. WHERE SUCH EQUIPMENT AND DUCTWORK IS LOCATED WITHIN THE INTERIOR EXIT STAIRWAY AND RAMP, THE INTAKE AIR SHALL BE TAKEN DIRECTLY FROM THE OUTDOORS AND THE EXHAUST AIR SHALL BE DISCHARGED DIRECTLY TO THE OUTDOORS, OR SUCH AIR SHALL BE CONVEYED THROUGH DUCTS ENCLOSED IN CONSTRUCTION AS REQUIRED FOR SHAFTS.
3. WHERE LOCATED WITHIN THE BUILDING, SUCH EQUIPMENT AND DUCTWORK SHALL BE SEPARATED FROM THE REMAINDER OF THE BUILDING, INCLUDING OTHER MECHANICAL EQUIPMENT, WITH CONSTRUCTION AS REQUIRED FOR SHAFTS.
   IN EACH CASE, OPENINGS INTO THE FIRE-RESISTANCE-RATED CONSTRUCTION SHALL BE LIMITED TO THOSE NEEDED FOR MAINTENANCE AND OPERATION AND SHALL BE PROTECTED BY OPENING PROTECTIVES IN ACCORDANCE WITH SECTION 716 FOR SHAFT ENCLOSURES. THE INTERIOR EXIT STAIRWAY AND RAMP VENTILATION SYSTEMS SHALL BE INDEPENDENT OF OTHER BUILDING VENTILATION SYSTEMS.

1023.7 INTERIOR EXIT STAIRWAY AND RAMP EXTERIOR WALLS
EXTERIOR WALLS OF THE INTERIOR EXIT STAIRWAY OR RAMP SHALL COMPLY WITH THE REQUIREMENTS OF SECTION 705 FOR EXTERIOR WALLS. WHERE NONRATED WALLS OR UNPROTECTED OPENINGS ENCLOSE THE EXTERIOR OF THE STAIRWAY OR RAMPS AND THE WALLS OR OPENINGS ARE EXPOSED BY OTHER PARTS OF THE BUILDING AT AN ANGLE OF LESS THAN 180 DEGREES (3.14 RAD), THE BUILDING EXTERIOR WALLS WITHIN 10 FEET (3048 MM) HORIZONTALLY OF A NONRATED WALL OR UNPROTECTED OPENING SHALL HAVE A FIRE-RESISTANCE RATING OF NOT LESS THAN 1 HOUR. OPENINGS WITHIN SUCH EXTERIOR WALLS SHALL BE PROTECTED BY OPENING PROTECTIVES HAVING A FIRE PROTECTION RATING OF NOT LESS THAN 3/4 HOUR. THIS CONSTRUCTION SHALL EXTEND VERTICALLY FROM THE GROUND TO A POINT 10 FEET (3048 MM) ABOVE THE TOPMOST LANDING OF THE STAIRWAY OR RAMP, OR TO THE ROOF LINE, WHICHEVER IS LOWER.

1023.8 DISCHARGE IDENTIFICATION
AN INTERIOR EXIT STAIRWAY AND RAMP SHALL NOT CONTINUE BELOW ITS LEVEL OF EXIT DISCHARGE UNLESS AN APPROVED BARRIER IS PROVIDED AT THE LEVEL OF EXIT DISCHARGE TO PREVENT PERSONS FROM UNINTENTIONALLY CONTINUING INTO LEVELS BELOW. DIRECTIONAL EXIT SIGNS SHALL BE PROVIDED AS SPECIFIED IN SECTION 1013. AN APPROVED BARRIER SHALL CONSIST OF PARTITIONS, DOORS, OR GATES SEPARATING THE PORTION OF THE INTERIOR EXIT STAIRWAY ABOVE GRADE FROM THE PORTION BELOW GRADE. WHERE DOORS OR GATES ARE PROVIDED AS APPROVED BARRIERS, SUCH DOORS OR GATES SHALL BE SELF-CLOSING, OPENING IN THE DIRECTION OF EXIT TRAVEL FROM THE FLOORS BELOW GRADE, AND PROVIDED WITH LANDINGS IN ACCORDANCE WITH SECTIONS 1010.1.5 AND 1010.1.6.
EXCEPTIONS:
1. SUCH BARRIER SEPARATING THE ABOVE-GRADE PORTION OF THE INTERIOR EXIT STAIRWAYS AND RAMPS FROM THE PORTION BELOW GRADE SHALL NOT BE REQUIRED IN GROUP E AND R-3 OCCUPANCIES.
2. SUCH BARRIER SEPARATING THE ABOVE-GRADE PORTION OF THE INTERIOR EXIT STAIRWAYS AND RAMPS FROM THE PORTION BELOW GRADE SHALL NOT BE REQUIRED WHERE THE STAIRWAY OR RAMP DESIGN IS INTENDED TO CONTINUE THE PATH OF EGRESS THROUGH A BELOW GRADE LEVEL.

1023.9 STAIRWAY IDENTIFICATION AND FLOOR LEVEL SIGNS
SIGNS IDENTIFYING STAIRWAYS SHALL COMPLY WITH SECTION 1023.9.1. SIGNS IDENTIFYING FLOOR LEVELS SHALL COMPLY WITH SECTIONS 1023.9.2 THROUGH 1023.9.5.

1023.9.1 STAIRWAY IDENTIFICATION SIGNS
A STAIRWAY IDENTIFICATION SIGN INDICATING EACH STAIR BY ALPHABETIC LETTER SHALL BE POSTED ON BOTH SIDES OF EACH STAIR DOOR. THE ALPHABETIC LETTERS DESIGNATING THE IDENTIFICATION OF THE INTERIOR EXIT STAIRWAY AND RAMP SHALL BE NOT LESS THAN 3 INCHES (76.2 MM) IN HEIGHT. SUCH SIGN SHALL COMPLY WITH ITEMS 2, 5 AND 6 OF SECTION 1023.9.4.

1023.9.2 FLOOR IDENTIFICATION SIGNS
A FLOOR IDENTIFICATION SIGN SHALL BE PROVIDED AT EACH FLOOR LANDING IN AN INTERIOR EXIT STAIRWAY AND RAMP CONNECTING MORE THAN THREE STORIES. SUCH SIGN SHALL DESIGNATE:
- THE FLOOR LEVEL;
- THE TERMINUS OF THE TOP AND BOTTOM OF THE INTERIOR EXIT STAIRWAY AND RAMP;
- THE IDENTIFICATION OF THE INTERIOR EXIT STAIRWAY AND RAMP;
- THE STORY OF THE EXIT DISCHARGE; AND
- THE AVAILABILITY OF ROOF ACCESS FROM THE INTERIOR EXIT STAIRWAY AND RAMP FOR THE FIRE DEPARTMENT.

1023.9.3 ACCESSIBLE FLOOR LEVEL IDENTIFICATION SIGNS
FLOOR LEVEL IDENTIFICATION SIGNS IN VISUAL CHARACTERS, RAISED CHARACTERS AND BRAILLE COMPLYING WITH ICC A117.1 SHALL BE LOCATED AT EACH FLOOR LEVEL LANDING ADJACENT TO THE DOOR ON THE STAIR SIDE.

1023.9.4 SIGNAGE REQUIREMENTS
FLOOR IDENTIFICATION SIGNS REQUIRED BY SECTION 1023.9.2 SHALL COMPLY WITH ALL OF THE FOLLOWING REQUIREMENTS:
1. THE SIGNS SHALL BE A MINIMUM SIZE OF 18 INCHES (457.2 MM) BY 12 INCHES (304.8 MM).
2. THE TOP OF THE SIGNS SHALL BE LOCATED 5 FEET (1524 MM) ABOVE THE FLOOR LANDING IN A POSITION THAT IS READILY VISIBLE WHEN THE DOORS ARE IN THE OPEN AND CLOSED POSITIONS.
3. THE NUMBER DESIGNATING THE FLOOR LEVEL SHALL BE NOT LESS THAN 5 INCHES (127 MM) IN HEIGHT AND LOCATED IN THE CENTER OF THE SIGN.
4. OTHER LETTERING AND NUMBERS SHALL BE NOT LESS THAN 1 INCH (25.4 MM) IN HEIGHT.
5. CHARACTERS AND THEIR BACKGROUND SHALL HAVE A NONGLARE FINISH. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND, WITH EITHER LIGHT CHARACTERS ON A DARK BACKGROUND OR DARK CHARACTERS ON A LIGHT BACKGROUND.
6. WHERE SIGNS REQUIRED BY SECTION 1023.9 ARE INSTALLED IN THE INTERIOR EXIT STAIRWAYS AND RAMPS OF BUILDINGS SUBJECT TO SECTION 1025, THE SIGNS SHALL BE MADE OF THE SAME LUMINOUS MATERIALS AS REQUIRED BY SECTION 1025.4.

1023.9.5 DIRECTIONS TO OPENABLE DOORS
WHERE DOORS SERVING INTERIOR EXIT STAIRWAYS ARE LOCKED ON THE STAIR SIDE, SIGNAGE SHALL BE POSTED IN COMPLIANCE WITH SECTIONS 1031.4.1, 1031.4.2 AND 1031.4.3.

1023.10 ELEVATOR LOBBY IDENTIFICATION SIGNS
AT LANDINGS IN INTERIOR EXIT STAIRWAYS WHERE TWO OR MORE DOORS LEAD TO THE FLOOR LEVEL, ANY DOOR WITH DIRECT ACCESS TO AN ENCLOSED ELEVATOR LOBBY SHALL BE IDENTIFIED BY SIGNAGE LOCATED ON THE DOOR OR DIRECTLY ADJACENT TO THE DOOR STATING "ELEVATOR LOBBY." SIGNAGE SHALL BE IN ACCORDANCE WITH SECTION 1023.9.4, ITEMS 4, 5 AND 6.
1023.11 SMOKEPROOF ENCLOSURES AND PRESSURIZATION ALTERNATIVE
IN BUILDINGS REQUIRED TO COMPLY WITH SECTION 403 OR 405, EACH OF THE INTERIOR EXIT STAIRWAYS AND RAMPS SERVING A STORY WITH A FLOOR SURFACE LOCATED MORE THAN 75 FEET (22 860 MM) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS OR MORE THAN 30 FEET (9144 MM) BELOW THE FINISHED FLOOR OF A LEVEL OF EXIT DISCHARGE SERVING SUCH STORIES SHALL BE PROTECTED BY A SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE IN ACCORDANCE WITH SECTION 909.20.

1023.11.1 TERMINATION AND EXTENSION
A SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE SHALL TERMINATE AT AN EXIT DISCHARGE OR A PUBLIC WAY. THE SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE SHALL BE PERMITTED TO BE EXTENDED BY AN EXIT PASSAGEWAY IN ACCORDANCE WITH SECTION 1023.3. THE EXIT PASSAGEWAY SHALL BE WITHOUT OPENINGS OTHER THAN THE FIRE DOOR ASSEMBLY REQUIRED BY SECTION 1023.3.1 AND THOSE NECESSARY FOR EGRESS FROM THE EXIT PASSAGEWAY. THE EXIT PASSAGEWAY SHALL BE SEPARATED FROM THE REMAINDER OF THE BUILDING BY 2-HOUR FIRE BARRIERS CONSTRUCTED IN ACCORDANCE WITH SECTION 707 OR HORIZONTAL ASSEMBLIES CONSTRUCTED IN ACCORDANCE WITH SECTION 711, OR BOTH.
EXCEPTIONS:
1. OPENINGS IN THE EXIT PASSAGEWAY SERVING A SMOKEPROOF ENCLOSURE ARE PERMITTED WHERE THE EXIT PASSAGEWAY IS PROTECTED AND PRESSURIZED IN THE SAME MANNER AS THE SMOKEPROOF ENCLOSURE, AND OPENINGS ARE PROTECTED AS REQUIRED FOR ACCESS FROM OTHER FLOORS.
2. OPENINGS IN THE EXIT PASSAGEWAY SERVING A PRESSURIZATION ALTERNATIVE ARE PERMITTED WHERE THE EXIT PASSAGEWAY IS PROTECTED AND PRESSURIZED IN THE SAME MANNER AS THE PRESSURIZATION ALTERNATIVE.
3. THE FIRE BARRIER SEPARATING THE SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE FROM THE EXIT PASSAGEWAY IS NOT REQUIRED, PROVIDED THE EXIT PASSAGEWAY IS PROTECTED AND PRESSURIZED IN THE SAME MANNER AS THE SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE.
4. A SMOKEPROOF ENCLOSURE OR PRESSURIZATION ALTERNATIVE SHALL BE PERMITTED TO EGRESS THROUGH AREAS ON THE LEVEL OF EXIT DISCHARGE OR VESTIBULES AS PERMITTED BY SECTION 1028.
1023.11.2 ENCLOSURE ACCESS
ACCESS TO THE STAIRWAY OR RAMP WITHIN A SMOKEPROOF ENCLOSURE SHALL BE BY WAY OF A VESTIBULE OR AN OPEN EXTERIOR BALCONY.
EXCEPTION: ACCESS IS NOT REQUIRED BY WAY OF A VESTIBULE OR EXTERIOR BALCONY FOR STAIRWAYS AND RAMPS USING THE PRESSURIZATION ALTERNATIVE COMPLYING WITH SECTION 909.20.5.

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403.4 EMERGENCY SYSTEMS
THE DETECTION, ALARM AND EMERGENCY SYSTEMS OF HIGH-RISE BUILDINGS SHALL COMPLY WITH SECTIONS 403.4.1 THROUGH 403.4.8.

403.4.1 SMOKE DETECTION
SMOKE DETECTION SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 907.2.13.1.

403.4.2 FIRE ALARMS SYSTEMS
A FIRE ALARM SYSTEM SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 907.2.13.

403.4.3 STANDPIPE SYSTEM
A HIGH-RISE BUILDING SHALL BE EQUIPPED WITH A STANDPIPE SYSTEM AS REQUIRED BY SECTION 905.3.

403.4.4 EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM
AN EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 907.5.2.2.

403.4.5 EMERGENCY RESPONDER RADIO COVERAGE
EMERGENCY RESPONDER RADIO COVERAGE SHALL BE PROVIDED IN ACCORDANCE WITH THE NEW YORK CITY FIRE CODE AND SECTION 907.2.13.2 OF THIS CODE.

403.4.6 FIRE COMMAND
A FIRE COMMAND CENTER COMPLYING WITH SECTION 911 SHALL BE PROVIDED IN A LOCATION APPROVED BY THE FIRE DEPARTMENT.

403.4.7 POST-FIRE SMOKE PURGE
A POST-FIRE SMOKE PURGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 917.

403.4.8 STANDBY AND EMERGENCY POWER
A STANDBY POWER SYSTEM COMPLYING WITH SECTION 2702 AND SECTION 3003 SHALL BE PROVIDED FOR THE STANDBY POWER LOADS SPECIFIED IN SECTION 403.4.8.3. AN EMERGENCY POWER SYSTEM COMPLYING WITH SECTION 2702 SHALL BE PROVIDED FOR THE EMERGENCY POWER LOADS SPECIFIED IN SECTION 403.4.8.4.

403.4.8.1 EQUIPMENT ROOM
IF THE STANDBY OR EMERGENCY POWER SYSTEM INCLUDES A GENERATOR SET INSIDE A BUILDING, THE SYSTEM SHALL BE LOCATED IN A SEPARATE ROOM IN ACCORDANCE WITH SECTION 2702.1.2.2.

403.4.8.2 FUEL LINE PIPING PROTECTION
FUEL LINES SUPPLYING A GENERATOR SET INSIDE A BUILDING SHALL COMPLY WITH SECTION 1305.9 OF THE NEW YORK CITY MECHANICAL CODE.

403.4.8.3 STANDBY POWER SYSTEMS
A STANDBY POWER SYSTEM COMPLYING WITH SECTION 2702 SHALL BE PROVIDED FOR STANDBY POWER LOADS SPECIFIED IN SECTIONS 403.4.8.3.1 AND 403.4.8.3.2. FUEL SOURCES FOR GENERATORS SHALL BE IN ACCORDANCE WITH SECTION 2702.1.1.

403.4.8.3.1 STANDBY POWER LOADS IN OCCUPANCIES OTHER THAN GROUP R-2
IN BUILDINGS OF ANY OCCUPANCY GROUP OTHER THAN GROUP R-2, THE FOLLOWING ARE CLASSIFIED AS STANDBY POWER LOADS:
1. POWER AND LIGHTING FOR FIRE COMMAND CENTER REQUIRED BY SECTION 403.4.6;
2. VENTILATION AND AUTOMATIC FIRE DETECTION EQUIPMENT FOR SMOKEPROOF ENCLOSURES;
3. ELEVATORS, IN ACCORDANCE WITH SECTION 3003; AND
4. STAIR PRESSURIZATION SYSTEMS WHEN PROVIDED.

403.4.8.3.2 STANDBY POWER LOADS IN GROUP R-2 OCCUPANCIES
GROUP R-2 OCCUPANCIES IN BUILDINGS GREATER THAN 125 FEET (38 100 MM) IN HEIGHT SHALL BE REQUIRED TO PROVIDE A STANDBY POWER SYSTEM TO SUPPORT THE FOLLOWING LOADS:
1. POWER AND LIGHTING FOR FIRE COMMAND CENTER REQUIRED BY SECTION 403.4.6;
2. VENTILATION AND AUTOMATIC FIRE DETECTION EQUIPMENT FOR SMOKEPROOF ENCLOSURES;
3. AT LEAST ONE ELEVATOR SERVING ALL FLOORS, OR ONE ELEVATOR PER BANK WHERE DIFFERENT BANKS SERVE DIFFERENT PORTIONS OF THE BUILDING; AND
4. STAIR PRESSURIZATION SYSTEMS WHEN PROVIDED.

403.4.8.4 EMERGENCY POWER SYSTEMS
AN EMERGENCY POWER SYSTEM COMPLYING WITH SECTION 2702 SHALL BE PROVIDED FOR EMERGENCY POWER LOADS SPECIFIED IN SECTIONS 403.4.8.4.1 AND 403.4.8.4.3. FUEL SOURCES FOR GENERATORS SHALL BE IN ACCORDANCE WITH SECTION 2702.1.1.

403.4.8.4.1 EMERGENCY POWER LOADS IN OCCUPANCIES OTHER THAN GROUP R-2
IN BUILDINGS OF ANY OCCUPANCY GROUP OTHER THAN GROUP R-2, THE FOLLOWING ARE CLASSIFIED AS EMERGENCY POWER LOADS:
1. EXIT SIGNS AND MEANS OF EGRESS ILLUMINATION REQUIRED BY CHAPTER 10;
2. ELEVATOR CAR LIGHTING;
3. EMERGENCY VOICE/ALARM COMMUNICATIONS SYSTEMS, INCLUDING FIRE DEPARTMENT IN-BUILDING AUXILIARY RADIO COMMUNICATION SYSTEMS (ARCS);
4. AUTOMATIC FIRE DETECTION SYSTEMS;
5. FIRE ALARM SYSTEMS; AND
6. ELECTRICALLY POWERED FIRE PUMPS, INCLUDING MANUAL FIRE PUMPS, AUTOMATIC FIRE PUMPS, AND SPRINKLER BOOSTER PUMPS.

403.4.8.4.2 EMERGENCY POWER LOADS IN GROUP R-2 OCCUPANCIES
GROUP R-2 OCCUPANCIES IN BUILDINGS GREATER THAN 125 FEET (38 100 MM) IN HEIGHT SHALL BE REQUIRED TO PROVIDE AN EMERGENCY POWER SYSTEM TO SUPPORT THE FOLLOWING LOADS:
1. EXIT SIGNS AND MEANS OF EGRESS ILLUMINATION REQUIRED BY CHAPTER 10;
2. EMERGENCY VOICE COMMUNICATIONS SYSTEMS, INCLUDING FIRE DEPARTMENT IN-BUILDING AUXILIARY RADIO COMMUNICATION SYSTEMS (ARCS); AND
3. ELECTRICALLY POWERED FIRE PUMPS, UNLESS ELECTRICAL POWER TO THE MOTOR IS TAKEN AHEAD OF THE MAIN FROM THE STREET SIDE OF THE HOUSE SERVICE SWITCH.

403.4.8.4.3 EMERGENCY POWER LOADS IN GROUP R-2 OCCUPANCIES 125 FEET OR LESS IN HEIGHT
GROUP R-2 OCCUPANCIES IN BUILDINGS 125 FEET (38 100 MM) OR LESS IN HEIGHT SHALL BE REQUIRED TO PROVIDE AN EMERGENCY POWER SYSTEM TO SUPPORT THE FOLLOWING LOADS:
1. EMERGENCY VOICE COMMUNICATIONS SYSTEMS IN BUILDINGS CONTAINING GROUP R-2 OCCUPANCIES IN ACCORDANCE WITH SECTION 907.5.2.2 OF THIS CODE, OR WHERE OTHERWISE PROVIDED. BATTERIES IN ACCORDANCE WITH THE NEW YORK CITY ELECTRICAL CODE ARE PERMITTED TO SERVE AS THE SECONDARY POWER SUPPLY FOR SUCH SYSTEMS.
2. FIRE DEPARTMENT IN-BUILDING AUXILIARY RADIO COMMUNICATION SYSTEMS (ARCS) IN BUILDINGS CONTAINING GROUP R-2 OCCUPANCIES IN ACCORDANCE WITH SECTION 916.3 OF THIS CODE, OR WHERE OTHERWISE PROVIDED. BATTERIES IN ACCORDANCE WITH THE NEW YORK CITY ELECTRICAL CODE ARE PERMITTED TO SERVE AS THE SECONDARY POWER SUPPLY FOR SUCH SYSTEMS.

403.5 MEANS OF EGRESS AND EVACUATION
THE MEANS OF EGRESS IN HIGH-RISE BUILDINGS SHALL COMPLY WITH SECTIONS 403.5.1 THROUGH 403.5.6.

403.5.1 REMOTENESS OF INTERIOR EXIT STAIRWAYS
REQUIRED INTERIOR EXIT STAIRWAYS SHALL BE SEPARATED BY A DISTANCE NOT LESS THAN 30 FEET (9144 MM) OR NOT LESS THAN 1/4 OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE BUILDING OR AREA TO BE SERVED, WHICHEVER IS LESS. THE DISTANCE SHALL BE MEASURED IN A STRAIGHT LINE BETWEEN THE NEAREST POINTS OF THE ENCLOSURE SURROUNDING THE INTERIOR EXIT STAIRWAYS. IN BUILDINGS WITH THREE OR MORE INTERIOR EXIT STAIRWAYS, NO FEWER THAN TWO OF THE INTERIOR EXIT STAIRWAYS SHALL COMPLY WITH THIS SECTION. STAIRS SHARING ANY COMMON WALL, FLOORS, CEILINGS, SCISSOR STAIR ASSEMBLIES, OR OTHER ENCLOSURES SHALL BE COUNTED AS ONE INTERIOR EXIT STAIRWAY.

EXCEPTION: GROUP R-2 OCCUPANCIES.

403.5.2 ADDITIONAL EXIT STAIRWAY
FOR BUILDINGS OTHER THAN GROUP R-2 THAT ARE MORE THAN 420 FEET (128 M) IN BUILDING HEIGHT, ONE ADDITIONAL EXIT STAIRWAY MEETING THE REQUIREMENTS OF SECTIONS 1011 AND 1023 SHALL BE PROVIDED IN ADDITION TO THE MINIMUM NUMBER OF EXITS REQUIRED BY SECTION 1006.3. THE TOTAL WIDTH OF ANY COMBINATION OF REMAINING EXIT STAIRWAYS WITH ONE EXIT STAIRWAY REMOVED SHALL NOT BE LESS THAN THE TOTAL WIDTH REQUIRED BY SECTION 1005.1. STAIRS SHARING ANY COMMON WALL, FLOORS, CEILINGS, SCISSOR STAIR ASSEMBLIES, OR OTHER ENCLOSURES SHALL NOT BE CONSIDERED THE ADDITIONAL EXIT STAIRWAY REQUIRED BY THIS SECTION.

EXCEPTIONS: AN ADDITIONAL EXIT STAIRWAY SHALL NOT BE REQUIRED TO BE INSTALLED IN ANY OF THE FOLLOWING INSTANCES:
1. IN BUILDINGS WHERE ALL PASSENGER ELEVATORS FOR GENERAL PUBLIC USE AND ALL OTHER ELEVATORS USED FOR OCCUPANT SELF-EVACUATION COMPLY WITH SECTIONS 3008.1 THROUGH 3008.11;
2. IN BUILDINGS WHERE ALL OF THE FOLLOWING CONDITIONS ARE MET:
2.1 THE COMMISSIONER HAS APPROVED A TIMED EGRESS ANALYSIS ESTABLISHING THE EGRESS TIME IT WOULD TAKE FOR A FULL BUILDING EVACUATION, UTILIZING THE STAIRS REQUIRED BY SECTION 1006 AND THE ADDITIONAL STAIR THAT WOULD HAVE BEEN REQUIRED PURSUANT TO SECTION 403.5.2;
2.2 THE COMMISSIONER HAS APPROVED A TIMED EGRESS ANALYSIS ESTABLISHING THE EGRESS TIME IT WOULD TAKE FOR A FULL BUILDING EVACUATION, UTILIZING THE COMBINATION OF THE STAIRS REQUIRED BY SECTION 1006 AND ELEVATORS USED FOR OCCUPANT SELF-EVACUATION AS FOLLOWS:
2.2.1 SUCH ANALYSIS NEED ONLY UTILIZE A NUMBER OF DESIGNATED ELEVATORS DESIGNED FOR OCCUPANT SELF-EVACUATION NECESSARY TO DEMONSTRATE AN EVACUATION TIME THAT IS LESS THAN THE TIME ESTABLISHED IN EXCEPTION 2.1; AND
2.2.2 EVERY BANK OF PASSENGER ELEVATORS FOR GENERAL PUBLIC USE SHALL BE SERVED BY AT LEAST ONE SUCH DESIGNATED ELEVATOR;
2.3 ALL ELEVATORS IN THE BUILDING THAT EITHER ARE PASSENGER ELEVATORS FOR GENERAL PUBLIC USE OR ARE USED FOR OCCUPANT SELF-EVACUATION SHALL COMPLY WITH SECTIONS 3008.1 THROUGH 3008.11. HOWEVER, THE STANDBY POWER GENERATING EQUIPMENT REQUIRED BY SECTION 3008.9 NEED ONLY BE SIZED TO SATISFY THE LOADS REQUIRED TO SIMULTANEOUSLY OPERATE THOSE ELEVATORS IDENTIFIED IN THE TIMED EGRESS ANALYSIS DESCRIBED IN EXCEPTION 2.2.

THE MINIMUM NUMBER OF EXITS REQUIRED BY SECTION 1006 ARE ALL AT LEAST 25 PERCENT WIDER THAN THE EXIT WIDTH REQUIRED BY CHAPTER 10. THE INCREASE IN THE STAIR WIDTH SHALL NOT BE UTILIZED IN THE TIMED EGRESS ANALYSES REQUIRED BY EXCEPTIONS 2.1 AND 2.2.

403.5.3 STAIRWAY DOOR OPERATION
OORS OPENING INTO INTERIOR STAIR ENCLOSURES SHALL NOT BE LOCKED FROM EITHER SIDE. HOWEVER, A DOOR LOCKED FROM THE STAIR SIDE MAY BE PERMITTED PROVIDED THAT SUCH DOOR IS EQUIPPED WITH AN AUTOMATIC FAIL SAFE SYSTEM FOR OPENING IN THE EVENT OF THE ACTIVATION OF ANY AUTOMATIC FIRE DETECTION SYSTEM, OR WHEN ANY ELEVATOR RECALL IS ACTIVATED, OR WHEN ANY SIGNAL IS RECEIVED FROM THE FIRE COMMAND CENTER. SUCH DOOR SHALL BE DEEMED AS OPENABLE FROM THE STAIR SIDE. STAIR REENTRY SIGNS SHALL BE POSTED THROUGHOUT THE STAIRWAY INDICATING THAT REENTRY IS PROVIDED ONLY DURING FIRE EMERGENCIES. SUCH SIGNS SHALL BE IN ACCORDANCE WITH SECTION 1031.4.2.

EXCEPTION: IN SCHOOLS CLASSIFIED AS GROUP E OCCUPANCIES THAT REQUIRE "LOCKDOWN DRILLS" AS PER SECTION 807 OF THE NEW YORK STATE EDUCATION LAW, STAIRWAY EGRESS DOORS FROM OCCUPIED SPACES ARE PERMITTED TO BE LOCKED FROM THE SIDE OPPOSITE THE EGRESS SIDE FOR THE DURATION OF THE LOCKDOWN DRILL, PROVIDED THEY ARE OPENABLE FROM THE OCCUPIED SIDE FOR EGRESS AND ARE UNLOCKED UPON DIRECTIONS FROM THE SCHOOL ADMINISTRATIVE PERSONNEL FOLLOWING THE COMPLETION OF THE LOCKDOWN DRILL.

403.5.3.1 STAIRWAY COMMUNICATION SYSTEM
A TELEPHONE OR OTHER TWO-WAY VOICE‡ COMMUNICATIONS SYSTEM CONNECTED TO AN APPROVED CONSTANTLY ATTENDED STATION SHALL BE PROVIDED AT NOT LESS THAN EVERY FIFTH FLOOR IN EACH STAIRWAY WHERE THE DOORS TO THE STAIRWAY ARE LOCKED IN ACCORDANCE WITH SECTION 403.5.3.

403.5.4 SMOKEPROOF ENCLOSURES
EVERY REQUIRED INTERIOR EXIT STAIRWAY SERVING FLOORS MORE THAN 75 FEET (22 860 MM) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS SHALL COMPLY WITH SECTIONS 909.20 AND 1023.11.

EXCEPTION: SMOKEPROOF ENCLOSURES ARE NOT REQUIRED IN OCCUPANCY GROUP R-2 UNLESS PROVIDED PURSUANT TO EXCEPTION 2 OF SECTION 917.1..

403.5.5 LUMINOUS EGRESS PATH MARKINGS
LUMINOUS EGRESS PATH MARKINGS SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 1025 AND APPENDIX S.

EXCEPTION: EGRESS PATHS SERVING GROUP R-2.

403.5.6 EMERGENCY ESCAPE AND RESCUE
EMERGENCY ESCAPE AND RESCUE OPENINGS SPECIFIED IN SECTION 1030 ARE NOT REQUIRED

403.6 ELEVATORS
ELEVATOR INSTALLATION AND OPERATION IN HIGH-RISE BUILDINGS SHALL COMPLY WITH CHAPTER 30 AND SECTIONS 403.6.1 AND 403.6.2.

403.6.1 FIRE SERVICE ACCESS ELEVATOR
IN BUILDINGS WITH AN OCCUPIED FLOOR MORE THAN 120 FEET (36 576 MM) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS, A MINIMUM OF ONE FIRE SERVICE ACCESS ELEVATOR SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 3007

403.6.2 OCCUPANT EVACUATION ELEVATORS
WHERE INSTALLED IN ACCORDANCE WITH SECTION 3008, PASSENGER ELEVATORS FOR GENERAL PUBLIC USE SHALL BE PERMITTED TO BE USED FOR OCCUPANT SELF-EVACUATION.

403.6.3 ELEVATOR LOBBIES
ELEVATOR LOBBIES SHALL BE PROVIDED IN ACCORDANCE WITH SECTIONS 3006.1.1 AND 3006.1.2.

403.7 OUTDOOR AIR INTAKES
FOR HIGH-RISE BUILDINGS, OUTDOOR AIR INTAKES SERVING SPACES ABOVE THE SECOND STORY AND SERVING SPACES GREATER THAN 10,000 SQUARE FEET (929 M2) OF FLOOR AREA SHALL BE LOCATED IN ACCORDANCE WITH SECTION 401.5 OF THE NEW YORK CITY MECHANICAL CODE.

EXCEPTION: GROUP R-2 OCCUPANCY.

403.8 OPEN WEB STEEL JOISTS
THE USE OF OPEN WEB STEEL JOISTS SHALL BE PROHIBITED IN HIGH-RISE BUILDINGS UNTIL THE COMMISSIONER PROMULGATES RULES ESTABLISHING MINIMUM ACCEPTABLE FIREPROOFING METHODS.

TABLE 504.3a
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION									
	SEE FOOTNOTES	TYPE I		TYPE II		TYPE III		TYPE IVi	TYPE V	
		A	Bi	A	B	A	B	HT	A	B
A-1	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-2	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-3	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-4	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
A-5	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
B	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
E	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
F-1	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
F-2	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
H-1	S	UL	160	65	55	65	55	65	50	NP
H-2f	S	UL	160	65	55	65	55	65	50	40
H-3f	S	UL	160	65	55	65	55	65	50	40
H-4	S	UL	180	85	75	85	75	85	70	60
H-5	S	UL	160	65	55	65	55	65	50	40
I-1	S13D	60	60	60	NP	60	55	60	NP	NP
	S13R	60	60	60	NP	60	55	60	NP	NP
	S	UL	420	85	NP	85	75	85	NP	NP
I-2	S	UL	180	85	55	65	55	65	50	NP
I-3	S	UL	180	85	75	85	75	85	70	NP
I-4	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
M	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
R-1	S13R	60	60	60	NP	60	NP	60	NP	NP
	S	UL	420	85	NP	85	NP	85	NP	NP
R-2	S13R	60	60	60	NP	60	60	60	NP	NP
	S	UL	420	85	NP	85	75	85	NP	NP
R-3	NSb,c	UL	160	65	55	65	55	65	50g,h	40g
	S13D	60	60	60	60	60	55	60	50g,h	40g
	S13R	60	60	60	60	60	60	60	60g,h	60g
	S	UL	420	85	75	85	75	85	70g,h	60g
S-1	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
S-2d,e	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	420	85	75	85	75	85	70	60
Ue	NSb,c	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60

NOT PERMITTED IN FIRE DISTRICT	NOT PERMITTED IN FIRE DISTRICT WITHOUT SPRINKLERS

X = Number of stories in nonsprinklered 1- & 2-family buildings shall be limited by Section 903.2.8

Note: UL = Unlimited; NP = Not permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See the following sections for general exceptions to Table 504.4:
1. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
2. Section 506.3, Allowable area increase due to frontage.
3. Section 507, Unlimited area building.
b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
c. The NS value is only for use in buildings not required by this code to be equipped throughout with an automatic sprinkler system.
d. For open parking structures, see Section 406.5.
e. For private garages, see Section 406.3.
f. See Section 415.8 for limitations.
g. See Exception 9 of Section D105.1 for allowances of Type VA and VB construction for R-3 occupancies.
h. See Exception 12 of Section D105.1 for allowances of Type VA construction and height limitations for R-3 occupancies in Lower Density Growth Management Areas.
i. Type IV construction utilizing cross-laminated timber or structural composite lumber shall be sprinklered where required by Section 903.2.13.

TABLE 504.3
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
S-2 [d,a]	NS [b,c]	UL	160	65	55	65	55	65	50	40

GENERAL BUILDING HEIGHTS AND AREAS; SEPARATION OF OCCUPANCIES

	S	UL	420	85	75	85	75	85	70	60
U [e]	NS [b,c]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60

= Not permitted in Fire District
= Not permitted in Fire District without sprinklers

For SI: 1 foot 304.8 mm.
Note: UL-Unlimited; NP-Not permitted; NS-Buildings not equipped throughout with an automatic sprinkler system; S-Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R - Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.
a. See the following sections for general exceptions to Table 504.3:
1. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
2. Section 506.3, Allowable area increase due to frontage.
3. Section 507, Unlimited area building
b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
c. The NS value is only for use in buildings not required by this code to be equipped throughout with an automatic sprinkler system.
d. For open parking structures, see Section 406.5.
e. For private garages, see Section 406.3.
f. See Section 415.8 for limitations.
g. See Exception 9 of Section D105.1 for allowances of Type VA and VB construction for R-3 occupancies.
h. See Exception 12 of Section D105.1 for allowances of Type VA construction and height limitations for R-3 occupancies in Lower Density Growth Management Areas.
i. See Section 403.2.1 for additional requirements for high-rise buildings.
j. Type IV construction utilizing cross-laminated timber or structural composite lumber shall be sprinklered where required by Section 903.2.13.

19. TABLE 508.4 OF 2022 NYC BC CHAPTER 5 GENERAL BUILDING HEIGHTS AND AREAS; SEPARATION OF OCCUPANCIES, SECTION BC 508 MIXED USE AND OCCUPANCY.

TABLE 508
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

Occupancy	A , E		I-1, I-3, 1-4		I-2		R[a]		F-2, S-2[b], U		B		F-1		M		S-1		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A , E	N	N	1	2	2	NP	1	2	N	1	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
I-1, I-3, 1-4	--	--	N	N	2	NP	1	NP	1	2	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
I-2	--	--	--	--	N	N	2	NP	2	NP	2	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
R[a]	--	--	--	--	--	--	N	N	1[c]	2[c]	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2[b], U	--	--	--	--	--	--	--	--	N	N	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
B	--	--	--	--	--	--	--	--	--	--	N	N	2	3	1	2	2	3	NP	NP	2	3	1	2	1	NP
F-1	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	2	3	NP	NP	2	3	1	2	1	NP
M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	NP	NP	2	3	1	2	1	NP
S-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	NP	NP	2	3	1	2	1	NP
H-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	NP	NP	NP	NP	NP	NP
H-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	1	NP	1	NP
H-3, H-4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1[d]	NP	1	NP
H-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement
NP = Not permitted
a. See Section 420
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.1.4.
d. Separation is not required between occupancies of the same classification.

MULTIPLE DWELLING LAW

GENERAL PROVISIONS

1. LIGHTING AND VENTILATION OF ROOMS SHALL BE AS PER SECTION 30, MDL.
2. SIZE OF ROOMS SHALL BE AS PER SECTION 31, MDL.
3. ALCOVES SHALL BE AS PER SECTION 32, MDL.
4. COOKING SPACES (KITCHENS & KITCHENETTES) SHALL BE AS PER SECTION 33, MDL.
5. BUILDING ENTRANCE DOORS AND LIGHTS SHALL BE AS PER SECTION 35, MDL.
6. MAIL RECEPTACLES SHALL BE AS PER SECTION 57, MDL.
7. ALL INCOMBUSTIBLE MATERIALS SHALL BE AS PER SECTION 58, MDL.
8. PARAPETS AND GUARD RAILINGS SHALL BE AS PER SECTION 62, MDL.
9. SUB-CURB USES SHALL BE AS PER SECTION 63, MDL.
10. LIGHTING, GAS METERS, GAS AND OIL APPLIANCES SHALL BE AS PER SECTION 64, MDL.
11. BOILER ROOMS SHALL BE AS PER SECTION 65, MDL.
12. WATER-CLOSET AND BATH ACCOMMODATIONS SHALL BE AS PER SECTION 76, MDL.
13. PLUMBING AND DRAINAGE SHALL BE AS PER SECTION 77, MDL.
14. REPAIRS SHALL BE MADE AS PER SECTION 78, MDL.
15. HEAT SHALL BE PROVIDED AS PER SECTION 79, MDL.
16. CLEANLINESS SHALL BE AS PER SECTION 80, MDL.
17. RECEPTACLES FOR WASTE MATTER SHALL BE AS PER SECTION 81, MDL.
18. PRIVACY SHALL BE AS PER SECTION 82, MDL.
19. JANITORIAL SERVICES SHALL BE AS PER SECTION 83, MDL.
20. CONSTRUCTION STANDARDS FOR THE CONTROL OF NOISE SHALL BE AS ER SECTION 84, MDL.

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

OCCUPANCY	A, E		I-1a, I-3, I-4		I-2		Ra		F-2, S-2b, U		Be		F-1		M		S-1		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A, E	N	N	1	2	2	NP	1	2	Nf	1f	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
I-1a, I-3, I-4	--	--	N	N	2	NP	1	NP	1	2	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
I-2	--	--	--	--	N	N	2	NP	2	NP	2	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
Ra	--	--	--	--	--	--	N	N	1c	2c	1	2	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2b, U	--	--	--	--	--	--	--	--	N	N	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
Be	--	--	--	--	--	--	--	--	--	--	N	N	2	3	1	2	2	3	NP	NP	2	3	1	2	1	NP
F-1	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	2	3	NP	NP	2	3	1	2	1	NP
M	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	NP	NP	2	3	1	2	1	NP
S-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	NP	NP	2	3	1	2	1	NP
H-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	NP	NP	NP	NP	NP	NP
H-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	1	NP	1	NP
H-3, H-4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1d	NP	1	NP
H-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.
a. See Section 420.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.3.4.
d. Separation is not required between occupancies of the same classification.
e. See Section 422.2 for ambulatory care facilities.
f. A commercial kitchen in Group F-2 that does not comply with Section 508.1, Exception 5 shall be separated from adjoining dining spaces with 1-hour fire separation where the dining spaces are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, and separated with 2-hour fire separation where the dining spaces is not equipped throughout with an automatic sprinkler system.

OCCUPANCY FIRE-RESISTANCE RATINGS NOTES

20. TABLE 601 OF 2022 NYC BC CHAPTER 6 TYPES OF CONSTRUCTION, SECTION BC 601 GENERAL.

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame (see section 202)	3[a]	2[a,j]	1[j]	0	1	0	HT	1	0
Bearing walls Exterior Interior	3 3[a]	2 2[a]	1 1	0 0	2 1	2 0	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior			See Table 602						
Nonbearing walls and partitions Interior	0	0	0	0	0	0	See Section 602.4.6.	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1[1/2b,c]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.
a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
b. 1. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members within any portion of the roof, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant- treated wood members shall be allowed to be used for such unprotected members.
2. Except in Group F occupancies subject to regulation under Sections 264(1) and 264(2) of the New York State Labor Law, and in Group I-1, R-1, and R-2 occupancies, in Types I and II construction, fire-retardant-treated wood shall be allowed in buildings including girders and trusses as part of the roof construction when the building is:
i. Type II construction of any height; or
ii. Type I construction two stories or less; or when over two stories, the vertical distance from the upper floor to the roof is 20 feet or more. c. Except in Group F occupancies subject to regulation under Sections 264(1) and 264(2) of the New York State Labor Law, and in Group I-1, R-1 and R-2 occupancies, heavy timber shall be allowed where a 1- hour or less fire-resistance rating is required.
d. Not less than the fire-resistance rating required by other sections of this code.
e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
f. Not less than the fire-resistance rating as referenced in Section 704.10.
g. See note g of Table 602.
h. See Section 711.2.4 for additional requirements.
i. Type V construction is not permitted inside fire districts except as provided for in Section D105.1 of Appendix D.
j. See Section 403.2.1 for additional requirements for high-rise buildings and fire-resistance rating of columns in such buildings.

21. TABLE 602 OF 2022 NYC BC CHAPTER 6 TYPES OF CONSTRUCTION, SECTION BC 602 CONSTRUCTION CLASSIFICATION.

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H [f]	OCCUPANCY GROUP F-1, M, S-1 [g,l]	OCCUPANCY GROUP A, B, E, F-2, I, R, S-2, U [b]
			a,e,g,h,j	
X<5[c]	All	3	2	1
5 < x < 10	IA	3	2	1
	Others	2	1	1
10 ≤ X < 30	IA,IB	2	1	1[d]
	IIB,VB	1	0	0
	Others	1	1	1[d]
X>30	All	0	0	0

For SI: 1 foot 304.8 mm.
a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
b. Group U when used as accessory to Group R-3 shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet or more for free standing private garages in compliance with Section 406.1, and when the separation distance is 3 feet or more for other freestanding Group U buildings. For free standing private garages where the fire separation distance is less than 5 feet, refer to Section 406.3.4 for required fire-resistance rating for exterior walls.
c. See Section 706.1.1 for party walls.
d. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
e. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
f. For special requirements for Group H occupancies, see Section 415.6.
g. Inside the fire district, exterior load-bearing walls of Type II buildings shall have a fire-resistance rating not less than prescribed below:
X<5 2 hours
5 < x <10 2 hours
10 <X<30 1 hour
X230 As per Table 602.

h. Inside the fire district, exterior nonload-bearing walls of Type II buildings shall have a fire-resistance rating not less than prescribed below: X<5 As per Table 602
5≤ X ≤10 As per Table 602
10<X<30 X230 1 hour
X>30 As per Table 602.
i. For special requirements for Group S aircraft hangars, see Section 412.4.1.
j. Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE Vi	
	A	B	A	B	A	B	HT	A	B
Primary structural framef (see Section 202)	3a	2a, j	1j	0	1	0	HT	1	0
Bearing walls									
Exteriore,f,g	3	2	1	0	2	2	2	1	0
Interior	3a	2a	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions									
Exterior			See Table 602						
Nonbearing walls and partitions Interiord	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor constructionh and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	11/2b,c	1b,c	1b,c	0c	1b,c	0	HT	1b,c	0

FOR SI: 1 FOOT = 304.8 MM.
A. ROOF SUPPORTS: FIRE-RESISTANCE RATINGS OF PRIMARY STRUCTURAL FRAME AND BEARING WALLS ARE PERMITTED TO BE REDUCED BY 1 HOUR WHERE SUPPORTING A ROOF ONLY.
B. 1.EXCEPT IN GROUP F-1, H, M AND S-1 OCCUPANCIES, FIRE PROTECTION OF STRUCTURAL MEMBERS IN ROOF CONSTRUCTION SHALL NOT BE REQUIRED, INCLUDING PROTECTION OF PRIMARY STRUCTURAL FRAME MEMBERS WITHIN ANY PORTION OF THE ROOF, ROOF FRAMING AND DECKING WHERE EVERY PART OF THE ROOF CONSTRUCTION IS 20 FEET OR MORE ABOVE ANY FLOOR IMMEDIATELY BELOW. FIRE-RETARDANT- TREATED WOOD MEMBERS SHALL BE ALLOWED TO BE USED FOR SUCH UNPROTECTED MEMBERS.
2. EXCEPT IN GROUP F OCCUPANCIES SUBJECT TO REGULATION UNDER SECTIONS 264(1) AND 264(2) OF THE NEW YORK STATE LABOR LAW, AND IN GROUP I-1, R-1, AND R-2 OCCUPANCIES, IN TYPES I AND II CONSTRUCTION, FIRE-RETARDANT—TREATED WOOD SHALL BE ALLOWED IN BUILDINGS INCLUDING GIRDERS AND TRUSSES AS PART OF THE ROOF CONSTRUCTION WHEN THE BUILDING IS:
i.TYPE II CONSTRUCTION OF ANY HEIGHT; OR
ii. TYPE I CONSTRUCTION TWO STORIES OR LESS; OR WHEN OVER TWO STORIES, THE VERTICAL DISTANCE FROM THE UPPER FLOOR TO THE ROOF IS 20 FEET OR MORE.
C. EXCEPT IN GROUP F OCCUPANCIES SUBJECT TO REGULATION UNDER SECTIONS 264(1) AND 264(2) OF THE NEW YORK STATE LABOR LAW, AND IN GROUP I-1, R-1 AND R-2 OCCUPANCIES, HEAVY TIMBER SHALL BE ALLOWED WHERE A 1-HOUR OR LESS FIRE-RESISTANCE RATING IS REQUIRED.
D. NOT LESS THAN THE FIRE-RESISTANCE RATING REQUIRED BY OTHER SECTIONS OF THIS CODE.
E. NOT LESS THAN THE FIRE-RESISTANCE RATING BASED ON FIRE SEPARATION DISTANCE (SEE TABLE 602).
F. NOT LESS THAN THE FIRE-RESISTANCE RATING AS REFERENCED IN SECTION 704.10.
G. SEE NOTE G OF TABLE 602.
H. SEE SECTION 711.2.4 FOR ADDITIONAL REQUIREMENTS.
I. TYPE V CONSTRUCTION IS NOT PERMITTED INSIDE FIRE DISTRICTS EXCEPT AS PROVIDED FOR IN SECTION D105.1 OF APPENDIX D.
J. SEE SECTION 403.2.1 FOR ADDITIONAL REQUIREMENTS FOR HIGH-RISE BUILDINGS AND FIRE-RESISTANCE RATING OF COLUMNS IN SUCH BUILDINGS.FOR SI: 1 FOOT = 304.8 MM.

HOUSING MAINTENANCE CODE

1. OWNER SHALL FILE REGISTRATION STATEMENT AS PER §27–2097 HMC.
2. OWNER SHALL PROVIDE A SIGN IDENTIFYING OWNER, MANAGEMENT AND SUPERINTENDENT AS PER § 27–2104 HMC.
3. FLOOR SIGNS SHALL BE PLACED AND MAINTAINED ON EACH FLOOR LEVEL AS PER §27–2048 HMC.
4. ALL APARTMENT ENTRANCE DOORS SHALL BE A MINIMUM 3/4 HOUR RATED, SELF CLOSING WITH PEEPHOLES AS PER §27–2041 HMC AND LOCKS AS PER §27–2043 HMC.
5. MIRRORS IN ELEVATORS SHALL BE AS PER §27–2042 HMC.
6. THE BUILDING'S HEATING AND HOT WATER SUPPLY SHALL COMPLY WITH §27–2028 THROUGH § 27–2033 HMC.
7. LIGHTING SHALL BE PROVIDED AS PER §27–2037 THROUGH §27–2040 AND C26-605AC, C26-1203AC AND SECTION 26-35 MDL.
8. RECEPTACLES AND COLLECTION FOR WASTE MATTER SHALL BE PROVIDED AS PER §27–2021 AND §27–2022 HMC.
9. U.S. MAIL SERVICE SHALL BE PROVIDED AS PER §27–2047 HMC.
10. THE BUILDING STREET NUMBER SHALL BE DISPLAYED AS §27–2049 HMC.
11. JANITORIAL SERVICES SHALL BE PROVIDED AS PER §27–2053 AND §27–2054 HMC.
12. OWNER SHALL PAINT ALL PUBLIC PARTS OF A MULTIPLE DWELLING AS PER §27–2013 HMC.
13. INTERIOR OF DWELLING UNITS SHALL BE CLEANED §27–2012 HMC
14. DUTIES OF OWNER SHALL BE AS PER §27–2005 HMC.
15. DUTIES OF TENANTS SHALL BE AS PER §27–2006 AND §27–2007 HMC.
16. OWNER'S RIGHT OF ACCESS SHALL BE AS PER §27–2008 HMC.
17. NOTICE AND REPORTING OF BEDBUG INFESTATION SHALL BE AS PER §27–2018
18. WATER SHALL BE SUPPLIED AS PER §27–2024 AND §27–2025 HMC.
19. THE PLUMBING AND DRAINAGE SYSTEM SHALL BE MAINTAINED AS PER §27–2026 HMC.
20. DRAINAGE OF ROOFS AND COURT YARDS SHALL BE AS PER §27–2027 HMC.
21. NATURAL LIGHT AND VENTILATION SHALL BE PROVIDED AS PER §27–2057 HMC FOR MULTIPLE DWELLINGS.
22. SANITARY FACILITIES IN MULTIPLE DWELLINGS AND LIGHT AND VENTILATION FOR TOILET COMPARTMENTS SHALL BE AS PER §27–2064, §27–2065, §27–2066 AND §27–2067 HMC.
23. KITCHENS AND KITCHENETTES SHALL BE PROVIDED WITH PROPER FACILITIES, EQUIPMENT, LIGHTING, VENTILATION AND FIRE PROTECTION AS PER §27–2070, §27–2071, AND §27–2072 HMC.
24. MINIMUM ROOM SIZES SHALL BE AS PER §27–2074 AND MAXIMUM OCCUPANCY SHALL BE AS PER §27–2075 HMC.

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) NOTES

1. EIFS SHALL BE CONSTRUCTED SUCH THAT IT MEETS THE PERFORMANCE CHARACTERISTICS REQUIRED IN ASTM E 2568.

2. THE UNDERLYING STRUCTURAL FRAMING AND SUBSTRATE SHALL BE DESIGNED AND CONSTRUCTED TO RESIST LOADS AS REQUIRED BY NUC B 2014, CHAPTER 16.

3. EIFS SHALL BE DESIGNED AND CONSTRUCTED TO RESIST WIND AND RAIN IN ACCORDANCE WITH THIS THE MANUFACTURER'S APPLICATION INSTRUCTIONS.

4. EIFS WITH DRAINAGE SHALL HAVE AN AVERAGE MINIMUM DRAINAGE EFFICIENCY OF 90 PERCENT WHEN TESTED IN ACCORDANCE WITH REQUIREMENTS OF ASTM E 2273.

5. EIFS WITH DRAINAGE SHALL HAVE A WATER-RESISTIVE BARRIER COMPLYING WITH SECTION 1404.2 OR ASTM E 2570.

6. INSTALLATION OF EIFS AND EIFS WITH DRAINAGE SHALL BE IN ACCORDANCE WITH THE EIFS MANUFACTURER'S INSTRUCTIONS.

7. EIFS INSTALLATION SPECIAL INSPECTIONS SHALL COMPLY WITH THE PROVISIONS OF NYC BC 2014, CHAPTER 17.

SMOKE DETECTING DEVICES NOTES

1. SMOKE DETECTING DEVICES SHALL CONFORM TO THE 2014 NYC BC SECTION BC 907 FIRE ALARM AND DETECTION SYSTEMS. SYSTEMS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH NFPA 72 AS MODIFIED IN APPENDIX Q AND THE NEW YORK CITY ELECTRICAL CODE.

2. SMOKE DETECTORS WITHIN DWELLING UNITS ARE REQUIRED IN THE FOLLOWING AREAS AS PER SECTION 907.2.8.3: IN SLEEPING AREAS AND IN EVERY ROOM IN THE PATH OF THE MEANS OF EGRESS FROM THE SLEEPING AREA TO THE DOOR LEADING FROM THE DWELLING UNIT.

3. AS PER SECTION 907.2.11.2, REQUIRED SMOKE ALARMS SHALL RECEIVE THEIR PRIMARY POWER FROM A DEDICATED BRANCH CIRCUIT OR THE UNSWITCHED PORTION OF A BRANCH CIRCUIT ALSO USED FOR POWER AND LIGHTING, AND SHALL BE EQUIPPED WITH A BATTERY BACKUP. SMOKE ALARMS SHALL EMIT A SIGNAL WHEN THE BATTERIES ARE LOW. WIRING SHALL BE PERMANENT AND WITHOUT A DISCONNECTING SWITCH OTHER THAN AS REQUIRED FOR OVER- CURRENT PROTECTION. EXCEPTION: SMOKE ALARMS WITH INTEGRAL STROBES SHALL NOT REQUIRE BATTERY BACKUP PROVIDED THAT THE SMOKE ALARMS ARE CONNECTED TO AN EMERGENCY ELECTRICAL SOURCE.

4. ACCESSIBLE AUDIBLE AND VISIBLE ALARMS AND NOTIFICATION APPLIANCES SHALL BE INSTALLED IN ACCORDANCE WITH ICC/ANSI A117.1.

5. AS PER SECTION 901.2, FIRE PROTECTION SYSTEMS SHALL BE INSTALLED, REPAIRED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE 2014 NYC BC AND THE NEW YORK CITY FIRE CODE.

6. AS PER SECTION 901.5 ACCEPTANCE TESTS, FIRE PROTECTION SYSTEMS SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2014 NYC BC AND THE NEW YORK CITY FIRE CODE.

CARBON MONOXIDE DETECTING DEVICES NOTES

1. CARBON MONOXIDE ALARMS AND DETECTORS SHALL CONFORM TO THE 2014 NYC BC SECTION BC 908.7.

2. CARBON MONOXIDE ALARMS OR DETECTORS WITHIN DWELLING UNITS ARE REQUIRED IN THE FOLLOWING AREAS AS PER SECTION 908.7.1.1: OUTSIDE ANY ROOM USED FOR SLEEPING PURPOSES, WITHIN 15 FEET OF THE ENTRANCE TO SUCH ROOM AND IN ANY ROOM USED FOR SLEEPING PURPOSES.

3. AS PER SECTION 908.7.1.1.2, CARBON MONOXIDE ALARMS OR DETECTORS SHALL COMPLY WITH THE POWER SOURCE, INTERCONNECTION, AND ACCEPTANCE TESTING REQUIREMENTS AS REQUIRED FOR SMOKE ALARMS IN ACCORDANCE WITH SECTIONS 907.2.11.2 THROUGH 907.2.11.3.

4. AS PER SECTION 908.7.4 INSTALLATION, CARBON MONOXIDE ALARMS AND DETECTORS SHALL BE LISTED IN ACCORDANCE WITH UL 2034 AND UL 2075.

5. ACCESSIBLE AUDIBLE AND VISIBLE ALARMS AND NOTIFICATION APPLIANCES SHALL BE INSTALLED IN ACCORDANCE WITH ICC/ANSI A117.1.

6. THE MAINTENANCE OF CARBON MONOXIDE DETECTION AND ALARM SYSTEMS AND THE INSTALLATION AND TESTING OF CARBON MONOXIDE DETECTING DEVICES THAT ARE INTERCONNECTED WITH A FIRE ALARM SYSTEM OR MONITORED BY A CENTRAL STATION SHALL BE ENFORCED AS PER ARTICLE 103 OF CHAPTER 1 OF THE GENERAL ADMINISTRATIVE PROVISIONS OF THE 2014 NYC BC.

ROOF ASSEMBLY REFLECTANCE NOTES

1. ROOF COVERING REFLECTANCE SHALL BE PROVIDED AS PER NYC BC 2014, SECTION 1504.9.

2. ROOF COVERINGS ON ROOFS OR SETBACKS WITH SLOPE EQUAL TO OR LESS THAN TWO UNITS VERTICAL IN 12 UNITS HORIZONTAL (17 PERCENT) SHALL HAVE:

A. A MINIMUM INITIAL SOLAR REFLECTANCE OF 0.7 IN ACCORDANCE WITH ASTM C 1549 OR ASTM E 1918, AND A MINIMUM THERMAL EMITTANCE OF 0.75 AS DETERMINED IN ACCORDANCE WITH ASTM C 1371 OR ASTM E 408; OR

B. A MINIMUM SRI OF 78 AS DETERMINED IN ACCORDANCE WITH ASTM E 1980. EXCEPTIONS:

a. TERRACES ON SETBACKS COMPRISING LESS THAN 25 PERCENT OF THE AREA OF THE LARGEST FLOOR PLATE IN THE BUILDING.

b. ANY PORTION OF A ROOF COVERED BY A GREEN ROOF SYSTEM, INCLUDING SUCH A SYSTEM WITH AGRICULTURAL PLANTINGS, IN COMPLIANCE WITH SECTION 1507.16.

c. ANY PORTION OF A ROOF USED AS OUTDOOR RECREATION SPACE BY THE OCCUPANTS OF THE BUILDING THAT IS LANDSCAPED COVERED BY WOOD DECKING OR COVERED WITH A WALKING SURFACE OR OTHER PROTECTIVE SURFACE, PROVIDED THAT SUCH WALKING SURFACE OR PROTECTIVE SURFACE HAS A MINIMUM INITIAL SOLAR REFLECTANCE OF 0.3 AS DETERMINED IN ACCORDANCE WITH ASTM C 1549 OR ASTM E 1918.

d. ANY PORTION OF A ROOF THAT IS UNDER MECHANICAL EQUIPMENT, FLUSH MOUNTED SOLAR PANELS LYING DIRECTLY ON THE ROOF SURFACE, DUCKBOARDING, DECKING, PLATFORM, ROOF TANK, COOLING TOWER OR ANY OTHER ROOFTOP STRUCTURE OR EQUIPMENT EXEMPTED BY RULE BY THE COMMISSIONER.

e. ANY ROOF OR PORTION OF A ROOF COMPOSED OF GLASS, METAL, CLAY OR CONCRETE TILE OR PLASTIC/RUBBER INTENDED TO SIMULATE CLAY OR CONCRETE TILE, WOOD, OR SLATE.

f. ANY PORTION OF A ROOF USED BY A SCHOOL OR DAYCARE CENTER AS A PLAYGROUND FOR CHILDREN

g. ANY ROOF, IF THE AMOUNT OF ROOFTOP SPACE N

WIND LOADS NOTES

1. BUILDINGS, STRUCTURES AND PARTS THEREOF SHALL BE DESIGNED TO WITHSTAND THE MINIMUM WIND LOADS PRESCRIBED IN THE 2014 NYC BC, CHAPTER 16 STRUCTURAL DESIGN, SECTION BC 1609 WIND LOADS. DECREASES IN WIND LOADS SHALL NOT BE MADE FOR THE EFFECT OF SHIELDING BY OTHER STRUCTURES.

2. AS PER SECTION 1609.1.1 DETERMINATION OF WIND LOADS, WIND LOADS ON EVERY BUILDING OR STRUCTURE SHALL BE DETERMINED IN ACCORDANCE WITH CHAPTER 6 OF ASCE 7, WITH THE BASIC WIND SPEED AND THE EXPOSURE CATEGORY DETERMINED IN ACCORDANCE WITH SECTIONS 1609.3 THROUGH 1609.4. WIND LOADS MAY ALSO BE DETERMINED USING PROVISIONS OF THE ALTERNATE METHODS DESCRIBED IN SECTION 1609.6. WIND S HALL BE ASSUMED TO COME FROM ANY HORIZONTAL DIRECTION AND WIND PRESSURES SHALL BE ASSUMED TO ACT NORMAL TO THE SURFACE CONSIDERED.

MECHANICAL SYSTEMS NOTES

1. MECHANICAL APPLIANCES, EQUIPMENT AND SYSTEMS SHALL BE CONSTRUCTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW YORK CITY MECHANICAL CODE AND THE NEW YORK CITY FUEL GAS CODE. MASONRY CHIMNEYS, FIREPLACES AND BARBECUES SHALL COMPLY WITH THE NYC 2014 MECHANICAL CODE AND NYC BC 2014, CHAPTER 21 MASONRY.

2. ALL BATHROOM AND TOILET ROOMS IN DWELLING UNITS TO HAVE MECHANICAL EXHAUST SYSTEM OF MIN. 50 CFM WHEN DESIGNED TO OPERATE INTERMITTENTLY AND MIN. OF 25 CFM WHEN DESIGNED TO OPERATE CONTINUOUSLY DURING NORMAL HOURS OF USE.

3. PUBLIC TOILETS SHALL BE VENTILATED WITH MECHANICAL EXHAUST SYSTEM OF 50/70 CFM RATES PER WATER CLOSET OR URINAL. THE HIGHER RATE SHALL BE PROVIDED WHERE PERIODS OF HEAVY USE ARE EXPECTED TO OCCUR, SUCH AS TOILETS IN THEATERS, SCHOOLS AND SPORTS FACILITIES. THE LOWER RATE SHALL BE PERMITTED WHERE PERIODS OF HEAVY USE ARE NOT EXPECTED.

4. IN DWELLING UNITS, WHEN KITCHEN REQUIRED TO HAVE MECHANICAL EXHAUST SYSTEM AND ALL KITCHENETTES TO BE PROVIDED WITH MIN. OF 100 CFM WHEN DESIGNED TO OPERATE INTERMITTENTLY AND MIN. OF 25 CFM WHEN DESIGNED TO OPERATE CONTINUOUSLY DURING NORMAL HOURS OF USE.

5. DUCT RISERS TO BE FIRE PROTECTED WITH TWO (2) HOUR FIRE RATED CONSTRUCTION ON ALL SIDES.

6. WHERE DUCTS PASS THROUGH FLOOR, FLOOR OPENINGS TO BE CUT TIGHT TO DUCT, AND REMAINING GAP BETWEEN DUCT AND FLOOR CONSTRUCTION TO BE FILLED WITH MINERAL WOOL OR EQUAL.

7. WHEN EACH BATHROOM AND KITCHEN TO BE EQUIPPED WITH ITS OWN INDEPENDENT EXHAUST BLOWER BACKDRAFT DAMPER TO BE PROVIDED OR AS PER MECHANICAL DOCUMENTS.

8. EACH BATHROOM AND KITCHEN/KITCHENETTE OUTLET TO BE EQUIPPED WITH APPROVED FIRE DAMPER WHEN REQUIRED.

9. MINIMUM FRESH AIR INTAKE (F.A.I.) WITH APPROVED FIRE DAMPER TO BE PROVIDED FOR BOILER ROOM AS PER MECHANICAL DOCUMENTS.

10. BATHROOMS CONTAINING BATHTUBS, SHOWERS, SPAS AND SIMILAR BATHING FIXTURES IN OTHER THAN R AND I-1 OCCUPANCIES SHALL BE MECHANICALLY VENTILATED IN ACCORDANCE WITH THE NYC 2014 MECHANICAL CODE, WHETHER OR NOT THEY ARE ALSO PROVIDED WITH NATURAL VENTILATION.

11. AIR INTAKE OPENING LOCATIONS SHALL COMPLY WITH THE FOLLOWING:

· INTAKE OPENINGS SHALL BE LOCATED A MINIMUM OF 10 FEET FROM LOT LINES OR BUILDINGS ON THE SAME LOT.

· FOR BUILDINGS ON LOTS MEASURING LESS THAN 20 FEET IN WIDTH, INTAKE OPENINGS SHALL BE LOCATED AT THE CENTERLINE BETWEEN LOT LINES. WHERE OPENINGS FRONT ON A STREET OR PUBLIC WAY, THE DISTANCE SHALL BE MEASURED TO THE CENTERLINE OF THE STREET OR PUBLIC WAY.

· OUTDOOR INTAKES FOR HIGH-RISE OFFICE BUILDINGS HAVING OCCUPIED FLOORS LOCATED MORE THAN 75 FEET ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS SERVING SPACES ABOVE THE SECOND STORY AND SERVING SPACES GREATER THAN 10,000 SQUARE FEET OF FLOOR AREA SHALL BE LOCATED AT LEAST 20 FEET ABOVE GROUND LEVEL, AT LEAST 30 FEET FROM EXHAUST OUTLETS AND OTHER EXHAUST DISCHARGES, AND AT LEAST 20 FEET FROM AREAS THAT MAY COLLECT VEHICULAR EXHAUST, SUCH AS OFF STREET LOADING BAYS.

· MECHANICAL AND GRAVITY OUTDOOR AIR INTAKE OPENINGS SHALL BE LOCATED NOT LESS THAN 10 FEET HORIZONTALLY FROM ANY HAZARDOUS OR NOXIOUS CONTAMINANT SOURCE.

· INTAKE OPENINGS ON STRUCTURES IN FLOOD HAZARD AREAS SHALL COMPLY WITH APPENDIX G OF THE NYC BC 2014.

· EXCEPTION: GROUP R-3 OCCUPANCIES ARE NOT REQUIRED TO COMPLY WITH ABOVE.

10. AIR INTAKE OPENINGS THAT TERMINATE OUTDOORS SHALL BE PROTECTED WITH CORROSION-RESISTANT SCREENS, LOUVERS OR GRILLES. OPENINGS IN LOUVERS, GRILLES AND SCREENS SHALL BE SIZED IN ACCORDANCE WITH TABLE 401.5, NYC 2014 MECHANICAL CODE AND SHALL BE PROTECTED AGAINST LOCAL WEATHER CONDITIONS. OUTDOOR AIR INTAKE OPENINGS LOCATED IN EXTERIOR WALLS SHALL MEET THE PROVISIONS FOR EXTERIOR WALL OPENING PROTECTIVES IN ACCORDANCE WITH THE NYC BC 2014.

11. FOR HIGH-RISE BUILDINGS, OUTDOOR AIR INTAKES SERVING SPACES ABOVE THE SECOND STORY AND SERVING SPACES GREATER THAN 10,000 SQUARE FEET OF FLOOR AREA SHALL BE LOCATED IN ACCORDANCE WITH SECTION 401.5 OF THE NYC 2014 MECHANICAL CODE. EXCEPTION: GROUP R-2 OCCUPANCY.

12. ENCLOSED PARKING GARAGES. MECHANICAL VENTILATION SYSTEMS FOR ENCLOSED PARKING GARAGES SHALL BE PERMITTED TO OPERATE INTERMITTENTLY WHERE THE SYSTEM IS ARRANGED TO OPERATE AUTOMATICALLY UPON DETECTION OF A CONCENTRATION OF CARBON MONOXIDE.

PLUMBING SYSTEMS NOTES

1. THE 2014 NEW YORK CITY PLUMBING CODE SHALL GOVERN THE ERECTION, INSTALLATION, ALTERATION, REPAIR, RELOCATION, REPLACEMENT, ADDITION TO, USE OR MAINTENANCE OF PLUMBING SYSTEMS. PLUMBING SYSTEMS AND EQUIPMENT SHALL BE CONSTRUCTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW YORK CITY PLUMBING CODE.

2. ALL MATERIALS, FIXTURES, AND APPLIANCES SHALL COMPLY WITH CHAPTER 3 GENERAL REGULATIONS, SECTION PC 303 MATERIALS .

3. ALL GAS-FIRED EQUIPMENT AND ACCESSORY EQUIPMENT SHALL COMPLY WITH THE 2014 NYC MECHANICAL CODE AND THE 2014 NYC FUEL GAS CODE.

4. PLUMBING CONTRACTOR TO EXAMINE PROPOSED LAYOUT WITH REGARD TO EXISTING FIELD CONDITIONS, AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BETWEEN ASSUMED FIELD CONDITIONS AND THOSE ENCOUNTERED DURING CONSTRUCTION. PLUMBING CONTRACTOR SHALL INFORM ARCHITECT OF ANY REVISIONS TO PLAN WHICH SHALL BE NECESSARY (BASED ON CONDITIONS UNCOVERED IN THE FIELD), IN ORDER TO INSTALL ALL FIXTURES, EQUIPMENT AND PIPING IN STRICT ACCORDANCE WITH REQUIREMENTS OF THE 2014 NYC BC, THE 2014 NYC PLUMBING CODE, AND/OR AS PER DESIGNS SHOWN IN THE CONTRACT DOCUMENTS.

5. PLUMBING CONTRACTOR SHALL ARRANGE AND OBTAIN INSPECTIONS AND REQUIRED SIGN-OFFS AS PER SECTION PC 107 INSPECTION AND TESTING, SECTION 107.5 SIGN-OFF OF COMPLETED WORK. REFER TO ARTICLE 116 OF CHAPTER 28 OF THE ADMINISTRATIVE CODE.

DIMENSIONING NOTES

1. ALL WALLS ARE ORTHOGONAL TO THE PROPERTY LINES UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL BE KNOWLEDGEABLE OF WHICH PROPERTY LINE DETERMINES THE ORIENTATION OF EACH WALL, AND SHALL NOTIFY THE ARCHITECT OF ANY CONDITIONS REQUIRING CLARIFICATION BEFORE PROCEEDING WITH THE WORK.

2. PARTITIONS ARE DIMENSIONED TO THE FURNISHED FACE OF THE WALL UNLESS OTHERWISE NOTED.

3. ALL DIMENSIONS SHALL HAVE PREFERENCE OVER SCALE. DO NOT SCALE THE DRAWINGS.

4. ALL DIMENSIONS OF EXISTING CONDITIONS ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD BEFORE PROCEEDING WITH THE WORK. THE ARCHITECT SHALL BE NOTIFIED OF ANY CORRECTIONS.

5. WHEN UNDIMENSIONED PARTITIONS APPEAR IN CONJUNCTION WITH DOOR OPENINGS, THE DOOR WIDTH AND DOOR FRAME DETAILS DETERMINE THE LOCATION OF THE ADJACENT WALLS AND FRAMES.

6. ALL ACCESSIBLE DIMENSIONS TO BE PROVIDED TO FINISH WALL, CEILING AND FLOORS.

PARTITION NOTES

1. DEFLECTION FOR ALL PARTITIONS SHALL NOT EXCEED 1/240TH OF THE SPAN MAXIMUM FOR TYPICAL GYPSUM PARTITIONS, OR 1/360 FOR WOOD-CLAD PARTITIONS OR STONE-CLAD PARTITION SYSTEMS.

2. WATER RESISTANT DRYWALL (FOR THE FULL HEIGHT OF THE PARTITION CONSTRUCTION) SHALL BE USED IN TOILETS, SHOWERS, SERVICE ROOMS, ETC. USE STANDARD GYPSUM BOARD FOR CEILING CONSTRUCTION.

3. PENETRATIONS: COORDINATE WITH MECHANICAL CONTRACTOR FOR OPENINGS REQUIRED FOR RETURN AIR IN FULL HEIGHT PARTITIONS.

4. PROVIDE LATERAL BRACING TO STRUCTURE ABOVE FINISHED CEILINGS FOR PARTITIONS EXCEEDING UNSUPPORTED HEIGHTS INDICATED ON DRAWINGS.

5. PROVIDE HORIZONTAL CONTROL JOINTS AT 12'-0' O.C. IN THE VERTICAL DIRECTION UNLESS NOTED OTHERWISE.

6. PROVIDE CONTROL JOINTS IN GYPSUM WALLBOARD CONSTRUCTION SUCH THAT PARTITION OR FURRING RUNS DO NOT EXCEED 30' AND CEILING DIMENSIONS DO NOT EXCEED 50' IN EITHER DIRECTION WITH PERIMETER RELIEF OR 30' WITHOUT PERIMETER RELIEF.

7. PROVIDE VERTICAL CONTROL JOINTS WITH SEALANT IN MASONRY WALLS AS SHOWN ON DRAWINGS, WITH MAXIMUM SPACING OF 25'-0'.

8. COMPLETELY SEAL WITH ACOUSTICAL SEALANT HEADS, BASES, AND ENDS, PLUS ALL PENETRATIONS (INCLUDING BUT NOT LIMITED TO MECHANICAL, ELECTRICAL, AND PLUMBING WORK).

9. PROVIDE SOUND BLANKETS AS INDICATED.

FINISHES & DETAILS NOTES - NYC BC 2014, CHAPTER 8

1. AS PER SECTION BC 803.1.1.2 INTERIOR FLAME SPREAD INDEX REQUIREMENTS BASED ON OCCUPANCY GROUP, INTERIOR WALL AND CEILING FINISH SHALL HAVE A FLAME SPREAD INDEX NOT GREATER THAN THAT FOR THE CLASSIFICATION RATING SPECIFIED IN TABLE 803.1 'INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY' FOR THE GROUP AND LOCATION DESIGNATED.

2. AS PER SECTION BC 803.1.1.3 INTERIOR SMOKE DEVELOPED INDEX REQUIREMENTS BASED ON OCCUPANCY GROUP, EXCEPT WHERE PERMITTED FOR INTERIOR TRIM IN SECTION 806.5, ACCEPTABLE SMOKE-DEVELOPED INDICES SHALL RANGE FROM 0-450 WITH THE FOLLOWING RESTRICTIONS:

EXITS, CORRIDORS .... 25 OR LESS
OCCUPANCY GROUP I .... 50 OR LESS
ROOMS IN WHICH THE NET FLOOR AREA PER OCCUPANT IS 10 SQUARE FEET OR LESS .... 100 OR LESS

3. WHERE INTERIOR FINISH MATERIALS ARE APPLIED ON WALLS, CEILINGS OR STRUCTURAL ELEMENTS REQUIRED TO HAVE A F FIRE-RESISTANCE RATING OR TO BE OF NONCOMBUSTIBLE CONSTRUCTION, THEY SHALL COMPLY WITH THE PROVISIONS OF SECTION BC 803.3.

4. AS PER SECTION BC 803.5 TOXICITY, INTERIOR WALL OR CEILING FINISHES, OTHER THAN TEXTILES, UPON EXPOSURE TO FIRE, SHALL NOT PRODUCE PRODUCTS OF DECOMPOSITION OR COMBUSTION THAT ARE MORE TOXIC IN POINT OF CONCENTRATION THAN THOSE GIVEN OFF BY WOOD OR PAPER WHEN DECOMPOSING OR BURNING UNDER COMPARABLE CONDITIONS AS TESTED IN ACCORDANCE WITH NFPA 269.

5. COMBUSTIBLE FLOORING MATERIALS ARE PERMITTED AS PER SECTION BC 805 COMBUSTIBLE FLOORING MATERIALS IN TYPES I AND II CONSTRUCTION.

6. THERMAL AND ACOUSTICAL INSULATION SHALL COMPLY WITH SECTION BC 807.

7. ACOUSTICAL CEILING SYSTEMS SHALL COMPLY WITH SECTION BC 808.

8. COMBUSTIBLE MATERIALS USED FOR MILLWORK, DOORS, AND TRIM ARE PERMITTED AS PER THE 2014 NYC BC CHAPTER 6 TYPES OF CONSTRUCTION, SECTION BC 603 COMBUSTIBLE MATERIAL IN TYPE I AND II CONSTRUCTION.

9. ALL GLASS FOR INTERIOR USE IN BOTH VERTICAL AND SLOPED APPLICATIONS SHALL COMPLY WITH THE NYC BC 2014, CHAPTER 24 GLASS AND GLAZING.

10. FLOORS AND WALL BASE FINISH MATERIALS IN TOILET, BATHING AND SHOWER ROOM FLOOR FINISH MATERIALS SHALL HAVE A SMOOTH, HARD, NONABSORBENT SURFACE. THE INTERSECTIONS OF SUCH FLOORS WITH WALLS SHALL HAVE A SMOOTH, HARD, NONABSORBENT VERTICAL BASE THAT EXTENDS UPWARD ONTO THE WALLS AT LEAST 4 INCHES. EXCEPTION: OCCUPANCY CLASSES I-1, R-1 AND R-2 SHALL HAVE A VERTICAL BASE THAT EXTENDS UPWARD ONTO WALLS AT LEAST 6 INCHES.

SEISMIC/EARTHQUAKE NOTES

1. THE PROPOSED BUILDING HAS BEEN DESIGNED IN COMPLIANCE WITH THE NEW YORK CITY SEISMIC CODE: LOCAL LAW 17/95.

2. EVERY STRUCTURE, AND PORTION THEREOF, INCLUDING NONSTRUCTURAL COMPONENTS THAT ARE PERMANENTLY ATTACHED TO STRUCTURES AND THEIR SUPPORTS AND ATTACHMENTS, SHALL BE DESIGNED AND CONSTRUCTED TO RESIST THE EFFECTS OF EARTHQUAKE MOTIONS IN ACCORDANCE WITH THE 2014 NYC BC, CHAPTER 16 STRUCTURAL DESIGN, SECTION BC 1613 EARTHQUAKE LOADS, AND ASCE 7-10 (2010 EDITION), EXCLUDING CHAPTER 14 AND APPENDIX 11A. THE SEISMIC DESIGN CATEGORY FOR A STRUCTURE SHALL BE DETERMINED IN ACCORDANCE WITH EITHER SECTION 1613 OR ASCE 7-10 (2010 EDITION).

3. THE PROPOSED BUILDING HAS BEEN DESIGNED WITH STRUCTURAL SEPARATIONS AS PER 2014 NYC BC 1613.7. ALL STRUCTURES SHALL BE SEPARATED FROM ADJACENT STRUCTURES. WHEN A STRUCTURE ADJOINS A PROPERTY LINE NOT COMMON TO A PUBLIC WAY (TYPICALLY SIDE OR REAR LOT LINES), THAT STRUCTURE SHALL ALSO BE SET BACK FROM THE PROPERTY LINE BY AT LEAST 1 INCH FOR EACH 50 FEET OF HEIGHT AND A MINIMUM OF 1 INCH FOR STRUCTURES WITH HEIGHTS LESS THAN 50 FEET. FOR STRUCTURES IN SEISMIC DESIGN CATEGORY D, REFER TO ASCE 7-10 FOR ADDITIONAL REQUIREMENTS.

4. FOR STRUCTURES ADJACENT TO EXISTING UN REINFORCED MASONRY BEARING WALL STRUCTURES, THE STRUCTURAL SEPARATION SHALL BE FILLED WITH A MATERIAL WITH A MINIMUM COMPRESSIVE STRENGTH OF 25 PSI AND A MAXIMUM COMPRESSIVE STRENGTH OF 100 PSI. ADDITIONALLY, WHEN THE ADJACENT WALL IS A PARTY WALL, THE PARTY WALL SHALL BE MADE SECURE BY THE PARTY RESPONSIBLE FOR THE NEW CONSTRUCTION AS PER CHAPTER 33.

5. THE INFILL MATERIAL SHALL BE COVERED ON ALL SIDES AND SHALL MEET THE APPROPRIATE PROVISIONS OF CHAPTER 26. THE COVERING MUST BE OF ADEQUATE STRENGTH TO RESIST THE WIND LOADS FOR CLADDING AS SPECIFIED IN CHAPTER 16 AND SHALL CONFORM TO ALL APPLICABLE PROVISIONS IN CHAPTER 14.

6. WHEN A BUILDING SEPARATION WIDER THAN 5 INCHES IS CREATED PURSUANT TO SECTION 1613.7, SUCH SEPARATION, AT THE ROOF LEVEL OF THE PROPOSED NEW BUILDING, OR AT THE ROOF LEVEL OF AN EXISTING ADJOINING BUILDING WHERE IF THAT BUILDING IS LOWER THAN THE PROPOSED NEW BUILDING, SHALL HAVE A HORIZONTAL COVER/CLOSURE THAT CONFORMS WITH THE FOLLOWING:

a. THE COVER/CLOSURE MATERIAL SHALL BE NON COMBUSTIBLE; AND
EXCEPTION: THE COVER/CLOSURE MATERIAL USED SHALL BE PERMITTED TO BE COMBUSTIBLE MATERIAL IN ACCORDANCE WITH SECTION 1509.9 IF ALL THE MATERIAL ON THE APPROPRIATE ROOF CONFORMS TO THE LIMITATIONS THEREIN, THERE ARE NO MASONRY OPENINGS IN EITHER WALL ABUTTING THE BUILDING SEPARATION, AND BOTH BUILDINGS ARE NON COMBUSTIBLE.

b. THE COVER/CLOSURE SHALL BE CAPABLE OF WITHSTANDING THE ROOF LIVE LOAD OF 30 PSF SECURELY FASTENED TO THE NEW BUILDING, AND BE OF A TYPE THAT WOULD BE CAPABLE OF PREVENTING UNAUTHORIZED OR ACCIDENTAL ACCESS TO THE SPACE.

7. SEISMIC DESIGN REQUIREMENTS FOR MASONRY STRUCTURES AND COMPONENTS SHALL COMPLY WITH THE REQUIREMENTS IN SECTION 1.17 OF TMS 402/ACI 530/ASCE 5 DEPENDING ON THE STRUCTURE'S SEISMIC DESIGN CATEGORY AS DETERMINED IN SECTION 1613 OF THIS CODE.

OTHER AGENCY REQUIREMENTS

508.1- EACH PORTION OF A BUILDING SHALL BE INDIVIDUALLY CLASSIFIED IN ACCORDANCE WITH § 302.1.
EXCEPTIONS:
• OCCUPANCIES SEPARATED IN ACCORDANCE WITH SECTION 510.
• WHERE IDENTIFIED IN TABLE 509, ROOMS OR SPACES SHALL BE TREATED AS INCIDENTAL USES.
• WHERE NOT IDENTIFIED IN TABLE 509, MECHANICAL AND/OR ELECTRICAL EQUIPMENT ROOMS SHALL BE PERMITTED TO BE CLASSIFIED AS THE OCCUPANCY WITHIN WHICH THEY ARE LOCATED, OR AT THE OPTION OF THE APPLICANT, CLASSIFIED AS GROUP F-2 OCCUPANCY IN ACCORDANCE WITH SECTION 306.3.

508.3-NONSEPARATED OCCUPANCIES
PROPOSED MIXED USE BUILDING COMPLIES WITH ALL PROVISIONS OF 508.3

508.3.1 OCCUPANCY CLASSIFICATION.
NONSEPARATED OCCUPANCIES SHALL BE INDIVIDUALLY CLASSIFIED IN ACCORDANCE WITH SECTION 302.1. THE REQUIREMENTS OF THIS CODE SHALL APPLY TO EACH PORTION OF THE BUILDING BASED ON THE OCCUPANCY CLASSIFICATION OF THAT SPACE. IN ADDITION, THE MOST RESTRICTIVE PROVISIONS OF CHAPTER 9 WHICH APPLY TO THE NONSEPARATED OCCUPANCIES SHALL APPLY TO THE TOTAL NONSEPARATED OCCUPANCY AREA. WHERE NONSEPARATED OCCUPANCIES OCCUR IN A HIGH-RISE BUILDING, THE MOST RESTRICTIVE REQUIREMENTS OF SECTION 403 WHICH APPLY TO THE NONSEPARATED OCCUPANCIES SHALL APPLY THROUGHOUT THE HIGH-RISE BUILDING.

508.3.2 ALLOWABLE BUILDING AREA AND HEIGHT.
THE ALLOWABLE BUILDING AREA AND HEIGHT OF THE BUILDING OR PORTION THEREOF SHALL BE BASED ON THE MOST RESTRICTIVE ALLOWANCES FOR THE OCCUPANCY GROUPS UNDER CONSIDERATION FOR THE TYPE OF CONSTRUCTION OF THE BUILDING IN ACCORDANCE WITH SECTION 503.1.
[PROPOSED BUILDING COMPLIES - PROPOSED USES ARE UNLIMITED IN HEIGHT AND AREA AS PER § 503.1]

508.3.3 SEPARATION.
NO SEPARATION IS REQUIRED BETWEEN NONSEPARATED OCCUPANCIES.

EXCEPTIONS:
1. GROUP H-2, H-3, H-4 AND H-5 OCCUPANCIES SHALL BE SEPARATED FROM ALL OTHER OCCUPANCIES IN ACCORDANCE WITH SECTION 508.4.
2. SEPARATED TENANCIES IN ACCORDANCE WITH SECTION 510.10.
3. KITCHENS SHALL BE SEPARATED IN ACCORDANCE WITH SECTION 508.4.4.

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
GENERAL NOTES

G-002D.00

Scale:	As indicated
Date:	12/1/2025 7:34:38 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

ACCESSIBILITY NOTES:

1. ALL MEASUREMENTS TO BE VERIFIED ON FIELD BY GC.
2. ALL SECTIONS IN DIAGRAMS REFERENCE THE ANSI A117.1 2009 WITH NYC MODIFICATIONS U.N.O.

NYC 2022 BUILDING CODE CHAPTER 11 - ACCESSIBILITY NOTES:

1101.3 CHAPTER 11 APPLIES TO ALTERATIONS, INCLUDING MINOR ALTERATIONS BUT EXCLUDING ORDINARY REPAIRS, AND CHANGES OF USE OR OCCUPANCY TO PRIOR CODE BUILDINGS, PORTIONS OF SUCH BUILDINGS, AND SPACES WITHIN SUCH BUILDINGS. THIS SECTION SHALL NOT IMPOSE A REQUIREMENT FOR GREATER ACCESSIBILITY THAN THAT WHICH WOULD BE REQUIRED FOR NEW CONSTRUCTION, NOR SHALL IT REDUCE OR HAVE THE EFFECT OF REDUCING ACCESSIBILITY.

1103.1 ALL SITES, BUILDINGS, STRUCTURES, FACILITIES, ELEMENTS AND SPACES, TEMPORARY OR PERMANENT, SHALL BE ACCESSIBLE TO INDIVIDUALS WITH DISABILITIES.

1104.5 ACCESSIBLE ROUTES SHALL COINCIDE WITH OR BE LOCATED IN THE SAME AREA AS A GENERAL CIRCULATION PATH. WHERE THE CIRCULATION PATH IS INTERIOR, THE ACCESSIBLE ROUTE SHALL ALSO BE INTERIOR. WHERE ONLY ONE ACCESSIBLE ROUTE IS PROVIDED, THE ACCESSIBLE ROUTE SHALL NOT PASS THROUGH KITCHENS, STORAGE ROOMS, RESTROOMS, CLOSETS OR SIMILAR SPACES.

1105.1 IN ADDITION TO ACCESSIBLE ENTRANCES REQUIRED BY § 1105.1.1 THROUGH 1105.1.8, ALL PUBLIC ENTRANCES SHALL BE ACCESSIBLE.

1105.1.7 DOORS AND DOORWAYSAT ENTRANCE(S) TO ACCESSIBLE UNITS AND TYPE B+NYC UNITS, INCLUDING HARDWARE, SHALL COMPLY WITH § 404 OF ICC A117.1. DOORS AND DOORWAYS, INCLUDING HARDWARE, AT ENTRANCE(S) TO TYPE B UNITS SHALL COMPLY WITH § 1003.5 OF ICC A117.1.

1106.1 WHERE PARKING IS PROVIDED, 5% OF THE TOTAL NUMBER OF PARKING SPACES PROVIDED FOR A FACILITY, BUT NOT LESS THAN ONE PARKING SPACE, SHALL BE ACCESSIBLE PARKING SPACES. VAN-ACCESSIBLE PARKING SPACES SHALL BE PROVIDED IN ACCORDANCE WITH 1106.5. ACCESSIBLE PARKING SPACES SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH § 502 OF ICC A117.1.

1106.6 ACCESSIBLE PARKING SPACES SHALL BE LOCATED ON THE SHORTEST ACCESSIBLE ROUTE OF TRAVEL FROM ADJACENT PARKING TO AN ACCESSIBLE BUILDING ENTRANCE.

1106.7 PASSENGER LOADING ZONES.PASSENGER LOADING ZONES SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH ICC A117.1 INCLUDING § 503.

1106.8.1 WHERE VEHICLE CHARGING STATIONS ARE PROVIDED FOR COMMON USE, AT LEAST FIVE PERCENT OF THE TOTAL NUMBER OF ELECTRICAL VEHICLE CHARGING STATIONS PER FACILITY, BUT NOT LESS THAN ONE FOR EACH TYPE OF ELECTRIC VEHICLE CHARGING STATION, SHALL BE ACCESSIBLE.

1107.2 DWELLING UNITS AND SLEEPING UNITS WHICH ARE REQUIRED TO BE ACCESSIBLE UNITS, TYPE B+NYC UNITS, OR TYPE B UNITS SHALL COMPLY WITH CHAPTER 10 OF ICC A117.1.

1107.2.2.5 LAVATORIES SHALL COMPLY WITH § 606 OF ICC A117.1.

1107.2.2.6 MIRRORS ABOVE LAVATORIES SHALL HAVE THE BOTTOM EDGE OF THE REFLECTING SURFACE 40" (1016 MM) MAX. ABOVE THE FLOOR OR GROUND. MEDICINE CABINETS, IF PROVIDED, MUST INCLUDE A STORAGE SHELF NO HIGHER THAN 44 " (1117.6 MM) ABOVE THE FLOOR.

1107.2.2.7.1 THE WATER CLOSET SHALL BE POSITIONED WITH A WALL TO THE REAR AND TO ONE SIDE. THE CENTERLINE OF THE WATER CLOSET SHALL BE 18" (457.2 MM) FROM THE SIDE WALL.

1107.2.2.7.2 CLEARANCE AROUND THE WATER CLOSET SHALL COMPLY WITH SECTIONS 1107.2.2.7.2.1 THROUGH 1107.2.2.7.2.3.

1107.2.2.7.3 GRAB BARS FOR WATER CLOSETS SHALL COMPLY § 609 OF ICC A117.1 AND 1107.2.2.7.3.1 THROUGH 1107.2.2.7.3.2.

1107.2.3 WHERE KITCHENS AND KITCHENETTES ARE PROVIDED IN ATYPE B+NYC DWELLING UNIT OR SLEEPING UNIT, THE PRIMARY KITCHEN OR KITCHENETTE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE KITCHEN REQUIREMENTS OF § 1003.12 AND 1003.3.2 OF ICC A117.1.

1107.2.8 WHERE WASHING MACHINES OR CLOTHES DRYERS ARE PROVIDED WITHIN A TYPE B+NYC DWELLING UNIT OR SLEEPING UNIT, SUCH EQUIPMENT SHALL COMPLY WITH § 611 OF ICC A117.1 AND SHALL BE FRONT LOADING.

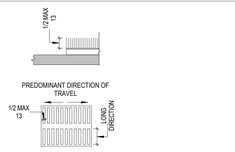
1107.3 ROOMS AND SPACES AVAILABLE TO THE GENERAL PUBLIC OR AVAILABLE FOR COMMONUSE BY RESIDENTS AND SERVINGACCESSIBLE UNITS, TYPE B+NYCUNITS ORTYPE B UNITS SHALL BE ACCESSIBLE.

1107.4 AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ACCESSIBLE BUILDING OR FACILITY ENTRANCES WITH THE REQUIRED ACCESSIBLE ENTRANCE(S) OF EACH ACCESSIBLE UNIT, TYPE B+NYC UNIT,AND TYPE B UNIT WITHIN THE BUILDING OR FACILITY AND WITH THOSE EXTERIOR AND INTERIOR SPACES AND FACILITIES THAT SERVE THE UNITS.

1111.1 REQUIRED ACCESSIBLE ELEMENTS SHALL BE IDENTIFIED BY THE DYNAMIC ACCESSIBILITY SYMBOL AT THE FOLLOWING LOCATIONS:

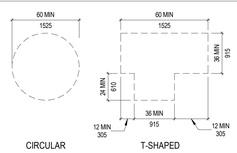
- ACCESSIBLE PARKING SPACES REQUIRED PER 1106.1 AND 1106.2.
- ACCESSIBLE PASSENGER LOADING ZONES.
- ACCESSIBLE ROOMS WHERE MULTIPLE SINGLE-OCCUPANT TOILET ROOMS OR BATHING ROOMS ARE CLUSTERED AT A SINGLE LOCATION.
- ACCESSIBLE ENTRANCES WHERE NOT ALL ENTRANCES ARE ACCESSIBLE.
- ACCESSIBLE CHECK-OUT AISLES WHERE NOT ALL AISLES ARE ACCESSIBLE.
- FAMILYOR ASSISTED-USE TOILET AND BATHING ROOMS.
- ACCESSIBLE DRESSING, FITTING AND LOCKER ROOMS WHERE NOT ALL SUCH ROOMS ARE ACCESSIBLE.
- ACCESSIBLE AREAS OF RESCUE ASSISTANCE.
- EXTERIOR AREAS FOR ASSISTED RESCUE.
- REFUSE DISPOSAL AND REFUSE STORAGE ROOMS.

302 FLOOR SURFACES



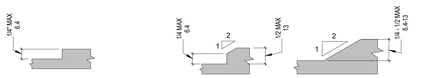
EXPOSED CARPET EDGES MUST BE FASTENED TO THE FLOOR AND PROVIDED WITH A FINISH TRIM COMPLYING W/ § 303.

304 TURNING SPACE



CIRCULAR T-SHAPED

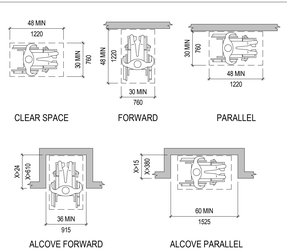
303 CHANGES IN LEVEL



VERTICAL CHANGES IN LEVEL BEVELED CHANGES IN LEVEL

CHANGES IN LEVEL GREATER THAN 1/2" (13mm) SHALL BE CONSIDERED RAMPS COMPLYING W/ § 405 & 406

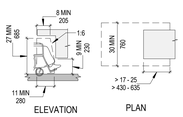
305 CLEAR FLOOR SPACE



CLEAR SPACE FORWARD PARALLEL

ALCOVE FORWARD ALCOVE PARALLEL

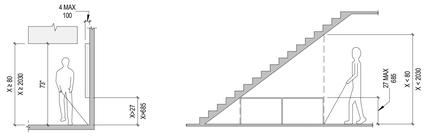
306 KNEE & TOE CLEARANCE



ELEVATION PLAN

ANY ADDITIONAL TOE CLEARANCE GREATER THAN 6" ABOVE THE MINIMUM 9" SHALL NOT BE CONSIDERED TOE CLEARANCE PER § 306.2.4

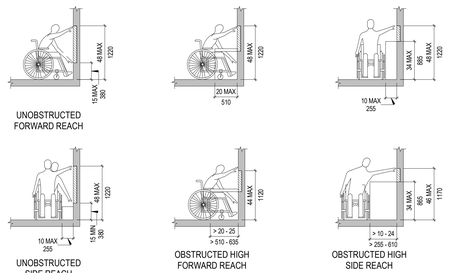
307 PROTRUDING OBJECTS



LIMITS OF PROTRUDING OBJECTS REDUCED VERTICAL CLEARANCE

EXCEPTIONS: HANDRAILS CAN PROTRUDE 4-1/2" (115mm) MAX. INTO CIRCULATION PATHS PER § 307.2. DOOR CLOSERS AND DOOR STOPS SHALL BE PERMITTED TO BE 78" (1980mm) A.F.F. PER § 307.4.

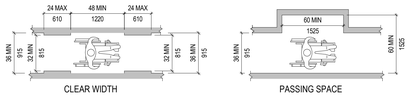
308 REACH RANGES

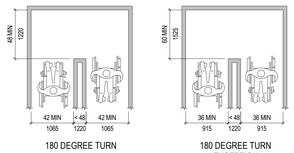


EXCEPTIONS: EXISTING ELEMENTS THAT ARE NOT ALTERED SHALL BE PERMITTED AT 54" (1370mm) A.F.F. ON SIDE REACH PER § 308.3.1. FOR WASHING MACHINES AND CLOTHES DRYERS OBSTRUCTION HEIGHT SHALL BE PERMITTED AT 36" (915mm) A.F.F. PER § 308.3.2.

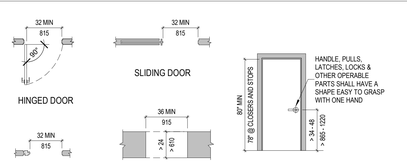
402/3 ACCESSIBLE ROUTES & WALKING SURFACES

ACCESSIBLE ROUTES CONSIST OF WALKING SURFACES WITH A MAX. SLOPE OF 1:20, DOORS/DOORWAYS, RAMPS, CURB RAMPS, ELEVATORS AND PLATFORM LIFTS. CROSS SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 1:48 PER § 402.

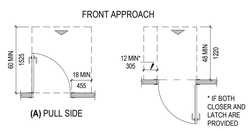




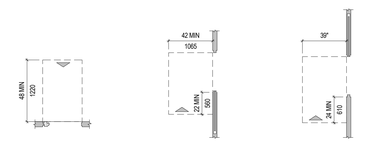
404 DOORS AND DOORWAYS



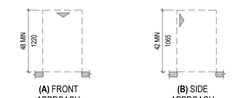
MANUAL SWING DOORS CLEARANCES



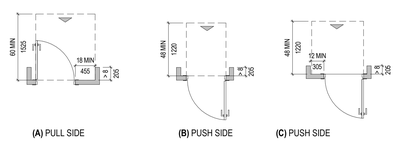
SLIDING AND FOLDING DOORS CLEARANCES



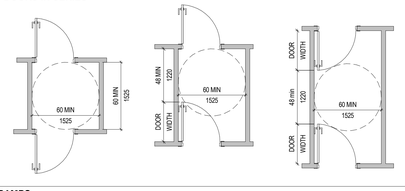
DOORWAYS CLEARANCE



RECESSED DOORS

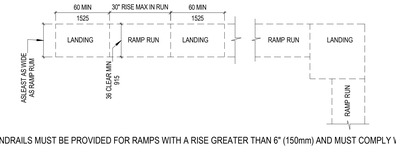


TWO DOORS IN SERIES



405 RAMPS

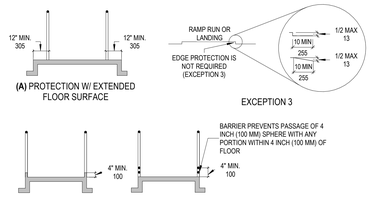
RAMPS SHOULD HAVE A SLOPE GREATER THAN 1:20 BUT NOT STEEPER THAN 1:12. CROSS SLOPE SHALL NOT BE STEEPER THAN 1:48 PER § 405. EXCEPTIONS: IN EXISTING BUILDINGS, RAMPS WITH A STEEPER SLOPE SHALL BE PERMITTED DUE TO SPACE LIMITATIONS BUT NOT STEEPER THAN 1:8. PER § 405.2.



HANDRAILS MUST BE PROVIDED FOR RAMPS WITH A RISE GREATER THAN 6" (150mm) AND MUST COMPLY WITH § 505.

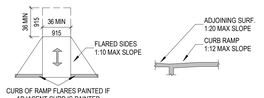
EDGE PROTECTION

PER § 405.9 EDGE PROTECTION MUST BE PROVIDED ON EACH SIDE OF RAMP RUNS AND LANDINGS. EXCEPTIONS: EDGE PROTECTIONS NOT REQUIRED ON 1) CURB RAMPS WITH FLARES AND W/OUT HANDRAILS 2) RAMP LANDINGS SERVING A RUN OR STAIRWAY 3) SIDES OF RAMPS HAVING A VERTICAL DROP OFF OF 1/2" (13mm) MAX WITHIN 10" (255mm) OUTSIDE MINIMUM LANDING AREA 4) RAMP AISLES PROVIDING ACCESS TO SEATS OF AISLE WAYS.



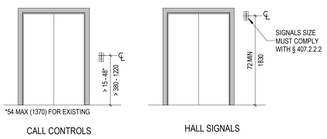
406 CURB RAMPS

DETECTABLE WARNINGS SHALL BE PROVIDED FOR CURB RAMPS COMPLYING WITH § 406.13 AND 705



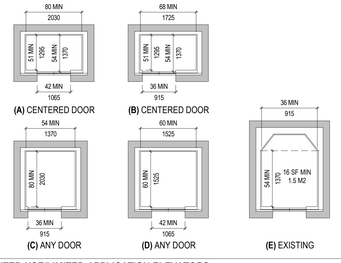
407 ELEVATORS

ELEVATORS SHALL BE PROVIDED FOR BUILDINGS WITH 5 STORIES OR MORE IN HEIGHT PER NYC BC § 3002.4 AND ONE MUST ACCOMMODATE AN AMBULANCE STRETCHER PER NYC BC § 3003.3. ALL ELEVATORS SHALL COMPLY WITH § 407 OF ANSI A117.1 2009 AND ASME A17.1/CSA B44. ELEVATORS CONTROLS SHALL HAVE A CLEAR FLOOR SPACE COMPLYING WITH § 305. EXISTING ELEVATORS SHALL NOT COMPLY WITH MINIMUM HEIGHTS OF § 407.2.2.2. AUDIBLE SIGNALS SHALL BE PROVIDED AND COMPLYING WITH § 407.2.2.3



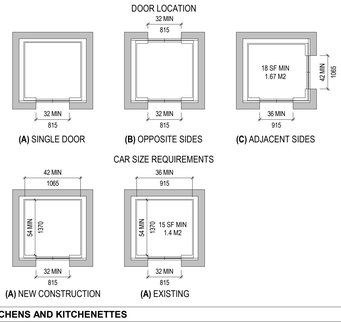
CAR REQUIREMENTS

IF OTHER ELEVATORS ARE PROVIDED BESIDES THE ELEVATOR-IN-READINESS MUST COMPLY WITH § 407.4



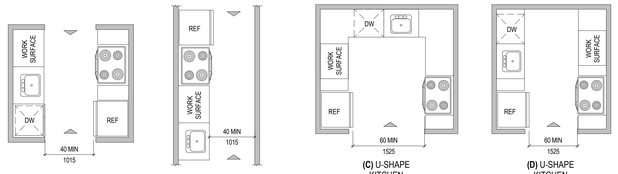
408 LIMITED-USE/LIMITED-APPLICATION ELEVATORS

ALL LIMITED-USE ELEVATORS SHALL COMPLY WITH § 408 OF ANSI A117.1 2009 AND ASME A17.1/CSA B44.



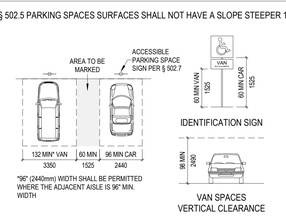
804 KITCHENS AND KITCHENETTES

PER § 804.25 EXCEPTION: SPACES THAT DO NOT PROVIDE COOKTOP OR CONVENTIONAL RANGE SHALL NOT REQUIRE TO COMPLY PROVIDED A 40" MIN DISTANCE BETWEEN OPPOSING CABINETS, COUNTERTOPS OR WALLS

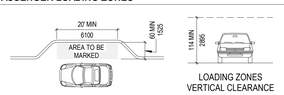


502 PARKING SPACES

PER § 502.5 PARKING SPACES SURFACES SHALL NOT HAVE A SLOPE STEEPER 1:48.

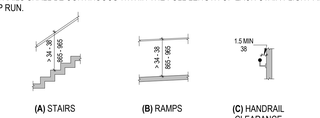


503 PASSENGER LOADING ZONES



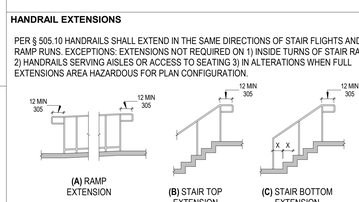
505 HANDRAILS

PER § 505 HANDRAILS SHALL BE PROVIDED ON BOTH SIDES OF STAIRS AND RAMPS. HANDRAILS SHALL BE CONTINUOUS WITHIN THE FULL LENGTH OF EACH STAIR FLIGHT AND RAMP RUN.



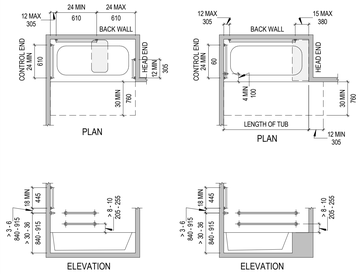
HANDRAIL EXTENSIONS

PER § 505.10 HANDRAILS SHALL EXTEND IN THE SAME DIRECTIONS OF STAIR FLIGHTS AND RAMP RUNS. EXCEPTIONS: EXTENSIONS NOT REQUIRED ON 1) INSIDE TURNS OF STAIR RAMPS 2) HANDRAILS SERVING AISLES OR ACCESS TO SEATING 3) IN ALTERATIONS WHEN FULL EXTENSIONS AREA HAZARDOUS FOR PLAN CONFIGURATION.



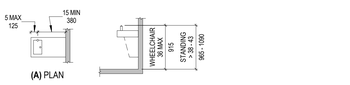
607 BATHTUBS

GRAB BARS SHALL BE PROVIDED PER § 607.4. EXCEPTIONS: GRAB BARS SHALL NOT BE PROVIDED ON SINGLE OCCUPANT RESTROOMS ACCESSED THROUGH PRIVATE OFFICE NOT FOR COMMON/PUBLIC USE. L-SHAPED CONTINUOUS GRAB BAR SHALL BE PERMITTED ON CONTROL END WALL WITH EQUIVALENT DIMENSIONS PER § 607.4 W/ PERMANENT SEAT.



602 DRINKING FOUNTAINS

DRINKING FOUNTAINS MUST HAVE A CLEAR SPACE AND CLEARANCES PER § 305.



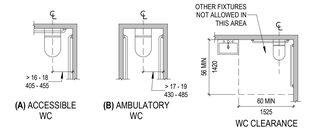
603 TOILET AND BATHING ROOMS

DOORS SHALL NOT SWING INTO CLEARANCE FOR ANY FIXTURE PER § 603.2.2. EXCEPTIONS: DOOR SWING SHALL BE PERMITTED ON FIXTURES CLEARANCES ON 1) SINGLE OCCUPANT TOILET OR BATHING ROOMS 2) INDIVIDUAL USE ROOMS WHERE CLEAR FLOOR SPACE IS PROVIDED BEYOND DOOR SWING.

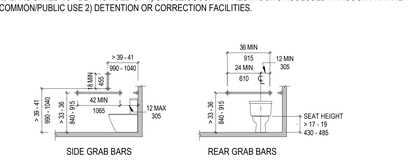
CLEAR FLOOR SPACE COMPLYING W/ § 305.3 (FORWARD APPROACH) SHALL BE PROVIDED AND KNEE AND TOE CLEARANCE SHALL BE PROVIDED PER § 306. EXCEPTIONS: 1) PARALLEL APPROACH SHALL BE PERMITTED FOR KITCHEN SINKS WHEN TOP RANGE IS NOT PROVIDED 2) KNEE AND TOE CLEARANCE SHALL NOT BE PROVIDED FOR SINGLE OCCUPANT TOILETS 3) KNEE AND TOE REQUIREMENTS ARE NOT REQUIRED TO FOR MORE THAN ONE BOWL IN MULTIBOWL SINKS.

604 WATER CLOSERS AND TOILET COMPARTMENTS

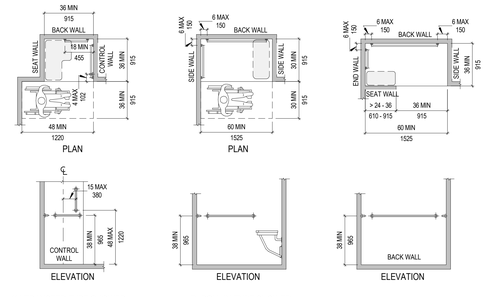
PER § 604.3.2 THE WATER CLOSET CLEARANCE CAN OVERLAP W/ GRAB BARS, PAPER DISPENSERS, SANITARY NAPKINS RECEPTACLES, COAT HOOKS, SHELVES AND OTHER FIXTURES CLEARANCES.



GRAB BARS SHALL COMPLY SHALL BE PROVIDED IN REAR AND SIDE WALLS CLOSEST TO THE WATER CLOSET PER § 604.5. EXCEPTIONS: GRAB BARS SHALL NOT BE PROVIDED ON 1) SINGLE OCCUPANT RESTROOMS ACCESSED THROUGH PRIVATE OFFICE NOT FOR COMMON/PUBLIC USE 2) DETENTION OR CORRECTION FACILITIES.

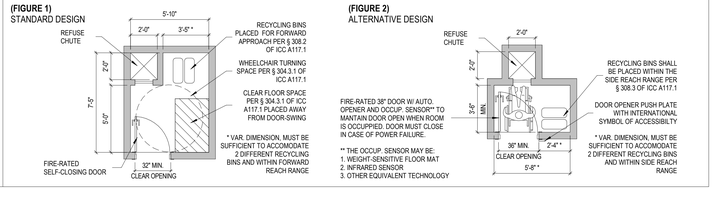


608 SHOWER COMPARTMENTS



BUILDINGS BULLETIN 2019-001 - ACCESSIBLE REFUSE ROOM

STANDARD DESIGN. IN MULTIPLE DWELLINGS, REFUSE DISPOSAL, RECYCLABLE, AND STORAGE ROOMS INTENDED FOR THE GENERAL COMMON-USE SHALL COMPLY WITH BULLETIN 2019-001. EACH ROOM MUST COMPLY W/ ICC A117.11, INCLUDING BUT NOT LIMITED TO, § 304 (TURNING SPACE), § 305 (CLEAR FLOOR SPACE), § 309 (OPERABLE PARTS) AND § 404 (DOORS AND DOORWAYS). THE REFUSE AND RECYCLABLE STORAGE ROOM DOOR MAY SWING INTO THE ROOM PROVIDED THAT A CLEAR FLOOR SPACE NOT LESS THAN 30" BY 48" IS PROVIDED WITHIN THE ROOM BEYOND THE ARC OF THE DOOR SWING. SEE FIGURE 1. **ALTERNATIVE DESIGN.** AN ALTERNATIVE DESIGN IS PERMITTED PROVIDED THAT THE CONDITIONS ARE MET PER FIGURE 2.



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CLIENT:
THE RABSKY GROUP
505 Flushing Ave
Brooklyn, NY 11205

Architect:
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Structure Engineer:
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40-12 28th Street
Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

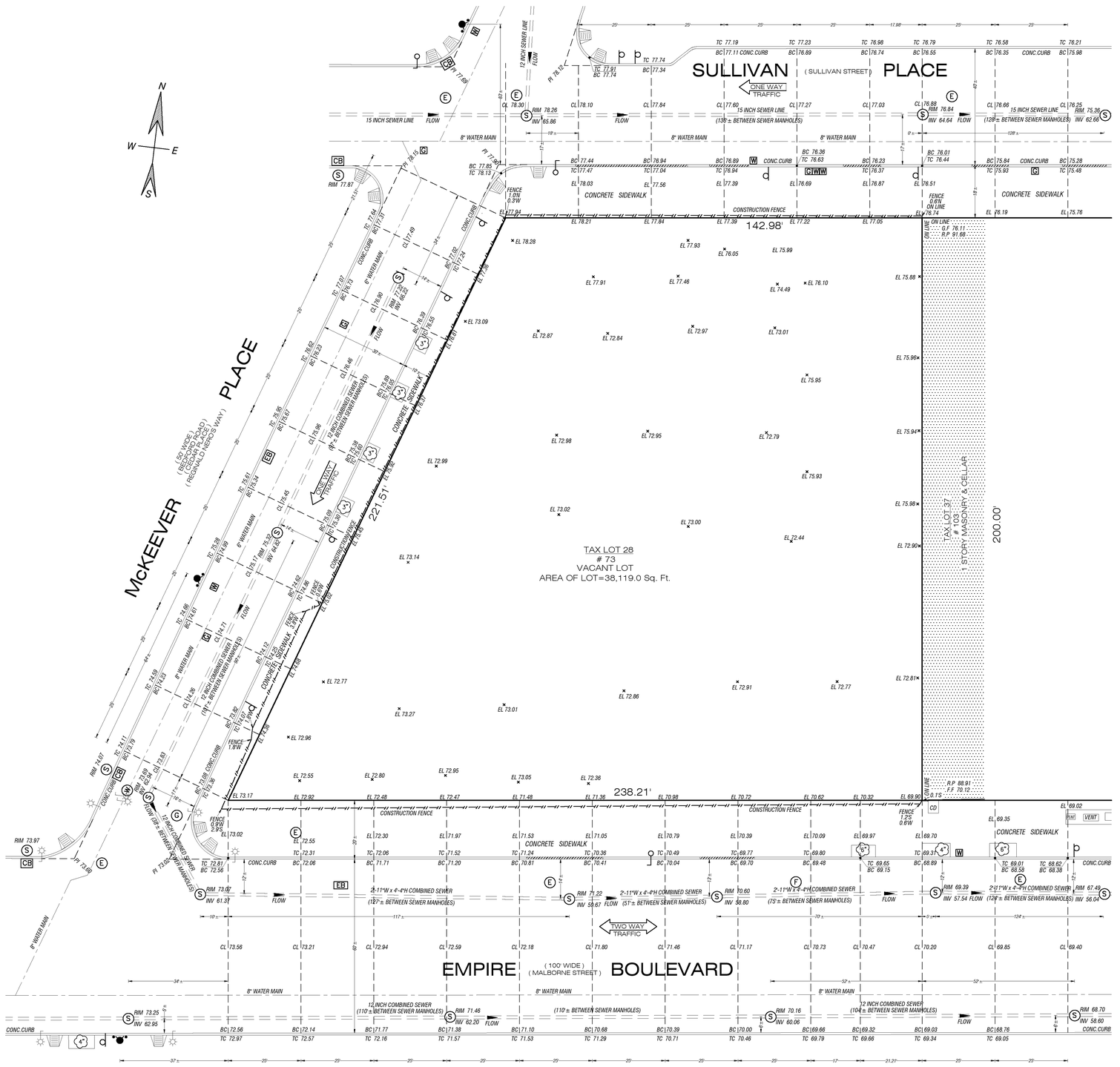
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ACCESSIBILITY NOTES

G-005D.00

Scale:	1/4" = 1'-0"
Date:	12/1/2025 7:34:40 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

JOB # CM 5022 ADDRESS: 73 EMPIRE BOULEVARD



GENERAL NOTES:

1. This survey was prepared only for the party (parties) and purpose indicated hereon.
2. Property corner monuments or markers were (not) placed as part of this survey.
3. Certifications on this survey map signify that the map was prepared in accordance with the current existing Code of Practice for Land Surveys adopted by the New York State Association of Professional Land Surveyors, Inc. Said certifications are limited to the party (parties) for whom the survey is prepared and are not transferable.
4. The location and nature of underground structures, internal walls and improvements or encroachments not visible to the surveyor are not covered under this certification.
5. Easements of record are only guaranteed if an Abstract of Title is furnished to the surveyor.
6. This is to certify that there are no streams nor natural water courses on the property except as shown on this survey.
7. Elevations refer to NAVD 1988 datum.

CAPTION	ARCHITECTURAL SURVEY				
DATE	REVISIONS				
10-20-2025	ARCHITECTURAL SURVEY UPDATE				
07-02-2025	ARCHITECTURAL SURVEY				
	DATE	BY		DATE	BY
SURVEYED	07-02-2025	V.B,V.J,P.J	DRAWN	07-05-2025	V.B

LEGEND

F.F	FIRST FLOOR ELEVATION
R.P	ROOF PARAPET ELEVATION
G.F	GARAGE FLOOR ELEVATION
TC	TOP OF CURB
BC	BOTTOM OF CURB
CL	CENTERLINE
EL	SPOT ELEVATION
INV	INVERT ELEVATION
CD	CELLAR DOOR
CONC.	CONCRETE
G	GAS MANHOLE
W	WATER MANHOLE
E	ELECTRIC MANHOLE
S	SEWER MANHOLE
F	FIRE DEPARTMENT MANHOLE
W	WATER VALVE
G	GAS VALVE
CB	CATCH BASIN
EB	ELECTRIC BOX
	TRAFFIC LIGHT
	LIGHT POLE
	STREET SIGN
	HYDRANT
	CHAIN LINK FENCE
	CONSTRUCTION FENCE
	DROP CURB
	PEDESTRIAN RAMP
30"	TREE & SIZE

SCALE: 1 INCH = 25 FEET

STATE OF NEW YORK
VINCENT TEUTONICO
050307
LICENSED LAND SURVEYOR

VINCENT TEUTONICO, L.S.
NEW YORK LICENSE 050307

MAP OF SURVEY OF PROPERTY

BOROUGH AND COUNTY OF BROOKLYN
CITY AND STATE OF NEW YORK
TAX MAP: BLOCK 1306, LOT 28

STATEWIDE LAND SURVEYING P.C.
16 FLAGG PLACE
STATEN ISLAND
NY 10304
TEL: 718-751-6871
email: citymapping@yahoo.com

KAO-HWA LEE
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00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

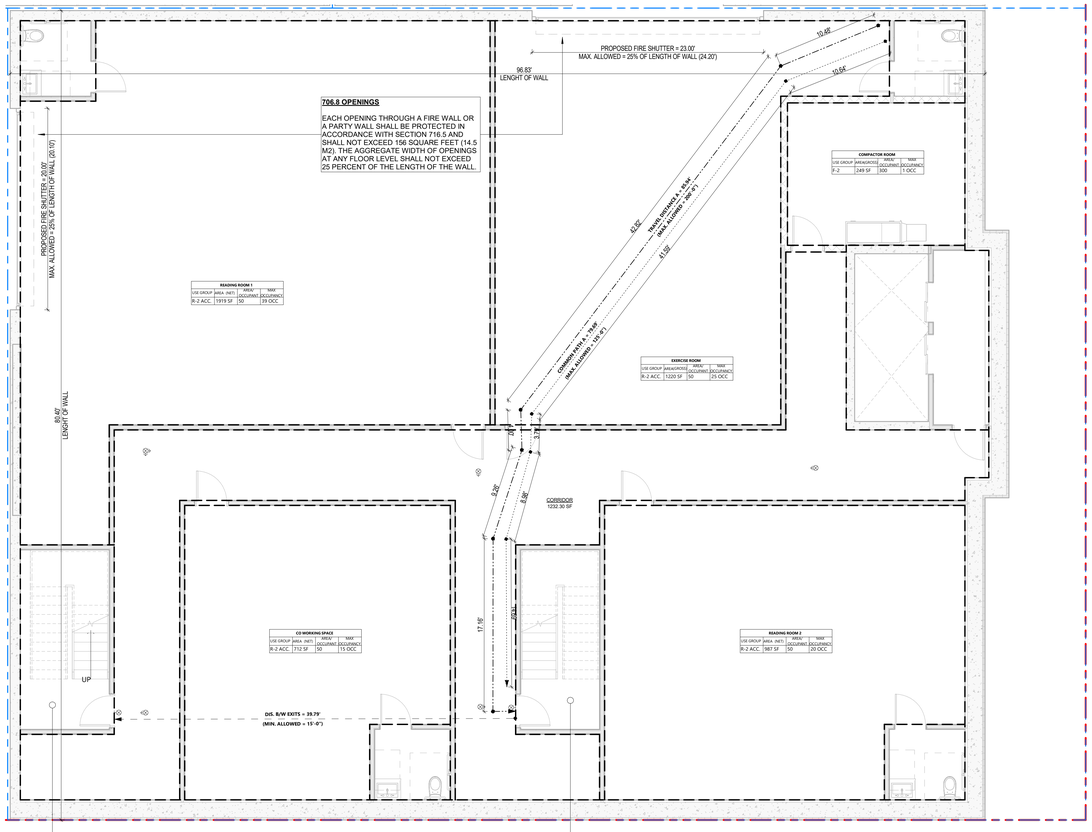
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ARCHITECTURAL SURVEY

V-001D.00

Scale:
Date: 12/1/2025 7:34:41 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

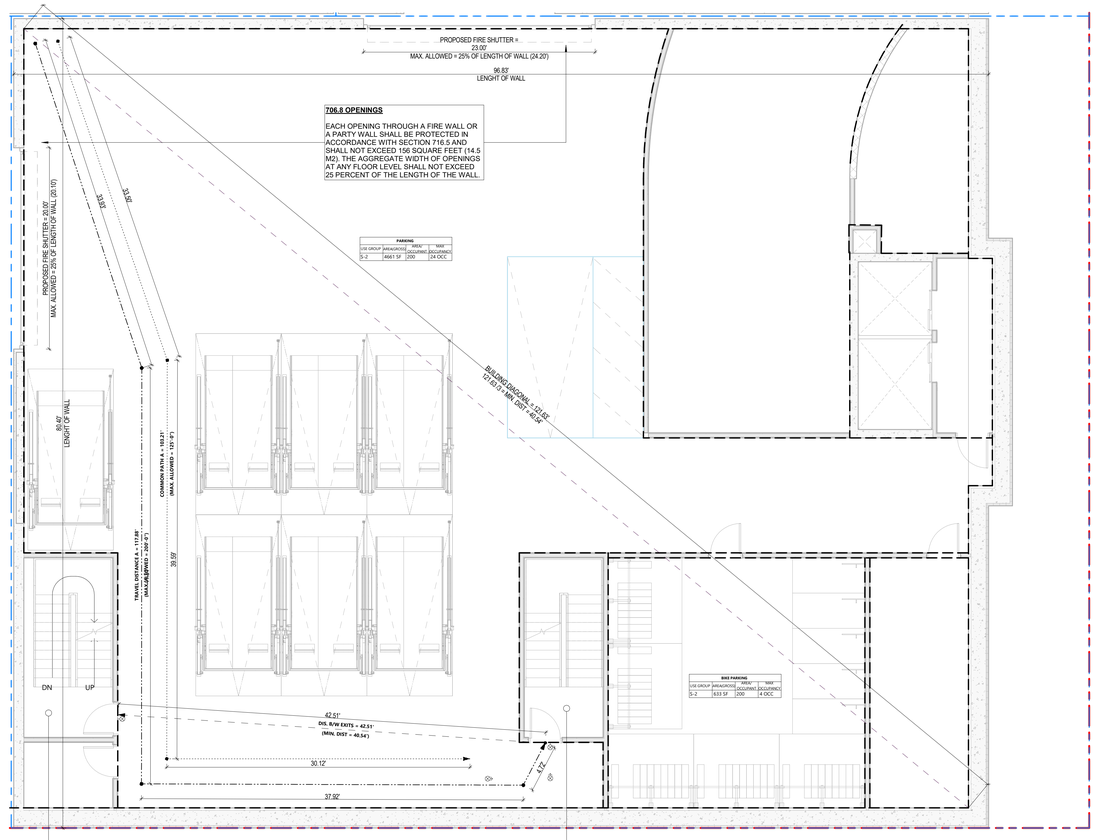
1 BLDG D - SUBCELLAR 2 LIFE SAFETY PLAN
3/16" = 1'-0"



EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

2 BLDG D - SUBCELLAR 1 LIFE SAFETY PLAN
3/16" = 1'-0"



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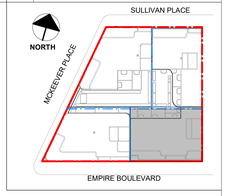
KEY PLAN
N.T.S.



SUB-CELLAR 2 EGRESS STAIRS - BLDG D				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	50	15	44"
EGRESS STAIR D	0.3	50	15	44"

SUB-CELLAR 2 EGRESS DOORS - BLDG D				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	50	10	36"
EGRESS DOOR B	0.2	50	10	36"

SUB-CELLAR 2 CORRIDOR CAPACITY - BLDG D				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	100	20	60"

SUB-CELLAR 2 OCCUPANT LOAD - BLDG D		
Name	Area	# of Occupants
CO WORKING SPACE	712 SF	15
EXERCISE ROOM	1220 SF	25
READING ROOM 1	1919 SF	39
READING ROOM 2	987 SF	20
	4837 SF	99
COMPACTOR ROOM	249 SF	1
	249 SF	1
TOTAL	5087 SF	100

SUB-CELLAR 2 TRAVEL DISTANCE - BLDG D			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	79' - 8"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2 ACC.	MIN. ALLOWED = 15'-0"	39' - 10"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	85' - 11"

SUB-CELLAR 1 EGRESS STAIRS - BLDG D				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	14	4.2	44"
EGRESS STAIR B	0.3	14	4.2	44"

SUB-CELLAR 1 EGRESS DOORS - BLDG D				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	14	2.8	36"
EGRESS DOOR B	0.2	14	2.8	36"

SUB-CELLAR 1 CORRIDOR CAPACITY - BLDG D				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width

SUB-CELLAR 1 OCCUPANT LOAD - BLDG D		
Name	Area	# of Occupants
BIKE PARKING	633 SF	4
PARKING	4661 SF	24
	5294 SF	28
TOTAL	5294 SF	28

SUB-CELLAR 1 TRAVEL DISTANCE - BLDG D			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	103' - 3"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. DIST = 40.54'	42' - 6"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	117' - 11"

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No.	Description	Date
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SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
SUBCELLAR 1 & 2 LIFE SAFETY PLANS

A-001D.00

Scale: As indicated
Date: 12/1/2025 7:34:54 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 BLDG D - CELLAR LIFE SAFETY PLAN
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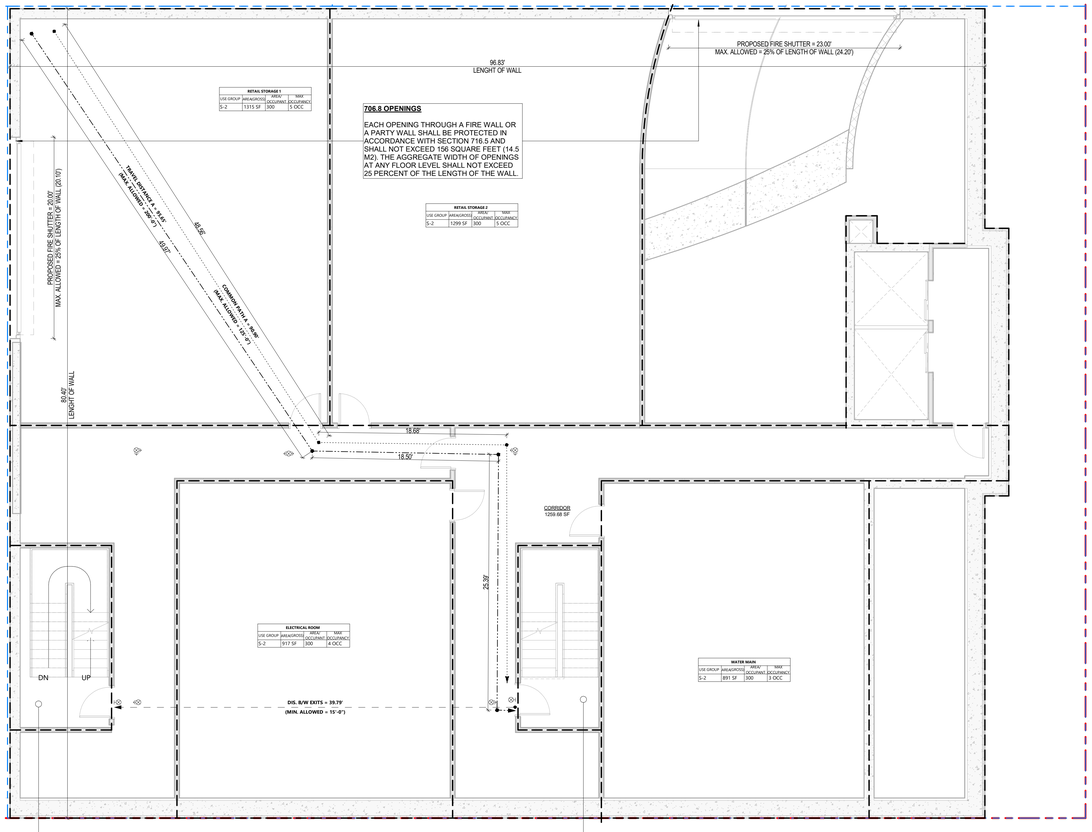

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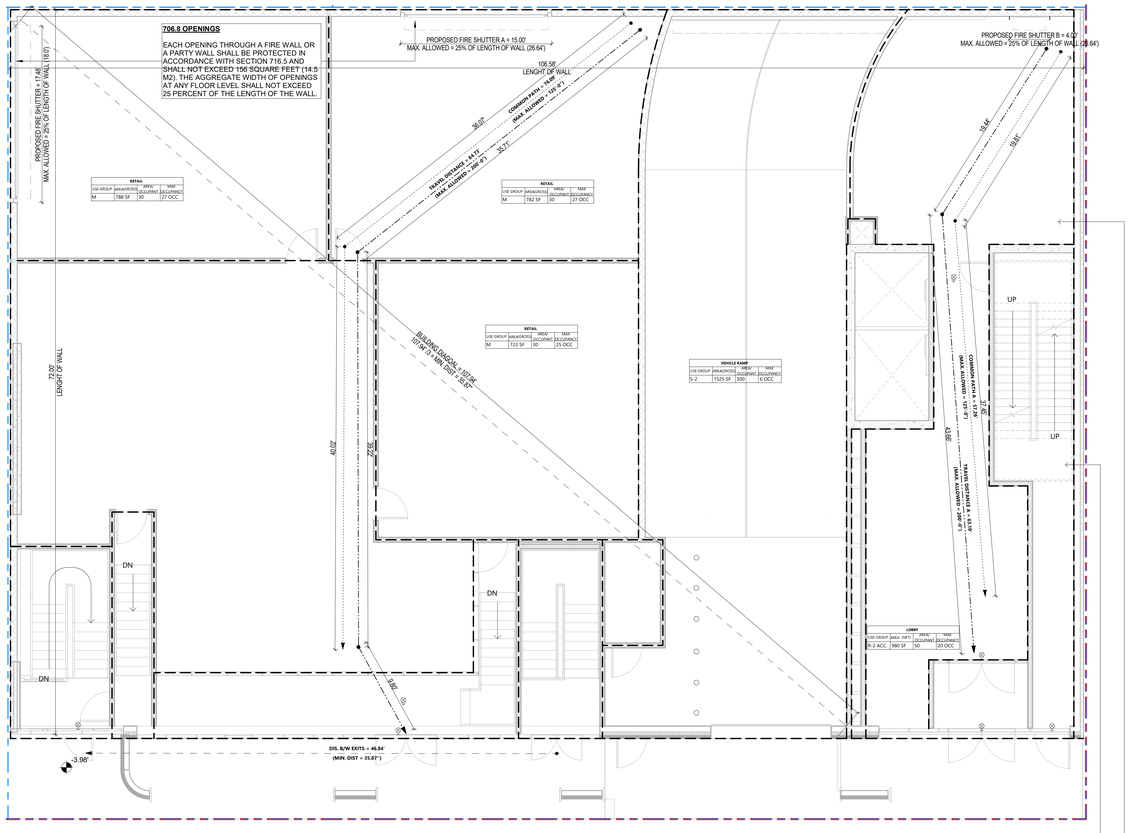
EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

2 BLDG D - 1ST FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"



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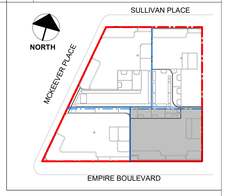
KEY PLAN
N.T.S.



CELLAR EGRESS STAIRS- BLDG D				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	14	4.2	44"
EGRESS STAIR B	0.3	14	4.2	44"

CELLAR EGRESS DOORS - BLDG D				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	9	1.8	36"
EGRESS DOOR B	0.2	8	1.6	36"

CELLAR CORRIDOR CAPACITY - BLDG D				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	17	3.4	60"

CELLAR OCCUPANT LOAD - BLDG D		
Name	Area	# of Occupants
RETAIL STORAGE 1	1315 SF	5
RETAIL STORAGE 2	1299 SF	5
	2615 SF	10
ELECTRICAL ROOM	917 SF	4
WATER MAIN	891 SF	3
	1808 SF	7
TOTAL	4422 SF	17

CELLAR TRAVEL DISTANCE - BLDG D			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	90' - 11"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	39' - 10"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	95' - 8"

1ST FLOOR EGRESS STAIRS - BLDG D				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	40	12	44"
EGRESS STAIR B	0.3	40	12	44"

1ST FLOOR EGRESS DOORS - BLDG D				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	40	8	42"
EGRESS DOOR C	0.2	40	8	36"

1ST FLOOR CORRIDOR CAPACITY - BLDG D				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	80	16	60"

1ST FLOOR OCCUPANT LOAD - BLDG D		
Name	Area	# of Occupants
RETAIL	788 SF	27
RETAIL	782 SF	27
	1569 SF	54
VEHICLE RAMP	1525 SF	6
	1525 SF	6
LOBBY	980 SF	20
	980 SF	20
TOTAL	4074 SF	80

1ST FLOOR TRAVEL DISTANCE - BLDG D			
Name	Occupancy Group	Required Distance	Proposed Distance

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
CELLAR & 1ST FL. LIFE SAFETY PLANS

A-002D.00

Scale:	As indicated
Date:	12/1/2025 7:35:06 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG D - 2ND FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"

2ND FLOOR EGRESS STAIRS - BLDG D				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	24	7.2	44"
EGRESS STAIR B	0.3	24	7.2	44"

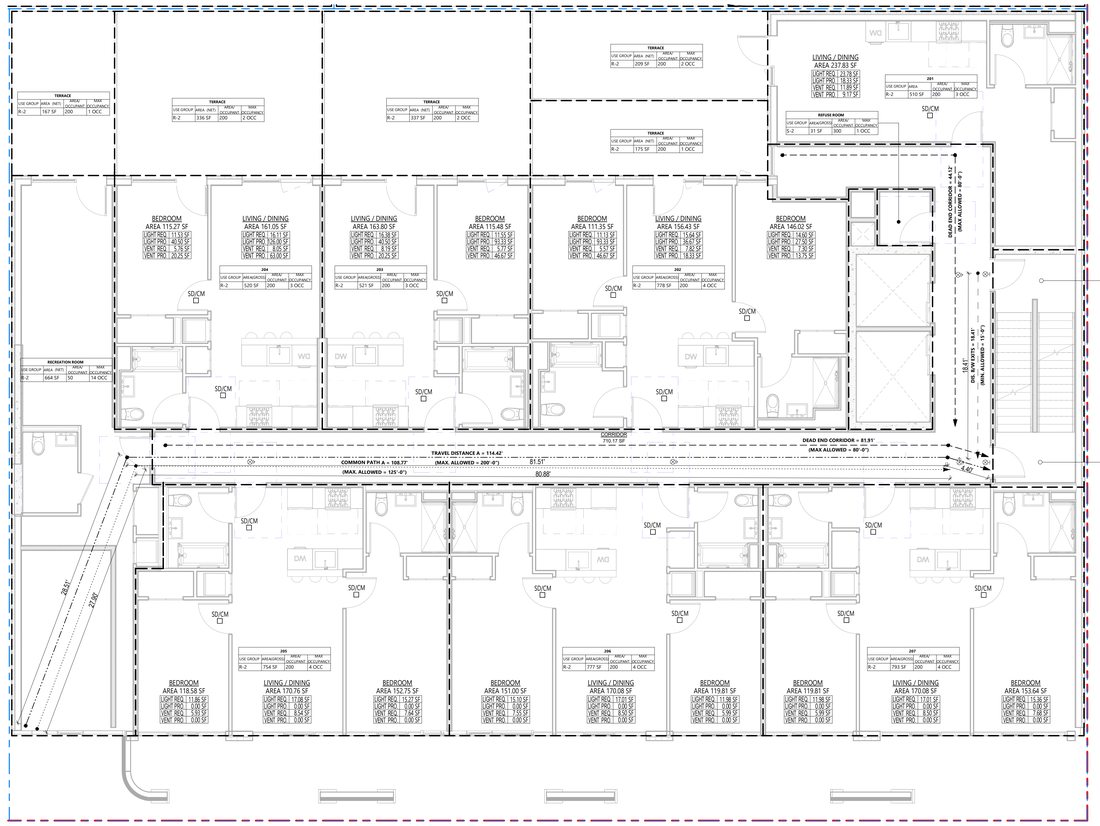
2ND FLOOR EGRESS DOORS - BLDG D				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	24	4.8	36"
EGRESS DOOR B	0.2	24	4.8	36"

2ND FLOOR CORRIDOR CAPACITY - BLDG D				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	48	9.6	60"

2ND FLOOR OCCUPANT LOAD - BLDG D		
Name	Area	# of Occupants
201	510 SF	3
202	778 SF	4
203	521 SF	3
204	520 SF	3
205	754 SF	4
206	777 SF	4
207	793 SF	4
	4653 SF	25
RECREATION ROOM	664 SF	14
TERRACE	167 SF	1
TERRACE	336 SF	2
TERRACE	337 SF	2
TERRACE	175 SF	1
TERRACE	209 SF	2
	1888 SF	22
REFUSE ROOM	31 SF	1
	31 SF	1
TOTAL	6572 SF	48

2ND FLOOR TRAVEL DISTANCE - BLDG D			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	108' - 9"
DEAD END			
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	44' - 1"
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	81' - 11"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	18' - 5"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	114' - 7"

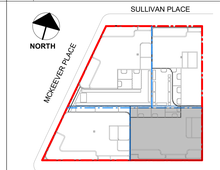
BLDG D - 2ND FL. -LIGHT AND AIR CALCULATION					
Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
02D_2ND FL.					
201	LIVING / DINING	23.782985	18.33 SF	11.891492	9.17 SF
202	BEDROOM	11.134995	93.33 SF	5.567498	46.67 SF
202	BEDROOM	14.601999	27.50 SF	7.300999	13.75 SF
203	LIVING / DINING	16.379994	40.50 SF	8.189997	20.25 SF
203	BEDROOM	11.5476	93.33 SF	5.7738	46.67 SF
204	BEDROOM	11.52663	40.50 SF	5.763315	20.25 SF
204	LIVING / DINING	16.105221	126.00 SF	8.052611	63.00 SF
205	BEDROOM	15.27487	0.00 SF	7.637435	0.00 SF
205	LIVING / DINING	17.076474	0.00 SF	8.538237	0.00 SF
205	BEDROOM	11.857715	0.00 SF	5.928857	0.00 SF
206	BEDROOM	15.10039	0.00 SF	7.550195	0.00 SF
206	LIVING / DINING	17.007894	0.00 SF	8.503947	0.00 SF
206	BEDROOM	11.98125	0.00 SF	5.990625	0.00 SF
207	BEDROOM	11.98125	0.00 SF	5.990625	0.00 SF
207	LIVING / DINING	17.007809	0.00 SF	8.503904	0.00 SF
207	BEDROOM	15.363522	0.00 SF	7.681761	0.00 SF
02D_2ND FL.					
202	LIVING / DINING	15.643135	36.67 SF	7.821567	18.33 SF
1207-2037	STAIR A	8.302344	0.00 SF	4.151172	0.00 SF
1207-2038	STAIR B	8.971528	0.00 SF	4.485764	0.00 SF



EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

KEY PLAN
N.T.S.



KAO-HWA LEE
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MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

2 BLDG D - 3RD FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"

3RD FLOOR EGRESS STAIRS - BLDG D				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	15	4.5	44"
EGRESS STAIR B	0.3	15	4.5	44"

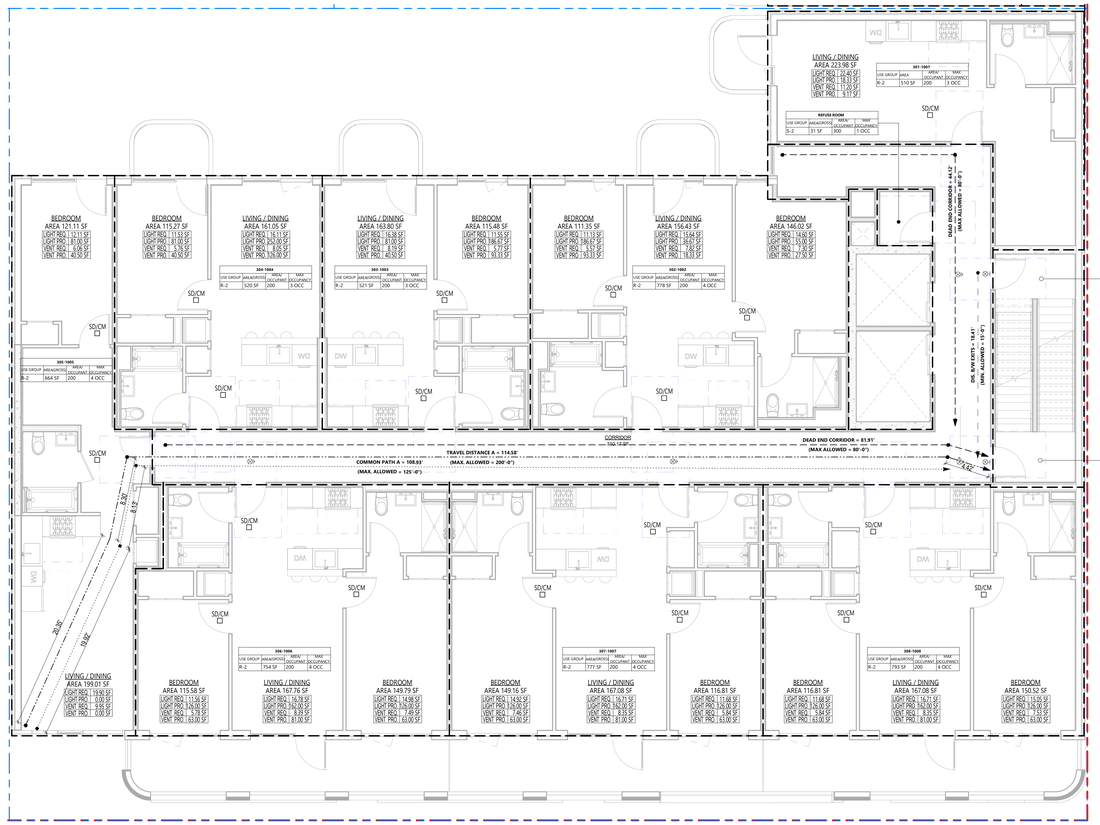
3RD FLOOR EGRESS DOORS - BLDG D				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	15	3	36"
EGRESS DOOR B	0.2	15	3	36"

3RD FLOOR CORRIDOR CAPACITY - BLDG D				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	30	6	60"

3RD FLOOR OCCUPANT LOAD - BLDG D		
Name	Area	# of Occupants
301-1001	510 SF	3
302-1002	778 SF	4
303-1003	521 SF	3
304-1004	520 SF	3
305-1005	664 SF	4
306-1006	754 SF	4
307-1007	777 SF	4
308-1008	793 SF	4
	5317 SF	29
REFUSE ROOM	31 SF	1
	31 SF	1
TOTAL	5347 SF	30

3RD FLOOR TRAVEL DISTANCE - BLDG D			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	108' - 11"
DEAD END			
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	44' - 1"
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	81' - 11"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	18' - 5"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	114' - 7"

BLDG D - 3RD FL. -LIGHT AND AIR CALCULATION					
Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
03D_3RD FL.					
301-1001	LIVING / DINING	22.398098	18.33 SF	11.199049	9.17 SF
302-1002	BEDROOM	14.601999	55.00 SF	7.300999	27.50 SF
302-1002	BEDROOM	11.134995	186.67 SF	5.567498	93.33 SF
303-1003	BEDROOM	11.5476	186.67 SF	5.7738	93.33 SF
303-1003	LIVING / DINING	16.379994	81.00 SF	8.189997	40.50 SF
304-1004	LIVING / DINING	16.105221	252.00 SF	8.052611	126.00 SF
304-1004	BEDROOM	11.52663	81.00 SF	5.763315	40.50 SF
305-1005	BEDROOM	12.111114	81.00 SF	6.055557	40.50 SF
305-1005	LIVING / DINING	19.901042	0.00 SF	9.950521	0.00 SF
306-1006	BEDROOM	11.557715	126.00 SF	5.778857	63.00 SF
306-1006	LIVING / DINING	16.776281	162.00 SF	8.38814	81.00 SF
306-1006	BEDROOM	14.979167	126.00 SF	7.489583	63.00 SF
307-1007	BEDROOM	14.915668	126.00 SF	7.457834	63.00 SF
307-1007	LIVING / DINING	16.707531	162.00 SF	8.353765	81.00 SF
307-1007	BEDROOM	11.68125	126.00 SF	5.840625	63.00 SF
308-1008	BEDROOM	11.68125	126.00 SF	5.840625	63.00 SF
308-1008	LIVING / DINING	16.707531	162.00 SF	8.353765	81.00 SF
308-1008	BEDROOM	15.051649	126.00 SF	7.525825	63.00 SF
03D_3RD FL.					
302-1002	LIVING / DINING	15.643135	36.67 SF	7.821567	18.33 SF
1207-1973	BALCONY	16.542942	292.50 SF	8.271471	146.25 SF
1207-1974	BALCONY	16.622222	292.50 SF	8.311111	146.25 SF
1207-1975	BALCONY	16.829707	292.50 SF	8.414854	146.25 SF
1207-2035	STAIR B	8.791233	0.00 SF	4.395616	0.00 SF
1207-2036	STAIR A	8.482639	0.00 SF	4.241319	0.00 SF



EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
2ND - 10TH FLOOR
LIFE SAFETY PLANS

A-003D.00

Scale: As indicated
Date: 12/1/2025 7:35:22 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 BLDG D - 11TH FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"

11TH FLOOR EGRESS STAIRS- BLDG D				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.2	14	2.8	44"
EGRESS STAIR B	0.3	14	4.2	44"

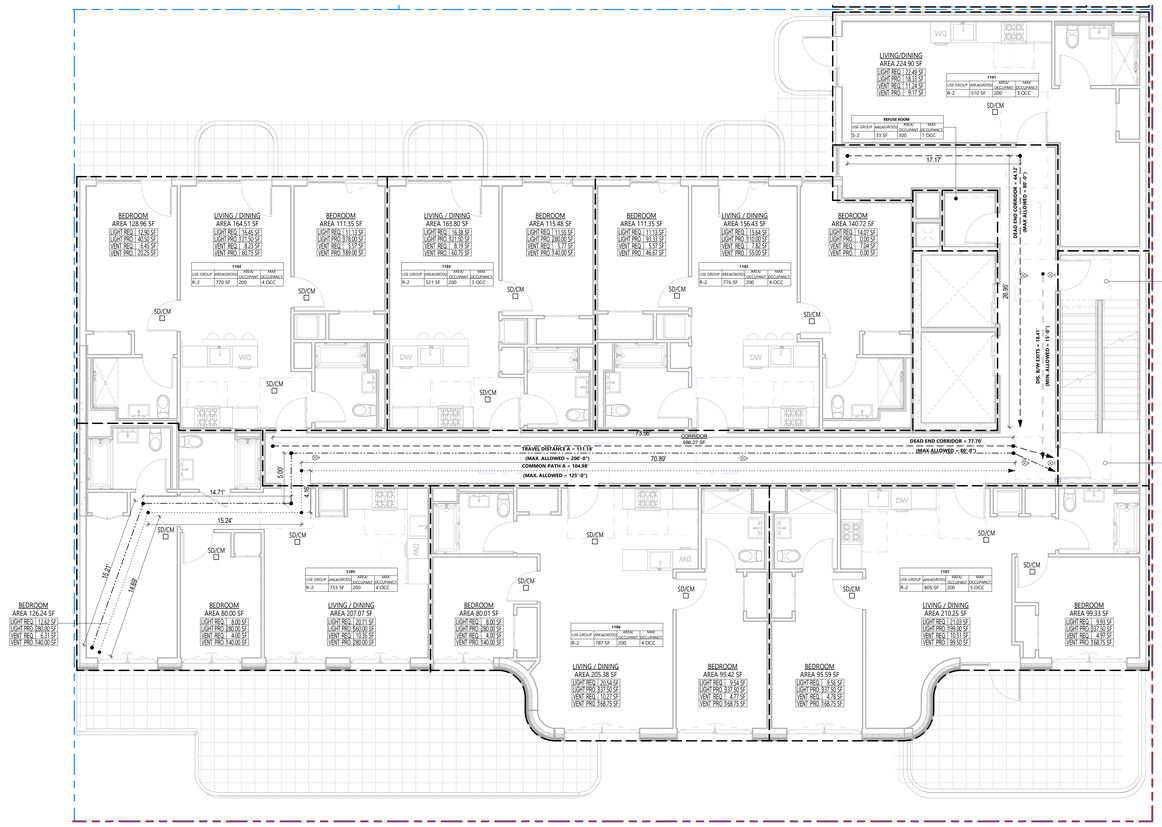
11TH FLOOR EGRESS DOORS - BLDG D				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	14	2.8	36"
EGRESS DOOR B	0.2	14	2.8	36"

11TH FLOOR CORRIDOR CAPACITY - BLDG D				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	28	5.6	60"

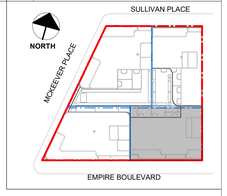
11TH FLOOR OCCUPANT LOAD - BLDG D		
Name	Area	# of Occupants
1101	510 SF	3
1102	776 SF	4
1103	521 SF	3
1104	770 SF	4
1105	753 SF	4
1106	787 SF	4
1107	805 SF	5
	4922 SF	27
REFUSE ROOM	33 SF	1
	33 SF	1
TOTAL	4955 SF	28

11TH FLOOR TRAVEL DISTANCE - BLDG D			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	105' - 0"
DEAD END			
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	77' - 8"
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	44' - 1"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	18' - 5"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	111' - 2"

BLDG D - 12TH -14TH FL. - LIGHT AND AIR CALCULATION					
Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
11D_11TH FL.					
1202-1402	LIVING / DINING	15.643135	110.00 SF	7.821567	55.00 SF
1202-1402	BEDROOM	14.071592	0.00 SF	7.035796	0.00 SF
1202-1402	BEDROOM	11.134995	93.33 SF	5.567498	46.67 SF
1203-1403	BEDROOM	11.5476	280.00 SF	5.7738	140.00 SF
1203-1403	LIVING / DINING	16.379994	121.50 SF	8.189997	60.75 SF
1204-1404	BEDROOM	11.134995	378.00 SF	5.567498	189.00 SF
1204-1404	LIVING / DINING	16.451001	121.50 SF	8.2255	60.75 SF
1205-1405	BEDROOM	8	280.00 SF	4	140.00 SF
1205-1405	LIVING / DINING	20.707019	560.00 SF	10.35351	280.00 SF
1205-1405	BEDROOM	12.623914	280.00 SF	6.311957	140.00 SF
1206-1406	BEDROOM	8.001321	280.00 SF	4.00066	140.00 SF
1206-1406	LIVING / DINING	20.537922	337.50 SF	10.268961	168.75 SF
1206-1406	BEDROOM	9.542296	337.50 SF	4.771148	168.75 SF
1207-1407	BEDROOM	9.558963	337.50 SF	4.779481	168.75 SF
1207-1407	LIVING / DINING	21.025276	199.00 SF	10.512638	99.50 SF
1207-1407	BEDROOM	9.933333	337.50 SF	4.966667	168.75 SF
11D_11TH FL.					
1204-1404	BEDROOM	12.896109	40.50 SF	6.448055	20.25 SF
1207-1999	KITCHENNETTE	3.180903	0.00 SF	1.590451	0.00 SF
1207-2039	STAIR A	8.751823	0.00 SF	4.375911	0.00 SF
1207-2040	STAIR B	7.846528	0.00 SF	3.923264	0.00 SF



KEY PLAN
N.T.S.



EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

2 BLDG D - 12TH FLOOR LIFE SAFETY PLAN
3/16" = 1'-0"

12TH FLOOR EGRESS STAIRS- BLDG D				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.2	14	2.8	44"
EGRESS STAIR B	0.3	14	4.2	44"

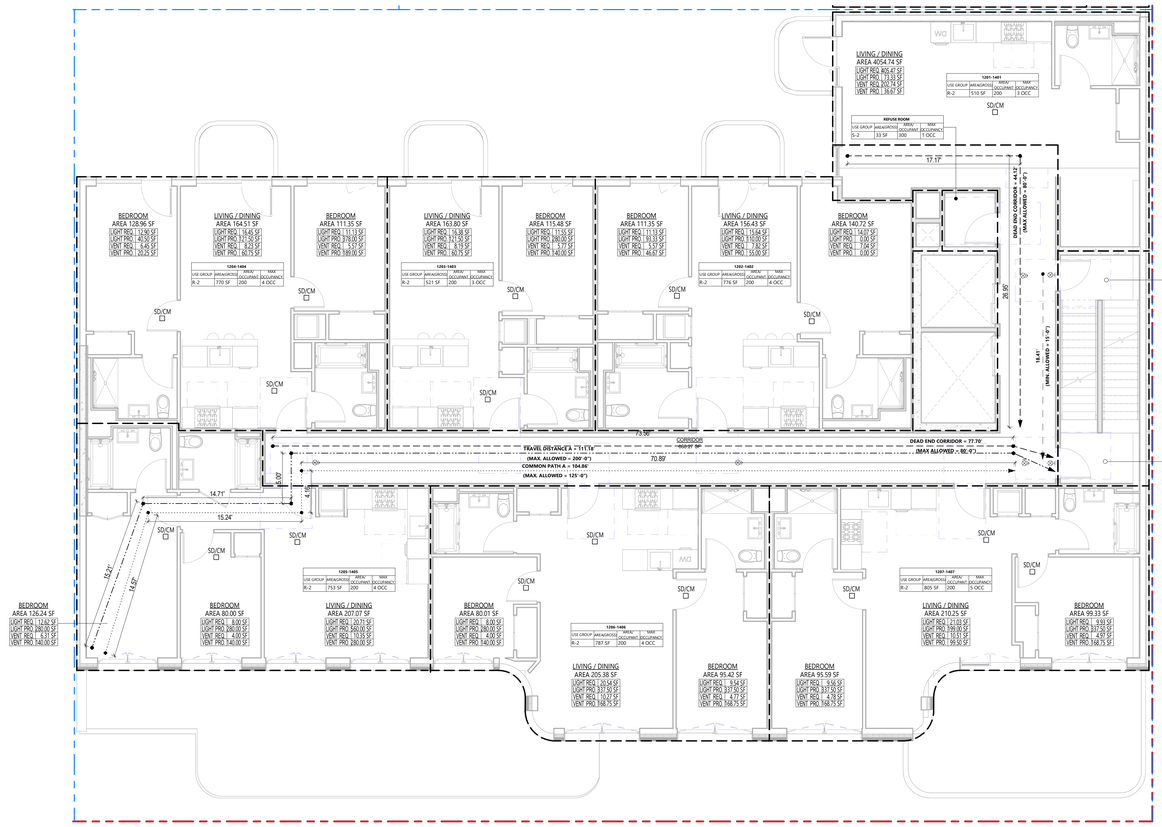
12TH FLOOR EGRESS DOORS - BLDG D				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	14	2.8	36"
EGRESS DOOR B	0.2	14	2.8	36"

12TH FLOOR CORRIDOR CAPACITY - BLDG D				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	28	5.6	60"

12TH FLOOR OCCUPANT LOAD - BLDG D		
Name	Area	# of Occupants
1201-1401	510 SF	3
1202-1402	776 SF	4
1203-1403	521 SF	3
1204-1404	770 SF	4
1205-1405	753 SF	4
1206-1406	787 SF	4
1207-1407	805 SF	5
	4922 SF	27
REFUSE ROOM	33 SF	1
	33 SF	1
TOTAL	4955 SF	28

12TH FLOOR TRAVEL DISTANCE - BLDG D			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	104' - 10"
DEAD END			
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	77' - 8"
DEAD END CORRIDOR	R-2	MAX ALLOWED = 80'-0"	44' - 1"
DIS. B/W EXITS			
	R-2	MIN. ALLOWED = 15'-0"	18' - 5"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	111' - 2"

BLDG D - 12TH -14TH FL. - LIGHT AND AIR CALCULATION					
Unit Number	Room Name	Light Requirement	Light Provided	Vent Requirement	Vent Provided
11D_11TH FL.					
1202-1402	LIVING / DINING	15.643135	110.00 SF	7.821567	55.00 SF
1202-1402	BEDROOM	14.071592	0.00 SF	7.035796	0.00 SF
1202-1402	BEDROOM	11.134995	93.33 SF	5.567498	46.67 SF
1203-1403	BEDROOM	11.5476	280.00 SF	5.7738	140.00 SF
1203-1403	LIVING / DINING	16.379994	121.50 SF	8.189997	60.75 SF
1204-1404	BEDROOM	11.134995	378.00 SF	5.567498	189.00 SF
1204-1404	LIVING / DINING	16.451001	121.50 SF	8.2255	60.75 SF
1205-1405	BEDROOM	8	280.00 SF	4	140.00 SF
1205-1405	LIVING / DINING	20.707019	560.00 SF	10.35351	280.00 SF
1205-1405	BEDROOM	12.623914	280.00 SF	6.311957	140.00 SF
1206-1406	BEDROOM	8.001321	280.00 SF	4.00066	140.00 SF
1206-1406	LIVING / DINING	20.537922	337.50 SF	10.268961	168.75 SF
1206-1406	BEDROOM	9.542296	337.50 SF	4.771148	168.75 SF
1207-1407	BEDROOM	9.558963	337.50 SF	4.779481	168.75 SF
1207-1407	LIVING / DINING	21.025276	199.00 SF	10.512638	99.50 SF
1207-1407	BEDROOM	9.933333	337.50 SF	4.966667	168.75 SF
11D_11TH FL.					
1204-1404	BEDROOM	12.896109	40.50 SF	6.448055	20.25 SF
1207-1999	KITCHENNETTE	3.180903	0.00 SF	1.590451	0.00 SF
1207-2039	STAIR A	8.751823	0.00 SF	4.375911	0.00 SF
1207-2040	STAIR B	7.846528	0.00 SF	3.923264	0.00 SF



EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
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Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
11TH - 14TH FLOOR
LIFE SAFETY PLANS

A-004D.00

Scale: As indicated
Date: 12/1/2025 7:35:38 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 BLDG D - ROOF LIFE SAFETY PLAN
3/16" = 1'-0"

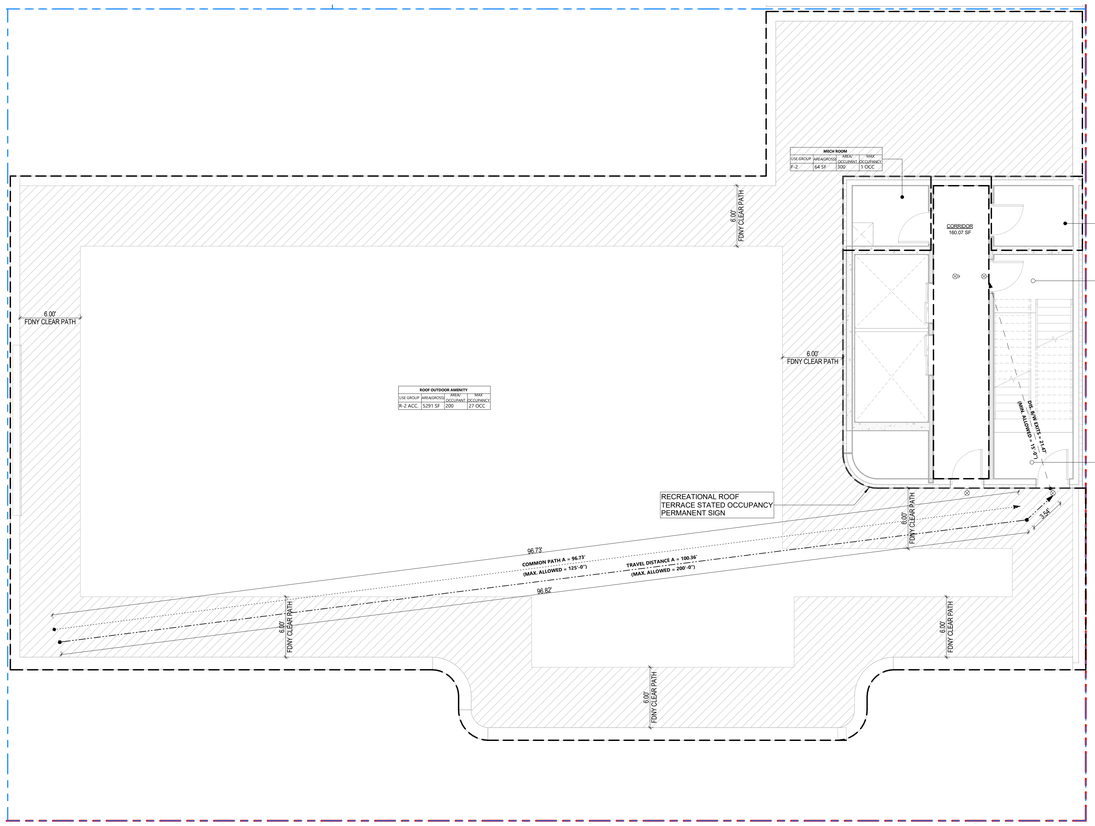
ROOF EGRESS STAIRS- BLDG D				
Mark	Occupancy Factor	Required Stair Capacity	Required Stair Width	Proposed Stair Width
EGRESS STAIR A	0.3	15	4.5	44"
EGRESS STAIR B	0.3	14	4.2	44"

ROOF EGRESS DOORS - BLDG D				
Name	Occupancy Factor	Required Door Capacity	Required Door Width	Proposed Door Width
EGRESS DOOR A	0.2	15	3	36"
EGRESS DOOR B	0.2	14	2.8	36"

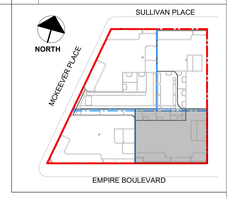
ROOF CORRIDOR CAPACITY - BLDG D				
Occupancy Type	Occupancy Factor	Required Corridor Capacity	Required Corridor Width	Proposed Corridor Width
CORRIDOR	0.2	29	5.8	65"

ROOF OCCUPANT LOAD - BLDG D		
Name	Area	# of Occupants
ROOF OUTDOOR AMENITY	5291 SF	27
	5291 SF	27
MECH ROOM	66 SF	1
MECH ROOM	64 SF	1
	131 SF	2
TOTAL	5422 SF	29

ROOF TRAVEL DISTANCE - BLDG D			
Name	Occupancy Group	Required Distance	Proposed Distance
COMMON PATH OF TRAVEL			
COMMON PATH A	R-2	MAX. ALLOWED = 125'-0"	96' - 9"
DIS. B/W EXITS			
DIS. B/W EXITS	R-2	MIN. ALLOWED = 15'-0"	21' - 6"
TRAVEL DISTANCE			
TRAVEL DISTANCE A	R-2	MAX. ALLOWED = 200'-0"	100' - 4"



KEY PLAN
N.T.S.



MECH ROOM			
USE GROUP	AREA(SQ/FT)	AREA/OCCUPANC	TOTAL OCCUPANC
F-2	66 SF	300	1 OCC

EXIT STAIR A	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

EXIT STAIR B	TOTAL CAPACITY: 146
STAIR WIDTH: 44"	OCCUPANCY FACTOR: 0.3
STAIR CAPACITY: 146	
DOOR WIDTH: 34"	OCCUPANCY FACTOR: 0.2
DOOR CAPACITY: 170 OCCUPANTS	

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Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

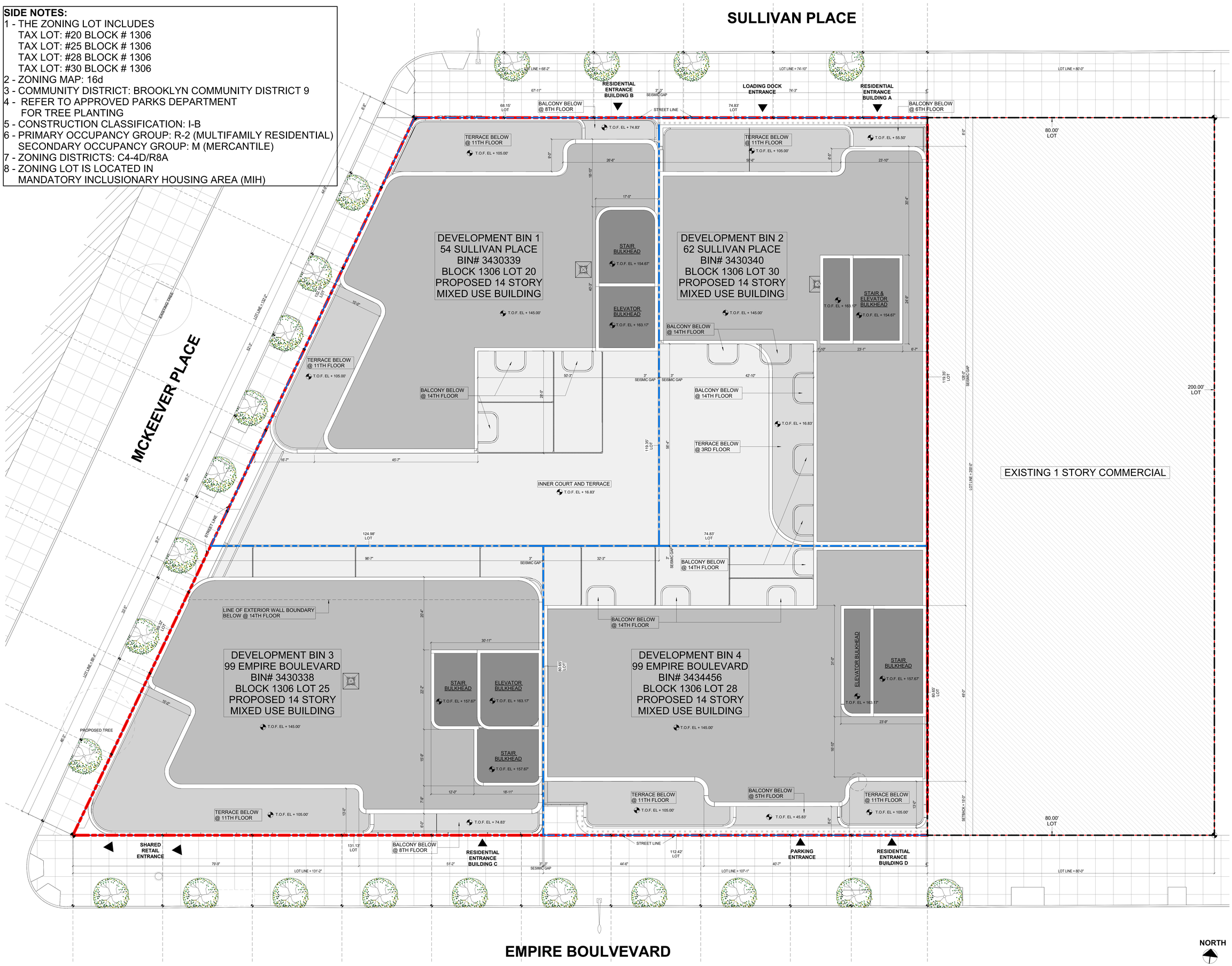
SHEET TITLE
ROOF LIFE SAFETY PLANS

A-005D.00

Scale:	As indicated
Date:	12/1/2025 7:35:45 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 SITE PLAN - Dependent 3
1/8" = 1'-0"

SIDE NOTES:
1 - THE ZONING LOT INCLUDES
TAX LOT: #20 BLOCK # 1306
TAX LOT: #25 BLOCK # 1306
TAX LOT: #28 BLOCK # 1306
TAX LOT: #30 BLOCK # 1306
2 - ZONING MAP: 16d
3 - COMMUNITY DISTRICT: BROOKLYN COMMUNITY DISTRICT 9
4 - REFER TO APPROVED PARKS DEPARTMENT FOR TREE PLANTING
5 - CONSTRUCTION CLASSIFICATION: I-B
6 - PRIMARY OCCUPANCY GROUP: R-2 (MULTIFAMILY RESIDENTIAL)
SECONDARY OCCUPANCY GROUP: M (MERCANTILE)
7 - ZONING DISTRICTS: C4-4D/R8A
8 - ZONING LOT IS LOCATED IN MANDATORY INCLUSIONARY HOUSING AREA (MIH)



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Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

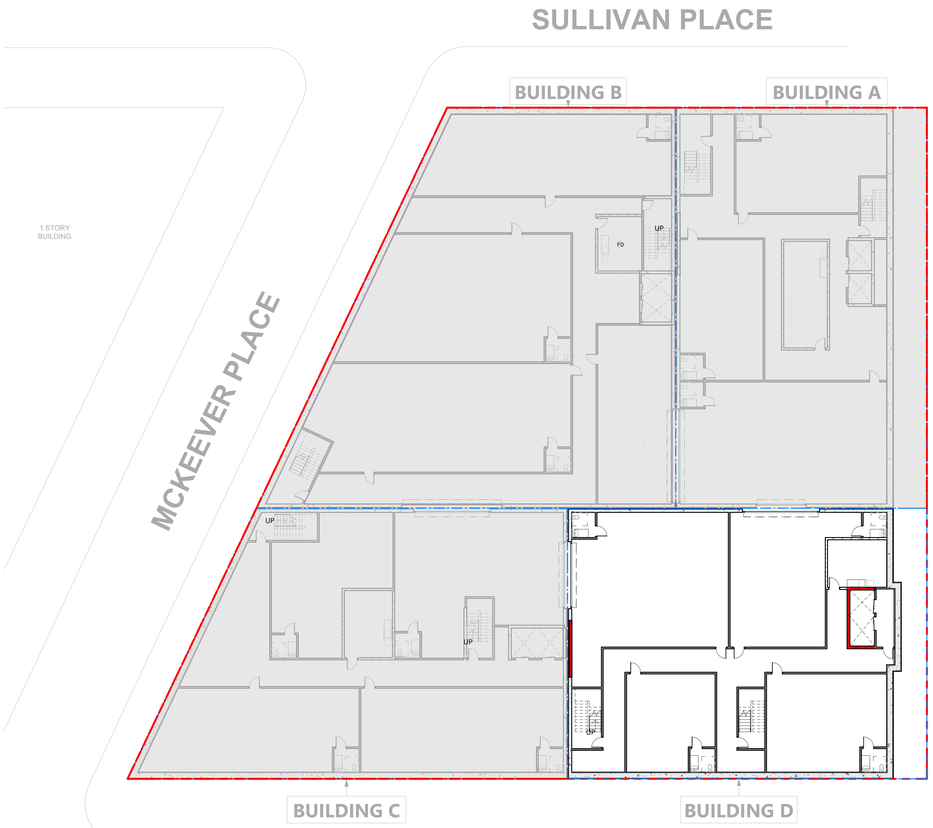
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
SITE PLAN

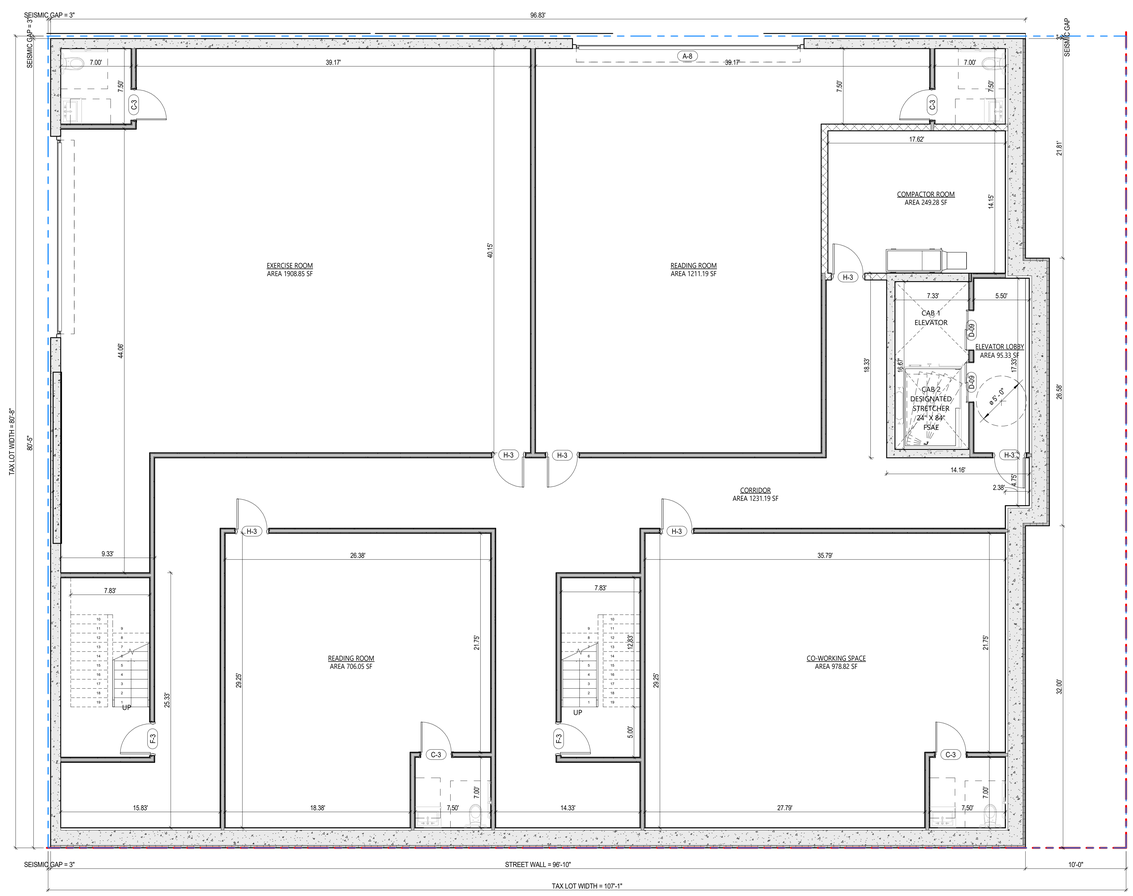
A-006D.00

Scale:	1/8" = 1'-0"
Date:	12/1/2025 7:35:51 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

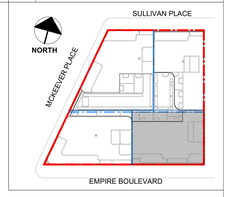
1 | 00 SUBCELLAR 2 OVERALL PLAN
1/16" = 1'-0"



2 | BLDG D - SUB-CELLAR 2 ENLARGED PLAN
3/16" = 1'-0"



KEY PLAN
1" = 80'-0"



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00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

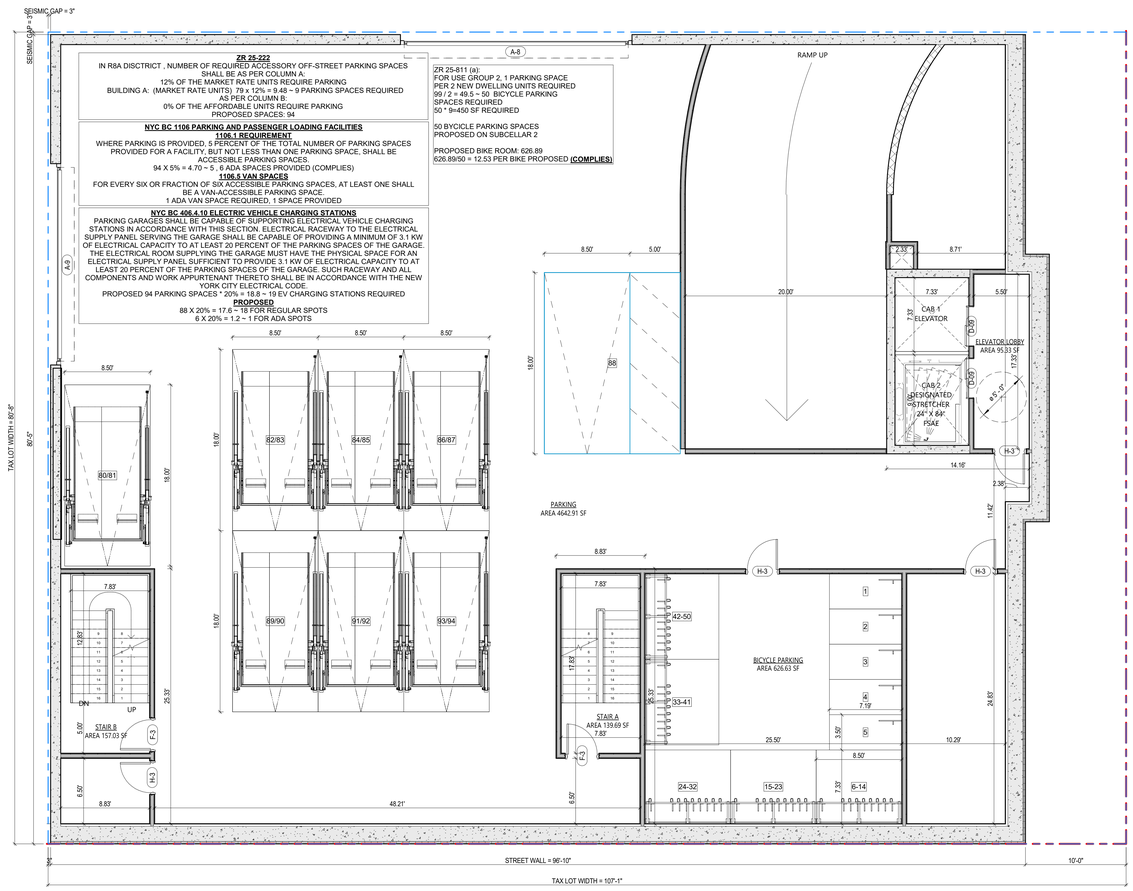
SHEET TITLE
PROPOSED
SUB-CELLAR 02 PLAN

A-100D.00

Scale:	As indicated
Date:	12/1/2025 7:35:54 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 | 00 SUBCELLAR 1 OVERALL PLAN
1/16" = 1'-0"

2 | 00D_SUBCELLAR 1 ENLARGED
3/16" = 1'-0"



KEY PLAN
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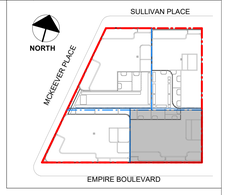

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

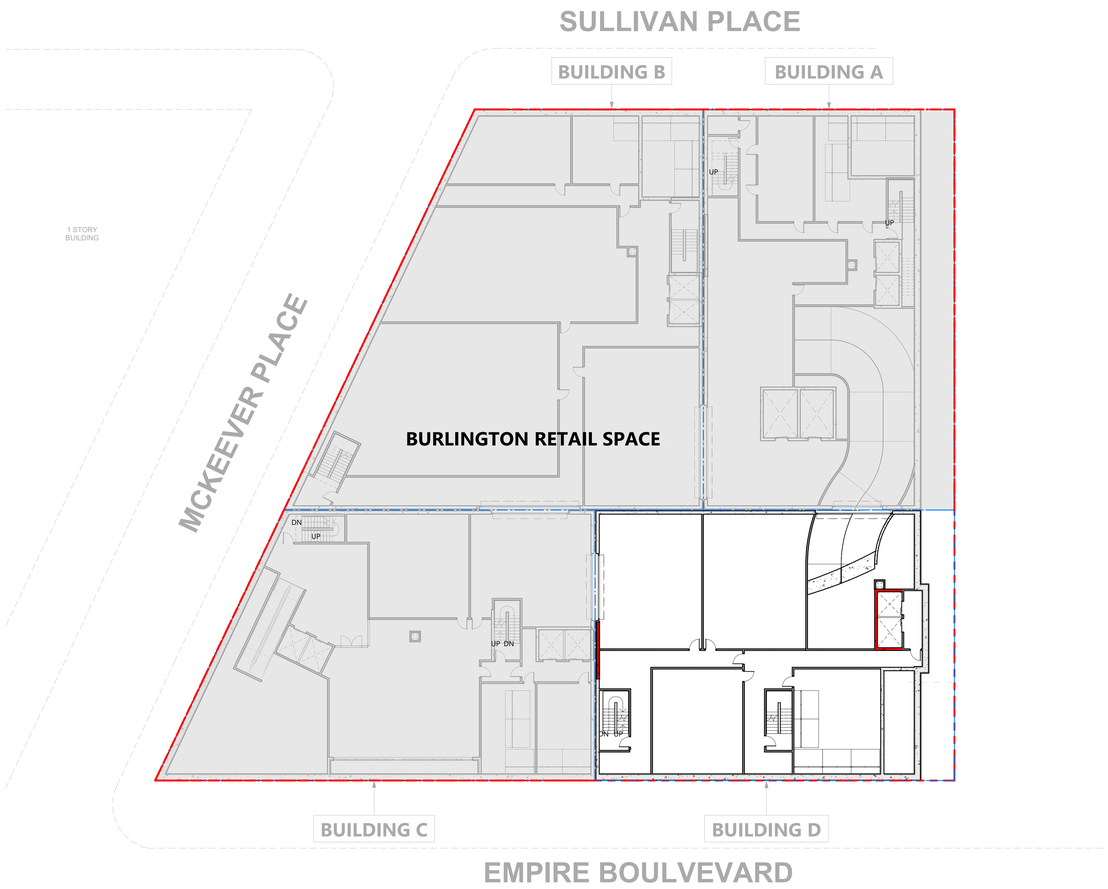
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED
SUB-CELLAR 01 PLAN

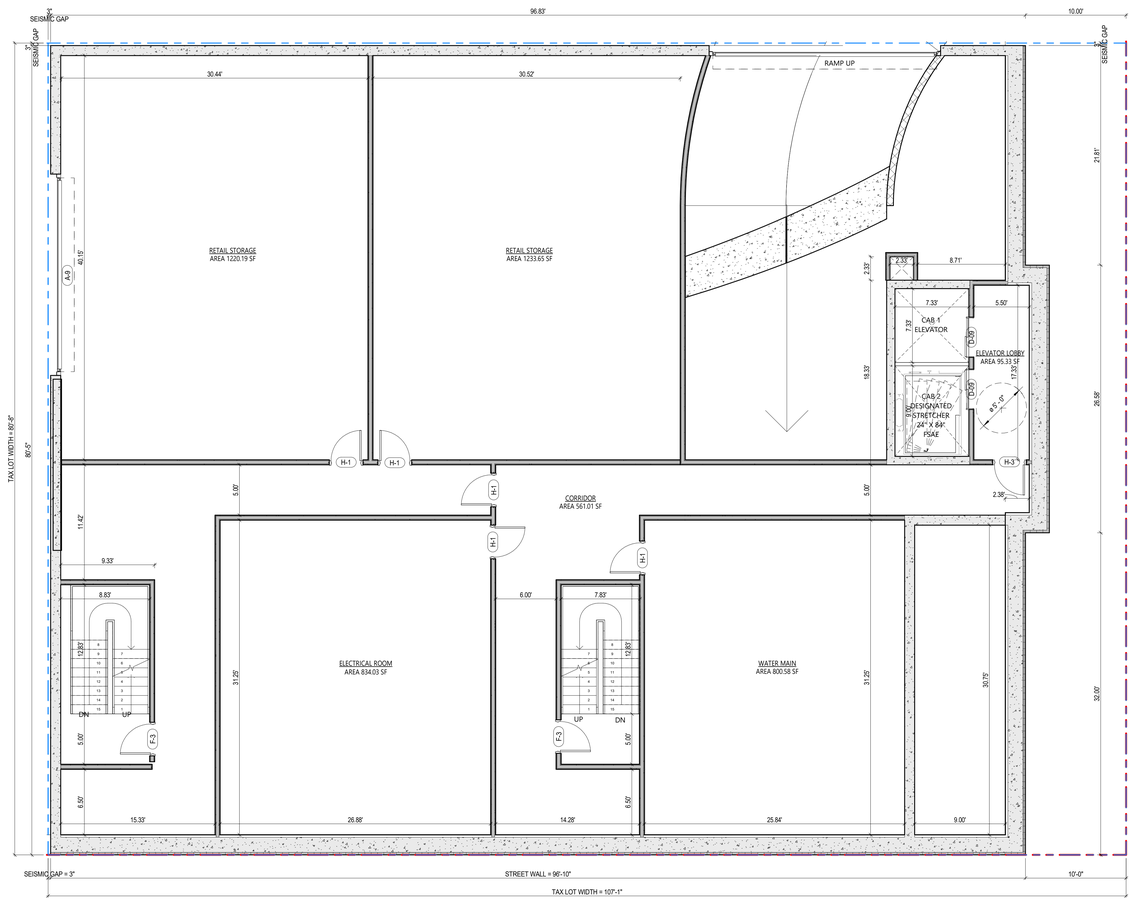
A-101D.00

Scale:	As indicated
Date:	12/1/2025 7:35:57 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

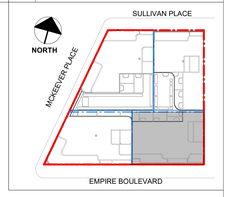
1 | 00D_CELLAR
1/16" = 1'-0"



2 | 00D_CELLAR ENLARGED
3/16" = 1'-0"



KEY PLAN
1" = 80'-0"



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00	INITIAL SUBMISSION	12/01/2025

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DOB SCAN STICKER:

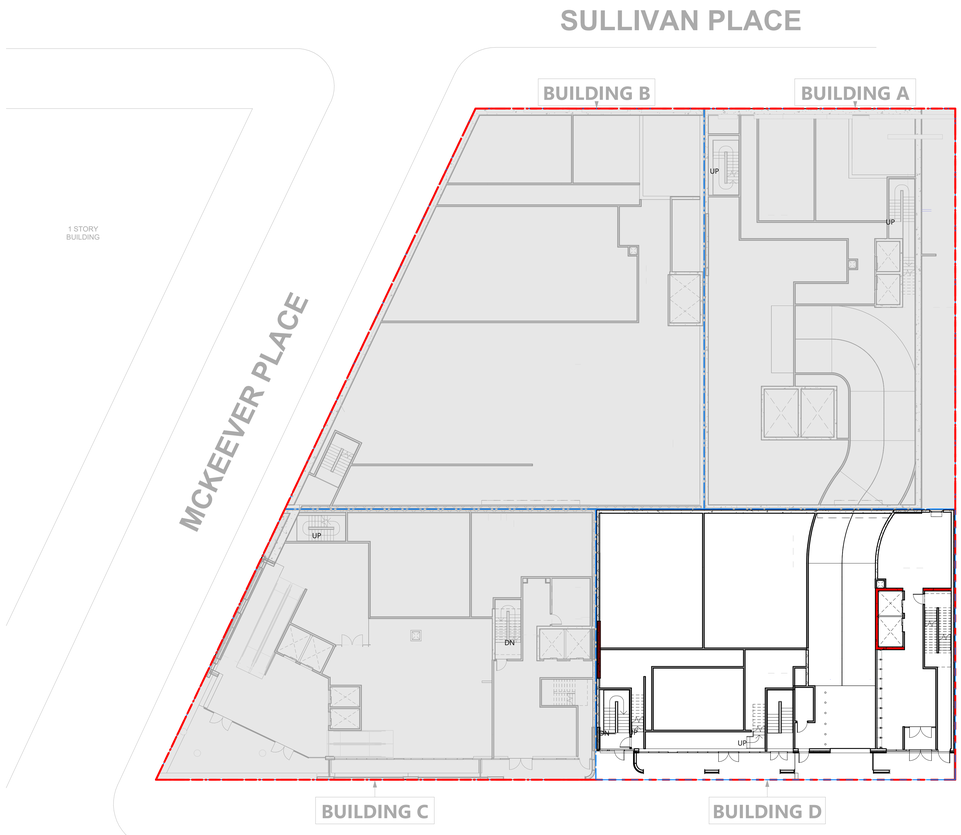
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED CELLAR PLAN

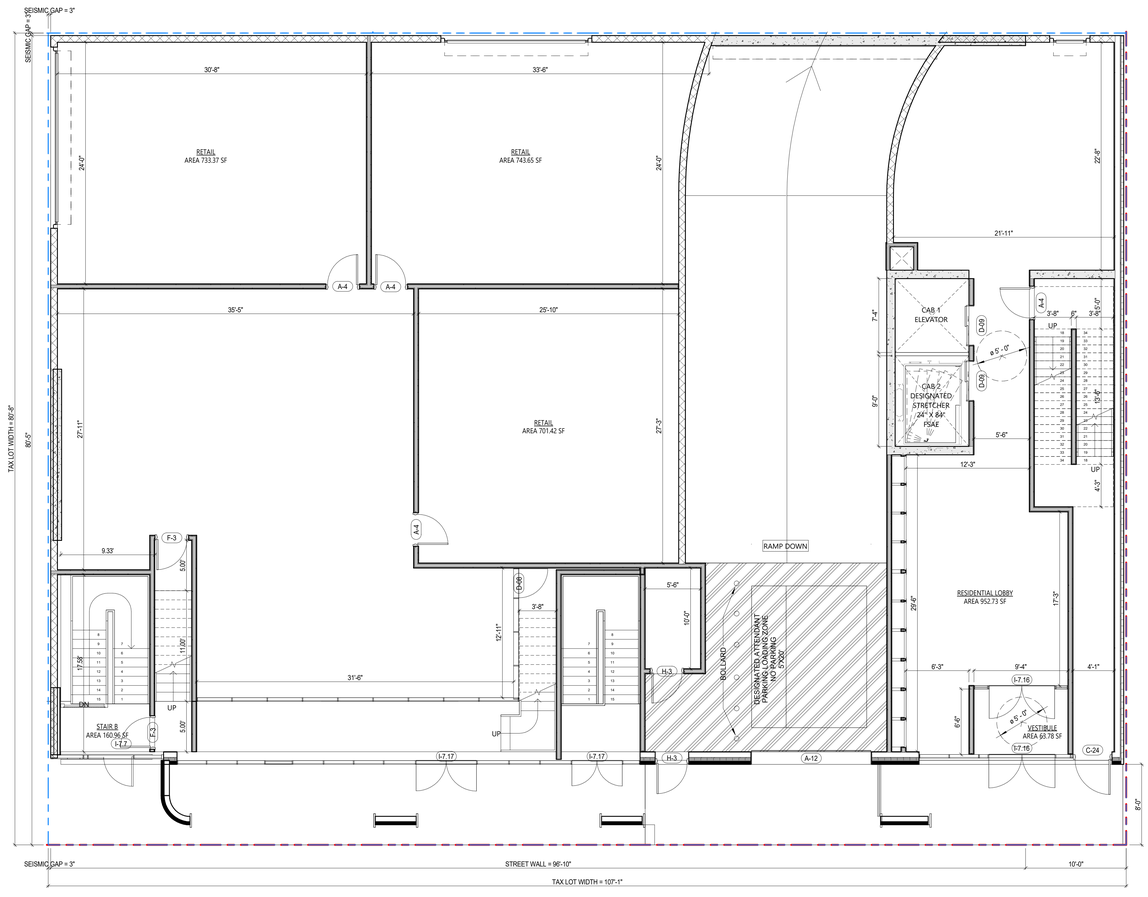
A-102D.00

Scale:	As indicated
Date:	12/1/2025 7:36:00 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

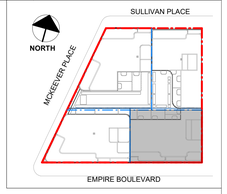
1 1ST FL. T.O.S LOBBY
1/16" = 1'-0"



2 1ST FL. T.O.S LOBBY ENLARGED
3/16" = 1'-0"



KEY PLAN
1" = 80'-0"



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

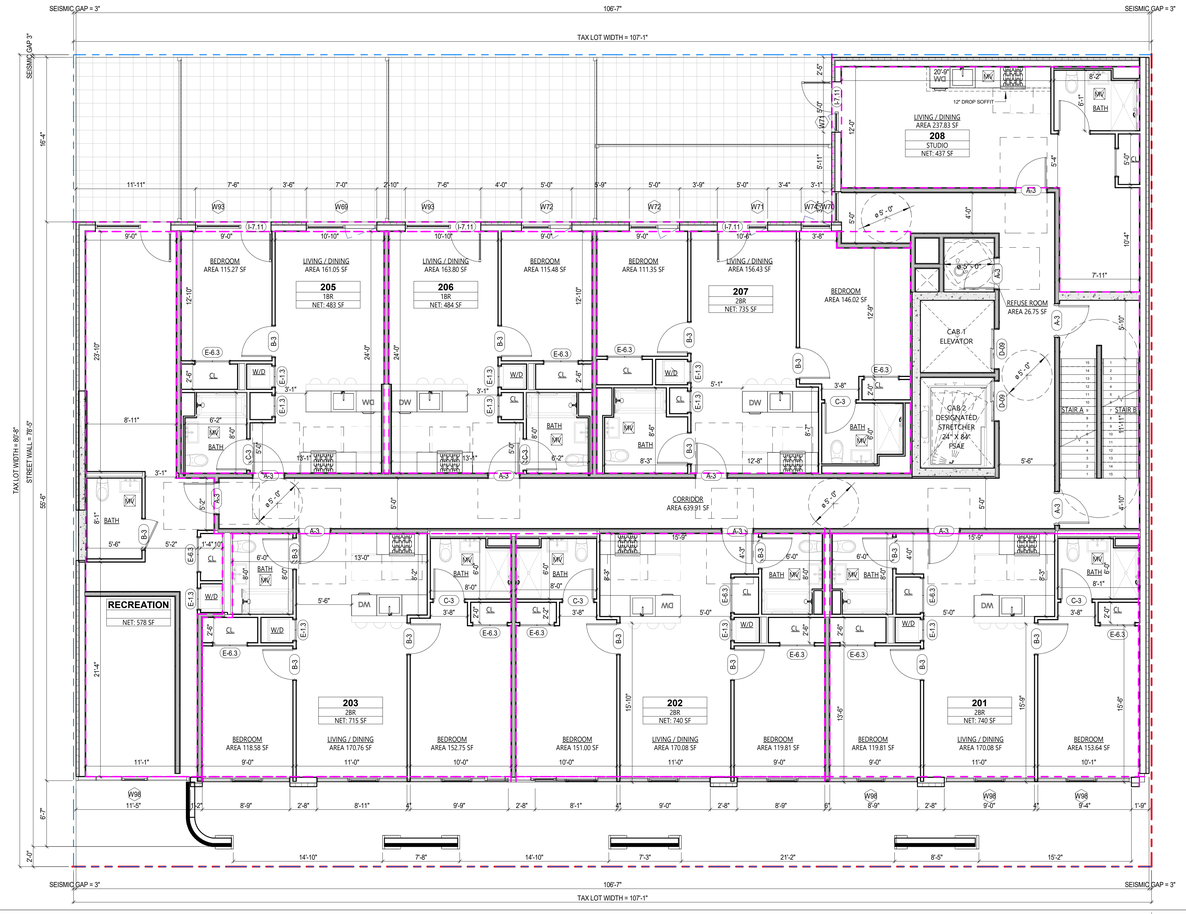
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED 1ST FLOOR PLAN

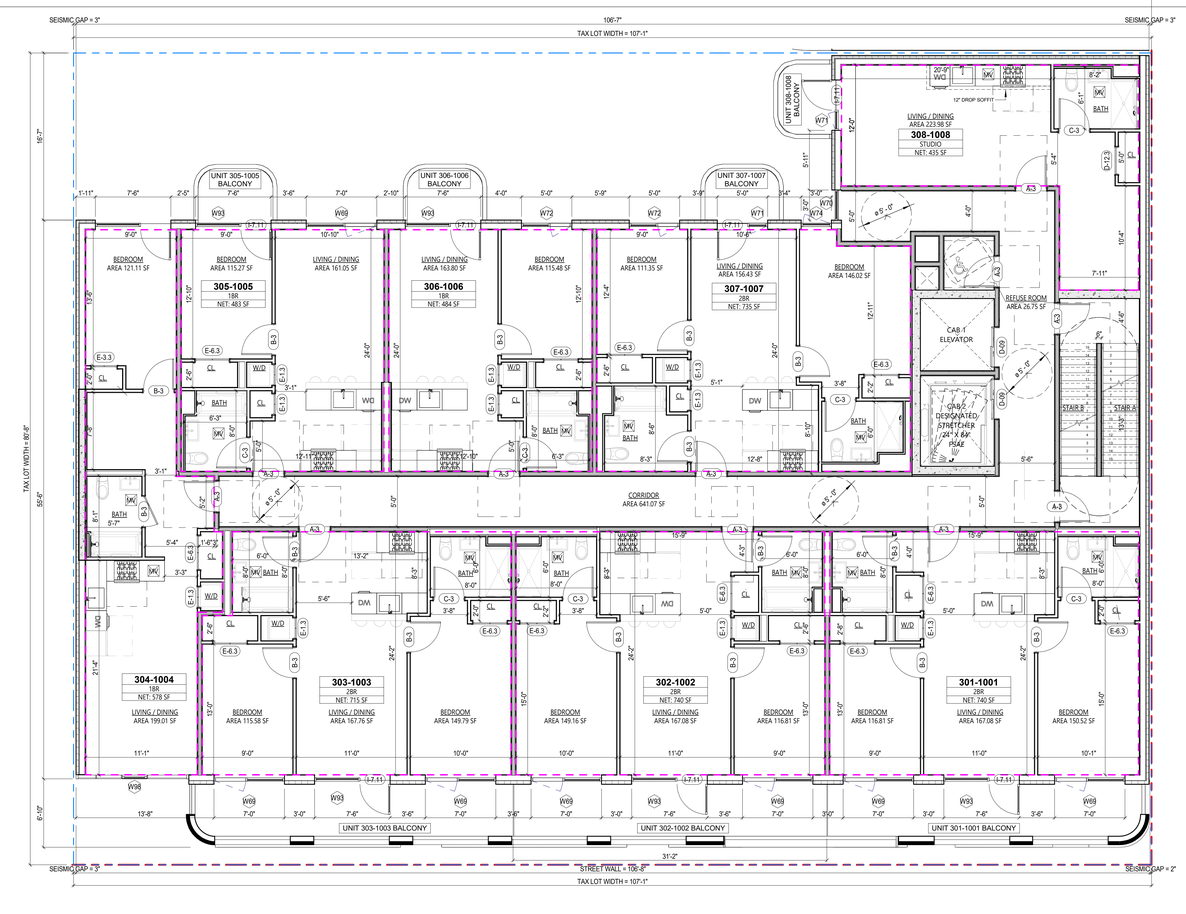
A-103D.00

Scale:	As indicated
Date:	12/1/2025 7:36:03 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 02D_2ND FL.
3/16" = 1'-0"



2 03D_3RD TO 10TH FL.
3/16" = 1'-0"



KEY PLAN
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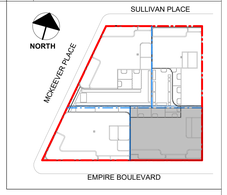

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

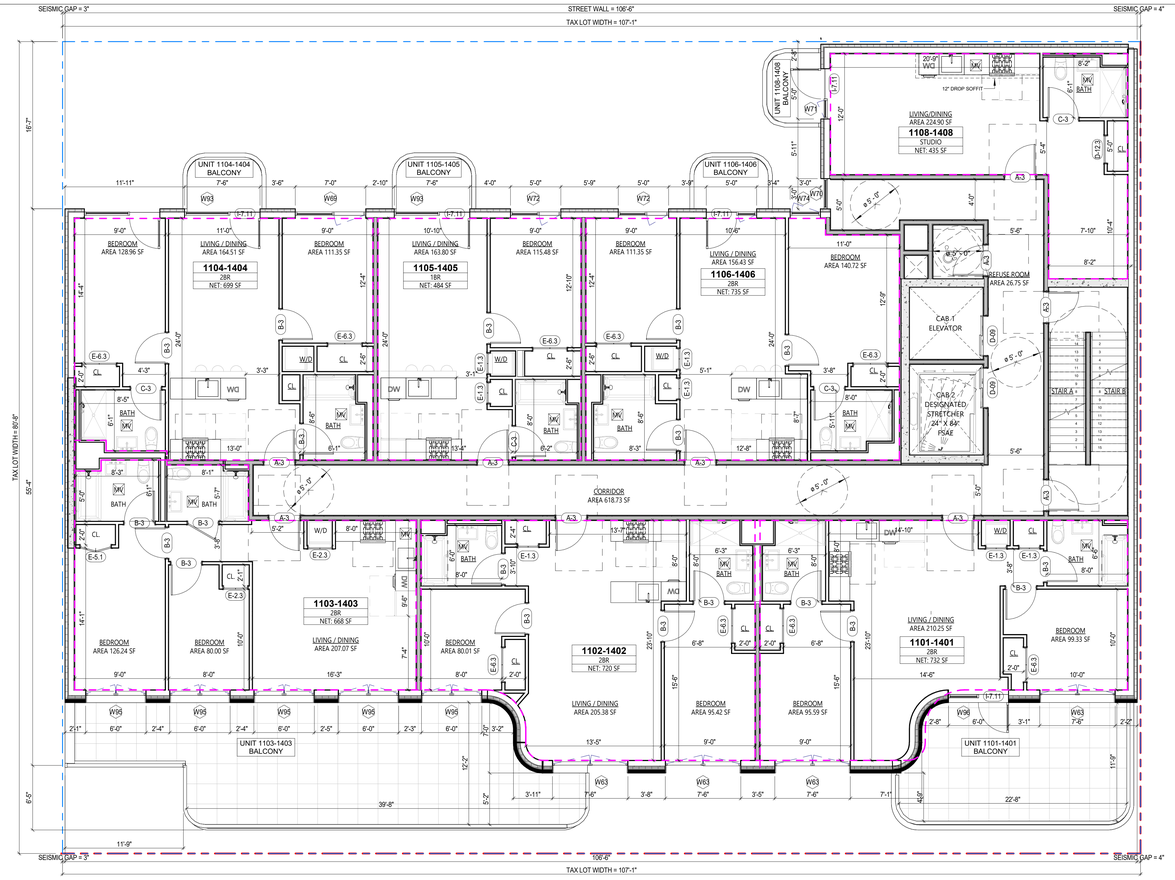
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED 2ND - 10TH FLOOR PLAN

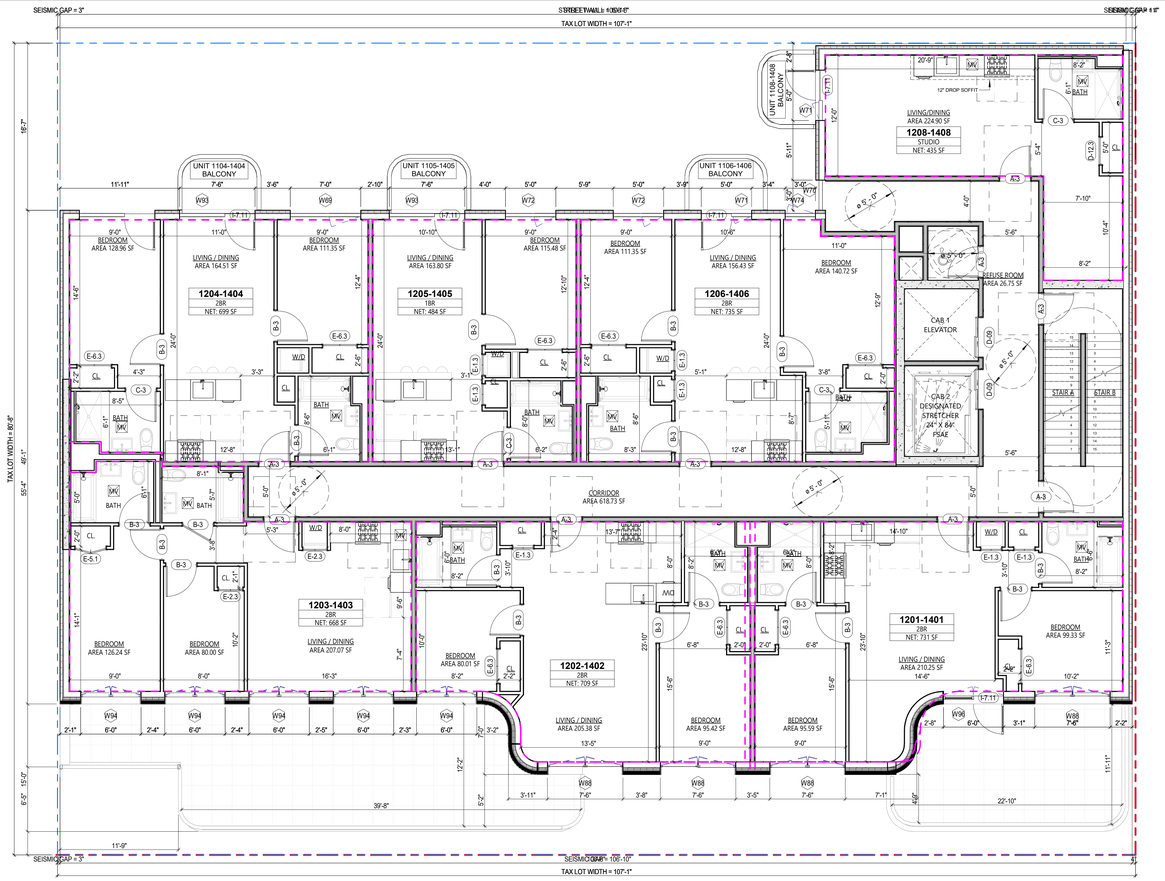
A-104D.00

Scale: As indicated
Date: 12/1/2025 7:36:08 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 | 11D_11TH FL.
3/16" = 1'-0"



2 | 12D_12TH FL.
3/16" = 1'-0"



KEY PLAN
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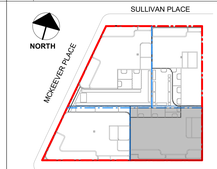

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55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

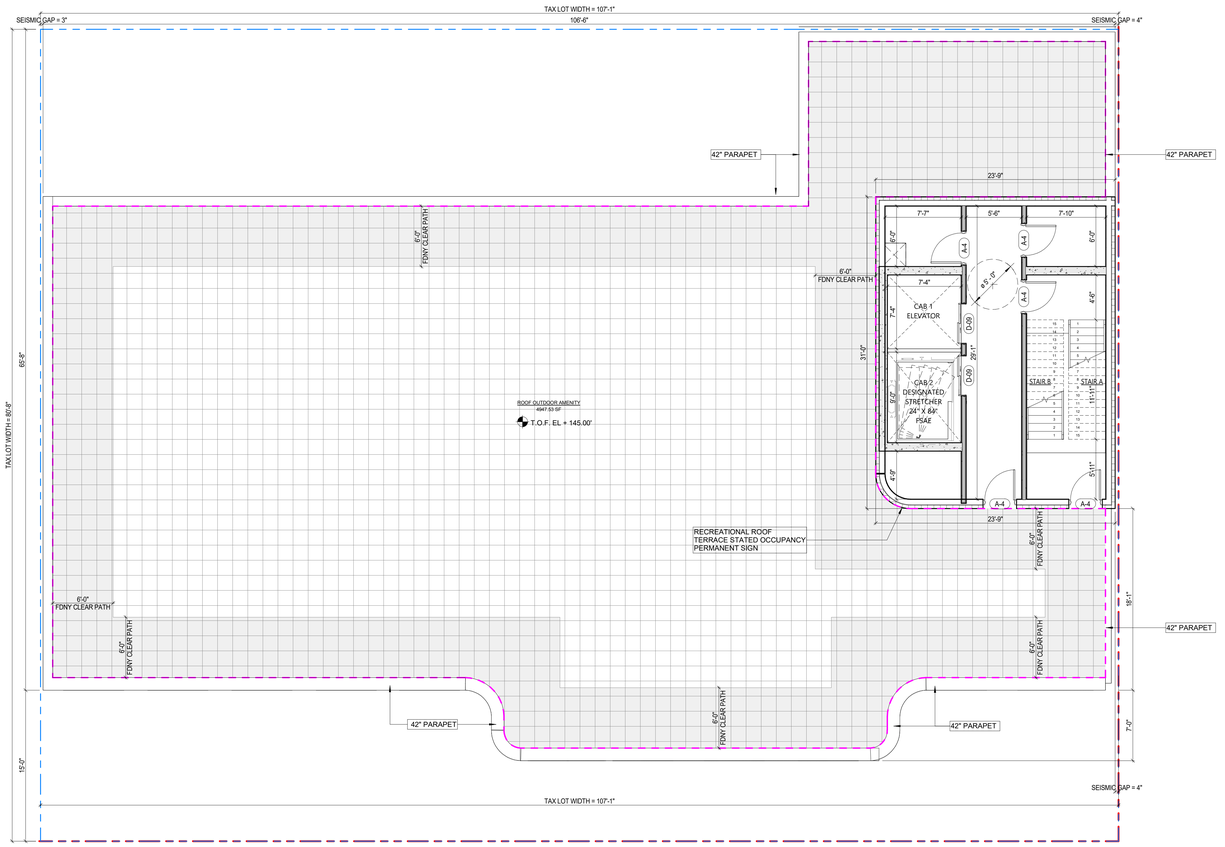
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED 11TH - 14TH FLOOR PLAN

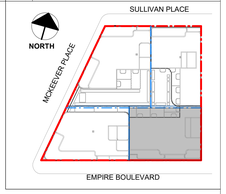
A-105D.00

Scale:	As indicated
Date:	12/1/2025 7:36:12 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 15D_ROOF
3/16" = 1'-0"



KEY PLAN
N.T.S.



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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

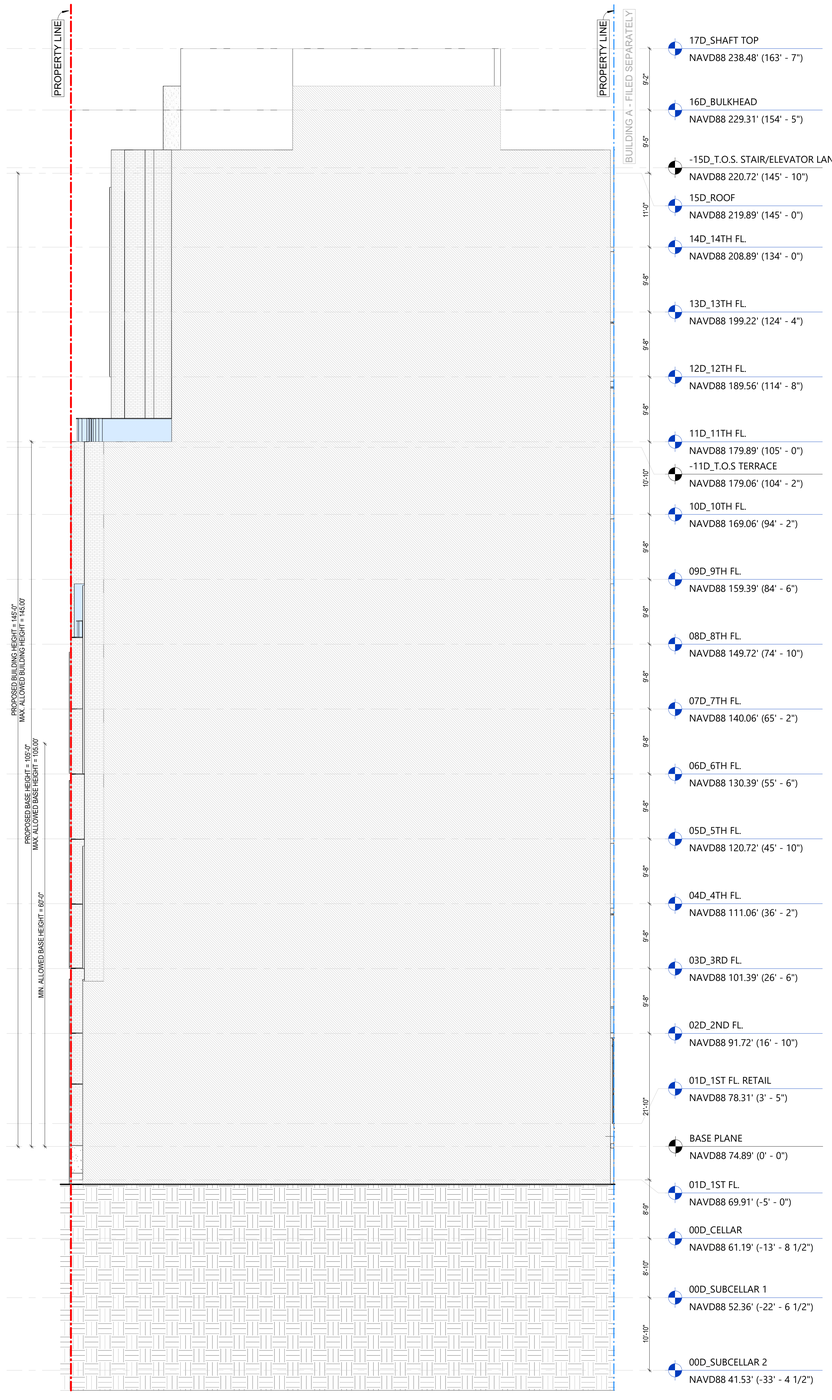
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
PROPOSED ROOF PLAN

A-106D.00

Scale: As indicated
Date: 12/1/2025 7:36:14 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

1 BLDG D - EAST ELEVATION
1/8" = 1'-0"



17D_SHAFT TOP
NAVD88 238.48' (163' - 7")

16D_BULKHEAD
NAVD88 229.31' (154' - 5")

-15D_T.O.S. STAIR/ELEVATOR LANDING
NAVD88 220.72' (145' - 10")

15D_ROOF
NAVD88 219.89' (145' - 0")

14D_14TH FL.
NAVD88 208.89' (134' - 0")

13D_13TH FL.
NAVD88 199.22' (124' - 4")

12D_12TH FL.
NAVD88 189.56' (114' - 8")

11D_11TH FL.
NAVD88 179.89' (105' - 0")

-11D_T.O.S TERRACE
NAVD88 179.06' (104' - 2")

10D_10TH FL.
NAVD88 169.06' (94' - 2")

09D_9TH FL.
NAVD88 159.39' (84' - 6")

08D_8TH FL.
NAVD88 149.72' (74' - 10")

07D_7TH FL.
NAVD88 140.06' (65' - 2")

06D_6TH FL.
NAVD88 130.39' (55' - 6")

05D_5TH FL.
NAVD88 120.72' (45' - 10")

04D_4TH FL.
NAVD88 111.06' (36' - 2")

03D_3RD FL.
NAVD88 101.39' (26' - 6")

02D_2ND FL.
NAVD88 91.72' (16' - 10")

01D_1ST FL. RETAIL
NAVD88 78.31' (3' - 5")

BASE PLANE
NAVD88 74.89' (0' - 0")

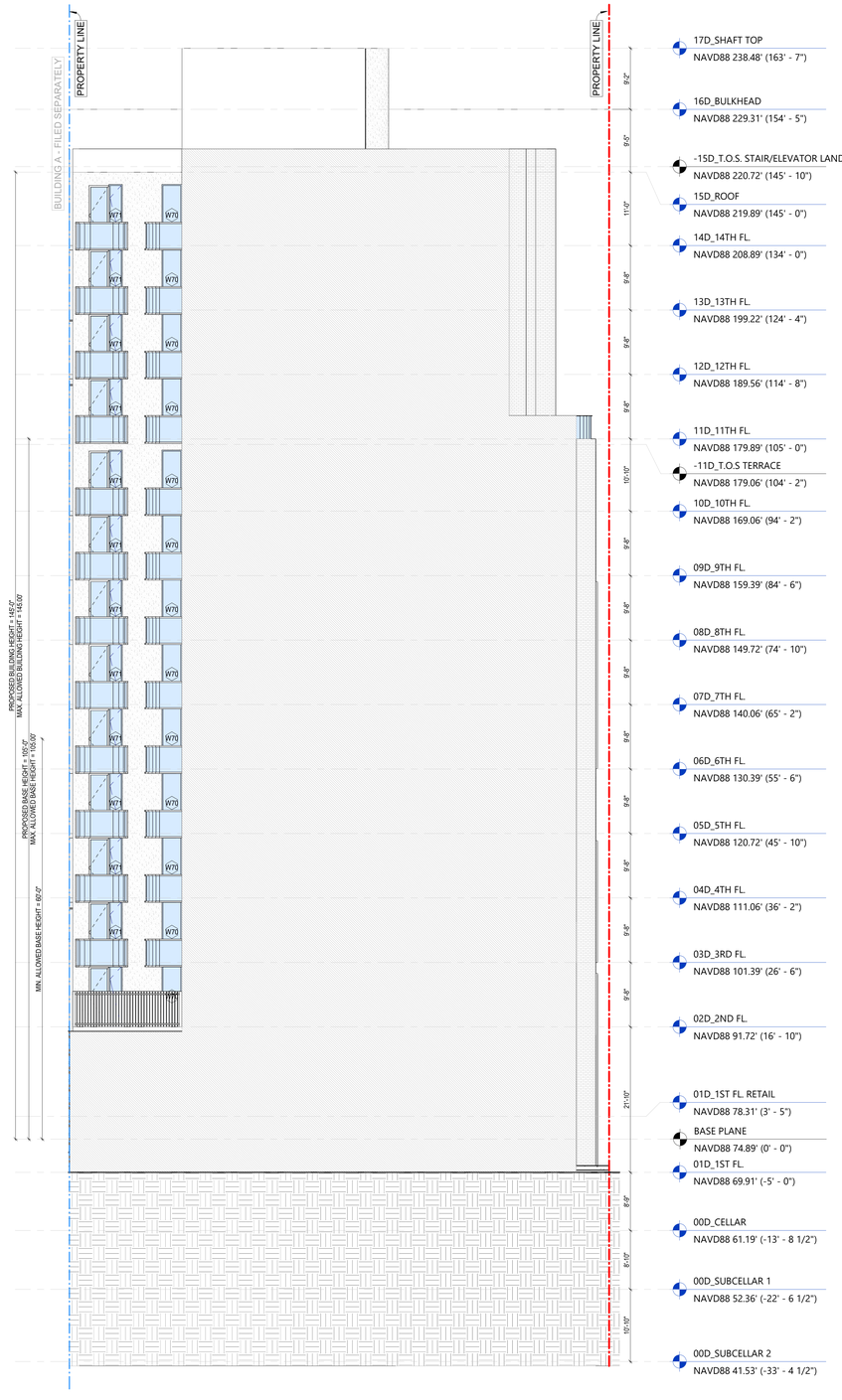
01D_1ST FL.
NAVD88 69.91' (-5' - 0")

00D_CELLAR
NAVD88 61.19' (-13' - 8 1/2")

00D_SUBCELLAR 1
NAVD88 52.36' (-22' - 6 1/2")

00D_SUBCELLAR 2
NAVD88 41.53' (-33' - 4 1/2")

2 BLDG D - WEST ELEVATION
1/8" = 1'-0"



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16D_BULKHEAD
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-15D_T.O.S. STAIR/ELEVATOR LANDING
NAVD88 220.72' (145' - 10")

15D_ROOF
NAVD88 219.89' (145' - 0")

14D_14TH FL.
NAVD88 208.89' (134' - 0")

13D_13TH FL.
NAVD88 199.22' (124' - 4")

12D_12TH FL.
NAVD88 189.56' (114' - 8")

11D_11TH FL.
NAVD88 179.89' (105' - 0")

-11D_T.O.S TERRACE
NAVD88 179.06' (104' - 2")

10D_10TH FL.
NAVD88 169.06' (94' - 2")

09D_9TH FL.
NAVD88 159.39' (84' - 6")

08D_8TH FL.
NAVD88 149.72' (74' - 10")

07D_7TH FL.
NAVD88 140.06' (65' - 2")

06D_6TH FL.
NAVD88 130.39' (55' - 6")

05D_5TH FL.
NAVD88 120.72' (45' - 10")

04D_4TH FL.
NAVD88 111.06' (36' - 2")

03D_3RD FL.
NAVD88 101.39' (26' - 6")

02D_2ND FL.
NAVD88 91.72' (16' - 10")

01D_1ST FL. RETAIL
NAVD88 78.31' (3' - 5")

BASE PLANE
NAVD88 74.89' (0' - 0")

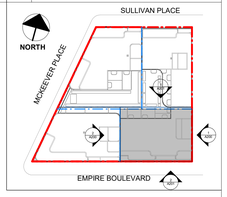
01D_1ST FL.
NAVD88 69.91' (-5' - 0")

00D_CELLAR
NAVD88 61.19' (-13' - 8 1/2")

00D_SUBCELLAR 1
NAVD88 52.36' (-22' - 6 1/2")

00D_SUBCELLAR 2
NAVD88 41.53' (-33' - 4 1/2")

KEY PLAN
N.T.S.



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00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

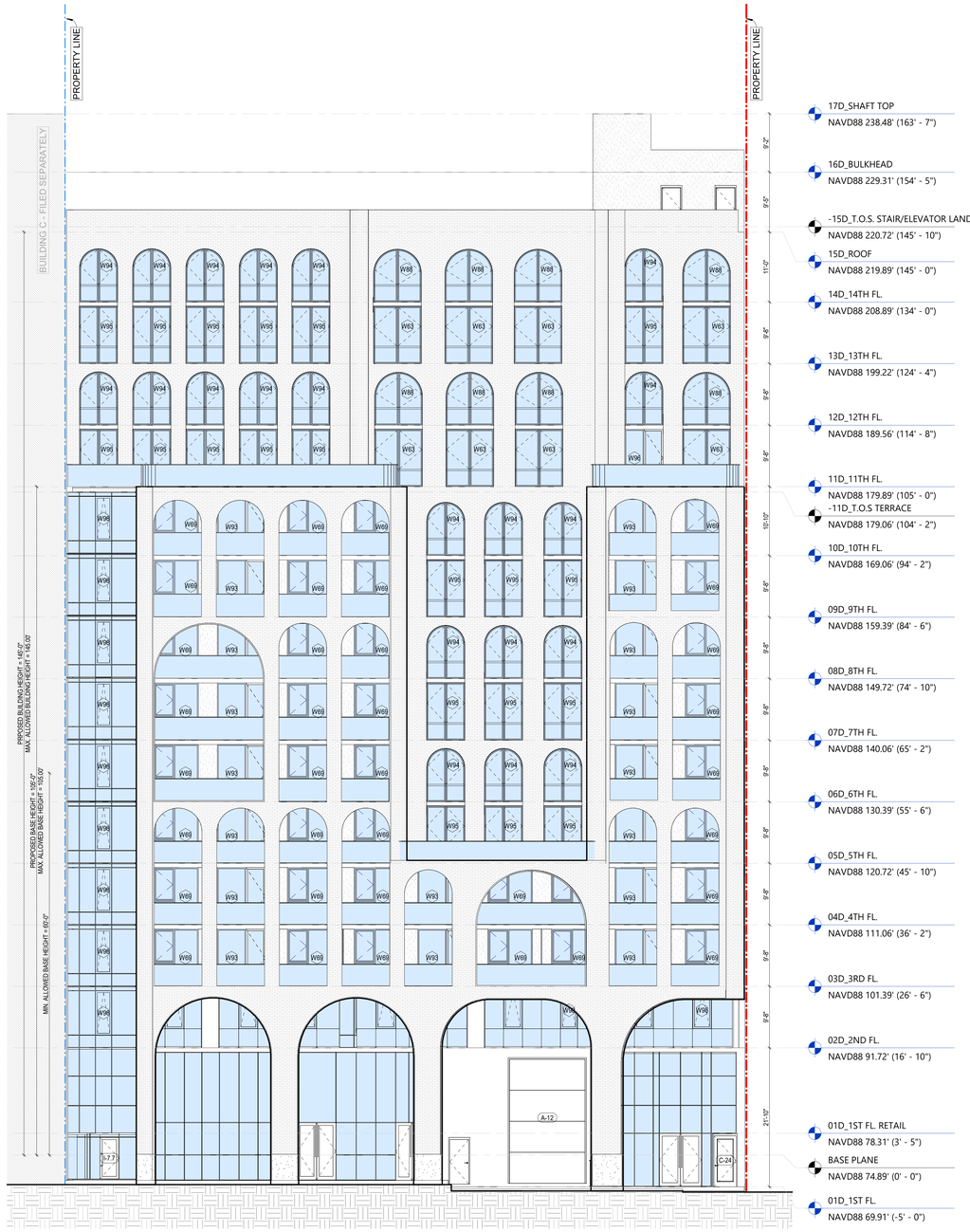
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
EAST & WEST ELEVATION

A-200D.00

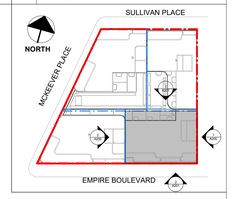
Scale:	As indicated
Date:	12/1/2025 7:36:22 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

1 BLDG D - SOUTH ELEVATION
1/8" = 1'-0"



2 BLDG D - NORTH ELEVATION
1/8" = 1'-0"

KEY PLAN
N.T.S.



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(609) 216 2975

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Long Island City, NY 11101

MEP Engineer:
VENTROP ECG PLLC
369 West 34th Street, 2nd Floor

Interior Designer:
DURUKAN DESIGN
55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

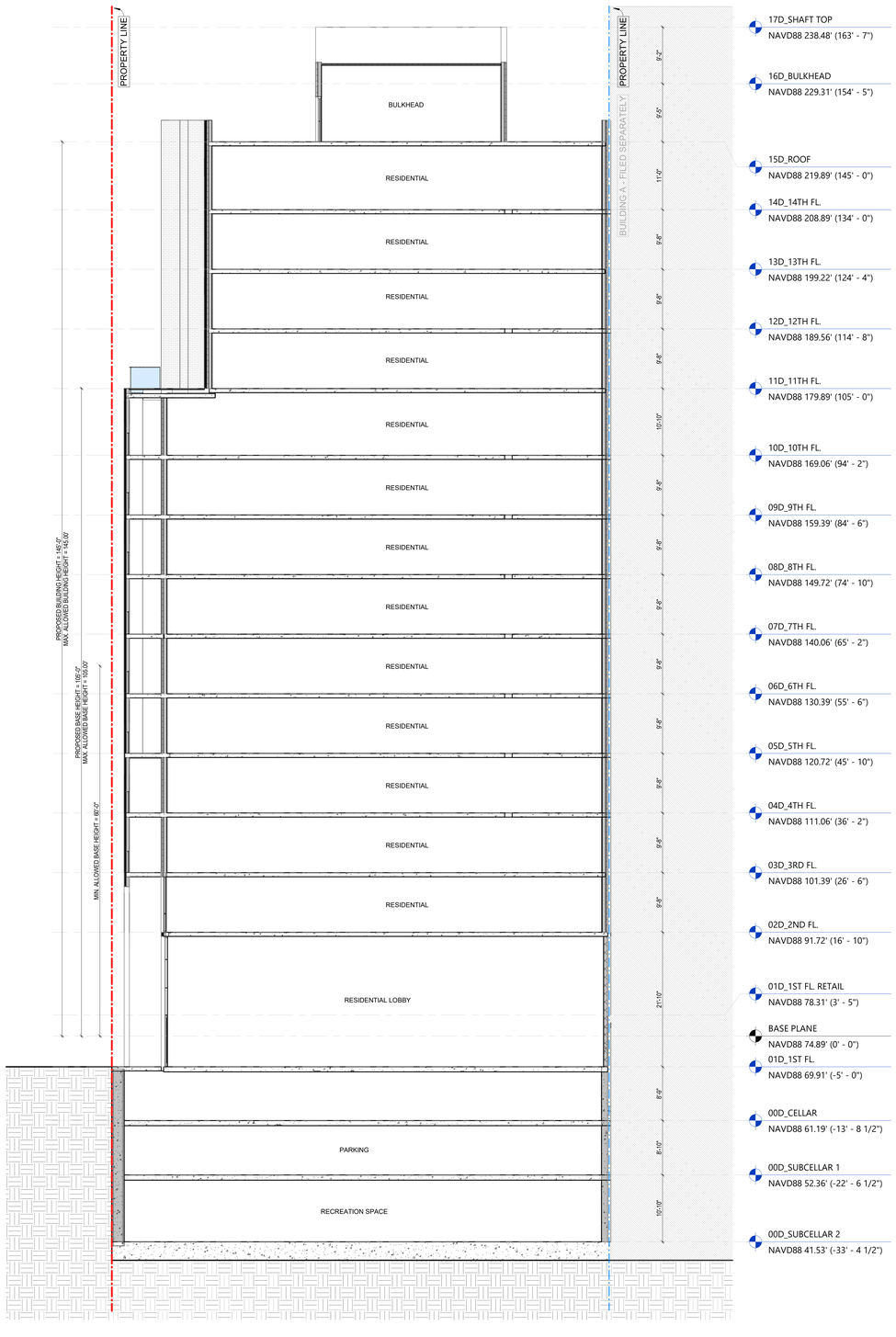
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
NORTH & SOUTH ELEVATION

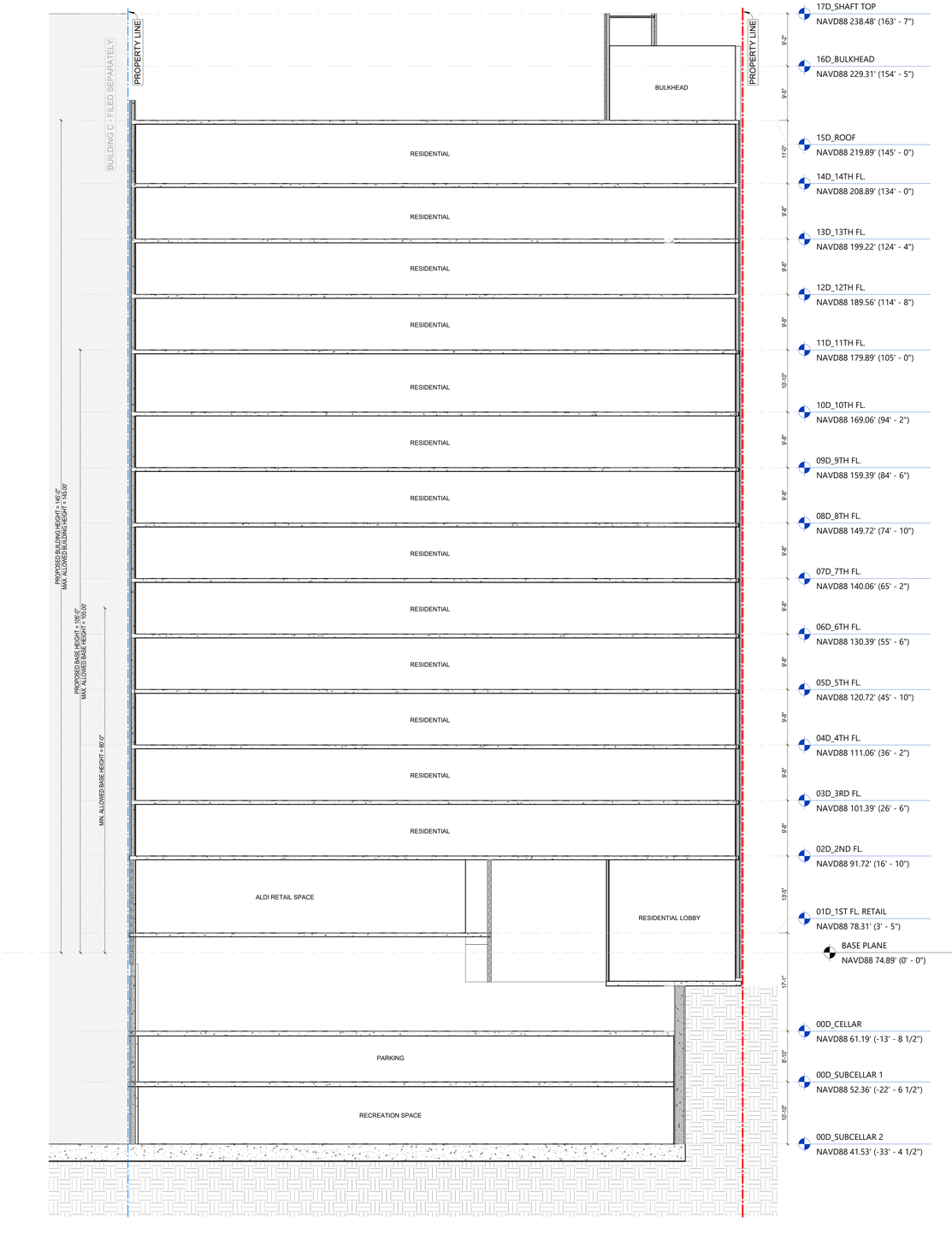
A-201D.00

Scale:	As indicated
Date:	12/1/2025 7:36:29 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

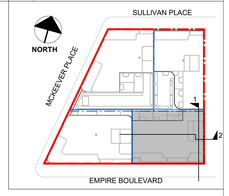
1 LONGITUDINAL SECTION
1/8" = 1'-0"



2 CROSS SECTION
1/8" = 1'-0"



KEY PLAN
N.T.S.



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DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
BUILDING SECTIONS

A-300D.00

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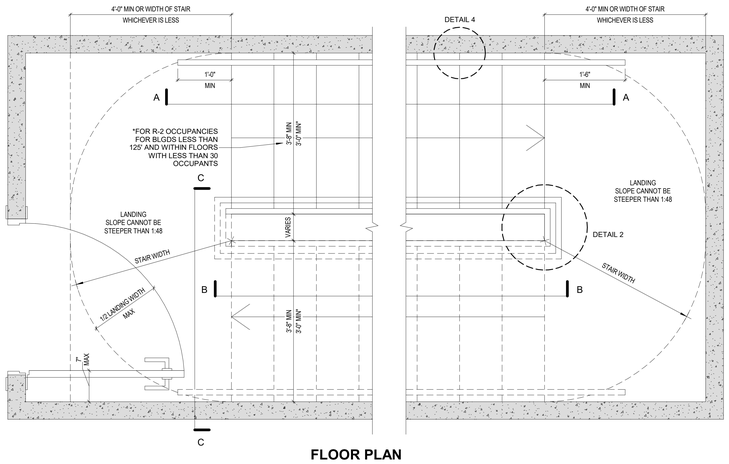
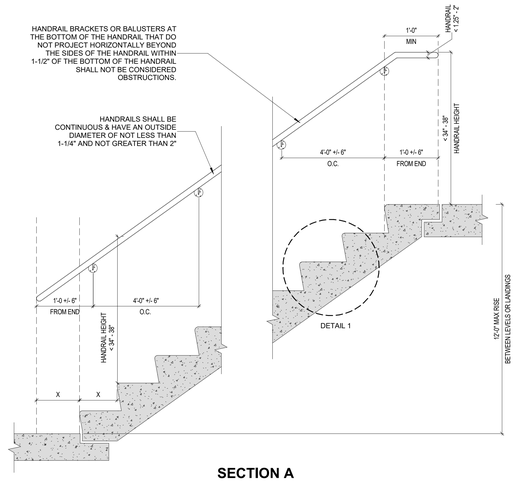
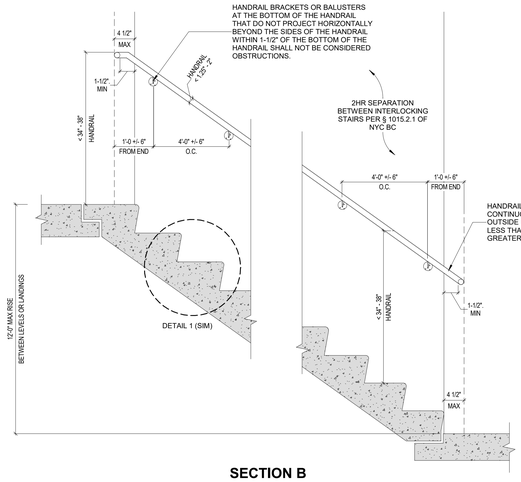
1 U-SHAPE STAIRS DETAILS



FLOOR PLAN



SECTION A



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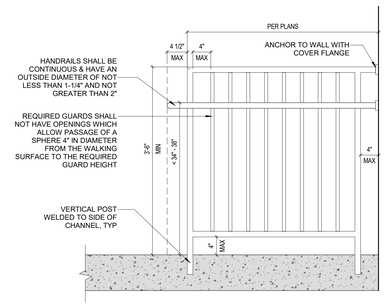
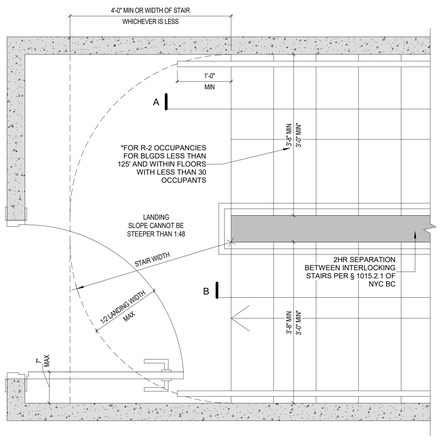
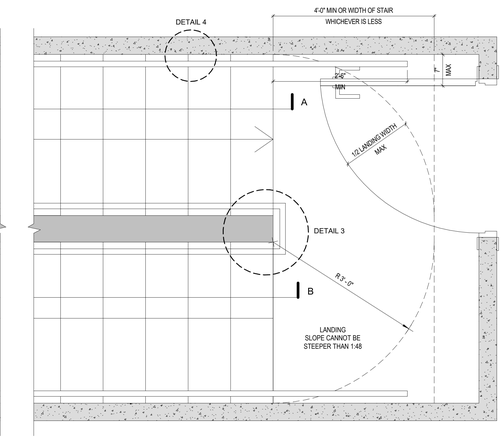


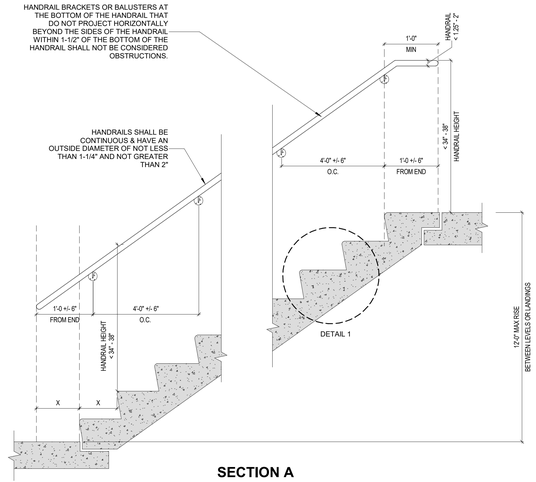
SECTION C
(ONLY ON 1ST FLOOR)

2 TWO INTERLOCKING / SCISSORS STAIRS DETAILS

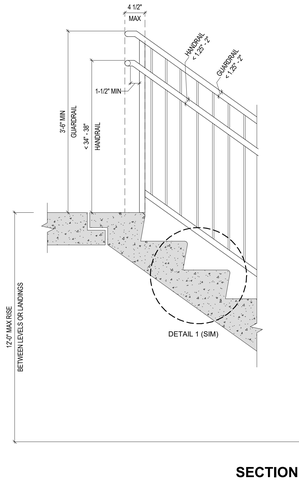




FLOOR PLAN



SECTION A



SECTION B

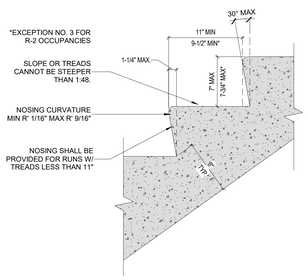
HANDRAIL BRACKETS OR BALUSTERS AT THE BOTTOM OF THE HANDRAIL THAT DO NOT PROJECT HORIZONTALLY BEYOND THE SIDES OF THE HANDRAIL WITHIN 1-1/2" OF THE BOTTOM OF THE HANDRAIL SHALL NOT BE CONSIDERED OBSTRUCTIONS.

REQUIRED GUARDS SHALL NOT HAVE OPENINGS WHICH ALLOW PASSAGE OF A SPHERE 4" IN DIAMETER FROM THE WALKING SURFACE TO THE REQUIRED GUARD HEIGHT

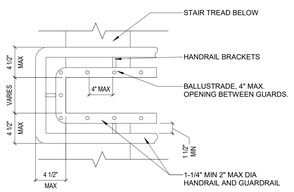
HANDRAILS SHALL BE CONTINUOUS & HAVE AN OUTSIDE DIAMETER OF NOT LESS THAN 1-1/4" AND NOT GREATER THAN 2"

THE TRIANGULAR OPENINGS AT THE OPEN SIDES OF A STAIR, FORMED BY THE RISER, TREAD AND BOTTOM RAIL SHALL NOT ALLOW PASSAGE OF A SPHERE 6" IN DIAMETER.

STAIRS DETAILS



DETAIL 1



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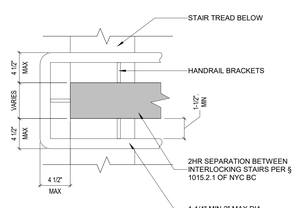
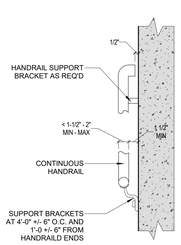


DETAIL 3

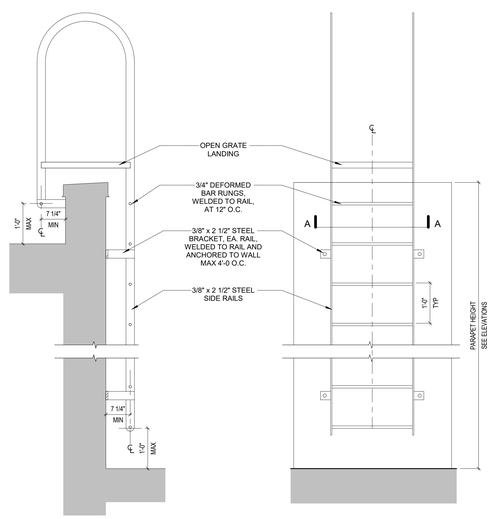


DETAIL 4

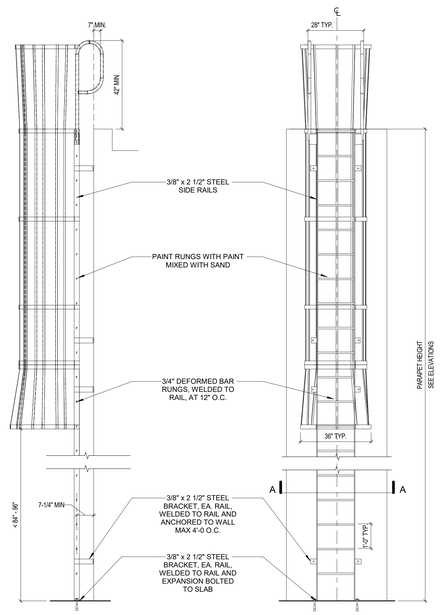
3 ROOF LADDERS

ROOF LADDERS NOTES

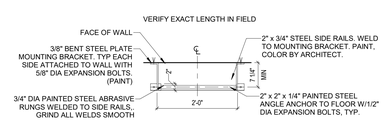
1. PER OSHA 1910.28(B)(9) LADDERS OVER 24 FT HIGH SHALL HAVE A PERSONAL FALL ARREST SYSTEM MEETING OSHA 1926.502(D)
2. ALL LADDERS SHALL MEET OSHA REGULATIONS FOR FIXED LADDERS 29 CFR SECTION 1910.23



ROOF LADDER - STRADDLE



ROOF LADDER - W/ CAGE



SECTION A

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73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
STAIRS DETAILS

A-404D.00

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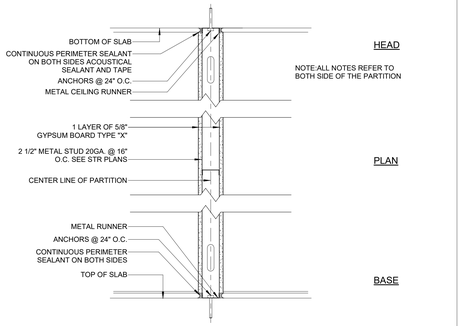
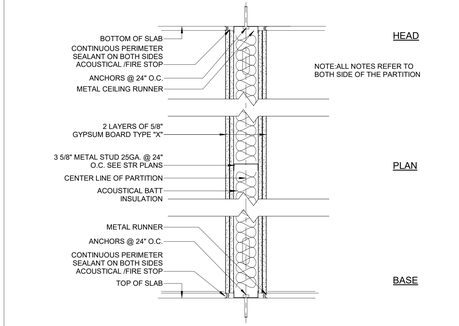


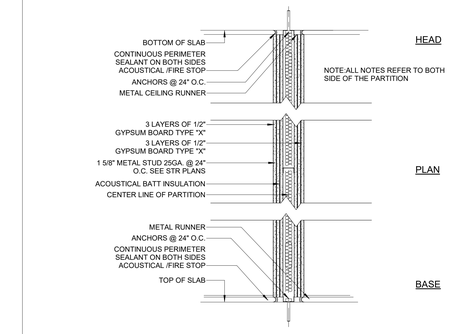
1 INTERIOR PARTITION

FIRE RATING: NON FIRE RATED
STC: NO STC REQUIRED



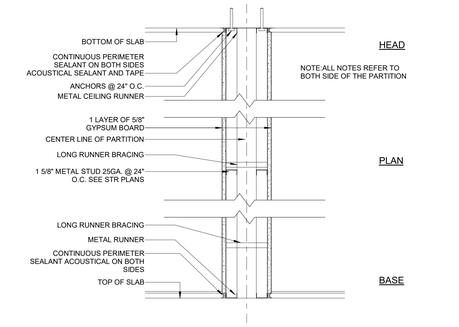
5 INTERIOR PARTITION

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC



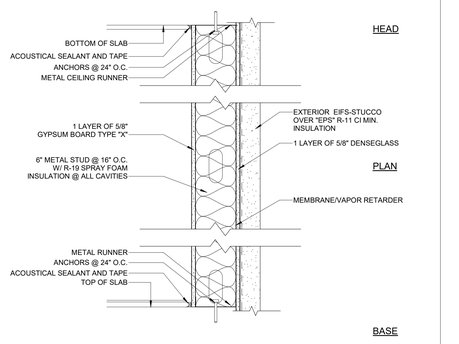
9 INTERIOR PARTITION

FIRE RATING: 3HR
FIRE TEST: UL. DESIGN NO: U455
STC: +50 STC



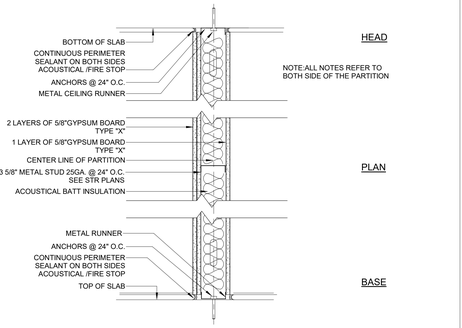
13 POCKET WALL

FIRE RATING: NON FIRE RATED
STC: NO STC REQUIRED



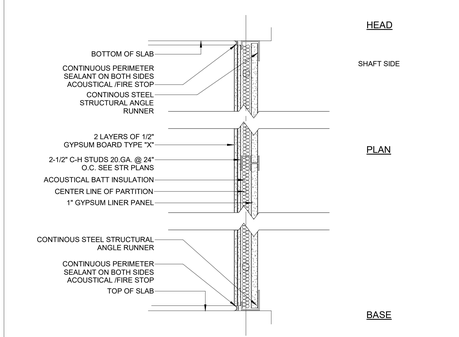
E2 EXTERIOR STUCCO WALL

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U419
STC: +50 STC



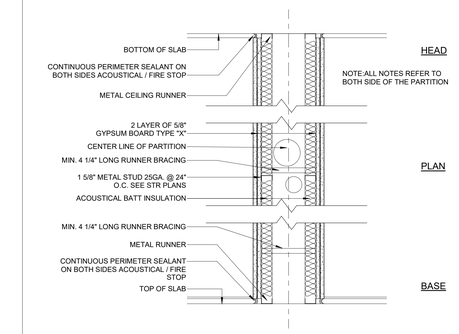
2 INTERIOR PARTITION

FIRE RATING: NON FIRE RATED
STC: +48 STC



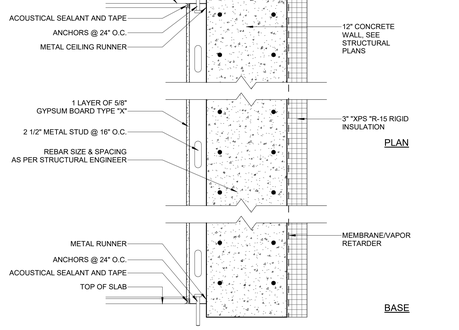
6 EXIT ENCLOUSURE RCNY 1014-01

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC



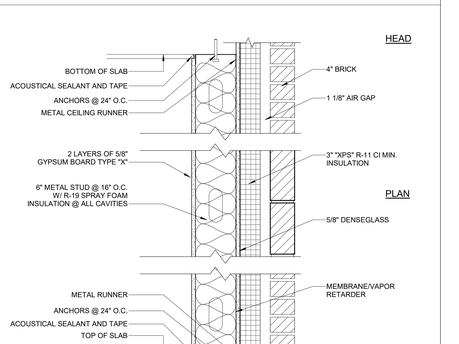
10 PLUMBING CHASE

FIRE RATING:NON FIRE RATED
STC: +48 STC



M1 CONCRETE MASONRY WALL

FIRE RATING: NON FIRE RATED
STC: NO STC REQUIRED



E3 EXTERIOR STUCCO WALL

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC

3 INTERIOR PARTITION

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U417 & U465
STC: +48 STC

7 ELEVATOR SHAFT

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U415
STC: +50 STC

11 PIPE CHASE

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U420
STC: +50 STC

S1 INTERIOR SHEAR WALL

FIRE RATING: 2HR
STC: NO STC REQUIRED

E4 EXTERIOR STUCCO SHEAR WALL

FIRE RATING: 2HR
STC: +50 STC

4 INTERIOR PARTITION

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U419
STC: +50 STC

8 MECHANICAL DUCT SHAFT WALL

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U415
STC: +50 STC

12 PIPE CHASE

FIRE RATING: 2HR
FIRE TEST: UL. DESIGN NO: U420
STC: +50 STC

E1 EXTERIOR BASEMENT WALL

FIRE RATING: 2HR
STC: NO STC REQUIRED

E4 EXTERIOR BRICK WALL

FIRE RATING: 1HR
FIRE TEST: UL. DESIGN NO: U419 & U411
STC: +50 STC

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Brooklyn, NY 11225

SHEET TITLE
WALL TYPES & DETAILS

A-500D.00

Scale:	1 1/2" = 1'-0"
Date:	12/1/2025 7:36:37 PM
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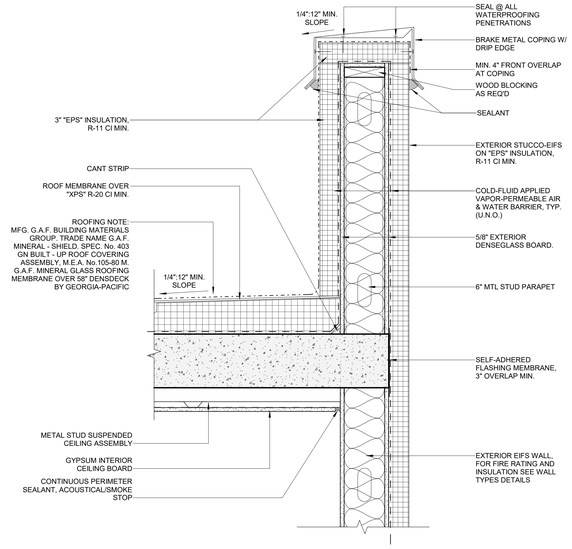
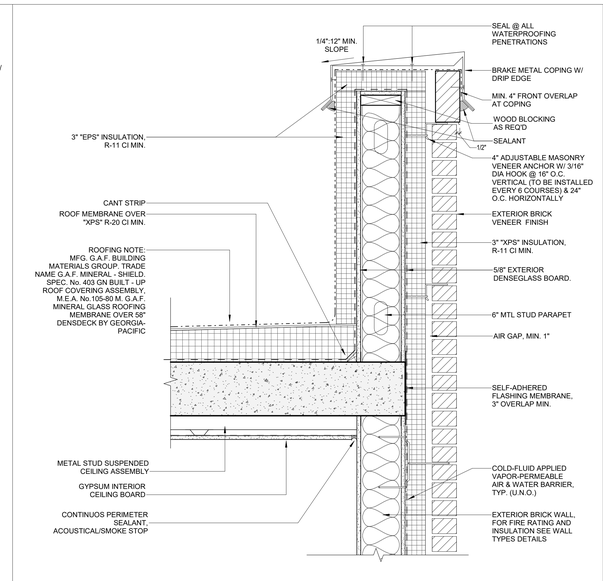
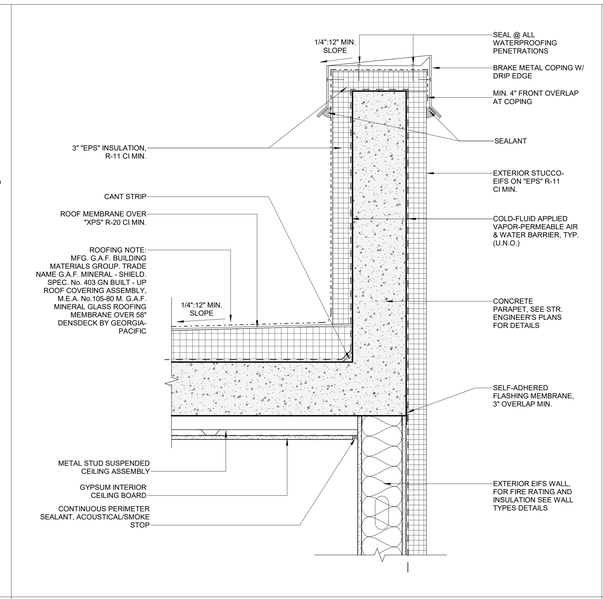


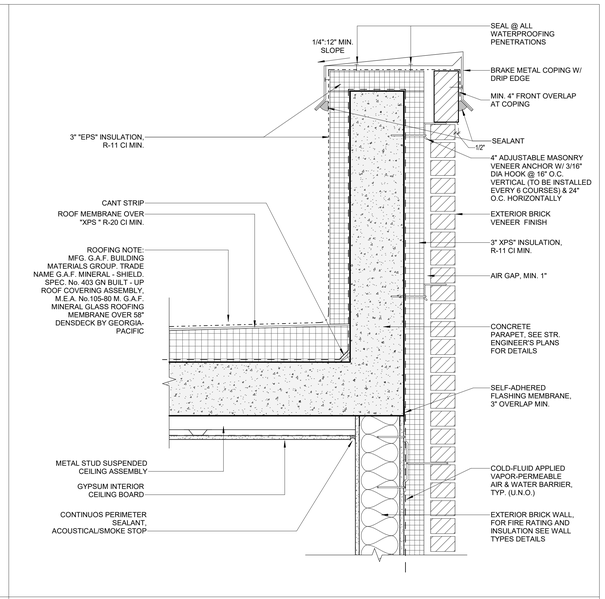
1 EIFS WALL @ STUD PARAPET
SCALE: 1 1/2" = 1'-0"



4 BRICK WALL 1HR @ STUD PARAPET
SCALE: 1 1/2" = 1'-0"



7 EIFS WALL @ CONC. PARAPET
SCALE: 1 1/2" = 1'-0"



9 BRICK WALL 1HR @ CONC. PARAPET
SCALE: 1 1/2" = 1'-0"

2 EIFS WALL @ CONC. SLAB
SCALE: 1 1/2" = 1'-0"

5 BRICK WALL 1HR @ CONC. SLAB
SCALE: 1 1/2" = 1'-0"

8 EIFS WALL @ CMU PARAPET
SCALE: 1 1/2" = 1'-0"

10 BRICK WALL 1HR @ CMU PARAPET
SCALE: 1 1/2" = 1'-0"

3 EIFS WALL @ BALCONY
SCALE: 1 1/2" = 1'-0"

6 BRICK WALL 1HR @ BALCONY
SCALE: 1 1/2" = 1'-0"

11 DETAIL @ FOUNDATION WALL
SCALE: 1 1/2" = 1'-0"

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Brooklyn, NY 11225

SHEET TITLE
SECTION DETAILS

A-510D.00

Scale:	1 1/2" = 1'-0"
Date:	12/1/2025 7:36:39 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

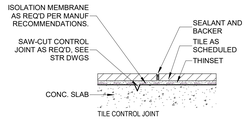
FINISH NOTES:

1. METAL EDGE SHALL BE PROVIDED ON ON SERVICE SIDE OF ALL DOORS.

2. ISOLATION MEMBRANE:
   - FOLLOW MANUF INSTRUCTIONS
   - MIN 4" COVERAGE FROM CRACK IN ANY DIRECTION
   - MIN 1-1/2x TILE SIZE
   - WHERE ANY PORTION OF A TILE SPANS A CRACK, TILE MUST REST COMPLETELY ON ISOLATION MEMBRANE

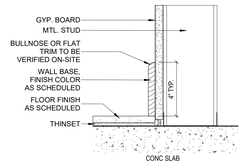
3. SEALANTS ON JOINTS MUST MATCH GROUT COLOR

TILE CONTROL JOINT

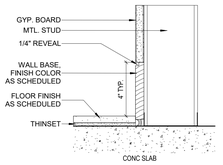


*THIS DETAIL IS NOT TO BE USED WITH BUILDING EXPANSION JOINTS. EXPANSION JOINTS MUST CARRY THRU THE TILE LAYER.

TYP. WALL BASE DETAIL

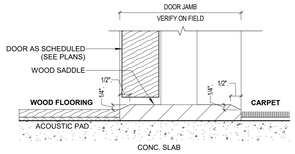


TYP. RECESSED WALL BASE DETAIL

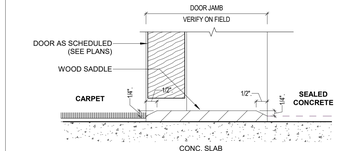


TRANSITION @ DOOR THRESHOLD

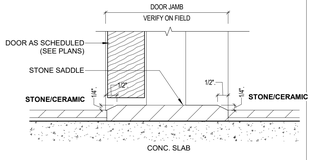
WOOD TO CARPET



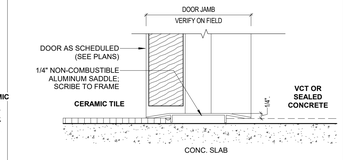
CARPET / SEALED CONCRETE



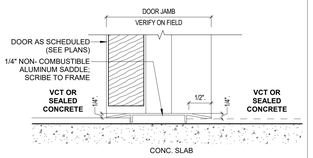
WOOD TO STONE/CERAMIC TILE



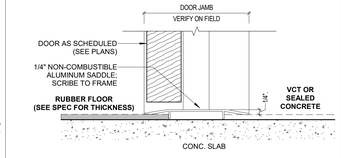
CERAMIC TILE / CARPET



TILE TO TILE



CERAMIC TILE / SEALED CONCRETE

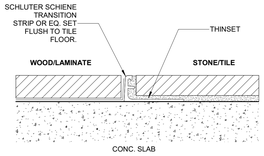


VCT TO VCT/SEALED CONCRETE

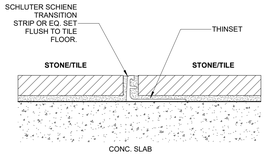
RUBBER / SEALED CONCRETE

TYPICAL TRANSITION

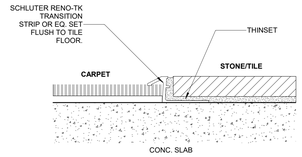
WOOD/LAMINATE TO TILE



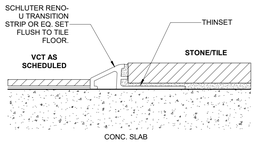
TILE TO TILE



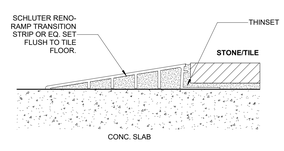
TILE TO CARPET



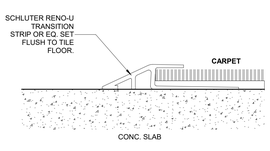
TILE TO VCT



TILE TO CONCRETE

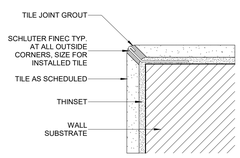


CARPET TO CONCRETE

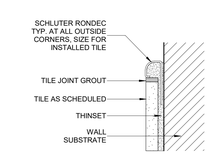


BATHROOM TILE TRIM

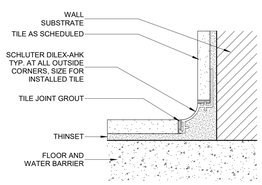
COVE/BASE



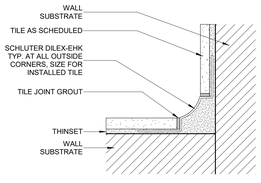
INSIDE CORNER



OUTSIDE CORNER



EDGE TRIM



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Interior Designer:
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55 Washington Street, Suite 508
Brooklyn, NY 11201

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

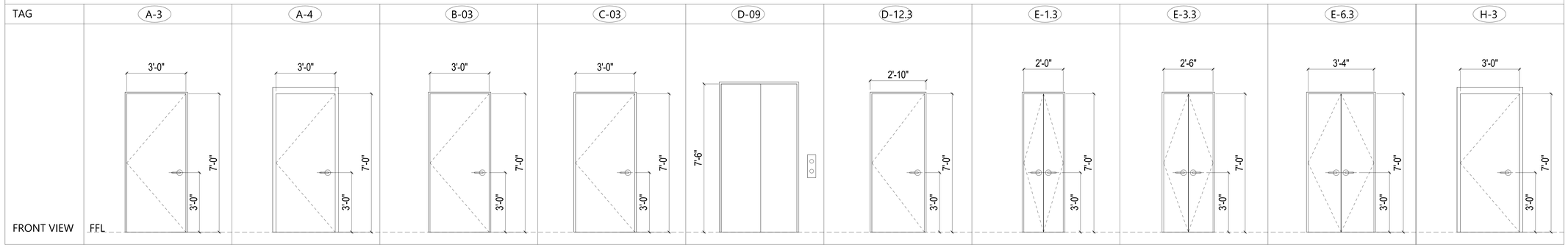
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
FLOOR AND TRANSITION DETAILS

A-701D.00

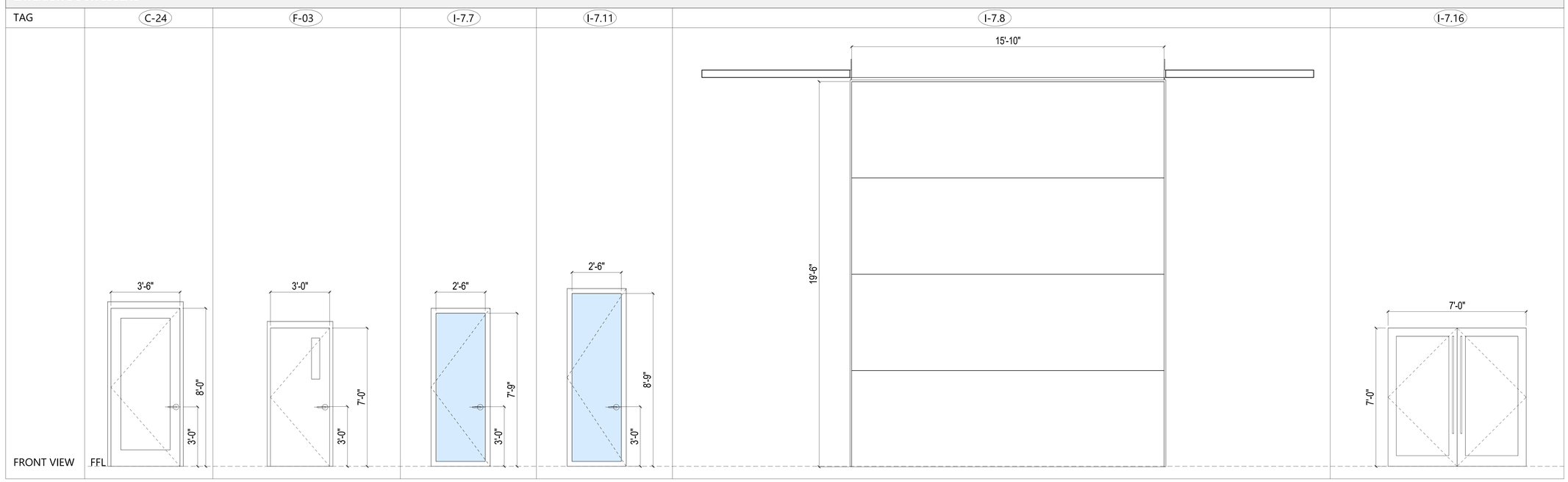
Scale:	As indicated
Date:	12/1/2025 7:36:41 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

INTERIOR DOOR LEGEND

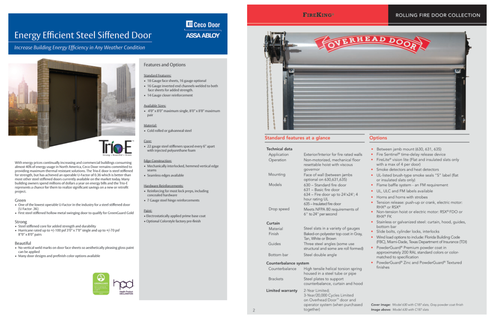


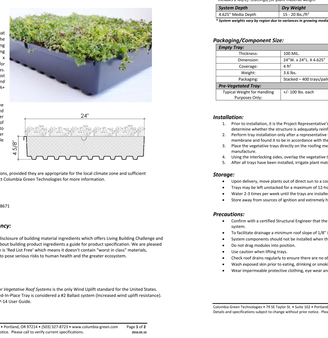
INTERIOR DOOR SCHEDULE - BUILDING D							
TAG	QTY	Operation	TYPE	COMMENTS	Fire Rating	WIDTH	HEIGHT
A-3	64	SINGLE SWING	HINGED DOOR	METAL APARTMENT DOOR 1-1/2 HR HSPF	1.5 HR FPSC	3' - 0"	7' - 0"
A-4	1	SINGLE SWING	HINGED DOOR	METAL APARTMENT DOOR 1-1/2 HR HSPF	1.5 HR FPSC	3' - 0"	7' - 0"
B-3	203	SINGLE SWING	HINGED DOOR	NON-RATED INTERIOR DOOR		3' - 0"	7' - 0"
C-3	79	SINGLE SWING	HINGED DOOR	NON-RATED INTERIOR DOOR		3' - 0"	7' - 0"
D-09	16	SLIDING	ELEVATOR DOOR	SLIDING ELEVATOR DOOR		3' - 8"	7' - 6"
D-12.3	9	SINGLE SWING	HINGED DOOR	NON-RATED INTERIOR DOOR		2' - 8"	7' - 0"
E-1.3	61	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		2' - 0"	7' - 0"
E-3.3	8	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		2' - 6"	7' - 0"
E-6.3	153	SINGLE SWING	DOUBLE HINGED DOOR	NON-RATED INTERIOR CLOSET DOOR		3' - 4"	7' - 0"
H-3	1	SINGLE SWING	HINGED DOOR	METAL APARTMENT DOOR 1-1/2 HR HSPF	1.5 HR FPSC	3' - 0"	7' - 0"

EXTERIOR DOOR LEGEND



EXTERIOR DOOR SCHEDULE - BUILDING D													
TAG	COUNT	Manufacturer	Model	Construction Type	Operation	TYPE	COMMENTS	WIDTH	HEIGHT	U-FACTOR	SHGC	AIR LEAKAGE	VT	Area
A-12	1	OVERHEAD DOOR	FIREKING 631	METAL	ROLLING	GARAGE	STEEL CORE_Insulation-CHD-Polystyrene	11' - 10"	19' - 6"	N/A	N/A	<0.02 CFM SF	0.56	230.75 SF
C-24	1	PELLA	SUPER 82	METAL	SWINGING	FULL GLASS ENTRY DOOR	GLAZED DOUBLE DOOR ENTRY	3' - 6"	8' - 0"	.25	.27	<0.02 CFM SF	0.56	28.00 SF
F-3	6	PELLA	SUPER 82	METAL	SINGLE SWING	HINGED DOOR	METAL APARTMENT DOOR 1-1/2 HR HSPF	3' - 0"	7' - 0"	N/A	N/A	<0.02 CFM SF	0.56	0.00 SF
I-7.7	1	PELLA	SUPER 82	METAL	SINGLE SWING	SINGLE GLASS	GLAZED BALCONY DOOR	2' - 11 1/2"	6' - 6 1/2"	.25	.27	<0.02 CFM SF	0.56	0.00 SF
I-7.11	27	PELLA	SUPER 82	METAL	SINGLE SWING	SINGLE GLASS	GLAZED BALCONY DOOR	3' - 0"	9' - 0"	.25	.27	<0.02 CFM SF	0.56	729.00 SF
I-7.16	1	PELLA	SUPER 82	METAL	SWINGING	DOUBLE GLASS DOOR	GLAZED DOUBLE DOOR ENTRY	6' - 6"	7' - 11 1/2"	.25	.27	<0.02 CFM SF	0.56	51.73 SF
														1039.48 SF





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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
DOOR LEGEND & SCHEDULE

A-700D.00

Scale: 1/2" = 1'-0"
Date: 12/1/2025 7:36:45 PM
Drawn by:
Checked by:
DOB JOB NUMBER:

COLUMBIA GREEN TECHNOLOGIES

TECHNICAL INFORMATION SHEET

Pre-Grown Tray System
(Patended: 7,603,808)
Product Number: PLK800

Description:
The pre-grown tray provides a turnkey solution that ensures rapid establishment of vegetation. The trays are easy to install and feature interlocking edges which prevent shifting or migration of growing media onto the roof membrane. At 24" x 24" x 4.625" deep, the pre-grown tray is appropriate for extensive and semi-intensive vegetative roof profiles. The modules are pre-grown with plants (most commonly sedum) selected by the project designer and shipped to the job site with approximately 90%+ vegetation coverage.

Comprised of a heavy duty recycled polypropylene, the Columbia Green Technologies' Tray system is designed with a channelized bottom to maximize stormwater retention. The tray system is designed to provide full stormwater run-off and is capable of retaining up to 70% of annual precipitation. Detailed stormwater retention calculations and hydrographs are available upon request.

Planting Options:
- Plants are grown per the project specifications, provided they are appropriate for the local climate zone and sufficient lead time has been provided. Please contact Columbia Green Technologies for more information.

LEED Information:
- Post-Consumer Recycled Content: 88%
- Manufacturing Location: Washougal, WA 98671

Declare Label for Materials Transparency:

The Declare Label is a voluntary disclosure of building material ingredients which offers Living Building Challenge and other project teams concerned about building product ingredients a guide for product specification. We are pleased to announce that our tray system is "Red List Free" which means it doesn't contain "worst in class" materials, chemicals, and elements known to pose serious risks to human health and the greater ecosystem.
www.declarerproducts.com

Wind Uplift:
- ANSI/SPRI RP-14 *Wind Design Standard for Vegetative Roof Systems* is the only Wind Uplift standard for the United States.
- Due to the interlocking design, The Planted-in-Place Tray is considered a #2 Ballast system (increased wind uplift resistance).
- Please request a copy of the ANSI/SPRI RP-14 User Guide.

COLUMBIA GREEN TECHNOLOGIES

TECHNICAL INFORMATION SHEET

System Weight:
Includes 2 lbs/s.f. (saturing) for plant material weight

System Depth	Dry Weight	Saturated Weight
4.625" Media Depth	15 - 20 lbs./ft²	25 - 30 lbs./ft²

† System weights vary by region due to variances in growing media weight content your local representative for more information.

Packaging/Component Size:

Empty Tray:	
Thickness:	100 MIL
Dimensions:	24" W. x 24"L. X 4.625"
Coverage:	4 ft²
Weight:	5 lb.
Packaging:	Stacked = 400 trays/pallet
Pre-Vegetated Tray:	
Typical Weight for Handling Purposes Only:	+/- 100 lbs. each

Installation:
1. Prior to installation, it is the Project Representative's responsibility to consult with a registered structural engineer to determine whether the structure is adequately reinforced to withstand the weight of a fully saturated vegetative tray.
2. Perform tray installation only after a representative from the roofing membrane manufacturer has inspected the membrane and found it to be in accordance with the membrane manufacturer's Specifications.
3. Place the vegetative trays directly on the roofing membrane or protective layer as determined by the membrane manufacturer.
4. Using the interlocking sides, overlap the vegetative trays.
5. After all trays have been installed, irrigate plant material to ensure growth.

Storage:
- Upon delivery, move plants out of direct sun to a cool location and remove cellophane wrapping.
- Trays may be left unstacked for a maximum of 13 hours, provided they are kept in the shade.
- Water 2-3 times per week until the trays are installed on the roof.
- Store away from sources of ignition and extremely high temperatures.

Precautions:
- Confirm with a certified Structural Engineer that the structure can support the saturated weight of the vegetative roof system.
- To facilitate drainage a minimum roof slope of 1/8" in 12" min. must be provided.
- System components should not be installed when the weather is below 45 ºF (7.2 ºC) or above 95 ºF (35 ºC).
- Do not drag modules into position.
- Use caution when lifting trays.
- Check roof drains regularly to ensure there are no obstructions to impede water flow.
- Wash exposed skin prior to eating, drinking or smoking and at the end of each shift.
- Wear impermeable protective clothing, eye wear and self-contained breathing apparatus when cutting trays.

WINDOW SCHEDULE - BUILDING D

TAG	COUNT	MANUFACTURER	MODEL	Construction Type	OPERATION	COMMENTS	GLAZING	WIDTH	HEIGHT	U-FACTOR	SHGC	AIR LEAKAGE	VT	TOTAL SF
W63	8	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	INSULATED	Insulated Low-E Advanced Low-E Insulating Glass Argon Neon High Attitude	7' - 6"	9' - 0"	.26	.33	<0.02 CFM/SF	0.56	540.00 SF
W69	49	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	INSULATED	Insulated Low-E Advanced Low-E Insulating Glass Argon Neon High Attitude	7' - 0"	9' - 0"	.26	.33	<0.02 CFM/SF	0.56	3087.00 SF
W70	13	ZEPHYR	SUPER 82	VINYL	FIXED	INSULATED	Insulated Low-E Advanced Low-E Insulating Glass Argon Neon High Attitude	3' - 0"	9' - 2"	.26	.33	<0.02 CFM/SF	0.56	357.50 SF
W71	26	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	INSULATED	Insulated Low-E Advanced Low-E Insulating Glass Argon Neon High Attitude	2' - 0"	9' - 2"	.26	.33	<0.02 CFM/SF	0.56	474.67 SF
W72	26	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	INSULATED	Insulated Low-E Advanced Low-E Insulating Glass Argon Neon High Attitude	5' - 0"	9' - 4"	.26	.33	<0.02 CFM/SF	0.56	1213.33 SF
W74	13	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	INSULATED	Insulated Low-E Advanced Low-E Insulating Glass Argon Neon High Attitude	3' - 0"	9' - 2"	.26	.33	<0.02 CFM/SF	0.56	357.50 SF
W88	8	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	INSULATED	Insulated Low-E Advanced Low-E Insulating Glass Argon Neon High Attitude	7' - 6"	8' - 6"	.26	.33	<0.02 CFM/SF	0.56	270.00 SF
W94	21	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	INSULATED	Insulated Low-E Advanced Low-E Insulating Glass Argon Neon High Attitude	6' - 0"	5' - 4"	.26	.33	<0.02 CFM/SF	0.56	672.00 SF
W95	20	ZEPHYR	SUPER 82	VINYL	OPERABLE/FIXED	INSULATED	Insulated Low-E Advanced Low-E Insulating Glass Argon Neon High Attitude	6' - 0"	9' - 0"	.26	.33	<0.02 CFM/SF	0.56	1080.00 SF
W96	1	ZEPHYR	SUPER 82	VINYL	FIXED	INSULATED	Insulated Low-E Advanced Low-E Insulating Glass Argon Neon High Attitude	3' - 0"	9' - 0"	.26	.33	<0.02 CFM/SF	0.56	27.00 SF
W98	10	ZEPHYR	SUPER 82	VINYL	OPERABLE	BIRD FRIENDLY	Insulated Low-E Advanced Low-E Insulating Glass Argon Neon High Attitude	2' - 5 1/2"	6' - 11"	.26	.33	<0.02 CFM/SF	0.56	0.00 SF
														8061.00 SF

WINDOW LEGEND

TAG

W94

FRONT VIEW

GLAZING LESS THAN 30" ABOVE FLOOR LEVEL DOES NOT CONTRIBUTE TO NATURAL LIGHT

2'-6"

FFL

8'-5" R.O

6'-0" R.O

W95

9'-2" R.O

6'-0" R.O

W96

9'-0" R.O

3'-0" R.O

WINDOW LEGEND

TAG

W63

FRONT VIEW

GLAZING LESS THAN 30" ABOVE FLOOR LEVEL DOES NOT CONTRIBUTE TO NATURAL LIGHT

2'-6"

FFL

9'-2" R.O

7'-6" R.O

W69

9'-0" R.O

7'-0" R.O

W70

9'-2" R.O

3'-0" R.O

W71

9'-2" R.O

2'-0" R.O

W72

9'-4" R.O

5'-0" R.O

W74

W88

8'-4" R.O

7'-6" R.O

No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

D08 SCAN STICKER

LOCATION

73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE

WINDOW LEGEND &
SCHEDULE

A-710D.00

Scale: 1/2" = 1'-0"

Date: 12/1/2025 7:36:48 PM

Drawn by:

Checked by:

D08 JOB NUMBER:

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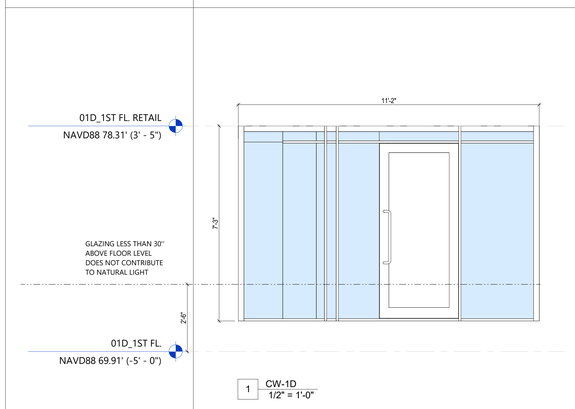
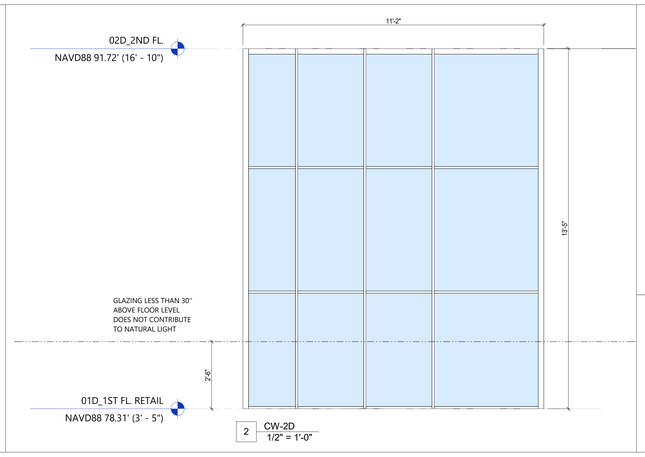


1 CW-1D
1/2" = 1'-0"



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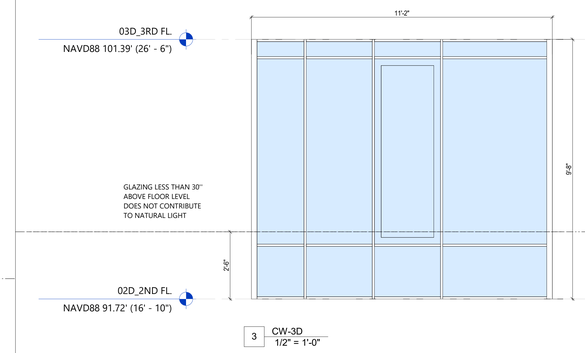

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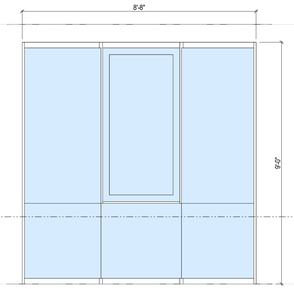

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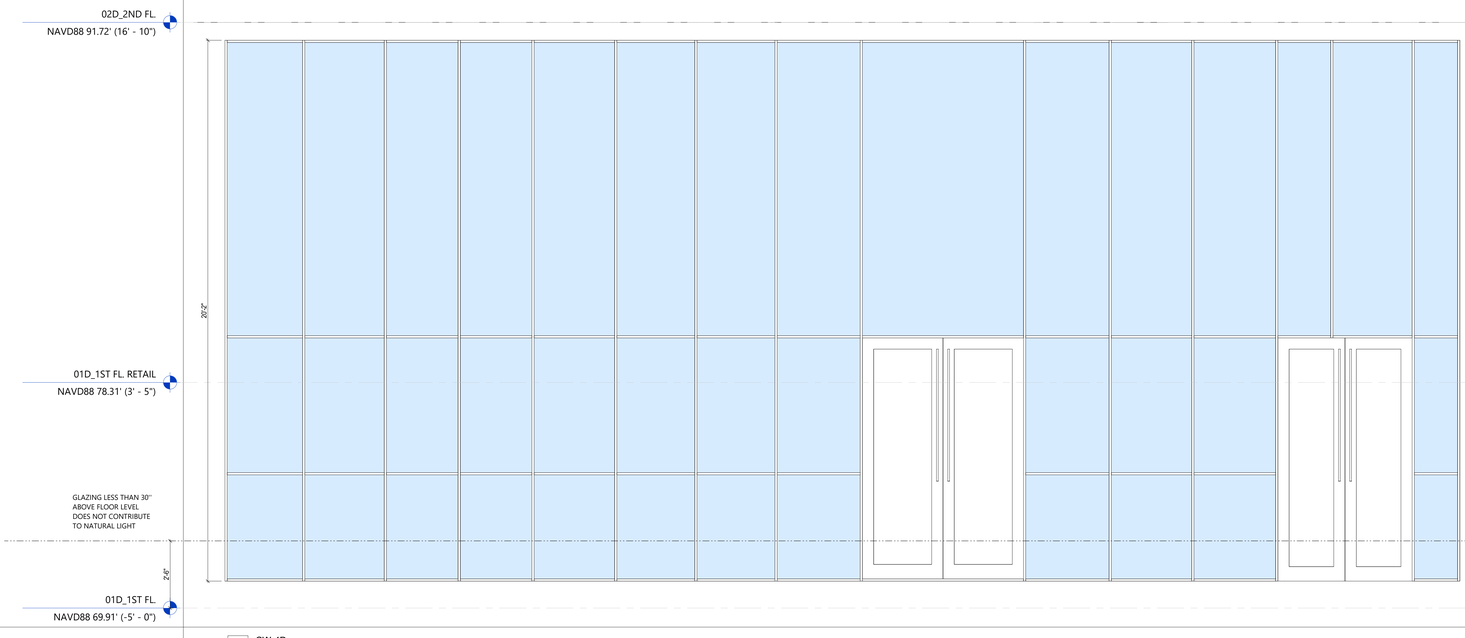
1/2" = 1'-0"



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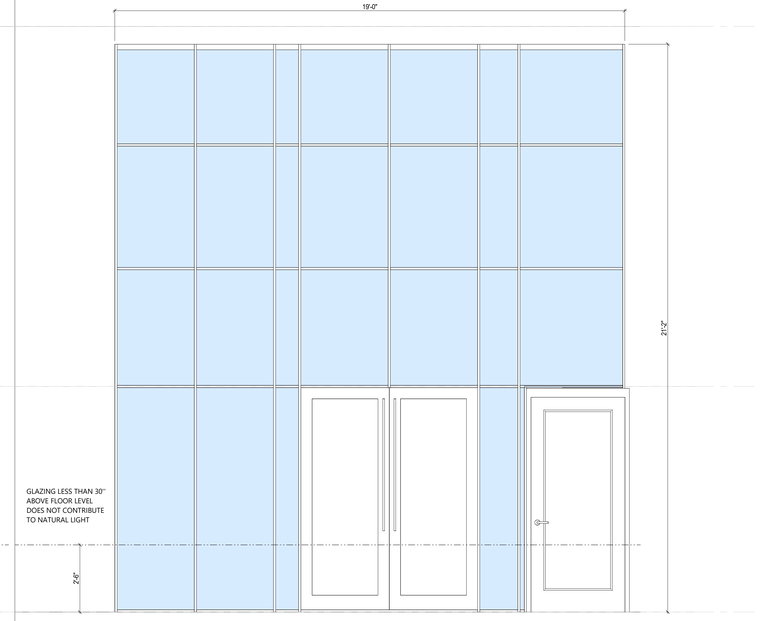
1/2" = 1'-0"



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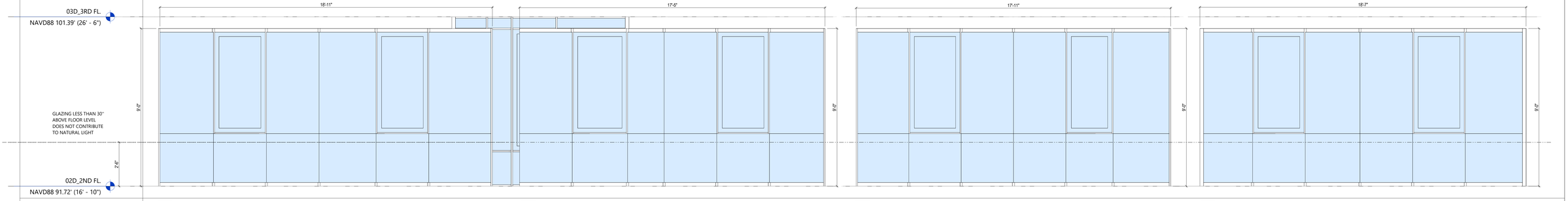

7 CW-7D
1/2" = 1'-0"

8 CW-8D
1/2" = 1'-0"

9 CW-9D
1/2" = 1'-0"

10 CW-10D
1/2" = 1'-0"

CURTAIN WALL SCHEDULE - BUILDING D				
Mark	Count	Length	Unconnected Height	Area
CW-1D	1	11' - 2 1/2"	7' - 3"	81.41 SF
CW-2D	1	11' - 2 1/2"	13' - 5"	150.37 SF
CW-3D	9	11' - 2 1/2"	9' - 8"	975.13 SF
CW-4D	1	46' - 0"	20' - 2"	926.90 SF
CW-5D	1	19' - 0"	21' - 2"	371.29 SF
CW-6D	1	8' - 11 1/2"	9' - 0"	78.38 SF
CW-7D	1	19' - 0 1/2"	9' - 0"	171.19 SF
CW-8D	1	17' - 5"	9' - 0"	156.56 SF
CW-9D	1	17' - 11"	9' - 0"	161.25 SF
CW-10D	1	18' - 7"	9' - 0"	167.25 SF
				3239.73 SF

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

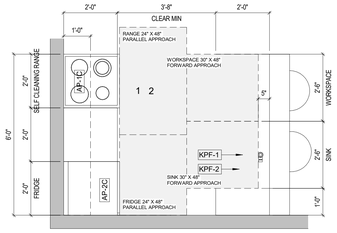
LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
CURTAIN WALL
LEGEND & SCHEDULE

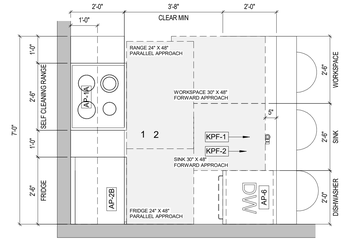
A-711D.00

Scale:	1/2" = 1'-0"
Date:	12/1/2025 7:36:53 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

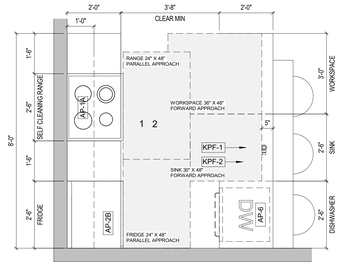
ISLAND OPEN



PLAN 6'-0"

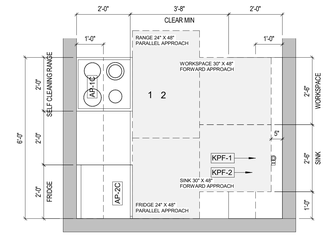


PLAN 7'-0"



PLAN 8'-0"

U-SHAPE CLOSE



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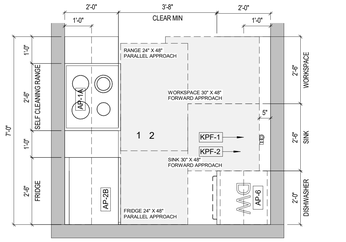
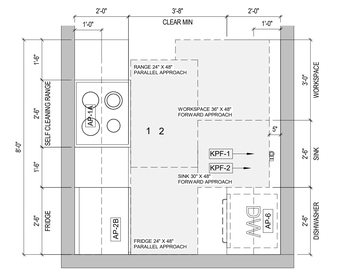
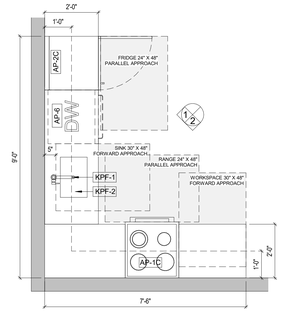


PLAN 7'-0"



PLAN 8'-0"

L-SHAPE KITCHEN



PLAN 9'-0" x 7'-6"

FIXTURE & APPLIANCE SCHEDULE

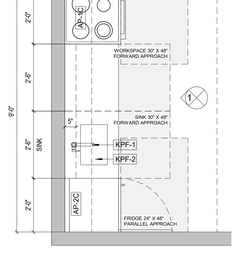
PLUMBING FIXTURES & ACCESSORIES

TAG	TYPE	MANUFACTURER	MODEL	FINISH
KPF-1	KITCHEN FAUCET	BLANCO	LINUS 526375	BLK
KPF-2	KITCHEN SINK	BLANCO	PRECIS ADA SILGRANIT	BLK
PF-2	BATHROOM SINK	KOHLER	VERTICYL L K-8189-0	WHT
PF-3	ADA TOILET	TOTO	ECO ULTRAMAX MS854114EL / MS854114ELR#01	WHT
PF-4	STANDARD TUB	FINE FIXTURES	BTA104	WHT
PF-4R	ADA TUB	AMERICAN STANDARD	2973.102 / 2973.202	WHT
PF-5	SHOWER HANDLE / DIVERTER	HANSGROHE	FINORIS	BLK
PF-5R	ADA SHOWER HANDLE / DIVERTER	SYMMONS	DIA - S3508BTRM-T736-MB	BLK
PF-6	BATHROOM FAUCET	HANSGROHE	FINORIS	BLK
BF-1	TOILET PAPER HOLDER	GATCO	RECESSED T.H.	BLK
BF-1R	RECESSED TOILET PAPER HOLDER / SHELF	HANSGROHE	ADDSTORIS 41772670	BLK
BF-2	VANITY MIRROR			
BF-3	REMOVABLE IN-TUB SEAT	ASI	8358	
	ADA GRAB BARS	KOHLER	K-10540	BLK

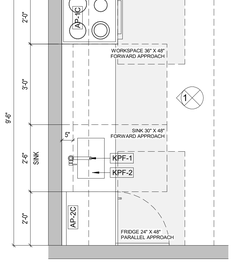
APPLIANCES

AP-1A	30" STOVE TOP	BLOMBERG	DWS51502SS	SS
AP-1B	30" BUILT-IN OVEN	BLOMBERG	DW51600SS	SS
AP-1C	24" STOVE TOP			
AP-2A	30" FRIDGE / FREEZER	BLOMBERG	BRFB1812SSLN	SS
AP-2B	30" FRIDGE / FREEZER ADA	FRIGIDAIRE	FFHT1835VS	SS
AP-2C	24" FRIDGE / FREEZER			
AP-4	STACKABLE WASHER / DRYER UNIT	BLOMBERG	WM72200W + DV17600W	WHT
AP-5	ADA COMBINATION WASHER / DRYER UNIT	BLOMBERG	WMD24400W	WHT
AP-6	DISHWASHER			

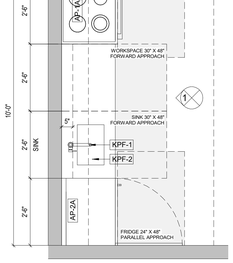
STRAIGHT KITCHEN



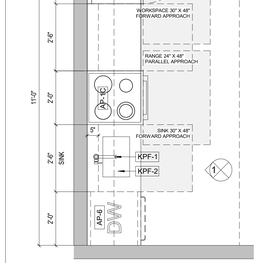
PLAN 9'-0"



PLAN 9'-6"

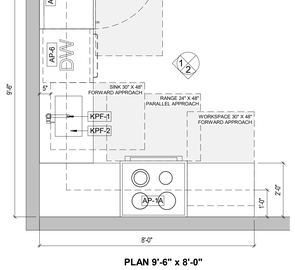


PLAN 10'-0"



PLAN 11'-0"

L-SHAPE KITCHEN



PLAN 9'-6" x 8'-0"

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

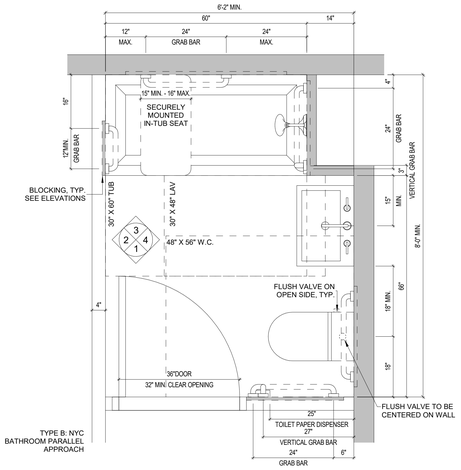
DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

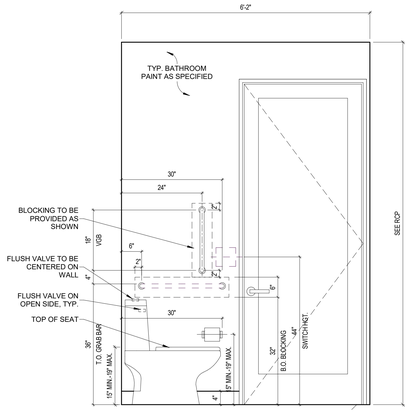
SHEET TITLE
ENLARGED KITCHEN PLANS & ELEVATIONS

A-910D.00

Scale:	As indicated
Date:	12/1/2025 7:36:55 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	



PLANS



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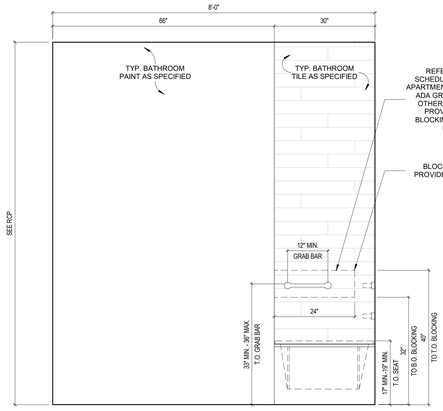

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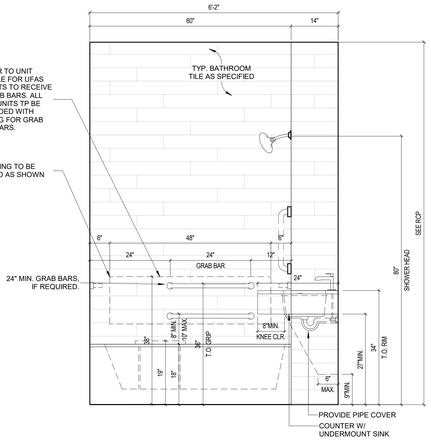

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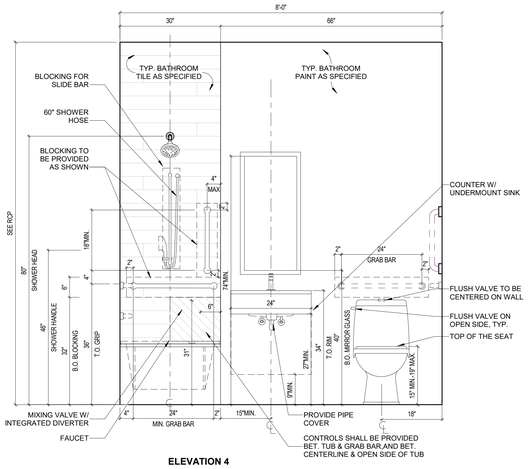

ELEVATION 4

1 BATHROOM TYPE 1A - PLAN

SCALE: 3/4" = 1'-0"

PLANS

ELEVATION 1

ELEVATION 2

ELEVATION 3

ELEVATION 4

2 BATHROOM TYPE 1B - PLAN

SCALE: 3/4" = 1'-0"

PLANS

ELEVATION 1

ELEVATION 2

ELEVATION 3

ELEVATION 4

3 BATHROOM TYPE 2 - PLAN

SCALE: 3/4" = 1'-0"

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No.	Description	Date
00	INITIAL SUBMISSION	12/01/2025

SIGNATURE & SEAL

DOB SCAN STICKER:

LOCATION
73 EMPIRE BLVD,
Brooklyn, NY 11225

SHEET TITLE
ENLARGED BATHROOM PLANS & ELEVATIONS

A-911D.00

Scale:	3/4" = 1'-0"
Date:	12/1/2025 7:36:57 PM
Drawn by:	
Checked by:	
DOB JOB NUMBER:	

APPENDIX C

Sanborn Maps

EDR Aerial Photo Decade Package

10/21/20

Site Name:

73 Empire Boulevard
73 Empire Boulevard
Brooklyn, NY 11225
EDR Inquiry # 6235031.8

Client Name:

The Vertex Companies, Inc.
400 Libbey Parkway
Weymouth, MA 02189-0000
Contact: Madalyn Kulas

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2017	1"=500'	Flight Year: 2017	USDA/NAIP
2013	1"=500'	Flight Year: 2013	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
1994	1"=500'	Acquisition Date: April 04, 1994	USGS/DOQQ
1984	1"=500'	Flight Date: March 26, 1984	USDA
1980	1"=500'	Flight Date: July 25, 1980	NOAA
1976	1"=500'	Flight Date: October 29, 1976	USGS
1974	1"=500'	Flight Date: October 19, 1974	NOAA
1966	1"=500'	Flight Date: February 23, 1966	USGS
1961	1"=500'	Flight Date: April 12, 1961	EDR Proprietary Aerial Viewpoint
1954	1"=500'	Flight Date: February 23, 1954	USGS
1951	1"=500'	Flight Date: April 21, 1951	EDR Proprietary Aerial Viewpoint
1924	1"=500'	Flight Date: July 01, 1924	FAIR

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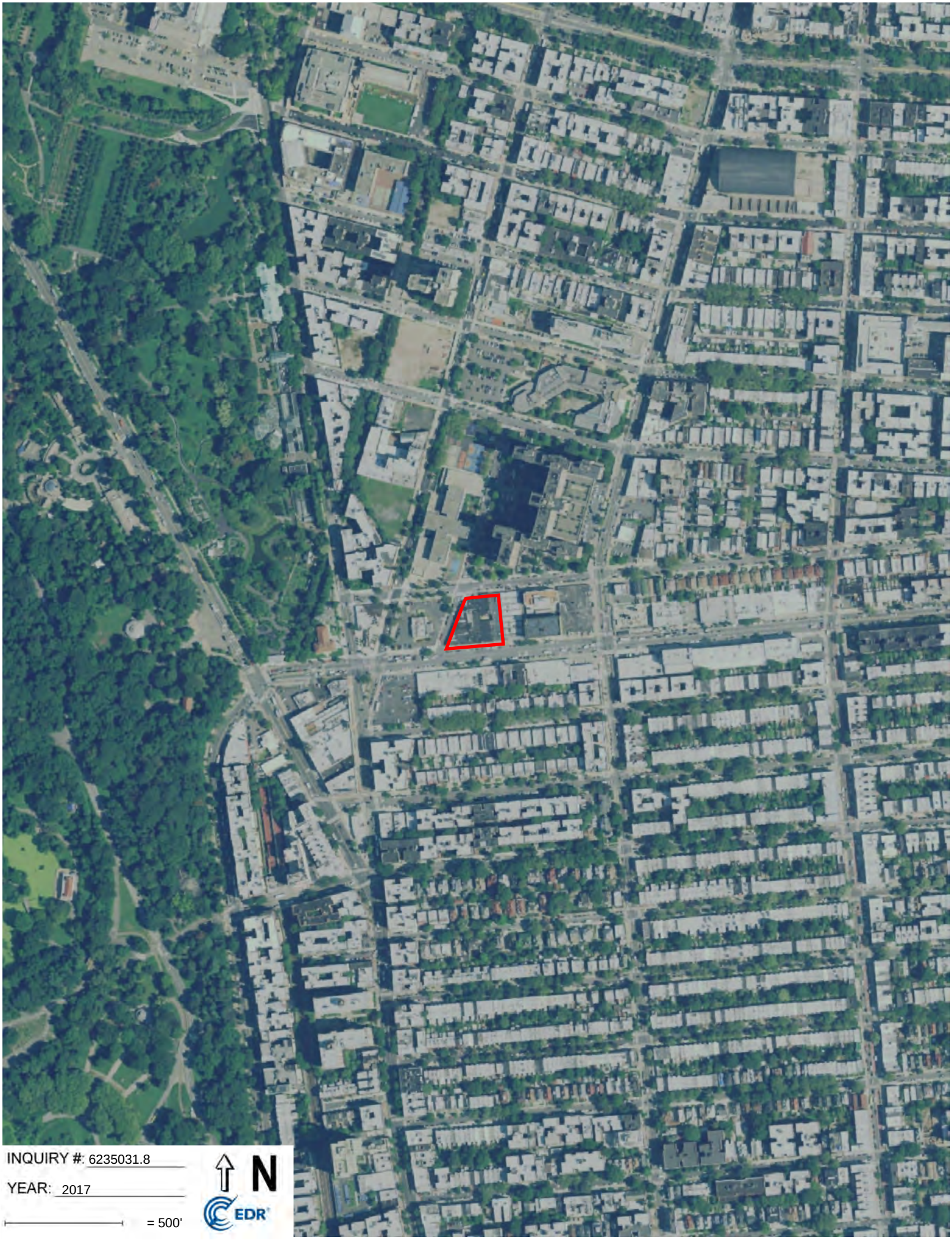
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= 500'
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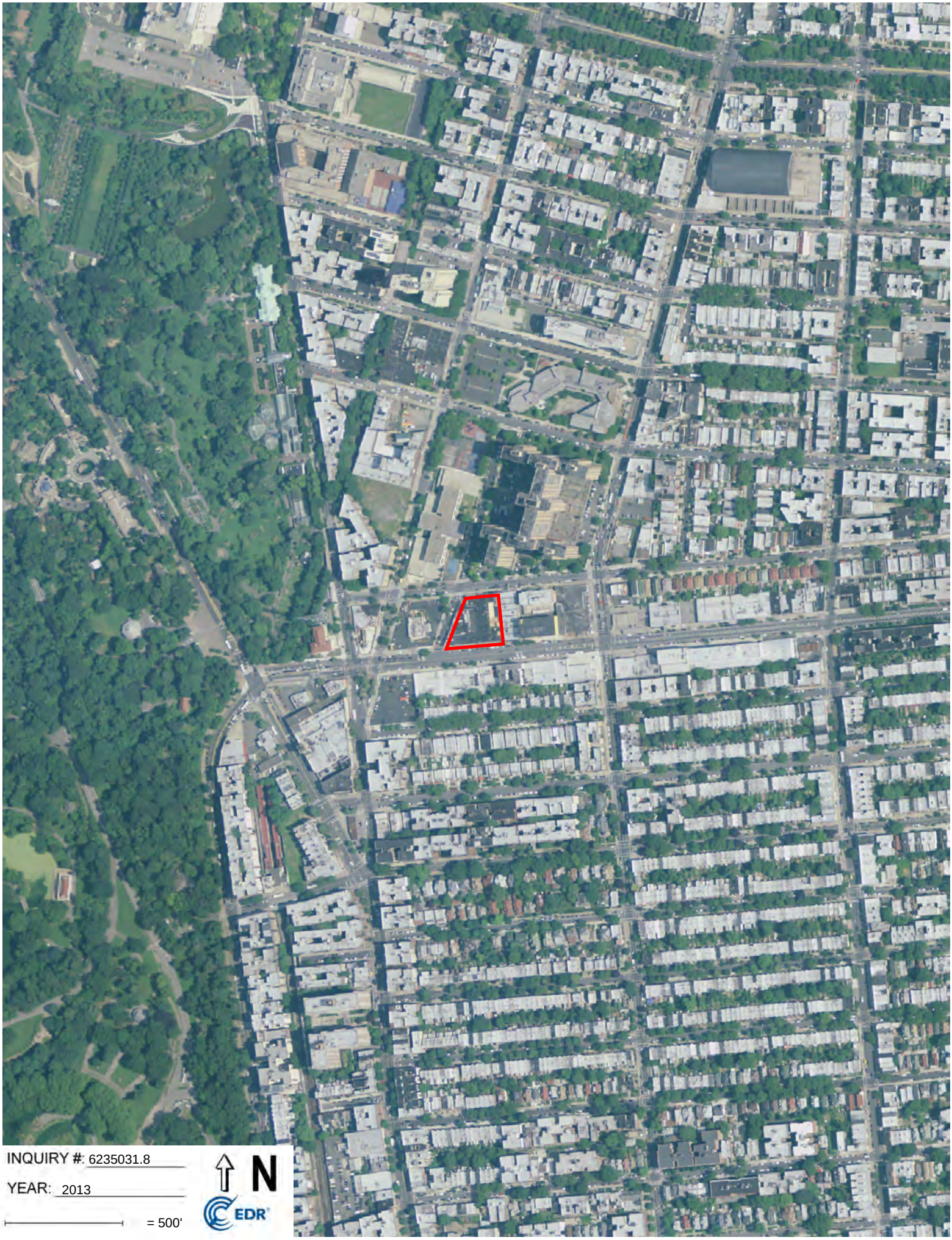
EDR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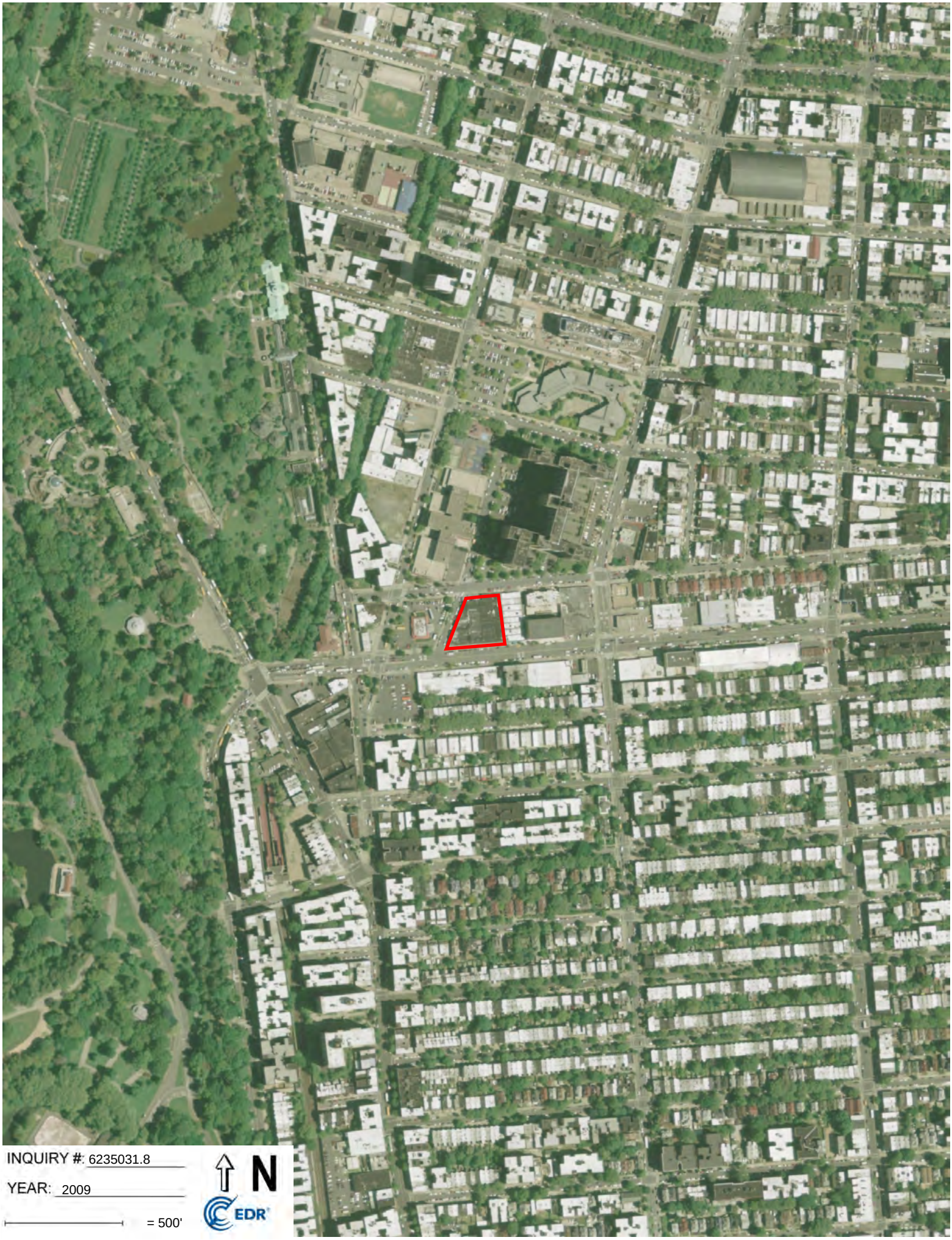
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= 500'
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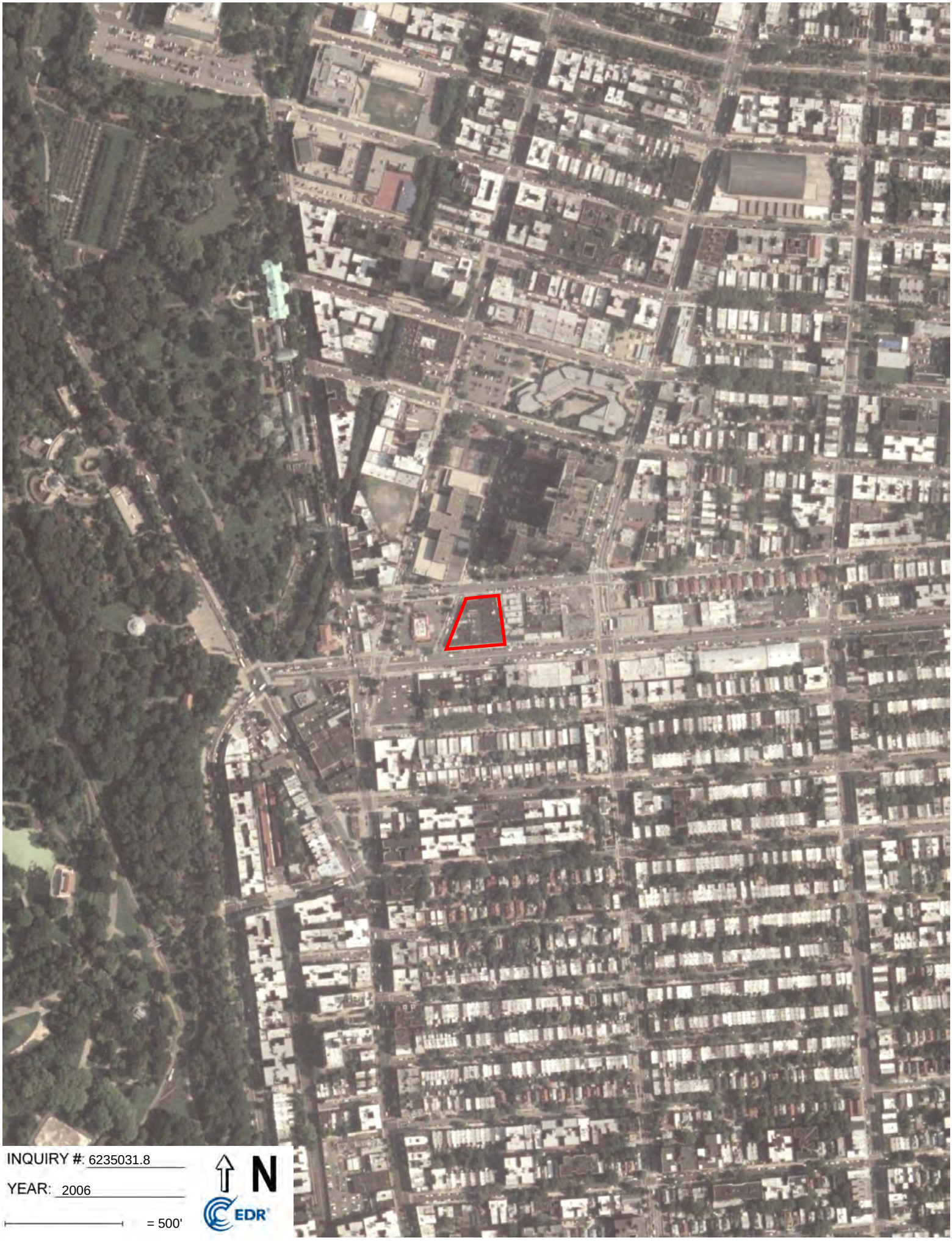
EDR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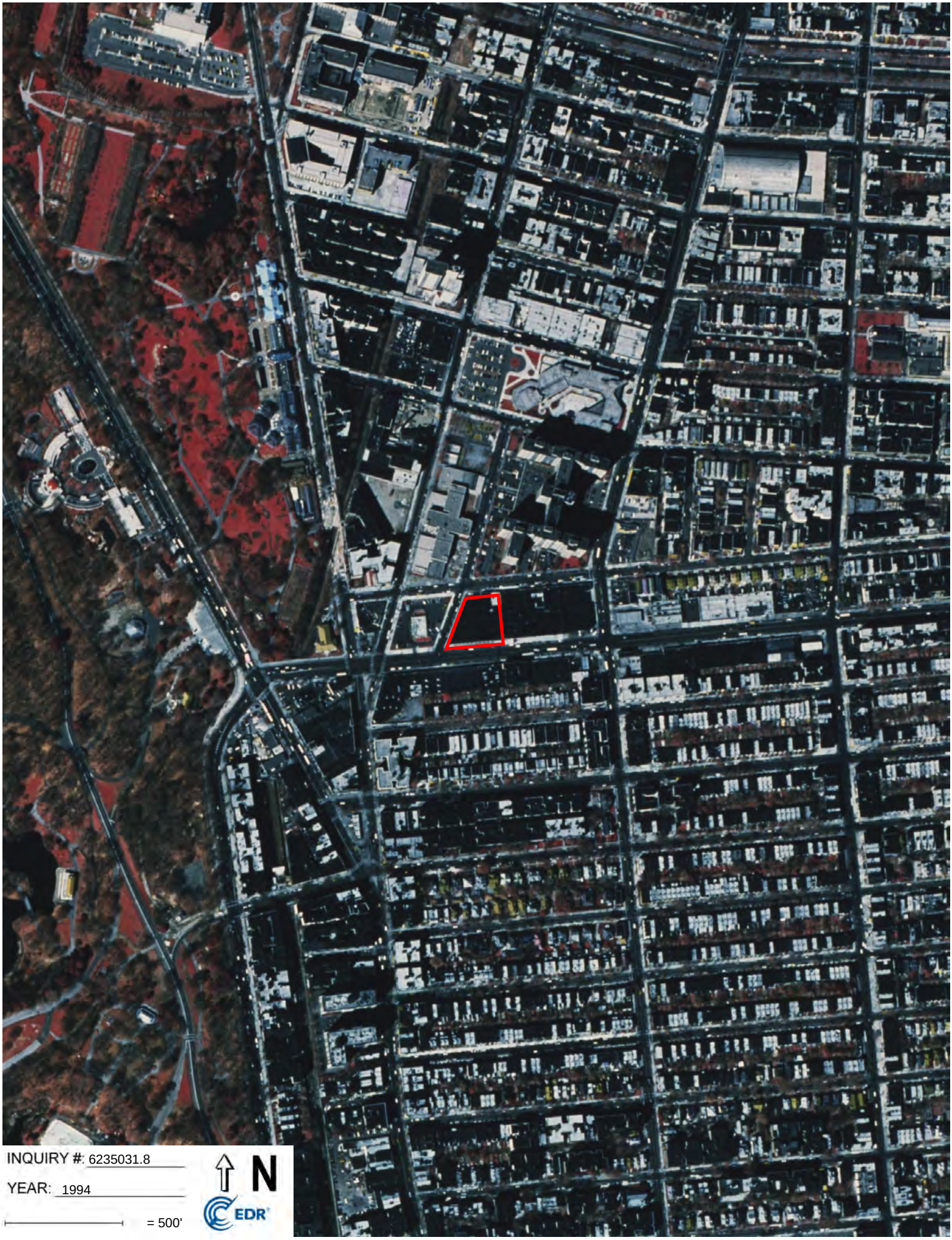
EDR



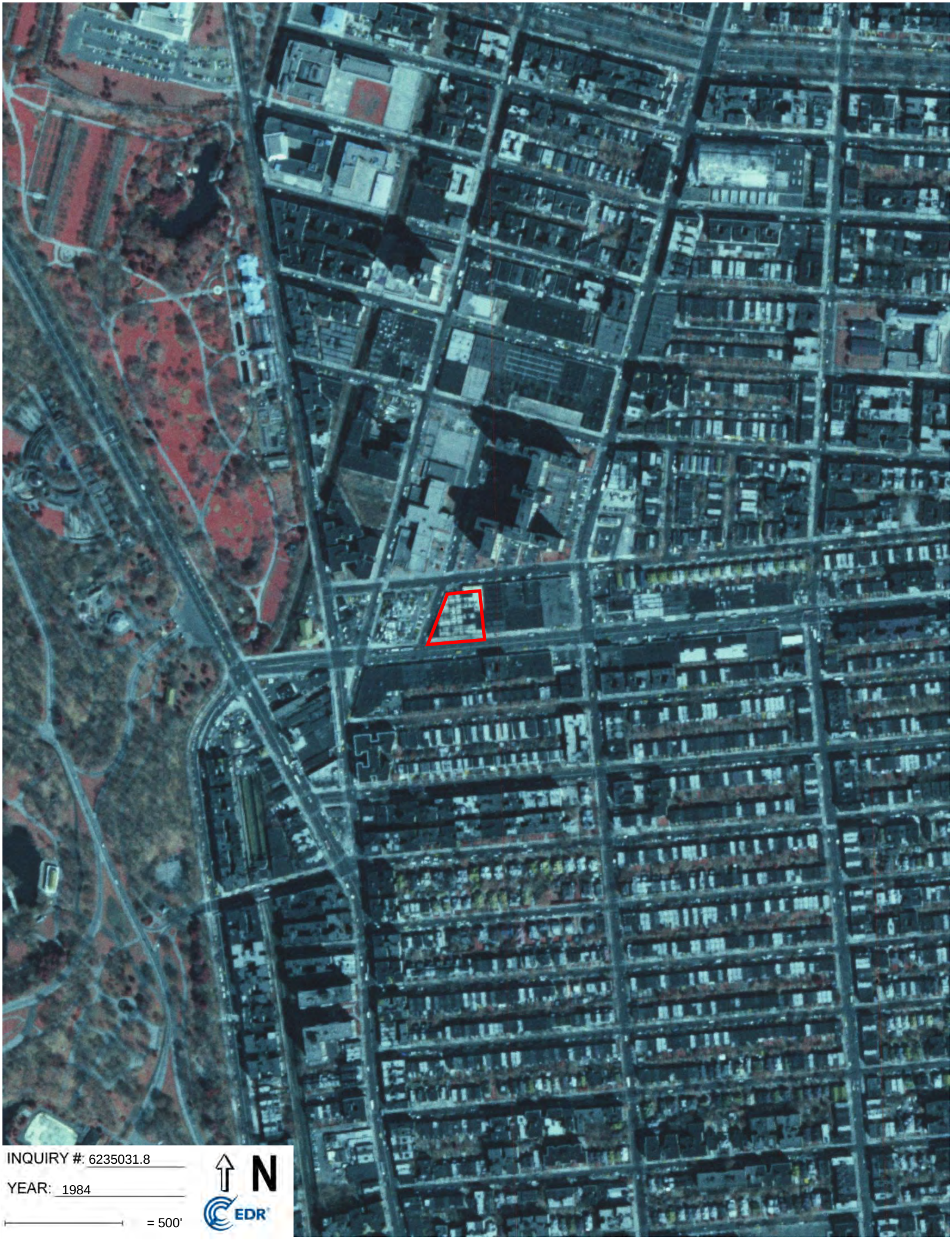
INQUIRY #: 6235031.8

YEAR: 1994

= 500'

N

EDR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YEAR: 1984
= 500'
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EDR

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YEAR: 1980
= 500'
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EDR

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YEAR: 1976
= 500'
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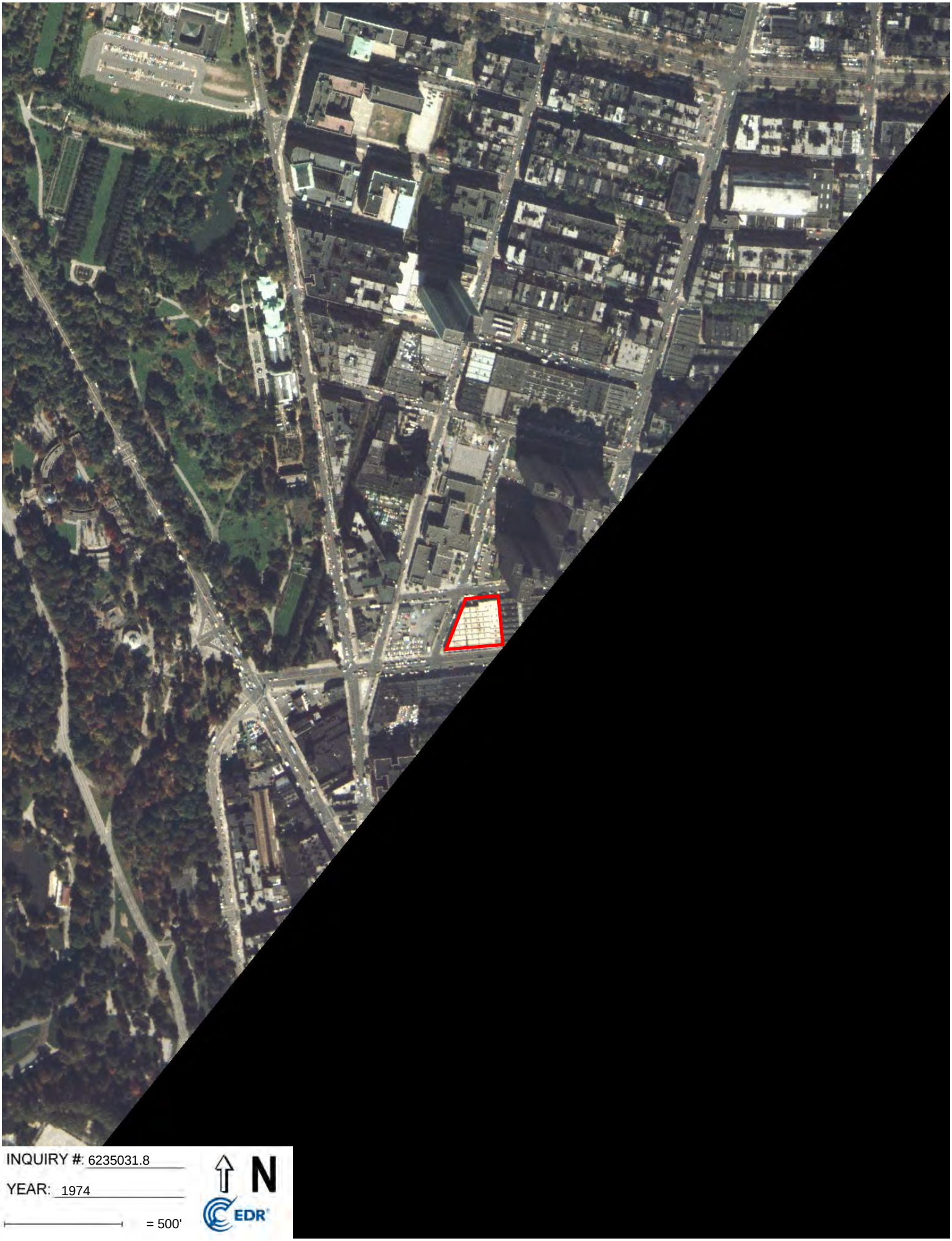
EDR



INQUIRY #: 6235031.8

YEAR: 1974

= 500'

N

EDR

INQUIRY #: 6235031.8
YEAR: 1966
= 500'
N
EDR

INQUIRY #: 6235031.8
YEAR: 1961
= 500'
N
EDR

INQUIRY #: 6235031.8
YEAR: 1954
= 500'
N
EDR

INQUIRY #: 6235031.8

YEAR: 1951

= 500'

N

EDR

INQUIRY #: 6235031.8

YEAR: 1924

= 500'

N

EDR

APPENDIX D

Soil Boring and Monitoring Well Logs

RXSB-10

Client: Bridges Development	Site: 73-99 Empire Boulevard (Laundromat)	Project Number: 2861.0003Y000
Address: 73-99 Empire Boulevard	City/State: Brooklyn, New York	Logged By: L. Fernandez

Start to Finish Date: 3/13/2023 - 3/13/2023	Contractor: ADT	Drill Type: Geoprobe	Sampler Type/Method: 2" Macro-Core
Borehole Depth: 11 feet	Backfill: Cuttings	Borehole Diameter: 6-inches	DTW:
Area: Laundromat	Elevation: NM	Northing: NM	Easting: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	CONC		CONCRETE			0.0	Handcleared to 5' bls. Drillers reached a depth of 11' bls with geoprobe 420M.
	MIXD		Medium brown, fine to coarse SAND, some fine to coarse Gravel, little Silt, trace brick, concrete (FILL); moist.	G	1	0.0	
				G	1	0.0	
				G	1	0.0	
	MIXD		Medium to Reddish brown, fine to medium SAND, fine to coarse Gravel, some Silt, little Brick (FILL); moist.	G	1	0.0	
5	MIXD		Medium brown, fine to medium SAND, fine to coarse Gravel, some Silt, little Brick (FILL); moist.		2	0.1	Collect soil sample RXSB-10 (5-8) for RI list of parameters.
	MLS		Medium brown, SILT, some SAND, little fine to coarse Gravel; moist.		3	0.1	Collect soil sample RXSB-10 (8-11) for RI list of parameters.
10						0.0	End of boring at 11' bls.

ROUX STANDARD LOG - 3/16/23 15:20 - S:\GINT\PROJECTS\2861.0003Y000.GPJ

RXSB-9

Client: Bridges Development	Site: 73-99 Empire Boulevard (Laundromat)	Project Number: 2861.0003Y000
Address: 73-99 Empire Boulevard	City/State: Brooklyn, New York	Logged By: L. Fernandez

Start to Finish Date: 3/13/2023 - 3/13/2023	Contractor: ADT	Drill Type: Geoprobe	Sampler Type/Method: 2" Macro-Core
Borehole Depth: 11 feet	Backfill: Cuttings	Borehole Diameter: 6-inches	DTW:
Area: Laundromat	Elevation: NM	Northing: NM	Easting: NM

Depth (ft)	USCS	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	CONC	CONCRETE			0.0	
	MIXD	Dark brown, fine to coarse SAND, some fine to coarse Gravel, little Silt, trace brick, concrete (FILL); moist.	G	1	0.0	Precleared to 5' bls.
	MIXD	Medium brown, fine to coarse SAND, some fine to coarse Gravel, little Silt, trace brick, slag, concrete (FILL); moist.	G	1	0.0	
	MIXD		G	1	0.0	
	MIXD		G	1	0.0	
5	MIXD	Medium brown, fine to coarse SAND, some fine to coarse Gravel, little Silt, Concrete, trace brick (FILL); moist.	G	1	0.0	
	MIXD				0.0	
	MIXD			2	0.0	Collected soil sample RXSB-9 (7-9) for RI list of parameters.
	MH	Medium brown, SILT, some fine to coarse Gravel; moist.			0.0	
	SWG	Medium brown, fine to coarse SAND, some fine to coarse Gravel, little Silt; moist.			0.0	Collected soil sample RXSB-9 (9-11) for RI list of parameters.
10	ML	Dark brown, SILT, little fine to medium Gravel, Organics, Wood; moist.		2	0.0	
					0.0	End of boring at 11' bls.

ROUX STANDARD LOG - 3/16/23 15:20 - S:\GINT\PROJECTS\2861.0003Y000.GPJ

RXSV-5

Client: Bridges Development	Site: 73-99 Empire Boulevard (Laundromat)	Project Number: 2861.0003Y000
Address: 73-99 Empire Boulevard	City/State: Brooklyn, New York	Logged By: L. Fernandez

Start to Finish Date: 3/10/2023 - 3/10/2023	Contractor: ADT	Drill Type: Hand Auger	Sampler Type/Method: 2" Hand Auger
Borehole Depth: 4.5 feet	Backfill: Cuttings	Borehole Diameter: 6-inches	DTW:
Area: Laundromat	Elevation: NM	Northing: NM	Easting: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	CONC		CONCRETE				Hand augered to 3.5' bls. Drillers could not advance farther than 3.5' bls with hand auger due to cobbles and boulders. Drillers reached a depth of 4.5' bls with a dig bar.
1	MIXD		Brown, fine to coarse SAND, some fine to coarse Gravel, little Silt, Brick, Glass (FILL); moist.			0.0	
2				G	3.5	0.0	
3			No Recovery.			0.0	
4							Soil Vapor point set at 4.5' bls. End of boring at 4.5' bls

ROUX STANDARD LOG - 3/16/23 15:20 - S:\GINT\PROJECTS\2861.0003Y000.GPJ

RXSV-6

Client: Bridges Development	Site: 73-99 Empire Boulevard (Laundromat)	Project Number: 2861.0003Y000
Address: 73-99 Empire Boulevard	City/State: Brooklyn, New York	Logged By: L. Fernandez

Start to Finish Date: 3/10/2023 - 3/10/2023	Contractor: ADT	Drill Type: Hand Auger	Sampler Type/Method: 2" Hand Auger
Borehole Depth: 4.5 feet	Backfill: Cuttings	Borehole Diameter: 6-inches	DTW:
Area: Laundromat	Elevation: NM	Northing: NM	Easting: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	CONC		CONCRETE				Hand augered to 3.5' bls. Drillers could not advance farther than 3.5' bls with hand auger due to cobbles and boulders. Drillers reached a depth of 4.5' bls with a dig bar.
1	MIXD		Brown, fine to coarse SAND, some fine to coarse Gravel, little Silt, Brick, Glass (FILL); moist.	G	3.5	0.0	
2						0.0	
3						0.0	
			No Recovery.				
4							Soil Vapor point set at 4.5' bls. End of boring at 4.5' bls

ROUX STANDARD LOG - 3/16/23 15:20 - S:\GINT\PROJECTS\2861.0003Y000.GPJ

RXSB-1

Client: Empire Boulevard Holdings	Site: Empire	Project Number: 2861.0003Y000	
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: MT	
Start to Finish Date: 7/31/2025 - 7/31/2025	Contractor: Aquifer Drilling and Testing	Drill Type: Rotosonic	Sampler Type/Method: 2" Split Spoon
Borehole Depth: 15 feet	Backfill:	Borehole Diameter: 2-inches	DTW:
Area: NM	Elevation: NM	Latitude: NM	Longitude: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
0	MIXD		Brown, fine to coarse SAND, little Cobble, fine to coarse Gravel, trace brick, glass (FILL); moist		3	0	
5	MIXD		Brown, fine to coarse SAND, little Cobble, Silt, fine to coarse Gravel, trace brick, glass (FILL); moist		2	0	Soil sample RXSB-1(8-10) and RXSB-1(8-10)_P collected from 8-10 ft BLS.
10	CL-CH		Brown, CLAY, little Silt; moist		4	0	Soil sample RXSB-1(10-12) and RXSB-1(10-12)_P collected from 10-12 ft BLS.
15			Bottom of borehole at 15 feet				

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-11/MW-1

Client:	Site:	Project Number:
Empire Boulevard Holdings	Empire	2861.0003Y000
Address:	**City/State:**	**Logged By:**
73-99 Empire Blvd	Brooklyn, NY	MT

Start to Finish Date:	Contractor:	Drill Type:	Sampler Type/Method:
7/28/2025 - 7/28/2025	Aquifer Drilling and Testing	Rotosonic	2" Split Spoon
Borehole Depth:	**Backfill:**	**Borehole Diameter:**	**DTW:**
105 feet		2-inches	85 feet
Area:	**Elevation:**	**Latitude:**	**Longitude:**
NM	NM	NM	NM

Well Depth:	Well Dia./Materials:	Screen Interval:	Screen Slot Size:	Sand/Filter Pack Size:	Annular Seal:
105 feet	2-inch PVC	85-105 feet	20-Slot	Morie #2	Bentonite

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
5		MIXD		Medium brown, fine to coarse SAND, some Cobble, little fine to coarse Gravel, trace silt, brick, asphalt (FILL); moist.				Soil sample RXSB-11(6-8) and RXSB-11(6-8)_P collected from 6-8 ft BLS.
10		SW		Medium brown, fine to coarse SAND, little Clay, fine to coarse Gravel, trace silt; moist.			0	
15						5	0	Soil sample RXSB-11(13-15) and RXSB-11(13-15)_P collected from 13-15 ft BLS.
				Light brown, fine to coarse SAND, some fine to coarse Gravel, little Cobble, trace silt; moist.		5		
20		SWG					0	
						5		

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

Client:	Site:	Project Number:
Empire Boulevard Holdings	Empire	2861.0003Y000
Address:	**City/State:**	**Logged By:**
73-99 Empire Blvd	Brooklyn, NY	MT

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
				Latitude:			Longitude:	
		SWG		Grey, fine to coarse SAND, some fine to coarse Gravel, little Cobble, trace silt; moist.		5	0	
30		SW		Medium brown, fine to coarse SAND, little Cobble; moist.		5	0	
35				Medium brown, fine to coarse SAND, little fine to coarse Gravel; moist.		4	0	
40						3	0	
45		SW				3	0	
50						4	0	

1" PVC Riser

ROUX STANDARD LOG - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

Client:	Site:	Project Number:
Empire Boulevard Holdings	Empire	2861.0003Y000
Address:	**City/State:**	**Logged By:**
73-99 Empire Blvd	Brooklyn, NY	MT

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
				Latitude:			Longitude:	
55				Medium brown, fine to coarse SAND, little fine to coarse Gravel; moist.			0	
						5		
60							0	
	GROUND WATER LEVEL							Groundwater observed at 61.20 ft BLS.
						3		
65							0	
						3		
		SW						
70							0	
						5		
75							0	
						5		
80							0	
						5		
	2 ft of Hole							

ROUX STANDARD LOG - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-11/MW-1

Client:	Site:	Project Number:
Empire Boulevard Holdings	Empire	2861.0003Y000
Address:	**City/State:**	**Logged By:**
73-99 Empire Blvd	Brooklyn, NY	MT

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
				Latitude:			Longitude:	
85	Plug	SW		Medium brown, fine to coarse SAND, little fine to coarse Gravel; wet.		5	0	
						5		
90							0	
						5		
95	#2 Morie Sand 1" PVC Screen	SW					0	
						2		
100								
105				Bottom of borehole at 105 feet				

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-12

Client: Empire Boulevard Holdings	Site: Empire	Project Number: 2861.0003Y000	
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: MT	
Start to Finish Date: 7/31/2025 - 7/31/2025	Contractor: Aquifer Drilling and Testing	Drill Type: Rotosonic	Sampler Type/Method: 2" Split Spoon
Borehole Depth: 15 feet	Backfill:	Borehole Diameter: 2-inches	DTW:
Area: NM	Elevation: NM	Latitude: NM	Longitude: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
0	MIXD		Brown, fine to coarse SAND, little Silt, Cobble, fine to coarse Gravel, trace brick (FILL); moist		5	0	
5						0	Soil sample RXSB-2(6-8) and RXSB-12(6-8)_P collected from 6-8 ft BLS.
					5		
10	CL-CH		Brown, CLAY, little Silt, trace fine gravel; moist			0	Soil sample RXSB-12(8-10) and RXSB-12(8-10)_P collected from 8-10 ft BLS.
	SW		Brown, fine to coarse SAND, little fine Gravel; moist		5		
15			Bottom of borehole at 15 feet				

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-13/MW-2

Client:	Site:	Project Number:
Empire Boulevard Holdings	Empire	2861.0003Y000
Address:	**City/State:**	**Logged By:**
73-99 Empire Blvd	Brooklyn, NY	MT

Start to Finish Date:	Contractor:	Drill Type:	Sampler Type/Method:
7/29/2025 - 7/29/2025	Aquifer Drilling and Testing	Rotosonic	2" Split Spoon
Borehole Depth:	**Backfill:**	**Borehole Diameter:**	**DTW:**
87 feet		2-inches	70 feet
Area:	**Elevation:**	**Latitude:**	**Longitude:**
NM	NM	NM	NM

Well Depth:	Well Dia./Materials:	Screen Interval:	Screen Slot Size:	Sand/Filter Pack Size:	Annular Seal:
87 feet	2-inch PVC	67-87 feet	20-Slot	Morie #2	Bentonite

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
5		SWG		Medium brown, fine to coarse SAND, some fine to coarse Gravel, Cobble, little Brick, Silt (FILL); moist				Soil sample RXSB-13(8-10) and RXSB-13(8-10)_P collected from 8-10 ft BLS.
10		SWG		Medium brown, fine to coarse SAND, some fine to coarse Gravel, Cobble, little Silt; moist			0	Soil sample RXSB-13(10-12) and RXSB-13(10-12)_P collected from 10-12 ft BLS.
15		CH		Medium brown, CLAY, little Silt, fine to coarse Gravel; moist		4		
20		SW		Medium brown, fine to coarse SAND, little fine to coarse Gravel, Cobble, trace silt; moist		10	0	

RXSB-13/MW-2

Client:	Site:	Project Number:
Empire Boulevard Holdings	Empire	2861.0003Y000
Address:	**City/State:**	**Logged By:**
73-99 Empire Blvd	Brooklyn, NY	MT

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
				Latitude:			Longitude:	
		SW		Grey, fine to coarse SAND, little fine to coarse Gravel, Cobble, trace silt; moist		5	0	
30		SW		Medium brown, fine to coarse SAND, little fine to coarse Gravel, Cobble, trace silt; moist		5	0	
35		SW				5	0	
40	1" PVC Riser	SWG		Medium brown, fine to coarse SAND, some fine to coarse Gravel, little Cobble, trace silt; moist		5	0	
45		SW		Medium brown, fine to coarse SAND, little fine to coarse Gravel, Cobble, trace silt; moist		5	0	
50		SW		Medium brown, fine to coarse SAND, little fine to coarse Gravel; moist		5	0	

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-13/MW-2

Client:	Site:	Project Number:
Empire Boulevard Holdings	Empire	2861.0003Y000
Address:	**City/State:**	**Logged By:**
73-99 Empire Blvd	Brooklyn, NY	MT

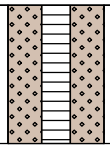
Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description Latitude:	Sample Interval	Recovery (ft)	PID Longitude:	Notes
55				Medium brown, fine to coarse SAND, little fine to coarse Gravel; moist			0	
						5		
60	GROUND WATER LEVEL						0	
		SW				5		Groundwater observed at 61.21 ft BLS.
65	2 ft of Hole Plug							
70				Medium brown, fine to coarse SAND, little fine to coarse Gravel; wet			0	
						10		
75	#2 Morie Sand 1" PVC Screen	SW						
80							0	
						10		

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE BLVD.GPJ

ROUX

RXSB-13/MW-2

Client:	Site:	Project Number:
Empire Boulevard Holdings	Empire	2861.0003Y000
Address:	**City/State:**	**Logged By:**
73-99 Empire Blvd	Brooklyn, NY	MT

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description Latitude:	Sample Interval	Recovery (ft)	PID Longitude:	Notes
85		SW		Medium brown, fine to coarse SAND, little fine to coarse Gravel; wet		10		
				Bottom of borehole at 87 feet				

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-14/MW-3

Client:	Site:	Project Number:
Empire Boulevard Holdings	Empire	2861.0003Y000
Address:	**City/State:**	**Logged By:**
73-99 Empire Blvd	Brooklyn, NY	MT

Start to Finish Date:	Contractor:	Drill Type:	Sampler Type/Method:
7/30/2025 - 7/30/2025	Aquifer Drilling and Testing	Rotosonic	2" Split Spoon
Borehole Depth:	**Backfill:**	**Borehole Diameter:**	**DTW:**
95 feet		2-inches	75 feet
Area:	**Elevation:**	**Latitude:**	**Longitude:**
NM	NM	NM	NM

Well Depth:	Well Dia./Materials:	Screen Interval:	Screen Slot Size:	Sand/Filter Pack Size:	Annular Seal:
95 feet	2-inch PVC	75-95 feet	20-Slot	Morie #2	Bentonite

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
5		SW		Medium brown, fine to coarse SAND, little fine to coarse Gravel, Cobble, Clay, trace silt, brick (FILL), moist.				Soil sample RXSB-14(8-10) and RXSB-14(8-10)_P collected from 8-10 ft BLS.
10		SW-SC		Medium brown, fine to coarse SAND, some Clay, little Cobble, fine to coarse Gravel, trace silt; moist.			0	Soil sample RXSB-14(10-12) and RXSB-14(10-12)_P collected from 10-12 ft BLS.
15		SW		Medium brown, fine to coarse SAND, little Cobble, fine to coarse Gravel; moist.		5 5	0	
20						5	0	

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-14/MW-3

Client:	Site:	Project Number:
Empire Boulevard Holdings	Empire	2861.0003Y000
Address:	**City/State:**	**Logged By:**
73-99 Empire Blvd	Brooklyn, NY	MT

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description Latitude:	Sample Interval	Recovery (ft)	PID Longitude:	Notes
		SW		Medium brown, fine to coarse SAND, little Cobble, fine to coarse Gravel; moist.		5	0	
30							0	
				Medium brown, fine to coarse SAND, little Cobble, trace fine to coarse Gravel; moist.		4		
35							0	
		SW				2		
40							0	
						5		
45				Medium brown, fine to coarse SAND, little fine to coarse Gravel; moist.			0	
						5		
	1" PVC Riser	SW						
50								

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-14/MW-3

Client:	Site:	Project Number:
Empire Boulevard Holdings	Empire	2861.0003Y000
Address:	**City/State:**	**Logged By:**
73-99 Empire Blvd	Brooklyn, NY	MT

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
				Latitude:			Longitude:	
55				Medium brown, fine to coarse SAND, little fine to coarse Gravel; moist.			0	
						3		
60							0	
	GROUND WATER LEVEL					4		Groundwater observed at 61.30 ft BLS.
65		SW					0	
						3		
70							0	
	2 ft of Hole Plug					3		
75				Medium brown, fine to coarse SAND, little fine to coarse Gravel; wet.			0	
						1		
80		SW					0	
						2		

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

ROUX

RXSB-14/MW-3

Client:	Site:	Project Number:
Empire Boulevard Holdings	Empire	2861.0003Y000
Address:	**City/State:**	**Logged By:**
73-99 Empire Blvd	Brooklyn, NY	MT

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description Latitude:	Sample Interval	Recovery (ft)	PID Longitude:	Notes
85	#2 Morie Sand 1" PVC Screen	SW		Medium brown, fine to coarse SAND, little fine to coarse Gravel; wet.		2	0	
						4		
90							0	
						4		
95				Bottom of borehole at 95 feet				

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-2

Client: Empire Boulevard Holdings	Site: Empire	Project Number: 2861.0003Y000	
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: MT	
Start to Finish Date: 7/31/2025 - 7/31/2025	Contractor: Aquifer Drilling and Testing	Drill Type: Rotosonic	Sampler Type/Method: 2" Split Spoon
Borehole Depth: 15 feet	Backfill:	Borehole Diameter: 2-inches	DTW:
Area: NM	Elevation: NM	Latitude: NM	Longitude: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	MIXD		Brown, fine to coarse SAND, little fine to coarse ravel, Cobble, trace brick, glass (FILL); moist		4	0	
5	MIXD		Brown, fine to coarse SAND, little fine to coarse Gravel, Silt, Cobble, trace brick, glass (FILL); moist		4	0	
	CL-CH		Brown, CLAY, little Silt; moist				Soil sample RXSB-2(8-10) and RXSB-2(8-10)_P collected from 8-10 ft BLS.
10	SW		Brown, fine to coarse SAND, little fine to coarse Gravel; moist		5	0	Soil sample RXSB-2(10-12) and RXSB-2(10-12)_P collected from 10-12 ft BLS.
15			Bottom of borehole at 15 feet				

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-3

Client: Empire Boulevard Holdings	Site: Empire	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: MT

Start to Finish Date: 7/31/2025 - 7/31/2025	Contractor: Aquifer Drilling and Testing	Drill Type: Rotosonic	Sampler Type/Method: 2" Split Spoon
Borehole Depth: 15 feet	Backfill:	Borehole Diameter: 2-inches	DTW:
Area: NM	Elevation: NM	Latitude: NM	Longitude: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
0	MIXD		Brown, fine to coarse SAND, little fine to coarse Gravel, trace cobble, brick (FILL); moist		5	0	
5						0	
					4		Soil sample RXSB-3(7-9) and RXSB-3(7-9)_P collected from 9-11 ft BLS.
10	CL-CH		Brown, CLAY, little Silt, trace fine to coarse gravel; moist			0	Soil sample RXSB-3(9-11) and RXSB-3(9-11)_P collected from 9-11 ft BLS.
	SP		Brown, fine to coarse SAND, little fine to coarse Gravel, trace cobble; moist		4		
15			Bottom of borehole at 15 feet				

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-4

Client: Empire Boulevard Holdings	Site: Empire	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: MT

Start to Finish Date: 8/1/2025 - 8/1/2025	Contractor: Aquifer Drilling and Testing	Drill Type: Rotosonic	Sampler Type/Method: 2" Split Spoon
Borehole Depth: 15 feet	Backfill:	Borehole Diameter: 2-inches	DTW:
Area: NM	Elevation: NM	Latitude: NM	Longitude: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
0	MIXD		Brown, fine to coarse SAND, little Silt, fine to coarse Gravel, trace cobble, brick, asphalt (FILL); moist		4	0	
5						0	Soil sample RXSB-4(6-8) and RXSB-4(6-8)_P collected from 6-8 ft BLS.
	CL-CH		Brown, CLAY, little Silt; moist		4		Soil sample RXSB-4(8-10) and RXSB-4(8-10)_P collected from 8-10 ft BLS.
10	SP		Brown, fine to coarse SAND, little Silt, trace fine gravel; moist		3	0	
15			Bottom of borehole at 15 feet				

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-5

Client: Empire Boulevard Holdings	Site: Empire	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: MT

Start to Finish Date: 8/1/2025 - 8/1/2025	Contractor: Aquifer Drilling and Testing	Drill Type: Rotosonic	Sampler Type/Method: 2" Split Spoon
Borehole Depth: 15 feet	Backfill:	Borehole Diameter: 2-inches	DTW:
Area: NM	Elevation: NM	Latitude: NM	Longitude: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
0	MIXD		Brown, fine to coarse SAND, little Silt, fine to coarse Gravel, trace cobble, brick, asphalt (FILL); moist		5	0	
5	MIXD		Brown, CLAY, little Silt (FILL); moist		5	0	
	MIXD		Brown, fine to coarse SAND, little fine to coarse Gravel, Cobble, Brick, Asphalt (FILL); moist				Soil sample RXSB-5(8-10) and RXSB-5(8-10)_P collected from 8-10 ft BLS.
10	SP		Brown, fine to coarse SAND, little Silt, fine to coarse Gravel; moist		5	0	Soil sample RXSB-5(10-12) and RXSB-5(10-12)_P collected from 10-12 ft BLS.
15			Bottom of borehole at 15 feet				

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-6

Client: Empire Boulevard Holdings	Site: Empire	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: MT

Start to Finish Date: 8/1/2025 - 8/1/2025	Contractor: Aquifer Drilling and Testing	Drill Type: Rotosonic	Sampler Type/Method: 2" Split Spoon
Borehole Depth: 15 feet	Backfill:	Borehole Diameter: 2-inches	DTW:
Area: NM	Elevation: NM	Latitude: NM	Longitude: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
0	MIXD		Brown, fine to coarse SAND, little Silt, fine to coarse Gravel, trace cobble, brick, asphalt (FILL); moist		5	0 0	
5					5	0	Soil sample RXSB-6(6-8) and RXSB-6(6-8)_P collected from 6-8 ft BLS.
	CL-CH		Brown, CLAY, little Silt, moist				Soil sample RXSB-6(8-10) and RXSB-6(8-10)_P collected from 8-10 ft BLS.
10	SP		Brown, fine to coarse SAND, little Silt, fine to coarse Gravel, trace cobble, moist		5	0	
15			Bottom of borehole at 15 feet				

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-7

Client: Empire Boulevard Holdings	Site: Empire	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: MT

Start to Finish Date: 8/1/2025 - 8/1/2025	Contractor: Aquifer Drilling and Testing	Drill Type: Rotosonic	Sampler Type/Method: 2" Split Spoon
Borehole Depth: 15 feet	Backfill:	Borehole Diameter: 2-inches	DTW:
Area: NM	Elevation: NM	Latitude: NM	Longitude: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	MIXD		Brown, fine to coarse SAND, little fine to coarse Gravel, trace silt, cobble, brick (FILL); moist		4	0	Soil sample RXSB-7(3-5) and RXSB-7(3-5)_P collected from 3-5 ft BLS.
5			Brown, CLAY, little Silt, trace fine gravel; moist			0	Soil sample RXSB-7(5-7) and RXSB-7(5-7)_P collected from 5-7 ft BLS.
					3		
10	CL-CH					0	
					3		
15			Bottom of borehole at 15 feet				

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

RXSB-8

Client: Empire Boulevard Holdings	Site: Empire	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: MT

Start to Finish Date: 8/1/2025 - 8/1/2025	Contractor: Aquifer Drilling and Testing	Drill Type: Rotosonic	Sampler Type/Method: 2" Split Spoon
Borehole Depth: 15 feet	Backfill:	Borehole Diameter: 2-inches	DTW:
Area: NM	Elevation: NM	Latitude: NM	Longitude: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
0	MIXD		Brown, fine to coarse SAND, little Silt, trace fine to coarse gravel, cobble, brick, wood (FILL)		5	0	Soil sample RXSB-8(7-9) and RXSB-8(7-9)_P collected from 7-9 ft BLS.
5					4	6	Soil sample RXSB-8(9-11) and RXSB-8(9-11)_P collected from 9-11 ft BLS.
10	CL-CH		Greyish brown, CLAY, little Silt; moist		4	22.4 18.2	
15			Bottom of borehole at 15 feet				

ROUX STANDARD LOG_ - 9/9/25 13:17 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE RI.GPJ

SRI-1

Client: Bridges Development	Site:	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: BW

Start to Finish Date: 10/31/2025 - 10/31/2025	Contractor: Aquifer Drilling & Testing	Drill Type: Rotosonic	Sampler Type/Method: BW
Borehole Depth: 6 feet	Backfill: Soil	Borehole Diameter: 6-inches	DTW:
Area: Brooklyn, NY	Elevation: NM	Latitude: 40.6639294	Longitude: -73.959335

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	MIXD		Brown, fine to coarse SAND, little fine to coarse Gravel, trace silt, cobble, asphalt, tile (FILL); moist.		6	1.0	Soil sample SRI-1 (0-2) collected from 0 to 2 ft bls.
5						0	Soil sample SRI-1 (4-6) collected from 4 to 6 ft bls.

Bottom of borehole at 6 feet

ROUX STANDARD LOG_ - 11/4/25 12:30 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE SRI.GPJ

SRI-10

Client: Bridges Development	Site:	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: BW

Start to Finish Date: 10/30/2025 - 10/30/2025	Contractor: Aquifer Drilling & Testing	Drill Type: Rotosonic	Sampler Type/Method: BW
Borehole Depth: 12 feet	Backfill: Soil	Borehole Diameter: 6-inches	DTW:
Area: Brooklyn, NY	Elevation: NM	Latitude: 40.6639927	Longitude: -73.9591392

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	MIXD		Brown, fine to coarse SAND, little Cobble, fine to coarse Gravel, trace asphalt (FILL); moist.		6	1	Soil sample SRI-10 (0-2) collected from 0 to 2 ft bls.
5							Soil sample SRI-10 (3-5) collected from 3 to 5 ft bls.
	MIXD		Brown, fine to coarse SAND, little Cobble, fine to coarse Gravel, trace silt, asphalt, brick (FILL); moist.		6	9.1	
10							Soil sample SRI-10 (10-12) collected from 10 to 12 ft bls.

Bottom of borehole at 12 feet

ROUX STANDARD LOG_ - 11/4/25 12:30 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE SRI.GPJ

SRI-11

Client: Bridges Development	Site:	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: BW

Start to Finish Date: 10/30/2025 - 10/30/2025	Contractor: Aquifer Drilling & Testing	Drill Type: Rotosonic	Sampler Type/Method: BW
Borehole Depth: 13 feet	Backfill: Soil	Borehole Diameter: 6-inches	DTW:
Area: Brooklyn, NY	Elevation: NM	Latitude: 40.6640886	Longitude: -73.9590049

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
0	MIXD		Brown, fine to coarse SAND, little fine to coarse Gravel, trace cobble, asphalt, brick (FILL); moist.		5	0	Soil sample SRI-11 (0-2) collected from 0 to 2 ft bls.
							Soil sample SRI-11 (2-4) collected from 2 to 4 ft bls.
5			Brown, fine to medium SAND, little Silt, trace fine to coarse gravel, asphalt, brick (FILL); moist.		5	0	
10	MIXD				3	0	Soil sample SRI-11 (11-13) collected from 11 to 13 ft bls.
			Bottom of borehole at 13 feet				

ROUX STANDARD LOG_ - 11/4/25 12:30 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE SRI.GPJ

SRI-12

Client: Bridges Development	Site:	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: BW

Start to Finish Date: 10/30/2025 - 10/30/2025	Contractor: Aquifer Drilling & Testing	Drill Type: Rotosonic	Sampler Type/Method: BW
Borehole Depth: 13 feet	Backfill: Soil	Borehole Diameter: 6-inches	DTW:
Area: Brooklyn, NY	Elevation: NM	Latitude: 40.6639744	Longitude: -73.9588579

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
			Brown, fine to coarse SAND, little Cobble, fine to coarse Gravel, trace asphalt (FILL); moist.		5	0	Soil sample SRI-12 (0-2) collected from 0 to 2 ft bls.
5	MIXD					0	Soil sample SRI-12 (4-6) collected from 4 to 6 ft bls.
					5		Soil sample SRI-12 (7-9) collected from 7 to 9 ft bls.
10			Brown, fine to medium SAND, little Clay, Silt, fine to coarse Gravel, trace coarse sand; moist.			0	
	SP				3		Soil sample SRI-12 (11-13) collected from 11 to 13 ft bls.
			Bottom of borehole at 13 feet				

ROUX STANDARD LOG_ - 11/4/25 12:30 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE SRI.GPJ

SRI-13

Client: Bridges Development	Site:	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: BW

Start to Finish Date: 10/30/2025 - 10/30/2025	Contractor: Aquifer Drilling & Testing	Drill Type: Rotosonic	Sampler Type/Method: BW
Borehole Depth: 13 feet	Backfill: Soil	Borehole Diameter: 6-inches	DTW:
Area: Brooklyn, NY	Elevation: NM	Latitude: 40.6639062	Longitude: -73.9591543

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
			Brown, fine to coarse SAND, little Cobble, fine to coarse Gravel, trace asphalt , brick (FILL); moist.		5	0	Soil sample SRI-13 (0-2) collected from 0 to 2 ft bls.
5	MIXD				5	0	Soil sample SRI-13 (4-6) collected from 4 to 6 ft bls.
10	MIXD		Brown, fine to medium SAND, little Clay, Silt, trace coarse sand, brick (FILL); moist.		3	0	Soil sample SRI-13 (7-9) collected from 7 to 9 ft bls. Soil sample SRI-13 (11-13) collected from 11 to 13 ft bls.
			Bottom of borehole at 13 feet				

ROUX STANDARD LOG_ - 11/4/25 12:30 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE SRI.GPJ

SRI-2

Client: Bridges Development	Site:	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: BW

Start to Finish Date: 10/31/2025 - 10/31/2025	Contractor: Aquifer Drilling & Testing	Drill Type: Rotosonic	Sampler Type/Method: BW
Borehole Depth: 14 feet	Backfill: Soil	Borehole Diameter: 6-inches	DTW:
Area: Brooklyn, NY	Elevation: NM	Latitude: 40.6638928	Longitude: -73.9589709

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	MIXD		Dark brown, fine to coarse SAND, little fine to coarse Gravel, trace cobble, silt, asphalt, brick (FILL); moist.		5	0	Soil sample SRI-2 (0-2) collected from 0 to 2 ft bls.
5	MIXD		Dark brown, fine to coarse SAND, little fine to coarse Gravel, Silt, trace cobble, asphalt, brick (FILL); moist.		5	0	Soil sample SRI-2 (4-6) collected from 4 to 6 ft bls. Soil sample SRI-2 (6-8) collected from 6 to 8 ft bls.
	ASPH		ASPHALT.				
	MIXD		Dark brown, fine to coarse SAND, little fine to coarse Gravel, Silt, trace cobble, asphalt, brick (FILL); moist.				
10	MIXD		Brown, fine to medium SAND, little SIlt, trace fine to coarse gravel, brick (FILL); moist.		4	0	
	MIXD		Brown, fine to coarse SAND, little SIlt, trace fine to coarse gravel, brick (FILL); moist.				Soil sample SRI-2 (12-14) collected from 12 to 14 ft bls.

Bottom of borehole at 14 feet

ROUX STANDARD LOG_ - 11/4/25 12:30 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE SRI.GPJ

SRI-3

Client: Bridges Development	Site:	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: BW

Start to Finish Date: 10/31/2025 - 10/31/2025	Contractor: Aquifer Drilling & Testing	Drill Type: Rotosonic	Sampler Type/Method: BW
Borehole Depth: 5 feet	Backfill: Soil	Borehole Diameter: 6-inches	DTW:
Area: Brooklyn, NY	Elevation: NM	Latitude: 40.663906	Longitude: -73.958885

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
1	MIXD		Dark brown, fine to coarse SAND, little fine to coarse Gravel, Silt, trace asphalt, tile, organics (shell), glass (FILL); moist.		5	0	Soil sample SRI-3 (0-2) collected from 0 to 2 ft bls.
2							
3							
4						0	Soil sample SRI-3 (4-6) collected from 3 to 5 ft bls.

Bottom of borehole at 5 feet

ROUX STANDARD LOG_ - 11/4/25 12:30 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE SRI.GPJ

SRI-4

Client: Bridges Development	Site:	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: BW

Start to Finish Date: 10/31/2025 - 10/31/2025	Contractor: Aquifer Drilling & Testing	Drill Type: Rotosonic	Sampler Type/Method: BW
Borehole Depth: 13 feet	Backfill: Soil	Borehole Diameter: 6-inches	DTW:
Area: Brooklyn, NY	Elevation: NM	Latitude: 40.6636588	Longitude: -73.9594785

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	MIXD		Brown, fine to coarse SAND, line fine to coarse Gravel, trace cobble, brick (FILL); moist.		5	0	Soil sample SRI-4 (0-2) collected from 0 to 2 ft bls.
5							
	MIXD		Brown, fine to coarse SAND, line fine to coarse Gravel, trace brick (FILL); moist.		5	0	Soil sample SRI-4 (4-6) collected from 4 to 6 ft bls.
10					3	0	Soil sample SRI-4 (11-13) collected from 11 to 13 ft bls.

Bottom of borehole at 13 feet

ROUX STANDARD LOG_ - 11/4/25 12:30 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE SRI.GPJ

SRI-5

Client: Bridges Development	Site:	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: BW

Start to Finish Date: 10/31/2025 - 10/31/2025	Contractor: Aquifer Drilling & Testing	Drill Type: Rotosonic	Sampler Type/Method: BW
Borehole Depth: 5 feet	Backfill: Soil	Borehole Diameter: 6-inches	DTW:
Area: Brooklyn, NY	Elevation: NM	Latitude: 40.6635772	Longitude: -73.9592884

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
1	MIXD		Dark brown, fine to coarse SAND, little fine to coarse Gravel, trace cobble, asphalt, brick (FILL); moist.		5	0	Soil sample SRI-5 (0-2) collected from 0 to 2 ft bls.
2							
3							
4							Soil sample SRI-5 (3-5) collected from 3 to 5 ft bls.

Bottom of borehole at 5 feet

ROUX STANDARD LOG_ - 11/4/25 12:30 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE SRI.GPJ

SRI-6

Client: Bridges Development	Site:	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: BW

Start to Finish Date: 10/31/2025 - 10/31/2025	Contractor: Aquifer Drilling & Testing	Drill Type: Rotosonic	Sampler Type/Method: BW
Borehole Depth: 2 feet	Backfill: Soil	Borehole Diameter: 6-inches	DTW:
Area: Brooklyn, NY	Elevation: NM	Latitude: 40.6635888	Longitude: -73.9591271

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
1	MIXD		Dark brown, fine to coarse SAND, little fine to coarse Gravel, trace cobble, brick, asphalt (FILL); moist.		2	0	Soil sample SRI-6 (0-2) collected from 0 to 2 ft bls.

Bottom of borehole at 2 feet

ROUX STANDARD LOG - 11/4/25 12:30 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE SRI.GPJ

SRI-7

Client: Bridges Development	Site:	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: BW

Start to Finish Date: 10/30/2025 - 10/30/2025	Contractor: Aquifer Drilling & Testing	Drill Type: Rotosonic	Sampler Type/Method: BW
Borehole Depth: 13 feet	Backfill: Soil	Borehole Diameter: 6-inches	DTW:
Area: Brooklyn, NY	Elevation: NM	Latitude: 40.6637219	Longitude: -73.958936

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
0	MIXD		Brown, fine to coarse SAND, little fine to coarse Gravel, Silt, trace cobble, asphalt, brick (FILL); moist.		5	0	Soil sample SRI-7 (0-2) collected from 0 to 2 ft bls.
5							Soil sample SRI-7 (2-4) collected from 2 to 4 ft bls.
5	MIXD				5	0	
10	SW		Brown, fine to coarse SAND, little fine to coarse Gravel, Silt, trace cobble; moist.		3	0	Soil sample SRI-7 (11-13) collected from 11 to 13 ft bls.

Bottom of borehole at 13 feet

ROUX STANDARD LOG_ - 11/4/25 12:30 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE SRI.GPJ

SRI-8

Client: Bridges Development	Site:	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: BW

Start to Finish Date: 10/30/2025 - 10/30/2025	Contractor: Aquifer Drilling & Testing	Drill Type: Rotosonic	Sampler Type/Method: BW
Borehole Depth: 5 feet	Backfill: Soil	Borehole Diameter: 6-inches	DTW:
Area: Brooklyn, NY	Elevation: NM	Latitude: 40.6635932	Longitude: -73.9589779

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
0	MIXD		Brown, fine to coarse SAND, little fine to coarse Gravel, Cobble, Brick (FILL); moist.		5	0	Soil sample SRI-8 (0-2) collected from 0 to 2 ft bls.
1							
2							
3							
4							Soil sample SRI-8 (3-5) collected from 3 to 5 ft bls.
5			Bottom of borehole at 5 feet				

ROUX STANDARD LOG_ - 11/4/25 12:30 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE SRI.GPJ

SRI-9

Client: Bridges Development	Site:	Project Number: 2861.0003Y000
Address: 73-99 Empire Blvd	City/State: Brooklyn, NY	Logged By: BW

Start to Finish Date: 10/30/2025 - 10/30/2025	Contractor: Aquifer Drilling & Testing	Drill Type: Rotosonic	Sampler Type/Method: BW
Borehole Depth: 5 feet	Backfill: Soil	Borehole Diameter: 6-inches	DTW:
Area: Brooklyn, NY	Elevation: NM	Latitude: 40.6636763	Longitude: -73.9588388

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
1	MIXD		Brown, fine to coarse SAND, little fine to coarse Gravel, Cobble, trace brick (FILL); moist.		5	0	Soil sample SRI-9 (0-2) collected from 0 to 2 ft bls.
2							
3							
4						0	Soil sample SRI-9 (3-5) collected from 3 to 5 ft bls.

Bottom of borehole at 5 feet

ROUX STANDARD LOG_ - 11/4/25 12:30 - S:\GINT\PROJECTS\2861.0003Y000 - EMPIRE SRI.GPJ

APPENDIX E

Purge Logs

Soil Vapor Sampling Form
Location: 73-99 Empire Blvd, Brooklyn NY

Date: 03/13/23 **Time:** 09:39
Weather : Rain Shower
Temperature (Start/End): 39°-43° F Humidity (Start/End): 94 %
Wind Magnitude (Sart/End): 7 mph Wind Direction (Start/End): ENE
Barometric Pressure (Start/End): 29.94" Precipitation (Start/End) 95 %

Sampling Team: LF / BH
Sampling Location: 73-99 Empire Blvd
Site Condition (i.e. any adjacent questionable facilities, vent pipes, tanks, etc. and what type of basements are present)
Inside of laundromat, all utilities above ground

Prior to commencing the GeoProbe activity, ensure that all the rods were properly deconed and a new disposable tip is present at the end of the rods (if applicable).

Calibrate helium detection meter

Utility Clearance Completed:
Sampling Depth: 4.5" feet below land surface
Sealed at land surface/rod end:
Purge Rate: 200 Must be less than 0.2 L/min
Purge Time: 2 min note : Assuming 0.17" I.D. tubing purge 15 sec. for every 10 ft of tubin
Helium Rate at enclosure: 3150
Helium Rate from sample tubing: 0 Is this rate <20% of the rate at the enclosure (Y) / N

If the Helium readings have a greater ratio than 20% the seals should be rechecked and the tracer gas should be reapplied.

Once the tracer gas screening procedures are completed and no short-circuiting is determined to be present at the location the soil vapor sample can be collected in a lab certified clean summa canister at a rate less than 0.2 L/min.

Finishing pressure should be within 0.5 - 4 in of Hg

Is the Summa Canister Certified Clean and within the proper holding time ? (Y) / N

Starting Pressure: 09:42 in. of Hg
Starting Time: -29.80 **Date:** 03/13/23
Ending Time: 17:11 **Date:** 03/13/23
Ending Pressure: -13.86 in. of Hg

Summa Canister Identification #: 2553 Start 09:42
Flow Regulator ID # 01929 End 17:11
Sample ID # RXSV-6 **Time**
Analysis TO-15
Laboratory Alpha

RXSV-5

Soil Vapor Sampling Form
Location: 73-99 Empire Blvd, Brooklyn NY

Date: 03/13/23 **Time:** 09:30
Weather : Rain Shower
Temperature (Start/End): 39° - 43° F Humidity (Start/End): 94 %
Wind Magnitude (Sart/End): 7 mph Wind Direction (Start/End): ENE
Barometric Pressure (Start/End): 29.94" Precipitation (Start/End) 95%

Sampling Team: LF / BH
Sampling Location: 73-99 Empire Blvd
Site Condition (i.e. any adjacent questionable facilities, vent pipes, tanks, etc. and what type of basements are present)
Inside of laundromat, all utilities above ground

Prior to commencing the GeoProbe activity, ensure that all the rods were properly deconed and a new disposable tip is present at the end of the rods (if applicable).

Calibrate helium detection meter

Utility Clearance Completed:
Sampling Depth: 4.5" feet below land surface
Sealed at land surface/rod end:
Purge Rate: 200 Must be less than 0.2 L/min
Purge Time: 2 min note : Assuming 0.17" I.D. tubing purge 15 sec. for every 10 ft of tubin
Helium Rate at enclosure: 4625
Helium Rate from sample tubing: 0 Is this rate <20% of the rate at the enclosure (Y) / N

If the Helium readings have a greater ratio than 20% the seals should be rechecked and the tracer gas should be reapplied.

Once the tracer gas screening procedures are completed and no short-circuiting is determined to be present at the location the soil vapor sample can be collected in a lab certified clean summa canister at a rate less than 0.2 L/min.

Finishing pressure should be within 0.5 - 4 in of Hg

Is the Summa Canister Certified Clean and within the proper holding time ? (Y) / N

Starting Pressure: -30.31 in. of Hg
Starting Time: 09:34 **Date:** 3/13/23
Ending Time: 17:09 **Date:** 3/13/23
Ending Pressure: -4.77 in. of Hg

Summa Canister Identification #: 2349
Flow Regulator ID # 0874
Sample ID # RXSV-5 **Time**
Analysis TO-15
Laboratory Alpha

start: 09:34
End : 17:09

Soil Vapor Sampling Form

Date: 8/4/2025 **Time:** 09:25

Weather : Sunny

Temperature: 85° F Humidity: 38%

Wind Magnitude: 2 mph Wind Direction: NNW

Barometric Pressure: 30.13" Hg Precipitation: N/A

Sampling Team: MT/KM

Sampling Location: 73-99 Empire BLVD, NY, NY

Site Condition (i.e. any adjacent questionable facilities, vent pipes, tanks, etc. and what type of basements are present)

Demolition site

Prior to commencing the sampling activity, remove the brass cap from the end of the sample tubing and fit a new brass hose barb fitting onto the sample tubing.

Calibrate the Helium detection meter

Utility Clearance Completed: Yes.

Sampling Depth: 5 ft. feet below land surface (If ambient air sample, elevate can to approx. 3 ft - 5 ft above land surface)

Sealed with bentonite: Yes.

Apparent Moisture Content: N/A

Purge Rate: 200 Must be less than 0.2 L/min (200 mL/min)

Purge Time: 5 min

Helium Rate at enclosure: 9110 ppm

Helium Rate from sample tubing: 0 ppm Is this rate <10% of the rate at the enclosure **Yes / No**

If the Helium readings have a greater ratio than 10% the seals should be rechecked and the tracer gas should be reapplied.

vapor sample can be collected in a lab certified clean summa canister at a rate less than 0.2 L/min.

Is the Summa Canister Certified Clean and within the proper holding time ? Yes

Starting Pressure: -29.45 in. of Hg

Starting Time: 11:35

Ending Time: 13:13

Ending Pressure: -4.85 in. of Hg

Summa Canister Identification #: 2726

Flow Regulator ID # 02346

Sample ID # RXSV-1

Time 98 minutes

Analysis TO-15

Laboratory Alpha / Pace

ROUX

Soil Vapor Sampling Form

Date: 8/4/2025 **Time:** 10:00

Weather : Sunny

Temperature: 85° F Humidity: 38%

Wind Magnitude: 2 mph Wind Direction: NNW

Barometric Pressure: 30.13" Hg Precipitation: N/A

Sampling Team: MT/KM

Sampling Location: 73-99 Empire BLVD, NY, NY

Site Condition (i.e. any adjacent questionable facilities, vent pipes, tanks, etc. and what type of basements are present)

Demolition site

Prior to commencing the sampling activity, remove the brass cap from the end of the sample tubing and fit a new brass hose barb fitting onto the sample tubing.

Calibrate the Helium detection meter

Utility Clearance Completed: Yes.

Sampling Depth: 5 ft. feet below land surface (If ambient air sample, elevate can to approx. 3 ft - 5 ft above land surface)

Sealed with bentonite: Yes.

Apparent Moisture Content: N/A

Purge Rate: 200 Must be less than 0.2 L/min (200 mL/min)

Purge Time: 5 min

Helium Rate at enclosure: 8725 ppm

Helium Rate from sample tubing: 0 ppm Is this rate <10% of the rate at the enclosure **Yes / No**

If the Helium readings have a greater ratio than 10% the seals should be rechecked and the tracer gas should be reapplied.

vapor sample can be collected in a lab certified clean summa canister at a rate less than 0.2 L/min.

Is the Summa Canister Certified Clean and within the proper holding time ? Yes

Starting Pressure: -23.22 in. of Hg

Starting Time: 10:08

Ending Time: 11:43

Ending Pressure: -6.40 in. of Hg

Summa Canister Identification #: 3708

Flow Regulator ID # 02722

Sample ID # RXSV-2

Time 95 minutes

Analysis TO-15

Laboratory Alpha / Pace

ROUX

Soil Vapor Sampling Form

Date: 8/4/2025 **Time:** 9:00

Weather : Sunny

Temperature: 85° F Humidity: 38%

Wind Magnitude: 2 mph Wind Direction: NNW

Barometric Pressure: 30.13" Hg Precipitation: N/A

Sampling Team: MT/KM

Sampling Location: 73-99 Empire BLVD, NY, NY

Site Condition (i.e. any adjacent questionable facilities, vent pipes, tanks, etc. and what type of basements are present)

Demolition site

Prior to commencing the sampling activity, remove the brass cap from the end of the sample tubing and fit a new brass hose barb fitting onto the sample tubing.

Calibrate the Helium detection meter

Utility Clearance Completed: Yes.

Sampling Depth: 5 ft. feet below land surface (If ambient air sample, elevate can to approx. 3 ft - 5 ft above land surface)

Sealed with bentonite: Yes.

Apparent Moisture Content: N/A

Purge Rate: 200 Must be less than 0.2 L/min (200 mL/min)

Purge Time: 5 min

Helium Rate at enclosure: 10375 ppm

Helium Rate from sample tubing: 0 ppm Is this rate <10% of the rate at the enclosure **Yes / No**

If the Helium readings have a greater ratio than 10% the seals should be rechecked and the tracer gas should be reapplied.

vapor sample can be collected in a lab certified clean summa canister at a rate less than 0.2 L/min.

Is the Summa Canister Certified Clean and within the proper holding time ? Yes

Starting Pressure: -30.64 in. of Hg

Starting Time: 9:08

Ending Time: 11:05

Ending Pressure: -6.20 in. of Hg

Summa Canister Identification #: 4365

Flow Regulator ID # 01171

Sample ID # RXSV-3

Time 117 minutes

Analysis TO-15

Laboratory Alpha / Pace

ROUX

Soil Vapor Sampling Form

Date: 8/4/2025 **Time:** 9:00

Weather : Sunny

Temperature: 85° F Humidity: 38%

Wind Magnitude: 2 mph Wind Direction: NNW

Barometric Pressure: 30.13" Hg Precipitation: N/A

Sampling Team: MT/KM

Sampling Location: 73-99 Empire BLVD, NY, NY

Site Condition (i.e. any adjacent questionable facilities, vent pipes, tanks, etc. and what type of basements are present)

Demolition site

Prior to commencing the sampling activity, remove the brass cap from the end of the sample tubing and fit a new brass hose barb fitting onto the sample tubing.

Calibrate the Helium detection meter

Utility Clearance Completed: Yes.

Sampling Depth: 5 ft. feet below land surface (If ambient air sample, elevate can to approx. 3 ft - 5 ft above land surface)

Sealed with bentonite: Yes.

Apparent Moisture Content: N/A

Purge Rate: 200 Must be less than 0.2 L/min (200 mL/min)

Purge Time: 5 min

Helium Rate at enclosure: 10375 ppm

Helium Rate from sample tubing: 0 ppm Is this rate <10% of the rate at the enclosure **Yes / No**

If the Helium readings have a greater ratio than 10% the seals should be rechecked and the tracer gas should be reapplied.

vapor sample can be collected in a lab certified clean summa canister at a rate less than 0.2 L/min.

Is the Summa Canister Certified Clean and within the proper holding time ? Yes

Starting Pressure: -31.11 in. of Hg

Starting Time: 11:13

Ending Time: 13:52

Ending Pressure: -2.55 in. of Hg

Summa Canister Identification #: 3216

Flow Regulator ID # 01171

Sample ID # DUP_080425

Time 159 minutes

Analysis TO-15

Laboratory Alpha / Pace

ROUX

Soil Vapor Sampling Form

Date: 8/4/2025 **Time:** 10:15

Weather : Sunny

Temperature: 85° F Humidity: 38%

Wind Magnitude: 2 mph Wind Direction: NNW

Barometric Pressure: 30.13" Hg Precipitation: N/A

Sampling Team: MT/KM

Sampling Location: 73-99 Empire BLVD, NY, NY

Site Condition (i.e. any adjacent questionable facilities, vent pipes, tanks, etc. and what type of basements are present)

Demolition site

Prior to commencing the sampling activity, remove the brass cap from the end of the sample tubing and fit a new brass hose barb fitting onto the sample tubing.

Calibrate the Helium detection meter

Utility Clearance Completed: Yes.

Sampling Depth: 5 ft. feet below land surface (If ambient air sample, elevate can to approx. 3 ft - 5 ft above land surface)

Sealed with bentonite: Yes.

Apparent Moisture Content: N/A

Purge Rate: 200 Must be less than 0.2 L/min (200 mL/min)

Purge Time: 5 min

Helium Rate at enclosure: 9225 ppm

Helium Rate from sample tubing: 0 ppm Is this rate <10% of the rate at the enclosure **Yes / No**

If the Helium readings have a greater ratio than 10% the seals should be rechecked and the tracer gas should be reapplied.

vapor sample can be collected in a lab certified clean summa canister at a rate less than 0.2 L/min.

Is the Summa Canister Certified Clean and within the proper holding time ? Yes

Starting Pressure: -30.02 in. of Hg

Starting Time: 10:17

Ending Time: 12:05

Ending Pressure: -5.75 in. of Hg

Summa Canister Identification #: 3938

Flow Regulator ID # 02346

Sample ID # RXSV-4

Time 108 minutes

Analysis TO-15

Laboratory Alpha / Pace

ROUX

Well Sampling Data Form

Client: Bridges Development **Project Number:**

Site Location: 73-99 Empire BLVD

Well No: MW-1 Weather: NA

Date: 8/5/2025 Purge Water Disposal: 55-gal drum

Sampled By: MT/KM Well Diameter / Type: 2"

Depth of Well (ft): 105.10 Water Column (ft): 43.90

Depth to Water(ft): 61.20 Volume of Water in Well (gal) 7.16

Depth to Product (ft): ND

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 10:20:00 AM Purge Rate (ml/min): 200

End Purging: 13:00:00 PM

Method of Purge: Bladder Method of Sampling: Low Flow

Physical Appearance/ Comments: Clear, no odor.

Samples Collected: (analyses / no. bottles) TCL/TAL+30TICs, VOC, Ecs

Time: Regular- 11:00 PFAS- 11:05 Laboratory : Pace

Field Measurements:

Time	DTW ft	Flow Rate ml/min	ORP mV (+/- 10 mV)	Conductivity mS/m - S/m (w/in 3%)	Turbidity NTU (w/in %10)	pH SU (+/- 0.1)	Temperature C° - F° (w/in 3%)	Dissolved O_2 mg/L (w/in 10%)
10:25	61.21	200	125	0.729	0.0	7.41	23.24	5.13
10:30	61.21	200	124	0.779	0.0	7.59	23.01	4.98
10:35	61.22	200	126	0.772	2.0	7.64	23.51	4.39
10:40	61.22	200	129	0.728	2.1	7.61	23.15	4.14
10:45	61.23	200	127	0.761	3.1	7.71	22.81	4.09
10:50	61.23	200	129	0.698	4.0	7.75	22.71	4.00
10:55	61.23	200	130	0.695	3.9	7.77	22.65	3.97

ROUX

Well Sampling Data Form

Client: Bridges Development **Project Number:**

Site Location: 73-99 Empire BLVD

Well No: MW-2 Weather: NA

Date: 8/4/2025 Purge Water Disposal: 55-gal drum

Sampled By: MT/KM Well Diameter / Type: 2"

Depth of Well (ft): 97.18 Water Column (ft): 35.97

Depth to Water(ft): 61.21 Volume of Water in Well (gal) 5.87

Depth to Product (ft): ND

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 8:20:00 AM Purge Rate (ml/min): 200

End Purging: 13:00:00 PM

Method of Purge: Bladder Method of Sampling: Low Flow

Physical Appearance/ Comments: Clear, no odor.

Samples Collected: (analyses / no. bottles) TCL/TAL+30TICs, VOC, Ecs

MS/MSD

Time: Regular- 09:20 PFAS- 09:25 Laboratory : Pace

Field Measurements:

Time	DTW ft	Flow Rate ml/min	ORP mV (+/- 10 mV)	Conductivity mS/m - S/m (w/in 3%)	Turbidity NTU (w/in %10)	pH SU (+/- 0.1)	Temperature C° - F° (w/in 3%)	Dissolved O_2 mg/L (w/in 10%)
8:45	61.25	200	95	0.000	236.0	6.67	26.31	7.16
8:50	61.25	200	101	0.000	247.0	7.06	26.38	6.98
8:55	61.25	200	108	0.000	193.0	7.02	26.34	6.78
9:00	61.25	200	112	0.000	102.0	6.64	26.35	6.67
9:05	61.25	200	114	0.000	62.3	6.31	26.87	6.52
9:10	61.25	200	113	0.000	50.1	6.23	26.77	6.37
9:15	61.25	200	115	0.000	49.8	6.1	26.9	6.26

ROUX

Well Sampling Data Form

Client: Bridges Development **Project Number:**

Site Location: 73-99 Empire BLVD

Well No: MW-3 Weather: NA

Date: 8/5/2025 Purge Water Disposal: 55-gal drum

Sampled By: MT/KM Well Diameter / Type: 2"

Depth of Well (ft): 95.23 Water Column (ft): 33.93

Depth to Water(ft): 61.30 Volume of Water in Well (gal) 5.54

Depth to Product (ft): ND

well diameter:	1 in	2 in	4 in	6 in	8 in
gallons per foot:	0.041	0.163	0.653	1.469	2.611

Start Purging: 7:30:00 AM Purge Rate (ml/min): 200

End Purging: 10:10:00 PM

Method of Purge: Bladder Method of Sampling: Low Flow

Physical Appearance/ Comments: Clear, no odor.

Samples Collected: (analyses / no. bottles) TCL/TAL+30TICs, VOC, Ecs

DUP

Time: Regular- 08:10 PFAS- 08:15 Laboratory : Pace

Field Measurements: Dup:12:00 PFAS Sup:12:05

Time	DTW ft	Flow Rate ml/min	ORP mV (+/- 10 mV)	Conductivity mS/m - S/m (w/in 3%)	Turbidity NTU (w/in %10)	pH SU (+/- 0.1)	Temperature C° - F° (w/in 3%)	Dissolved O_2 mg/L (w/in 10%)
7:35	61.32	200	111	1.010	18.8	7.66	22.62	4.98
7:40	61.32	200	111	1.030	17.3	7.53	22.42	4.04
7:45	61.33	200	18	0.980	16.2	7.52	21.98	3.99
7:50	61.34	200	-64	0.975	21.1	7.58	21.49	3.99
7:55	61.34	200	-61	0.000	20.0	7.49	22.01	2.99
8:00	61.34	200	-60	0.000	19.1	7.43	22.14	2.93
8:05	61.34	200	-57	0.982	19.8	7.44	22.15	2.87

ROUX

APPENDIX F

Laboratory Reports (submitted under separate cover)

APPENDIX G

NYSDEC Fact Sheet

APPENDIX H

Citizens Participation Plan

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan
for
73-99 Empire Boulevard

Revised May 2022

Site # C224343
73-99 Empire Boulevard
Brooklyn, NY 11225

Contents

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* * * * *

Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the site's investigation and cleanup process.

Applicant: **Empire Boulevard Holdings LLC ("Applicant")**
Site Name: **73-99 Empire Boulevard ("Site")**
Site Address: **73-99 Empire Boulevard, Brooklyn, NY 11225**
Site County: **New York**
Site Number: **C224343**

1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) that oversees Applicants who conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at:
http://www.dec.ny.gov/chemical/8450.html .

2. Citizen Participation Activities

Why NYSDEC Involves the Public and Why It Is Important

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well-being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision-makers form or adopt final positions.

Involving citizens affected and interested in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment
- Improving public access to, and understanding of, issues and information related

to a particular site and that site's investigation and cleanup process

- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process
- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community
- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision-making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Project Contacts

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

Locations of Reports and Information

The locations of the reports and information related to the site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC website. If this occurs, NYSDEC will inform the public in fact sheets distributed about the site and by other means, as appropriate.

Site Contact List

Appendix B contains the site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.

The site contact list includes, at a minimum:

- Chief executive officer and planning board chairperson of each county, city, town, and village in which the site is located;

- Residents, owners, and occupants of the site and properties adjacent to the site;
- The public water supplier which services the area in which the site is located;
- Any person who has requested to be placed on the site contact list;
- The administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility; and
- Location(s) of reports and information.

The site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

Note: The first site fact sheet (usually related to the draft Remedial Investigation Work Plan) is distributed both by paper mailing through the postal service and through DEC Delivers, its email listserv service. The fact sheet includes instructions for signing up with the appropriate county listserv to receive future notifications about the site. See http://www.dec.ny.gov/chemical/61092.html .

Subsequent fact sheets about the site will be distributed exclusively through the listserv, except for households without internet access that have indicated the need to continue to receive site information in paper form. Please advise the NYSDEC site project manager identified in Appendix A if that is the case. Paper mailings may continue during the investigation and cleanup process for some sites, based on public interest and need.

CP Activities

The table at the end of this section identifies the CP activities that, at a minimum, have been and will be conducted during the site's investigation and cleanup program. The flowchart in Appendix D shows how these CP activities integrate with the site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.
- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.

Technical Assistance Grant

NYSDEC must determine if the site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the site, as described in Section 5.

If the site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/ implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the site.

As of the date the declaration (page 2) was signed by the NYSDEC project manager the significant threat determination for the site had not yet been made.

To verify the significant threat status of the site, the interested public may contact the NYSDEC project manager identified in Appendix A.

For more information about TAGs, go online at
http://www.dec.ny.gov/regulations/2590.html

The table identifying the citizen participation activities related to the site's investigation and cleanup program appears below:

Citizen Participation Activities	Timing of CP Activity(ies)
Application Process:	
• Prepare site contact list • Establish document repository(ies)	At time of preparation of application to participate in the BCP.
• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to site contact list • Conduct 30-day public comment period	When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement (BCA):	
• Prepare Citizen Participation (CP) Plan	Before start of Remedial Investigation **Note:** Applicant must submit CP Plan to NYSDEC for review and approval within 20 days of the effective date of the BCA.
Before NYSDEC Approves Remedial Investigation (RI) Work Plan:	
• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined, and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
After Applicant Completes Remedial Investigation:	
• Distribute fact sheet to site contact list that describes RI results	Before NYSDEC approves RI Report
Before NYSDEC Approves Remedial Work Plan (RWP):	
• Distribute fact sheet to site contact list about draft RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty-five-day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.
Before Applicant Starts Cleanup Action:	
• Distribute fact sheet to site contact list that describes upcoming cleanup action	Before the start of cleanup action.
After Applicant Completes Cleanup Action:	
• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that NYSDEC is reviewing the Final Engineering Report • Distribute fact sheet to site contact list announcing NYSDEC approval of Final Engineering Report and issuance of Certificate of Completion (COC)	At the time, the cleanup action has been completed. **Note:** The two fact sheets are combined when possible if there is not a delay in issuing the COC.

3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the site. Additional major issues of public concern may be identified during the course of the site's investigation and cleanup process.

No major issues of public concern have been identified relative to the Site. However, some remediation and construction projects involve public concerns regarding dust, hazardous materials, and noise, particularly where, as here, there are residential buildings and a school playground nearby. Truck-related traffic may also be a concern.

The site is located in an Environmental Justice Area. Environmental justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Environmental justice efforts focus on improving the environment in communities, specifically minority and low-income communities, and addressing disproportionate adverse environmental impacts that may exist in those communities.

The site is located in an area with a sizable African-American population nearby. Therefore, no need to translate future fact sheets into another language.

For additional information, visit:
https://statisticalatlas.com/tract/New-York/Kings-County/032700/Overview

To protect public health and safety during investigation, remediation, and development activities at the Site, a Health and Safety Plan (HASP) and a Community Air Monitoring Plan (CAMP) will be included in the Remedial Action Work Plan (RAWP) that will be approved by NYSDEC and made available to the public. The procedures set forth in the HASP and CAMP will include:

- Securing the work perimeter with fencing during remediation/construction;
- On-site air monitoring for worker protection, if warranted;
- Perimeter air monitoring for community protection, if warranted; and
- Using odor, vapor, and dust controls such as water or foam sprays, as needed.

4. Site Information

Appendix C contains a map identifying the location of the site.

Site Description
The site is located in an urban area with a mix of commercial and residential buildings. The property is identified with the following addresses: 73 to 99 Empire Boulevard, 95 to

103 McKeever Place, and 46 to 62 Sullivan Place in Brooklyn, Kings County, New York (the site). The site is identified as Block 1306, Lot 28 on the Tax Map of Kings County. The site formerly consisted of three tax lots identified as Block 1306, Lots 28, 32, and 35. The site is located on the northern side of Empire Boulevard, the southern side of Sullivan Place, and the eastern side of McKeever Place. The approximate site area is 40,000 square feet (0.86 acres).

The site is improved with two, one-story commercial buildings with partial cellars. The larger building (29,000 square feet) is vacant, and the smaller building (8,000 square feet) is occupied by a laundromat. The site buildings encompass approximately 37,000 square feet. The site buildings are constructed of concrete block and brick with a concrete, brick, and metal-lined window façade. Exterior areas include concrete-paved sidewalks and asphalt paved parking areas.

A portion of the site is currently active. Based on a review of the New York City Department of City Planning Zoning and Land Use (ZoLa) mapping program, the site is zoned C8-2, R6, and C1-3.

The C8 (commercial) zoning is described as areas bridging commercial and manufacturing uses and provide for automotive and other heavy commercial services that often require large amounts of land. R6 (residential) zoning is described as mid-rise, eight- to ten-story buildings to much taller buildings set back from the street on large zoning lots. The C1 (commercial) zoning is described as commercial overlays that serve local retail needs within residential districts. The neighboring properties are currently used for a combination of commercial and residential uses.

The site is undergoing a rezoning process whereby the applicant intends to change the zoning from C8-2 (commercial), R6 (residential), and C1-3 (commercial) to c4-4D with an R8A residential equivalent prior to redevelopment.

History of Site Use, Investigation, and Cleanup

According to a Draft *Phase I Environmental Site Assessment (ESA)* prepared by VERTEX, dated December 23, 2021 (copy attached), the building on Lot 28 was constructed in 1925 and was initially occupied by Mack Truck Auto Service. The operations included the use of a gasoline tank, located on the southern portion of the property and a forge, located on the northeastern portion of the property. Mack Truck Auto Service operated at former Lot 28 until the late 1930s. Former Lot 28 was occupied by a garage in the mid-1940s and then occupied by an auto, truck and equipment manufacturer and auto parts and service station from the early 1950s through the early 2000s. A laundromat/laundry occupied the building from the early 2000s through 2014. The building has remained vacant since 2014.

Former Lot 32 was developed with a store and an apartment prior to 1932. The structures were demolished sometime between 1932 and 1951. The parcel has

remained an undeveloped/paved parking lot through present day.

The building on former Lot 35 was constructed in 1930 and was originally occupied by the parts department of Mack Truck Auto Service. From the late 1930s to the early 1960s, the building was occupied by Tire Sales & Service. From the early 1960s to the late 1980s, the building was occupied by an auto and truck manufacturer. From the late 1980s through the early 1990s, the site was listed as Family Services. The building was vacant from 1994 through 2014. World Laundry has occupied the building on former Lot 35 since 2014.

5. Investigation and Cleanup Process

Application

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a Volunteer. This means that the Applicant was not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of contaminants. The Volunteer must fully characterize the nature and extent of contamination on-site, and must conduct a "qualitative exposure assessment," a process that characterizes the actual or potential exposures of people, fish, and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicant in its Application proposes that the site will be used for restricted purposes.

To achieve this goal, the Applicant will conduct investigation activities at the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

Investigation

The Applicant will conduct an investigation of the site officially called a "remedial investigation" (RI). This investigation will be performed with NYSDEC oversight. The Applicant developed a remedial investigation workplan, which was subjected to public comment.

The site investigation has several goals:

1) Define the nature and extent of contamination in soil, surface water, groundwater and any other parts of the environment that may be affected;
2) Identify the source(s) of the contamination;
3) Assess the impact of the contamination on public health and the environment; and
4) Provide information to support the development of a proposed remedy to address the contamination or the determination that cleanup is not necessary.

The Applicant will submit a "Remedial Investigation Work Plan" to NYSDEC for review by May 15, 2022.

When the investigation is complete, the Applicant will prepare and submit a report that summarizes the results. This report also will recommend whether cleanup action is needed to address site-related contamination. The investigation report is subject to review and approval by NYSDEC.

NYSDEC will use the information in the investigation report to determine if the site poses a significant threat to public health or the environment. If the site is a "significant threat," it must be cleaned up using a remedy selected by NYSDEC from an analysis of alternatives prepared by the Applicant and approved by NYSDEC. If the site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

Interim Remedial Measures

An Interim Remedial Measure (IRM) is an action that can be undertaken at a site when a source of contamination or exposure pathway can be effectively addressed before the site investigation and analysis of alternatives are completed. If an IRM is likely to represent all or a significant part of the final remedy, NYSDEC will require a 30-day public comment period.

Remedy Selection

When the investigation of the site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the site. In this case, NYSDEC would make the investigation report available for public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a "Certificate of Completion" (described below) to the Applicant.

or

2. The Applicant may recommend in its investigation report that action needs to be taken to address site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a "Remedial Work Plan." The Remedial Work Plan describes the Applicant's proposed remedy for addressing contamination related to the site.

When the Applicant submits a draft Remedial Work Plan for approval, NYSDEC would announce the availability of the draft plan for public review during a 45-day public comment period.

Cleanup Action

NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy. The selected remedy is formalized in the site Decision Document.

The Applicant may then design and perform the cleanup action to address the site contamination. NYSDEC and NYSDOH oversee the activities. When the Applicant completes cleanup activities, it will prepare a Final Engineering Report (FER) that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the site.

Certificate of Completion

When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the site, it will approve the FER. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved and relieves the Applicant from future liability for site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the site after it receives a COC.

Site Management

The purpose of site management is to ensure the safe reuse of the property if contamination will remain in place. Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An *institutional control* is a non-physical restriction on use of the site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the site suitable for some, but not all uses.

An *engineering control* is a physical barrier or method to manage contamination. Examples include caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that pumps and treats groundwater. Site management continues until NYSDEC determines that it is no longer needed.

Appendix A -
Project Contacts and Locations of Reports and Information

Project Contacts

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

Madeleine Babick
Project Manager
NYSDEC
Long Island City
Office- One Hunters
Point Plaza
47-40 21st Street
Long Island City, NY 11101
Phone: (718) 482-4992
Email: madeleine.babick@dec.ny.gov

Thomas Panzone
Public Participation Specialist
NYSDEC Region 2
47-40 21st Street
Long Island City, NY 11101
Phone: (718) 482-4953
Email: Thomas.panzone@dec.ny.gov

New York State Department of Health (NYSDOH):

Christine Vooris
Director
NYSDOH
Bureau of Environmental Exposure Investigation
Empire State Plaza Corning Tower, Room 1787
Albany, New York 12237
Phone: (518) 402-7860
Email: BEEI@health.ny.gov

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

Brooklyn Public Library-
Crown Heights Branch
560 New York Avenue
Brooklyn, NY 11225
Phone: (718) 773-1180

Hours of Operation:

Monday: 10AM-6PM

Tuesday: 1PM-8PM

Wednesday: 10AM-6PM

Thursday: 10AM-8PM

Friday: 10AM-6PM

Saturday: 10AM-5PM

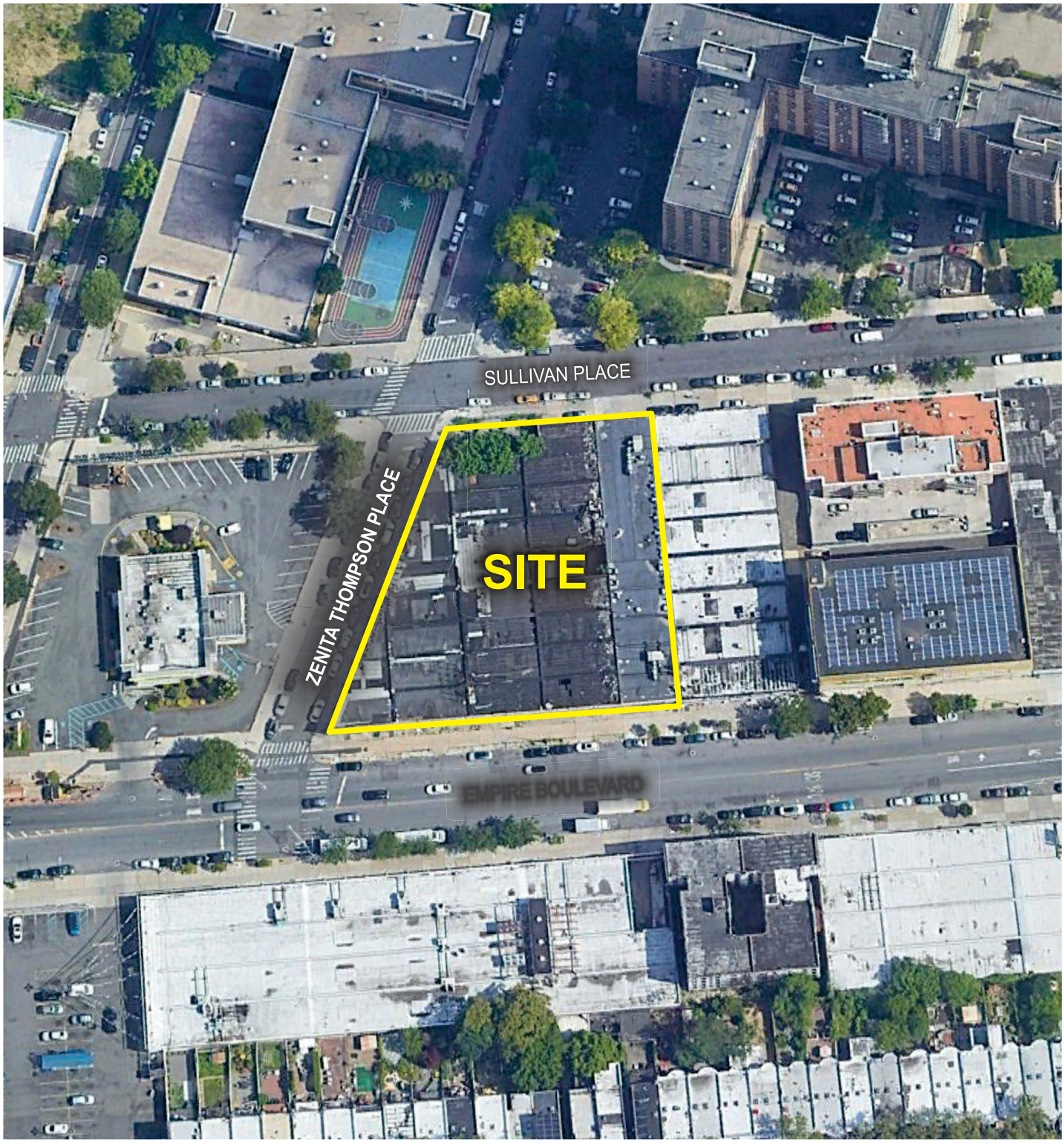
Sunday: CLOSED

Brooklyn Community Board 9
890 Nostrand Avenue
Brooklyn, NY 11225
Phone: (718) 778-9279
Email: bk09-1@cb.nyc.gov
Dante B. Arnwine – District Manager
Fred P. Baptiste - Environmental Committee Chairperson

Appendix B - Site Contact List

	A	B	C	D	E	F	G	H	I	J
1										
2	Site Contact List									
3	Site #: C224343		Site Address: 73-99 Empire Boulevard							
4	Site Name: 73-99 Empire Boulevard Site			List Last Updated: 4-29-22						
5		Name, Title	Address 1	Address 2	Address 3	Street Address	City	State	Zip	Site Name (County)
6	**Local Government Officials**	Hon. Eric Adams	NYC Mayor			City Hall	New York	NY	10007	73-99 Empire Boulevard Site (Kings)
7		Hon. Brad Lander	NYC Comptroller			1 Centre Street	New York	NY	10007	73-99 Empire Boulevard Site (Kings)
8		Hon. Jumaane Williams	Public Advocate			1 Centre Street	New York	NY	10007	73-99 Empire Boulevard Site (Kings)
9		Mark McIntyre, Acting Director/General Counsel	NYC Office of Environmental Remediation			100 Gold Street - 2nd Floor	New York	NY	10038	73-99 Empire Boulevard Site (Kings)
10		Hon. Antonio Reynoso	Brooklyn Borough President			209 Joralemon Street	Brooklyn	NY	11201	73-99 Empire Boulevard Site (Kings)
11		Hon. Yvette D. Clarke	U.S. House of Representatives			222 Lenox Road, Suites 1 & 2	Brooklyn	NY	11226	73-99 Empire Boulevard Site (Kings)
12		Hon. Crystal Hudson	NYC Councilmember			55 Hanson Place, Suite 778	Brooklyn	NY	11217	73-99 Empire Boulevard Site (Kings)
13		Hon. Phara Souffrant	NYS Assemblymember			55 Hanson Place	Brooklyn	NY	11217	73-99 Empire Boulevard Site (Kings)
14		Hon. Zellnor Myrie	NYS Senator			1077 Nostrand Avenue	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
15		Hon Charles Schumer	U.S. Senator			780 Third Avenue, Suite 2301	New York	NY	10017	73-99 Empire Boulevard Site (Kings)
16		Hon. Kirsten Gillibrand	U.S. Senator			780 Third Avenue, Suite 2601	New York	NY	10017	73-99 Empire Boulevard Site (Kings)
17		Madeleine Babick	NYSDEC Project Manager			47-40 21st Street	Long Island City	NY	11101	73-99 Empire Boulevard Site (Kings)
18		Thomas V. Panzone	NYSDEC Public Participation Specialist			47-40 21st Street	Long Island City	NY	11101	73-99 Empire Boulevard Site (Kings)
19		Christine Vooris	NYSDOH Director	Bureau of Environmental Exposure Investigation	Empire State Plaza	Corning Tower, Room 1787	Albany	NY	12237	73-99 Empire Boulevard Site (Kings)
20	**County Clerk**	Nancy T. Sunshine	Kings County Clerk			360 Adams Street Room 189	Brooklyn	NY	11201	73-99 Empire Boulevard Site (Kings)
21		Daniel Garodnick	Commission Chair, NYC Dept. of City Planning			120 Broadway, 31st Floor	New York	NY	10271	73-99 Empire Boulevard Site (Kings)
22		Winston Von Engel - Director	NYC Department of City Planning	Brooklyn Office		16 Court Street, 7th Fl.	Brooklyn	NY	11241	73-99 Empire Boulevard Site (Kings)
23	**Community Board**	Dante B. Arnwine – District Manager	Brooklyn Community Board 9			890 Nostrand Avenue	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
24		Fred P. Baptiste, Chairperson	Brooklyn Community Board 9			890 Nostrand Avenue	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
25		Environmental Committee Chairperson	Brooklyn Community Board 9			890 Nostrand Avenue	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
26	**Public Water Supplier**	Rohit Aggarwala	Commissioner, NYC Dept. of Environmental Protection			59-17 Junction Boulevard	Flushing	NY	11373	73-99 Empire Boulevard Site (Kings)
27	**Consolidated Edison**	Antonia Yuille – Director	Consolidated Edison Corporate Affairs			30 Flatbush Avenue	Brooklyn	NY	11217	73-99 Empire Boulevard Site (Kings)
28	**NYPD**	Karl Cohen - President	71st NYPD Police Precinct Council			421 Empire Boulevard	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
29	**FDNY**	Engine 249 Ladder 113	FDNY			491 Rogers Avenue	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
30	**Local Media Outlets**	New York Daily News				270C Duffy Avenue	Hicksville	NY	11801	73-99 Empire Boulevard Site (Kings)
31		New York Post				1211 Avenue of the Americas	New York	NY	10036	73-99 Empire Boulevard Site (Kings)
32		Spectrum NY 1 News				75 Ninth Avenue	New York	NY	10011	73-99 Empire Boulevard Site (Kings)
33		Brooklyn Eagle				16 Court Street, Suite 2901	Brooklyn	NY	11241	73-99 Empire Boulevard Site (Kings)
34		Courier-Life Publications				1 Metrotech Center #10T	Brooklyn	NY	11201	73-99 Empire Boulevard Site (Kings)
35		The Brooklyn Papers				1 Metrotech Center, 3rd Floor	Brooklyn	NY	11201	73-99 Empire Boulevard Site (Kings)
36	**School and Daycare Facilities**	PS 375 Jackie Robinson School	President/Executive Director/Principal	Phone: 718-693-6655		46 McKeever Place	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
37		Medgar Evers College	President/Executive Director/Principal	Phone: 718-270-4900		1650 Bedford Avenue	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
38		PS 241 Emma L. Johnston	President/Executive Director/Principal	Phone: 718-636-4725		976 President Street	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
39		Medgar Evers College Preparatory School	President/Executive Director/Principal	Phone: 718-703-5400		1186 Carroll Street	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
40		The Maple Street School	President/Executive Director/Principal	718-282-4345	https://www.maplestreetschool.org	21 Lincoln Road	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
41		Workshop Middle School	President/Executive Director/Principal			1100 Washington Ave	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
42	**Community, Civic, Religious and Other Environmental Organizations**									
43		Prospect Park Alliance	James Snow, Interim President/Chief Operating and Financial Officer			95 Prospect Park West	Brooklyn	NY	11215	73-99 Empire Boulevard Site (Kings)
44		Young Life Red Hook				495 Flatbush Ave,	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
45	**Adjacent Properties**	Empire Boulevard Holdings LLC				1991 Ocean Parkway	Brooklyn	NY	11223	73-99 Empire Boulevard Site (Kings)
46		World Laundry				99 Empire Blvd	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
47		Resident/Business Owner				103 Empire Boulevard	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
48		Empire-Sull7, LLC c/o Nadine Chang Dunkley				445 Broadhollow Road, CL-10	Melville	NY	11747	73-99 Empire Boulevard Site (Kings)
49		Resident/Business Owner				1720 Bedford Avenue	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
50		Fieldbridge Associates LLC				1720 Bedford Avenue	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
51		Resident/Business Owner				945 Franklin Avenue	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
52		Resident/Business Owner				57 Empire Boulevard	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
53		Richgene Realty Corporation				8800 N River Road	Ware Neck	VA	23178	73-99 Empire Boulevard Site (Kings)
54		Resident/Business Owner				62 Empire Boulevard	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
55		Cactus 44 Empire LLC				47-05 Metropolitan Avenue	Ridgewood	NY	11385	73-99 Empire Boulevard Site (Kings)
56		Resident/Business Owner				104 Empire Boulevard	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)
57		Empire Valley LLC				176 Lynch Street, Box #1	Brooklyn	NY	11206	73-99 Empire Boulevard Site (Kings)
58		Resident/Business Owner				110 Empire Boulevard	Brooklyn	NY	11225	73-99 Empire Boulevard Site (Kings)

Appendix C - Site Location Map



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Title:

SITE LOCATION MAP

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE BOULEVARD HOLDINGS LLC

ROUX
ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: W.S.	Date: 14APR22	APPENDIX
Prepared by: G.M.	Scale: AS SHOWN	C
Project Mgr.: W.S.	Project No.: 2861.0003Y000	
File: 2861.0003Y100.01.cdr		

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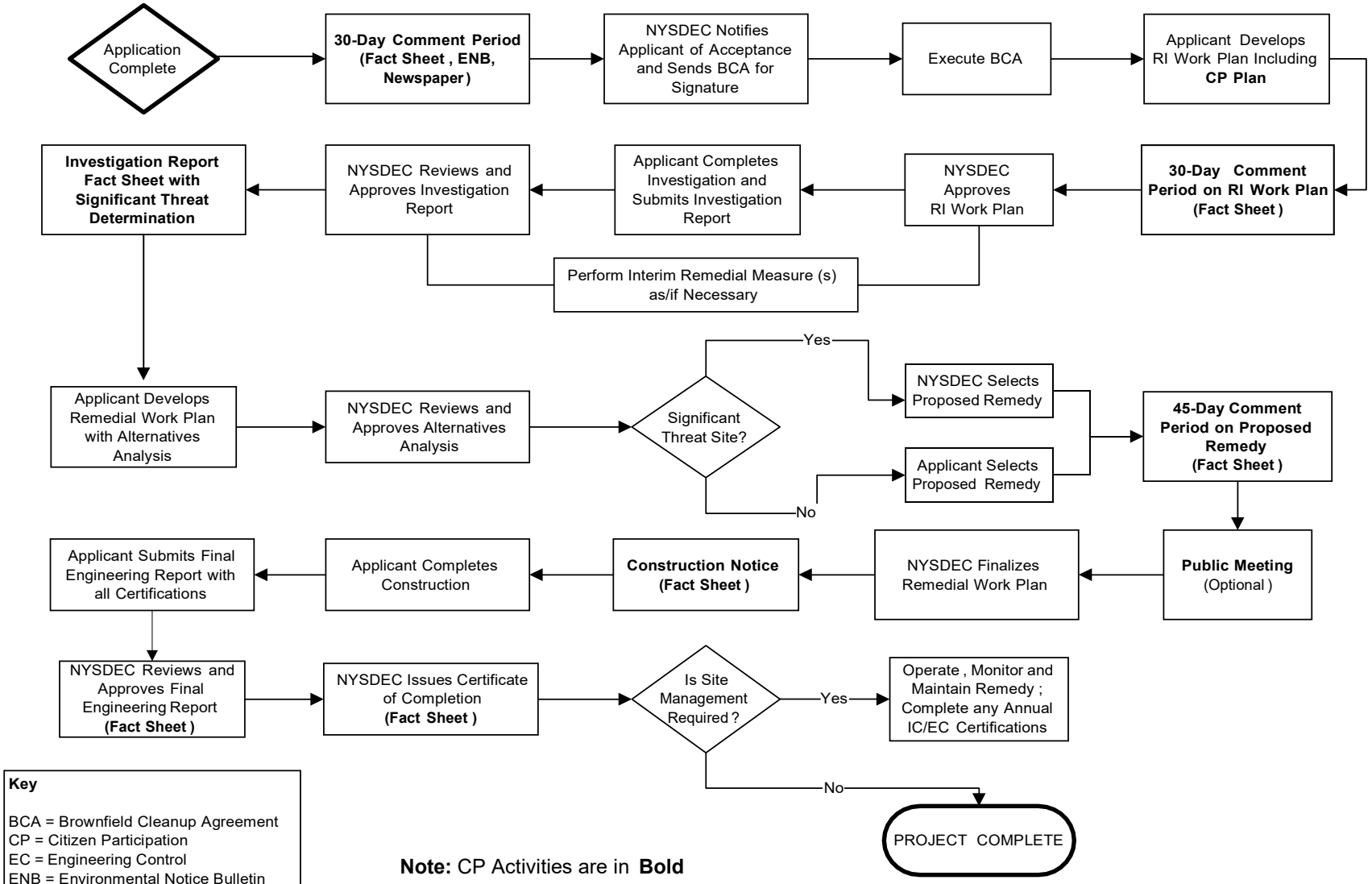
Appendix D– Brownfield Cleanup Program Process



Key

BCA = Brownfield Cleanup Agreement
CP = Citizen Participation
EC = Engineering Control
ENB = Environmental Notice Bulletin
IC = Institutional Control
RI = Remedial Investigation

Note: CP Activities are in **Bold**

Remedial Programs

Scoping Sheet for Major Issues of Public Concern

Instructions

This Scoping Sheet assesses: major issues of public concern; impacts of the site and its remedial program on the community; community interest in the site; information the public needs; and information needed from the public, if applicable.

The information generated helps to plan and conduct required citizen participation (CP) activities, and to choose and conduct additional CP activities, if appropriate. The scoping sheet can be revisited and updated as appropriate during the site's remedial process to more effectively implement the site's CP program.

Note: Use the information as an aid to prepare and update the Major Issues of Public Concern section of the site CP Plan.

General Instructions

- When to prepare: During preparation of the CP Plan for the site. It can be revisited and updated anytime during the site remedial process.
- Fill in site name and other information as appropriate.

Instructions for Numbered Parts

Consider the bulleted issues and questions below and any others that may be appropriate to the site and the community to help complete the five Parts of this Scoping Sheet. Include the issue stakeholders in Parts 1 through 3 and adjust the site's contact list accordingly.

Part 1. List Major Issues of Public Concern and Information the Community Wants.

- Is our health being impacted? (e.g. Are there problems with our drinking water or air? Are you going to test our water, yards, sumps, basements? Have health studies been done?)
- There are odors in the neighborhood. Do they come from the site and are they hazardous?
- Are there restrictions on what we may do (e.g. Can our children play outside? Can we garden? Must we avoid certain areas? Can we continue to recreate (fish, hunt, hike, etc. on/around the site?)
- How and when were the site's contamination problems created?
- What contaminants are of concern and why? How will you look for contamination and find out where it is going? What is the schedule for doing that?
- The site is affecting our property values!
- How can we get more information (e.g. who are the project contacts?)
- How will we be kept informed and involved during the site remedial process?
- Who has been contacted in the community about site remedial activities?
- What has been done to this point? What happens next and when?
- The site is going to be cleaned up for restricted use. What does that mean? We don't want redevelopment on a "dirty" site.

Part 2. List Important Information Needed From the Community, if Applicable.

- Can the community supplement knowledge about past/current uses of the site?
- Does the community have knowledge that the site may be significantly impacting nearby properties, natural resources, etc.?

- Are there activities currently taking place at the site or at nearby properties that may need to be restricted?
- Who may be interested or affected by the site that has not yet been identified?
- Are there unique community characteristics that could affect how information is exchanged?
- Do the community and/or individuals have any concerns they want monitored?
- Does the community have information about other sources in the area for the contamination?

Part 3. List Major Issues and Information That Need to be Communicated <u>to</u> the Community.

- The process and general schedule to investigate, remediate and, if applicable, redevelop the site.
- Current understanding about the site contamination and effects, if any, on public health and the environment.
- Site impacts on the community and any restrictions on the public's use of the site and/or nearby properties.
- Planned CP activities, their schedule, and how they relate to the site's remedial process.
- Ways for the community to obtain/provide information (document repositories, contacts, etc.).

Part 4. Community Characteristics

a. - e. Obtain information from local officials, property owners and residents, site reports, site visits, "windshield surveys," other staff, etc.

f. Has the affected community experienced other **significant** present or past environmental problems unrelated to this site? Such experiences could significantly affect public concerns and perspectives about the site; how the community will relate to project staff; the image and credibility of project staff within the community; and the ways in which project staff communicate with the community.

g. Consider factors such as:

- Is English the primary language of the affected community? If not, provisions should be considered regarding public outreach activities such as fact sheets, meetings, door-to-door visits and other activities to ensure their effectiveness.

- The age demographics of the community. For example, is there a significant number of senior citizens in the community? It may be difficult for some to attend public meetings and use document repositories. This may suggest adopting more direct interaction with the community with activities such as door-to-door visits, additional fact sheets, visits to community and church centers, nursing homes, etc.

- How do people travel about the community? Would most people drive to a public meeting or document repository? Is there adequate public transportation?

Part 5. Affected/Interested Public. Individuals and organizations who need or want information and input can change during the site's remedial process. This need is influenced by real, potential or perceived impacts of the site or the remedial process. Some people may want information and input throughout the remedial process. Others may participate only during specific remedial stages, or may only be interested in particular issues. It is important to revisit this question when reviewing this scoping sheet. Knowing who is interested in the site – and the issues that are important to them – will help in the selection and conduct of appropriate outreach activities, and to identify their timing and the information to be exchanged.

Check all affected/interested parties that apply to the site. **Note: Adjust the site's contact list appropriately.** The following are some ways to identify affected/interested parties:

- Tax maps of adjacent property owners
- Attendees at public meetings
- Telephone discussions
- Letters and e-mails to DER, the remedial party, and other agencies
- Political jurisdictions and boundaries
- Media coverage
- Current/proposed uses of site and/or nearby properties (recreational, commercial, industrial)
- Discussions with community organizations: grass roots organizations, local environmental groups, environmental justice groups, churches, and neighborhood advisory groups

New York State Department of Environmental Conservation
Division of Environmental Remediation

Remedial Programs
Scoping Sheet for Major Issues of Public Concern (see instructions)

Remedial Party: Empire Boulevard Holdings LLC

Site Name: 73-99 Empire Boulevard

Site Number: C224343

Site County: Kings County, Brooklyn, New York

Note: For Parts 1. – 3., the individuals, groups, organizations, businesses, and units of government identified should be added to the site contact list as appropriate.

Part 1. List major issues of public concern and information the community wants. Identify individuals, groups, organizations, businesses, and/or units of government related to the issue(s) and/or information. **Use this information as an aid to prepare or update the Major Issues of Public Concern section of the site Citizen Participation Plan.**
None

How were these issues and/or information identified?
N/A

Part 2. List important information needed **from** the community, if applicable. Identify individuals, groups, organizations, businesses, and/or units of government related to the needed information.
None

How were these information needs identified?
N/A

Part 3. List major issues and information that need to be communicated **to** the community. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and/or information.
None

How were these issues and/or information identified?
N/A

Part 4. Identify the following characteristics of the affected/interested community. This knowledge will help to identify and understand issues and information important to the community, and ways to effectively develop and implement the site citizen participation plan (mark all that apply):

a. Land use/zoning around site:
☒ **Residential** ☐ **Agricultural** ☒ **Recreational** ☒ **Commercial** ☐ **Industrial**

b. Residential type around site:
☒ **Urban** ☐ **Suburban** ☐ **Rural**

c. Population density around site:
☒ **High** ☒ **Medium** ☐ **Low**

d. Community economic status:
☐ **High** ☒ **Medium** ☐ **Low**

e. Water supply of nearby residences:
☒ **Public** ☐ **Private Wells** ☐ **Mixed**

f. Other environmental issues significantly impacting affected community?
☐ **Yes** ☒ **No**

Provide details if appropriate:
Click here to enter text.

g. Special considerations:
☐ **Language** ☐ **Age** ☐ **Transportation** ☐ **Other**

Explain marked categories in **g.**:
N/A

Part 5. The site contact list must include, at a minimum, the individuals, groups, and organizations identified in the instructions for **Part 5.** Are other individuals, groups, organizations, and units of government affected by, or interested in, the site, or its remedial program? (Mark and identify all that apply, then adjust the site contact list as appropriate.)

☒ **Non-Adjacent Residents/Property Owners:** Click here to enter text.

☒ **Local Officials:** Click here to enter text.

☒ **Media:** Click here to enter text.

☐ **Business/Commercial Interests:** Click here to enter text.

☐ **Labor Group(s)/Employees:** Click here to enter text.

☐ **Indian Nation:** Click here to enter text.

☒ **Citizens/Community Group(s):** Click here to enter text.

☐ **Environmental Justice Group(s):** Click here to enter text.

☒ **Environmental Group(s):** Click here to enter text.

☒ **Civic Group(s):** Click here to enter text.

☐ **Recreational Group(s):** Click here to enter text.

☐ **Other(s):** Click here to enter text.

Date Completed: 04/18/2022 (Revised 05/09/2022)

Prepared By: Wendy Shen

Reviewed By: Thomas V. Panzone Click here to enter text.

APPENDIX I

Health and Safety

Site-Specific Health and Safety Plan

73-99 Empire Boulevard
Brooklyn, New York 11225
Tax Block 1306 Lot 28
NYSDEC Site #C224343

December 18, 2025

Prepared for:

Empire McKeever Heights LLC
505 Flushing Avenue
Brooklyn, New York 11205

Prepared by:

Roux Environmental Engineering and Geology, D.P.C.
209 Shafter Street
Islandia, New York 11749

2861.0003Y147/CV

Environmental Consulting
& Management
+1.800.322.ROUX
rouxinc.com

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Site-Specific Emergency Information

Emergency Phone Numbers

Most emergency services can be obtained by calling **911**. Where 911 service is not available, use the telephone numbers provided in the below table. The following is a master emergency phone list for use by the project management personnel. A more condensed version of the emergency numbers listed below will be posted throughout project work areas. Emergencies encountered on the site will be responded to by a combination of off-site emergency services and on-site personnel.

Emergency Contact Information			
Site Personnel			
Title	**Contact**		**Telephone**
Operations Manager (OM)	Jeff Wills		516-637-0213
Project Principal (PP)	Charlie McGuckin		631-921-6857
Project Manager (PM)	Wendy Shen		718-913-6240
Site Supervisor (SS)	TBD		
Site Health and Site Safety Officer (SHSO)	TBD		
Office Health and Safety Manager (OHSM)	Nevin Pahlad		347-885-6930
Corporate Health and Safety Director (CHSD)	Brian Hobbs, CIH, CSP		631-807-0193
Client Emergency Contact	Zelig Weiss		917-510-5214
Outside Assistance			
Agency	**Contact**	**Telephone**	**Address/Location**
Urgent Care	Proxi Medical Urgent Care	(718) 756-4000	1655 Bedford Avenue, Brooklyn, New York 11225
Hospital	Kings County Hospital Center	(718) 245-3131	451 Clarkson Avenue, Brooklyn, New York 11203
Police	New York City Police Department, 71st Precinct	(718) 735-0511	421 Empire Boulevard, Brooklyn, New York 11225
Fire	FDNY Engine 280/Ladder 132	(718) 783-9538	489 Johns Place, Brooklyn, New York 11238
Site Address	73-99 Empire Boulevard, Brooklyn, New York 11225		

Proxi Medical Urgent Care directions from Site:

- Head west on Empire Boulevard toward McKeever Place
- Turn right onto McKeever Place/Reginald Nero's Wy
- Turn right onto Dr. Derrick E. Griffith Way/Montgomery Street
- Turn left on Bedford Avenue, destination will be on the right (1655 Bedford Avenue, Brooklyn, New York 11225)

Kings County Hospital Center directions from Site:

- Head west on Empire Boulevard towards McKeever Place
- Turn left onto Washington Avenue
- Turn left onto Lefferts Avenue
- Turn right at the 3rd cross street onto Nostrand Avenue/Toussaint L'ouverture Boulevard
- Turn left onto Clarkson Avenue
- Turn left, destination will be on the right (451 Clarkson Avenue, Brooklyn, New York 11203

1. Introduction

This Site-specific Health and Safety Plan (HASP) has been prepared by Roux Environmental Engineering and Geology, D.P.C. (Roux) for use during the remedial action activities being performed by Roux at the 73-99 Empire Boulevard, Brooklyn, New York 11225 (Site; **Figure 1**). This HASP was prepared in general accordance with the requirements of the Occupational Safety and Health Administration (OSHA) standards promulgated at 29 CFR 1910.120 and 29 CFR 1926.65, both commonly referred to as the Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard. In accordance with the HAZWOPER Standard, this Site-specific HASP was prepared to address the safety and health hazards associated with the remedial action activities being performed at the Site by Roux and to provide requirements and procedures for the protection of Roux employees, subcontractor personnel, government oversight personnel, Site personnel, and the general public. It also addresses client- and Site-specific requirements for health and safety. Additionally, subcontractors may be required to submit their own HASP as it relates to their specific work activities and will be kept onsite during such work.

Implementation of this HASP is the joint responsibility of the Project Manager (PM), the Site Health and Safety Officer (SHSO), and all field staff, with assistance from the Project Principal (PP), Office Health and Safety Manager (OHSM), and Corporate Health and Safety Director (CHSD). The PM for this project is Wendy Shen. The Site Supervisor (SS)/Safety Officer (SHSO) will be determined prior to the start of the project.

This HASP will be introduced to, reviewed, and signed off on by all Roux personnel through a formal training session prior to commencing work. A copy of the HASP will be kept at the Site at all times. The Roux SHSO or PM will be responsible for posting any changes, amendments, memos, etc. to the HASP. Any revisions to this HASP will be signed by appropriate personnel, which can include Roux's PP, CHSD, and SS. Any changes will be announced to all workers at the next safety meeting.

1.1 Roles and Responsibilities

Overall Roles and Responsibilities (R&Rs) of Roux personnel are provided in Roux's Policies and Procedures Manual. Only those R&Rs specific to HASP requirements are listed below.

Project Manager (PM)

The PM has responsibility and authority to direct all work operations. The PM coordinates safety and health functions with the Site Health and Safety Officer (SHSO), has the authority to oversee and monitor the performance of the SHSO, and bears ultimate responsibility for the proper implementation of this HASP. The specific duties of the PM are:

- Preparing and coordinating the Site work plan;
- Providing Site supervisor(s) with work assignments and overseeing their performance; Coordinating safety and health efforts with the SSHO;
- Ensuring effective emergency response through coordination with the Emergency Response Coordinator (ERC); and
- Serving as primary Site liaison with public agencies and officials and Site contractors.

Site Health and Safety Officer (SHSO)

The SHSO has the full responsibility and authority to develop and implement this HASP and to verify compliance. The SHSO reports to the Project Manager. The SHSO is on Site or readily accessible to the Site during all work operations and has the authority to halt Site work if unsafe conditions are detected. The specific responsibilities of the SHSO include:

- Managing the safety and health functions on this Site;
- Serving as the Site's point of contact for safety and health matters;
- Ensuring Site monitoring, worker training, and effective selection and use of PPE;
- Assessing Site conditions for unsafe acts and conditions and providing corrective action;
- Assisting the preparation and review of this HASP;
- Maintaining effective safety and health records as described in this HASP; and
- Coordinating with the SS and others as necessary for safety and health efforts.

Site Supervisor (SS)

The Site Supervisor (SS) is responsible for field operations and reports to the Project Manager (PM). The SS ensures the implementation of the HASP requirements and procedures in the field. The specific responsibilities of the Site Supervisor include:

- Executing the work plan and schedule as detailed by the PM;
- Coordination with the SHSO on safety and health; and
- Ensuring Site work compliance with the requirements of this HASP.

Employees

All Roux employees are responsible for reading and following all provisions of the Corporate Health and Safety Manual, including this HASP. Employees report to the SS at the project Site. Each employee is also responsible for the following:

- Wearing all appropriate PPE as outlined within this HASP;
- Attending all safety meetings;
- Inspecting tools and equipment prior to use, and taking any defective tools or equipment out of service;
- Appropriately documenting field events as they occur within a logbook or equivalent;
- Properly operating machinery and/or equipment only if trained to do so;
- Stopping work operations if unsafe conditions exist;
- Identifying and mitigating hazards when observed;
- Reporting all incidents and near misses to the Roux SHSO and SS immediately; and
- Knowing where emergency equipment is located (e.g., first aid kit, fire extinguisher).

Subcontractors and Visitors

Subcontractors and visitors are responsible for complying with the same health and safety requirements. It is the responsibility of all to make sure subcontractors and visitors comply and uphold the HASP. Subcontractors and visitors have the following additional responsibilities:

- Designating a qualified safety representative for the project that can make the necessary changes in work practices, as necessary;
- Attending all safety meetings while participating in Roux Site work activities;
- Reporting all incidents and near misses to Roux SHSO and SS immediately;
- Conducting initial and periodic equipment inspections in accordance with manufacturer and regulatory guidelines; and
- Providing copies of all Safety Data Sheets (SDS) to Roux SHSO for materials brought to the Site.

2. Background

Relevant background information is provided below, including a general description of the Site; a brief review of the Site's history with respect to hazardous material use, handling, and/or storage; and a review of known and potential releases of hazardous substances at the Site.

2.1 Site Description

The Site location is in the Crown Heights neighborhood of Brooklyn, New York. The Site is on 0.86 acres with McKeever Place to the west, Bedford Avenue to the east, Empire Boulevard to the south, and Sullivan Place to the north. Currently, all buildings have been demolished and the Site is currently vacant.

2.2 Site History

Based on a review of previous environmental reports and documentation, including historical aerial photographs, former Lot 28 on the western portion of the Site was constructed in 1925 and was initially occupied by Mack Truck Auto Service until the late 1930s. It was later occupied by a garage in the mid-1940s and by an auto/truck/auto parts and service station in the early 1950s through early 2000s. A laundromat occupied the building from the early 2000s through 2014. The building remained vacant since 2014.

Former Lot 32 on the northwestern portion of the Site was developed with a store and apartment prior 1932. The structures were demolished sometime between 1932 and 1951. Later, the parcel remained undeveloped and used as a parking lot.

Former Lot 35 on the eastern portion of the Site was constructed in 1930 and was originally occupied by the parts department of Mack Truck Auto Service. From the late 1930s to the early 1960s, the building was occupied by Tire Sales & Service. From the early 1960s to the late 1980s, the building was occupied by an auto and truck manufacturer. From the late 1980s through the early 1990s, the parcel was listed as Family Services. The building was vacant from 1994 through 2014. Later, World Laundry occupied the building until 2024.

2.3 Known and Potential Releases of Hazardous Substances at the Site

Based upon the review of the Sanborn maps, Aerial Photographs and City Directory, the following Recognized Environmental Conditions (RECs) were identified:

- Historical onsite operations including auto service and auto, truck, and equipment manufacturing at Lot 28 and auto service operations at Lot 35. A forge and a gasoline tank were depicted at Lot 28 in historical resources.
- The historical operations on off-site properties to the west (filling station and/or auto repair from the 1920s to 1990s with gasoline tanks) and to the east (auto repair and/or manufacturing from the 1950s to late 2000s with gasoline tanks) represent a REC to the site.
- A reportedly out of service 1,500-gallon fuel oil tank was observed in the partial basement of Lot 28.
- A gasoline UST was identified on historical maps on Lot 28.
- Remnants of hydraulic lifts observed in the building on Lot 28.

3. Scope of Work

The objectives of the RAWP are to facilitate remedial action during redevelopment construction activities onsite. The following activities will be completed by Roux as part of the remedial action:

- Construction oversight.
- Collection of end-point soil samples.
- Management and tracking of onsite soils.
- Tracking appropriate offsite disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal.
- Implementation of a Community Air Monitoring Plan (CAMP) during any intrusive subsurface activities to conduct monitoring and protection for potential offsite receptors (see Appendix I of the RAWP).

Additional quality assurance/quality control (QA/QC) samples will be collected in accordance with the Quality Assurance Project Plan/Field Sampling Plan (QAPP/FSP) which is included as Appendix K of the RAWP.

If there are any changes with the scope a revision of the HASP will be required to address any new hazards.

4. Site Control

This Site control program is designed to reduce the spread of hazardous substances from contaminated areas to clean areas, to identify and isolate contaminated areas of the Site, to facilitate emergency evacuation and medical care, to prevent unauthorized entry to the Site, and to deter vandalism and theft.

4.1 Site Map

A map of this Site, showing Site boundaries, designated work zones, and points of entry and exit is provided in **Figure 2**.

4.2 Site Access

Access to the work areas at the Site is restricted to reduce the potential for exposure to its safety and health hazards. During hours of Site operation, Site entry and exit is authorized only at the points identified in **Figure 2**. Entry and exit at these points is controlled by the following: locking doors. When the Site is not operating, access to the Site is controlled by the following: locking doors.

4.3 Buddy System

While working in the Exclusion Zone, Site workers use the buddy system. The buddy system means that personnel work in pairs and stay in close visual contact to be able to observe one another and summon rapid assistance in case of an emergency. The responsibilities of workers using the buddy system include:

- Remaining in close visual contact with partner;
- Providing partner with assistance as needed or requested;
- Observing partner for signs of heat stress, chemical overexposure or other difficulties;
- Periodically checking the integrity of partner's PPE; and
- Notifying the SS or other Site personnel if emergency assistance is needed.

4.4 Site Communications

The following communication equipment is used to support on-site communication: cell phones, visual hand signals.

As applicable, hand signals will be used according to the following:

Hand Signals

SIGNAL	MEANING
Hand gripping throat	Out of air, cannot breathe
Grip partner's wrist	Leave area immediately
Hands on top of head	Need assistance
Thumbs up	I am all right, okay
Thumbs down	No, negative

A current list of emergency contact numbers is included in the Site-Specific Emergency Information at the beginning of this HASP.

4.5 Site Work Zones

This Site is divided into three (3) major zones, described below. These zones are characterized by the likely presence or absence of biological, chemical, or physical hazards and the activities performed within them. Zone boundaries are clearly marked at all times and the flow of personnel among the zones is controlled. The Site is monitored for changing conditions that may warrant adjustment of zone boundaries. Zone boundaries are adjusted as necessary to protect personnel and clean areas. Whenever boundaries are adjusted, zone markings are also changed and workers are immediately notified of the change.

Exclusion Zone

The area where contamination exists is the Exclusion Zone (EZ). All areas where excavation and handling of contaminated materials take place are considered part of the EZ. This zone will be clearly delineated by chain link fencing, caution tape, cones or other effective barriers, as necessary. Safety tape may be used as a secondary delineation within the EZ. The zone delineation markings may be opened in areas for varying lengths of time to accommodate equipment operation or specific construction activities. The SHSO may establish more than one EZ where different levels of protection may be employed or where different hazards exist. Personnel are not allowed in the EZ without:

- A buddy (co-worker);
- Required minimum level PPE;
- Medical authorization;
- Training certification; and
- Requirement to be in the zone.

Contamination Reduction Zone

A Contamination Reduction Zone (CRZ) is established between the exclusion zone and the support zone. The CRZ contains the Contamination Reduction Corridor (CRC) and provides an area for decontamination of personnel and equipment. The CRZ will be used for general Site entry and egress in addition to access for heavy equipment and emergency support services. Personnel are not allowed in the CRZ without:

- A buddy (co-worker);
- Appropriate PPE;
- Medical authorization;
- Training certification; and
- Requirement to be in the zone.

Support Zone

The Support Zone (SZ) is an uncontaminated area that will be the field support area for the Site operations. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel or materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

5. Job Hazard Evaluation

Roux's work at the Site is expected to entail a variety of physical, chemical, and biological hazards, all of which must be sufficiently managed to allow the work to be performed safely. Some of the hazards are Site-specific (i.e., they are associated with the nature, physical characteristics, and/or routine operation of the Site itself), while others are activity-specific (i.e., they are associated with [or arise from] the particular activity being performed). The various hazards can be grouped into the following categories:

- **Caught/Crushed** – the potential to become caught in, under, between, or by an object or parts of an object, such as equipment with parts that open and close or move up and down ("pinch points") or equipment that rotates, and the accompanying potential to have body parts cut, mangled, or crushed thereby.
- **Contact** – the potential to be struck by or against moving or stationary objects that can cause physical injury, such as heavy machinery, overhead piping, moving vehicles, falling objects, and equipment (including tools and hand-held equipment) or infrastructure with the ability to cut or impale.
- **Energy Sources** – the potential for bodily harm associated with energy sources, most notably electricity, but also including latent energy sources such as compressed air and equipment under tension (which when released could cause injurious contact or a fall).
- **Ergonomics** – the potential for musculoskeletal injury associated with lifting/carrying, pushing/pulling, bending, reaching, and other physical activity attributable to poor body position/mechanics, repetitive motion, and/or vibration.
- **Exposure** – the potential for injury/illness due to physical, chemical, or biological exposures in the work environment, including, but not limited to, temperature extremes, solar radiation, and noise (physical), chemical splashes and hazardous atmospheres (chemical), and animal/insect bites and poisonous plants (biological).
- **Falls** – the potential to slip or trip and thus fall or drop a load, resulting in bodily injury to oneself or others.

The foregoing is intended to provide Roux employees with a general awareness of the hazards involved with Site work. A more detailed review of the potential hazards associated with each specific activity planned for the Site (or on-going activity, as the case may be) is provided in the activity-specific Job Safety Analysis (JSA) forms in **Appendix A**. As can be seen in the JSA forms, the hazards are identified by category per the above, and specific measures designed to mitigate/manage those hazards are also identified. In preparing the JSA forms, all categories of hazards were considered, and all anticipated potential hazards were identified to the extent possible based on the experience of the personnel preparing and reviewing the JSA forms. However, there is always the possibility for an unanticipated hazard to arise, potentially as condition change over the course of the workday. Roux personnel must maintain a continual awareness of potential hazards in the work zone, regardless of whether the hazard is identified in the JSA form. Particular attention should be paid to hazards associated with exposure to hazardous substances (see **Table 1** for a listing of the hazardous substances most likely to be encountered in environmental media at the Site) and to Site personnel being located "in the line of fire" with respect to moving equipment, pinch points, and latent energy (e.g., being located or having body parts located within the swing radius of an excavator, between two sections of pipe being connected, below a piece of suspended equipment, or adjacent to a compressed air line).

5.1 Hazard Communication and Overall Site Information Program

The information in the JSAs and SDSs is made available to all employees and subcontractors who could be affected by it prior to the time they begin their work activities.

Modifications to JSAs are communicated during routine pre-work briefings, and periodically updated as needed in the HASP. SDSs will be maintained by the SHSO/SS for new chemicals brought on-site as needed. Copies of SDSs can be found in **Appendix B**.

5.2 Noise

Noise is associated with the operation of heavy equipment, power tools, pumps, and generators. Noise is also a potential hazard when working near operating equipment such as excavators, drill rigs or pole drivers. High noise (i.e., < 85 dBA) operations may be evaluated by the SHSO utilizing a type 2 handheld sound level meter (SLM) operating on the "A"-weighted scale with slow response because this scale most closely resembles human response to noise and complies with OSHA 29 CFR 1910.95. Hearing protection is required in areas with noise exposure greater than 85 dBA. Double hearing protection (ear plugs and earmuffs) should be donned in areas where the noise exposure is more than 95 dBA. Noise exposure will be controlled by hearing protection as described above or by maintaining set-backs from high-noise equipment, as warranted. Personnel handling heavy equipment and using power tools that produce noise levels exceeding those described levels above are required by OSHA 29 CFR 1910.95 to wear the appropriate Noise Reduction Rating (NRR) level of hearing protection. Appropriate hearing protection will be evaluated by the SHSO as necessary in consultation with the OHSM and CHSD.

5.3 Slip, Trip, and Fall Hazards

Slip, trip, and fall hazards may include, but are not limited to, general slip and trip hazards associated with uneven ground, possible debris, wet grass, and equipment. Prior to work, walking paths will be assessed for solid footings, any ground penetrations that may cause a tripping hazard will be appropriately marked, and other areas will be noted and discussed with the field team.

Personnel shall be aware of their surroundings and footings at all time, and all accommodations should be made for proper housekeeping and organized equipment placement at the Site, where possible, to help prevent any slip, trip, and fall-related incidents. All tools and materials should be appropriately stored when not in use and placed in appropriate storage containers.

5.4 Biological Hazards

Biological hazards that may potentially be present at a Site, include poisonous plants, insects (ticks, spiders, bees), animals (snakes, dogs), etc. Information on biological hazards can be found within Roux's Biological Hazard Awareness Management Program located within Roux's Corporate Health and Safety Manual. There is also potential for transmission and/or exposure to SARS-CoV-2, the virus that causes COVID-19. Prior to beginning work, on-Site protocols shall be established by the project team, including subcontractors, in accordance with federal, state, county, city, and/or other guidance, as applicable and consistent with Roux's COVID-19 Interim Health and Safety Guidance which can be found in **Appendix C**.

6. Emergency Response Plan

This emergency response plan details actions to be taken in the event of Site emergencies. The PM and SHSO is responsible for the implementation of emergency response procedures onsite. The SHSO/PM provides specific direction for emergency action based upon information available regarding the incident and response capabilities and initiates emergency procedures and notification of appropriate authorities. In the event of an emergency, Site personnel are evacuated and do not participate in emergency response activities, response is facilitated through external emergency services.

6.1 Emergency Response

The SHSO, after investigating the incident and relevant information, shall determine the level of response required for containment, rescue and medical care. Limited on-site emergency response activities could occur therefore the SHSO is responsible for notifying external emergency response agencies. The SHSO provides relevant information to the responding organizations, including, but not limited to, the hazards associated with the emergency incident, potential containment problems, and missing Site personnel.

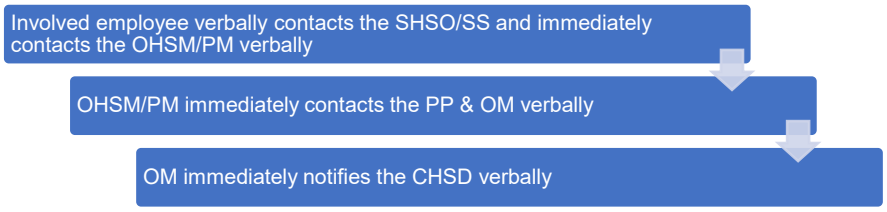
6.2 Emergency Alerting and Evacuation

If evacuation notice is given, Site workers leave the worksite, if possible, by way of the nearest exit. Appropriate primary and alternate evacuation routes and assembly areas have been identified and are shown on the Site Plan with Emergency Muster Area (**Figure 2**). The routes and assembly area will be determined by conditions at the time of the evacuation based on wind direction, the location of the hazard source, and other factors as determined by SHSO/PM.

Personnel exiting the Site gather at a designated assembly point. To determine that everyone has successfully exited the Site, personnel will be accounted for at the assembly point. If any worker cannot be accounted for, notification is given to the SHSO, PM, and any arriving response authorities so that appropriate action can be initiated. Subcontractors on this Site have coordinated their emergency response plans to ensure that these plans are compatible and potential emergencies are recognized, alarm systems are clearly understood, and evacuation routes are accessible to all personnel relying upon them.

6.3 Emergency Medical Treatment and First Aid

In the event of a work-related injury or illness, employees are required to follow the procedures outlined below. All work-place injury and illness situations require Roux's Project and Corporate Management Team to be notified when an injury/illness incident occurs, and communication with the contracted Occupational Health Care Management Provider, WorkCare, Inc. (Formally AllOne Health), is initiated, as necessary. The Injury/Illness Notification Flowchart is provided below and within Roux's Incident Investigation and Reporting program included within Roux's Corporate Health and Safety Manual.



If on-Site personnel require any medical treatment, the following steps will be taken:

a. Notify Roux's Project and Corporate Management Team for any work-related injury and/or illness occurrence, and communicate with the contracted Occupational Health Care Management Provider, WorkCare, immediately following the notifications provided above.

b. Based on discussions with the Project Team, Corporate Management and the WorkCare evaluation, if medical attention beyond onsite first aid is warranted, transport the injured / ill person (IP) to the Urgent Care Center, or notify the Fire Department or Ambulance Emergency service and request an ambulance or transport the victim to the hospital, and continue communications with Corporate Management Team. An Urgent Care/Hospital Route map with location to Northwell Health GoHealth Urgent Care/New York-Presbyterian Brooklyn Hospital is included as **Figure 3**.

c. Decontaminate to the extent possible prior to administration of first aid or movement to medical or emergency facilities.

d. First aid medical support will be provided by onsite personnel trained and certified in First Aid, Cardio Pulmonary Resuscitation (CPR), Automatic External Defibrillation (AED), and Blood-Borne Pathogens (BBP) Awareness, until relieved by emergency medical services (EMS).

e. The SHSO and PM will perform a Loss Investigation (LI) and the Project Team will complete the final Loss Report. If a Roux employee is involved in a vehicular incident, the employee must also complete the Acord Automobile Loss Notice.

7. Environmental Conditions and Response

7.1 Adverse Weather Conditions

In the event of adverse weather conditions, the SHSO or project principal will determine if work can continue without jeopardizing the health and safety of field workers. Some of the items related to adverse weather conditions to be considered prior to determining if work should continue include:

- Potential for heat stress and heat-related injuries;
- Potential for cold stress and cold-related injuries;
- Treacherous weather-related conditions. If wind speed is greater than 15 mph averaged over a 15-minute period or wind gusts over 25 mph, earthmoving operations will be ceased;
- Limited visibility; and
- Electrical storm potential.

Site activities will be limited to daylight hours and acceptable weather conditions. Inclement working conditions may include heavy rain, fog, high winds, and lightning. The SHSO and/or PM shall observe daily weather reports and evacuate, if necessary, in case of inclement weather conditions.

7.2 Electrical Storm Guidelines

In the event that lightning and/or thunder are observed while working onsite, all onsite activities shall stop and personnel shall seek proper shelter (e.g., substantial building, enclosed vehicle, etc.). Work shall not resume until the threat of lighting has subsided and no lightning or thunder has been observed for 30 minutes. If the possibility of lightning is forecast for the day, advise the onsite personnel on the risks and proper procedure at the pre-work safety briefing. Continuously monitor for changing weather conditions and allow enough time to properly stop work if lightning is forecast.

7.3 Environmental Stressors, Heat Stress, Heat Exhaustion, and Heat Stroke

It is the employer's responsibility to monitor weather forecasts and ambient air temperatures, both prior to the work shift and during the shift. The National Oceanic and Atmospheric Administration records average minimum/maximum temperatures of 30/70 degrees Fahrenheit during the year in Brooklyn, NY.

To prevent potential heat illness, the following strategies will be implemented:

- Adjusting personnel work/rest intervals;
- Monitoring for symptoms of heat illness;
- Providing shaded rest areas;
- Providing cool potable water so that each employee has access to at least one quart per hour for the entire shift, free of charge;
- Allowing for employees to acclimatize to the weather conditions and work demands;
- Observe workers during a heat wave (i.e., when the temperature is at least 80°F, and 10 degrees hotter than the average temperature of the five preceding days); and
- Implementing high heat procedures when the temperature reaches 95°F.

Roux's Heat Illness Prevention Plan is implemented when the ambient temperatures exceed 80°F. Roux's Heat Illness Prevention Program can be found within **Appendix D**. Additional information regarding heat illnesses is provided below. This can include, but is not limited to, access to shade that is sufficient in size to fit all workers who are on break; a car with air conditioning is acceptable, too. Preventative cool-down breaks shall be allowed at any time, and anyone taking such a break will be monitored for heat illness symptoms and not required to return to work until all symptoms (if present) of heat illness have disappeared. If necessary, first aid will be offered, but if symptoms are severe, emergency response procedures will be implemented per Section 6.3. Anyone who has shown symptoms of severe heat illness will not be sent home without being offered first aid or medical treatment.

High heat procedures must be implemented when temperatures reach 95°F. These procedures include:

- Ensuring that effective communication by voice, observation, or electronic means is maintained so that employees at the work site can contact a supervisor when necessary. An electronic device, such as a cell phone or text messaging device, may be used for this purpose only if the reception in the area is reliable.
- Observing employees for alertness and signs or symptoms of heat illness. The employer shall ensure effective employee observation/monitoring by implementing one or more of the following:
    - Supervisor or designee observation of 20 or fewer employees;
    - Mandatory buddy system; and
    - Regular communication with sole employee such as by radio or cellular phone, or other effective means of observation.
- Designating one or more employees on each worksite as authorized to call for emergency medical services and allowing other employees to call for emergency services when no designated employee is available.
- Encouraging employees throughout the work shift to drink plenty of water.
- A review of the high heat procedures during the daily tailgate meeting and remind employees of their right to take a cool-down rest when necessary.

7.3.1 Heat Stress

Heat stress is the body's response to excessive heat and can be a significant potential hazard. The risk of heat stress can be increased with heavy physical activity and/or the use of personal protective equipment in hot, humid weather environments. There are also personal risk factors that can contribute to the risk of suffering from heat stress, such as obesity, water intake, alcohol and caffeine consumption, pregnancy, age, medication, etc. Heat illness includes heat cramps, heat exhaustion, heat syncope, and heat stroke.

7.3.2 Heat Cramps

Heat cramps may be brought on by prolonged exposure to heat. As an individual sweats, water and salts are lost by the body resulting in painful muscle cramps, typically in the legs.

First aid treatment includes, but is not limited to, shade, rest, and fluid replacement. Typically, the individual should recover within one-half hour while being monitored constantly. If the individual has not improved substantially within 30 minutes and the body temperature has not decreased, the individual should be transported to a hospital for medical attention.

Per Roux's Heat Illness Prevention Plan, employees shall have access to potable drinking water that is fresh, pure, suitably cool, free of charge and in sufficient quantities. Access to shade shall be present when temperatures exceed 80 degrees Fahrenheit and shall be available when temperatures do not exceed 80 degrees Fahrenheit.

7.3.3 Heat Exhaustion

Heat exhaustion may occur in an individual who has been exposed to excessive heat while working or exercising. The circulatory system of the individual fails as blood collects near the skin to rid the body of excess heat through transference. The signs and symptoms of heat exhaustion are as follows:

- Rapid and shallow breathing;
- Weak pulse;
- Cold and clammy skin with heavy perspiration;
- Skin appears pale;
- Fatigue and weakness;
- Dizziness; and
- Elevated body temperature.

First aid treatment includes, but is not limited to, cooling the victim, elevating the feet, and replacing fluids.

If the individual is not substantially improved within 30 minutes and the body temperature has not decreased, the individual should be transported to the hospital for medical attention.

7.3.4 Heat Stroke

Heat stroke occurs when an individual is exposed to excessive heat and stops sweating. This condition is classified as a MEDICAL EMERGENCY requiring immediate cooling of the victim and transport to a medical facility. The signs and symptoms of heat stroke are as follows:

- Dry, hot, red skin;
- Body temperature approaching or above 105^{o}F;
- Confusion, altered mental state, slurred speech;
- Seizures;
- Large (dilated) pupils; and
- Loss of consciousness – the individual may go into a coma.

First aid treatment requires immediate cooling and transportation to a medical facility. Heat stress is a significant hazard if any type of protective equipment (semi-permeable or impermeable) that prevents evaporative cooling when worn in hot weather environments.

7.4 Cold Stress

Cold stress is a danger at low temperatures and when the wind-chill factor is low. Prevention of cold-related illnesses is a function of whole-body protection. Adequate insulating clothing must be used when the air temperature is below 60°F. A work/rest regimen will be initiated when ambient temperatures and protective

clothing cause a stressful situation. In addition, reduced work periods followed by rest in a warm area may be necessary in extreme conditions. The signs and symptoms of cold stress include the following:

- Severe shivering;
- Abnormal behavior;
- Slowing;
- Weakness;
- Stumbling or repeated falling;
- Inability to walk;
- Collapse; and/or
- Unconsciousness.

First aid requires removing the victim from the cold environment and seeking medical attention immediately. Also, prevent further body heat loss by covering the victim lightly with blankets. Do not cover the victim's face. If the victim is still conscious, administer hot drinks and encourage activity such as walking, wrapped in a blanket.

8. Safety Procedures

This section of the HASP presents the specific safety procedures to be implemented during Roux's activities at the Site in order to protect the health and safety of various on-site personnel. Minimum OSHA-mandated procedures are presented first, followed by client- and Site-specific procedures. Lastly, activity-specific procedures are discussed. These Site and activity-specific procedures supplement the general safety procedures included in Roux's Corporate Health and Safety Manual, which also must be followed in their entirely.

8.1 Training

At a minimum, Site personnel who will perform work in areas where there exists the potential for toxic exposure will be health and safety-trained prior to performing work onsite per OSHA 29 CFR 1910.120(e) and 29 CFR 1926.65(e). More specifically, all Roux, subcontractor, and other personnel engaged in sampling and remedial activities at the Site and who are exposed or potentially exposed to hazardous substances, health hazards, or safety hazards must have received at a minimum the 40 hour initial HAZWOPER training consistent with the requirements of 29CFR 1910.120(e)(3)(i) training and a minimum of 3 days' actual field experience under the direct supervision of a trained experienced supervisor, plus 8 hours of refresher training on an annual basis. Depending on tasks performed, less training may be permitted. Evidence of such training must be maintained at the Site at all times. Furthermore, all on-Site management and supervisory personnel directly responsible for or who supervise the employees engaged in Site remedial operations, must have received an additional 8 hours of specialized training at the time of job assignment on topics including, but not limited to, the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques, plus 8 hours of refresher training on an annual basis. Additionally, all workers who will be required to don a respirator will be properly trained on their employer's Respiratory Protection Program, which also includes being medically cleared to wear a respirator and passed a fit test, at least initially prior to use, and then annually thereafter in accordance with 29 CFR 1910.134, Respiratory Protection.

Roux personnel training records are maintained in a corporate database with records available upon request from either the OHSM/SHSO/CHSD or Human Resources Department.

8.2 Site-Specific Safety Briefings for Visitors

A site-specific briefing is provided to all site visitors who enter this site beyond the site entry point. For visitors, the site-specific briefing provides information about site hazards, the site lay-out including work zones and places of refuge, the emergency alarm system and emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

8.3 HASP Information and Site-Specific Briefings for Workers

Site personnel review this HASP and are provided a Site-specific tailgate briefing prior to the commencement of work to ensure employees are familiar with this HASP and the information and requirements it contains, as well as the relevant JSAs included in **Appendix A**. Additional briefings are provided as necessary to notify employees of any changes to this HASP as a result of information gathered during on-going Site characterization and analysis of changing conditions. Conditions for which we schedule additional briefings

include, but are not limited to: changes in site conditions, changes in the work schedule/plan, newly discovered hazards, and incidents occurring during Site work.

8.4 Medical Surveillance

The medical surveillance section of the Health and Safety Plan describes how worker health status is monitored at this site. Medical surveillance is used when there is the potential for worker exposure to hazardous substance at levels above OSHA Permissible Exposure Limits (PEL) or other published limits. The purpose of a medical surveillance program is to medically monitor worker health to ensure that personnel are not adversely affected by site hazards. The provisions for medical surveillance at this site are based on the site characterization and job hazard analysis found in Section 4 of this HASP and are consistent with OSHA requirements in 29 CFR 1910.120(f) as applicable.

8.4.1 Site Medical Surveillance Program

Medical surveillance requirements are based on a worker's potential for exposure as determined by the site characterization and job hazard analysis documented in Section 4 and JSAs within **Appendix A** of this HASP and in compliance with the requirements of 29 CFR 1910.120(f)(2). Based on site information and use of direct reading instruments, limited use of respirators (less than 30 days per year), and the absence of an employee-staffed HAZMAT team, a limited medical surveillance program is required and implemented at this site. The medical surveillance program provides that:

1. Workers assigned to tasks requiring the use of respirators receive medical examinations in accordance with 29 CFR 1910.134(e) to ensure they are physically capable to perform the work and use the equipment, and
2. If a worker is injured, becomes ill, or develops signs or symptoms of possible over-exposure to hazardous substance or health hazards, medical examinations are provided to that worker as soon as possible after the occurrence and as required by the attending physician.
3. These medical examinations and procedures are performed by or under the supervision of a licensed physician and are provided to workers free of cost, without loss of pay, and at a reasonable time and place. In addition, the need to implement a more comprehensive medical surveillance program will be re-evaluated after any apparent over-exposure.

8.4.2 Medical Recordkeeping Procedures

Medical recordkeeping procedures are consistent with the requirements of 29 CFR 1910.1020 and are described in the company's overall safety and health program. A copy of that program is available at our Islandia, New York office.

The following items are maintained in worker medical records:

- Respirator fit test and selection;
- Physician's medical opinion of fitness for duty (pre-placement, periodic, termination);
- Physician's medical opinion of fitness for respirator protection (pre-placement, periodic); and
- Exposure monitoring results.

8.4.3 Program Review

The medical program is reviewed to ensure its effectiveness. The Corporate Health and Safety Manager, in coordination with the Human Resources Director, is responsible for this review. At minimum, this review consists of:

- Review of accident and injury records and medical records to determine whether the causes of accidents and illness were promptly investigated and whether corrective measures were taken wherever possible;
- Evaluation of the appropriateness of required medical tests based on site exposures; and
- Review of emergency treatment procedures and emergency contacts list to ensure they were site-specific, effective, and current.

8.5 Personnel Protection

Site safety and health hazards are eliminated or reduced to the greatest extent possible through engineering controls and work practices. Where hazards are still present, a combination of engineering controls, work practices and PPE are used to protect employees. Appropriate personal protective equipment (PPE) shall be worn by Site personnel when there is a potential exposure to chemical, biological or physical hazards (e.g., falling objects, flying particles, sharp edges, electricity, and noise), as determined by the SHSO. The level of personal protection, type and kind of equipment selected will depend on the hazardous conditions and in some cases cost, availability, compatibility with other equipment, and performance. An accurate assessment of all these factors will be made before work can be safely executed.

Roux maintains a comprehensive written PPE program that addresses proper PPE selection, use, maintenance, storage, fit and inspection. Roux's PPE program can be found within **Appendix E**. PPE to be used at the Site will meet the appropriate American National Standards Institute (ANSI) standards and the following OSHA (General/Construction Industry) standards for minimum PPE requirements.

The minimum level of PPE for entry onto the Site is Level D. The following equipment shall be worn:

- Work uniform (long pants, sleeved shirt);
- Hard hat;
- Steel or composite toe work boots (must comply with American Society for Testing and Materials [ASTM]) F 2412-05, Standard Test Methods for Foot Protection and ASTM F 2413-05, Standard Specification for Performance Requirements for Foot Protection);
- Safety Glasses (must comply with one of the following ANSI/ISEA Z87.1-2010, ANSI Z87.1-2003, ANSI Z87.1-2003);
- Boot Covers (as needed);
- Hearing protection (as needed);
- High visibility clothing (shirt/vest); and
- Hand protection (e.g., minimum cut resistance meeting ANSI 105-2000 Level 2).

Note that jewelry shall be removed or appropriately secured to prevent it from becoming caught in rotating equipment or unexpectedly snagged on a fixed object (e.g., wrist watches, bracelets, rings, chains and necklaces, open earrings). Do not wear loose clothing and all shoulder-length hair should be tied back.

Site specific PPE ensembles and materials are identified within task specific JSAs located within **Appendix A**, and any upgrades or downgrades of the level of protection (i.e., not specified in the JSA) must be approved by the PP and immediately communicated to all Roux personnel and subcontractors as applicable. PPE is used in accordance with manufacturer's recommendations.

8.5.1 Additional Personal Protection

As outlined above the minimum PPE for entry onto the Site is modified Level D. Outlined below are the requirements for Level C and B PPE.

EPA Level C Protection

Personal Protective Equipment:

- Full-face, air-purifying, cartridge-equipped respirator* (Mine Safety and Health Administration/ National Institute of Occupational Safety and Health [MSHA/ NIOSH] specifically approved for protection from organic vapors or particulates);
- Chemical-resistant clothing (coverall; hooded, two-piece chemical splash suit; chemical-resistant hood and apron; disposable chemical-resistant coveralls);
- Cotton coveralls;
- Gloves (outer), chemical-resistant, nitriles;
- Gloves (inner), cut resistant (with minimum blade cut-rating of ANSI 105-2000 Level 2);
- Boots (inner), chemical-resistant, steel (or composite) toe and including task-specific boot requirements as consistent with ASTM F2413-11;
- Boots (outer), chemical-resistant (disposable);
- Hard hat;
- Hearing protection (as needed); and
- Escape mask (as needed).

*Cartridges in use will be changed out based on their End of Service Life Indicator. If organic vapor (OV) cartridges are worn for benzene exposures above 1 ppm, the cartridge shall be removed from service at the end of the calculated service life or before the next shift, whichever is sooner. For other contaminants present a cartridge change out schedule will be provided based off 3M Select & Service Life Software or in consultation with the CHSD; worst case assumptions will be made to provide a conservative estimate on cartridge change out. If multiple contaminants are present at varying degrees, the work must cease operation, as cartridges in use may not cover all contaminants present. Screening will be carried out during work activities as specified in Section 8.6 Air Monitoring Plan. Organic vapors adsorbed on an organic vapor cartridge can migrate through the carbon bed without airflow. Desorption of the contaminant after partial use of the chemical cartridge can occur after a short period (hours) without use (e.g., overnight). This is most significant for the most volatile and poorly retained organic vapors (e.g., boiling point < 65 degrees Celsius [°C]). For organic vapors with a boiling point less than 65 degrees C, it is recommended that the organic vapor cartridge never be used longer than one shift, even if the estimated service life is greater than 8 hours, and the cartridge is used for only a short time during the shift.

Criteria for Selection-Level C:

Meeting any of these criteria warrants use of Level C protection.

- Airborne hazards are known to be present but are unlikely to exceed protection factors provided by air purifying respirators.

- Continuous total organic vapor readings in the breathing zone register between 50 ppm and to less than 100 ppm on a PID (such as a MiniRAE 3000 or other comparable instrument), and chemical specific (e.g., benzene/vinyl chloride/formaldehyde) readings utilizing colorimetric indicator tubes (e.g., Dräeger or Sensidyne) are undetectable.
- See the Combustible Gases table for decisions based on LEL within Section 8.5. Air Monitoring Plan.
- Measured air concentrations of known organic vapors will be reduced by the respirator to at or below one half of the PEL, and the individual and combined compound concentrations are within the service limit of the respirator cartridge.
- Atmospheric contaminant concentrations do not exceed Immediately Dangerous to Life and Health (IDLH) concentrations.
- Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect the small area of skin left unprotected by chemical-resistant clothing.
- Job functions have been determined not to require self-contained breathing apparatus.

Notes:
1. Benzene and or other specific compounds may also be monitored initially and periodically in the breathing zone utilizing activated sampling devices approved for use based on lower occupational exposure limits.
2. Modifications of Level C will be used to increase or decrease the level of skin protection during activities that increase or preclude, respectively, the degree of contact with chemical hazards. Modifications for increased protection may include, but are not limited to, the use of chemical resistant coveralls (e.g., Tyveks) and cut and chemical resistant gloves. Any modifications to Level C will require approval of the SHSO, and PM in consultation with the CHSD.

EPA Level B Protection (Contact the OHSM and/or CHSD)

Personal Protection Equipment:

- Pressure-demand, self-contained breathing apparatus (MSHA/NIOSH approved);
- Chemical-resistant clothing (overall and long-sleeved jacket; coveralls; hooded, one or two-piece chemical-splash suit; disposable chemical-resistant coveralls);
- Cotton coveralls;
- Chemical-resistant gloves (outer) nitriles;
- Gloves (inner), cut-resistant (with minimum blade cut rating of ANSI Level 2);
- Boots (inner), chemical-resistant, steel (or composite) toe, and task-specific boot requirements as consistent with ASTM F2413-11;
- Boots (outer), chemical-resistant, (disposable);
- Hard hat;
- Hearing protection (as needed); and
- 2-way radio communications (intrinsically safe).

Criteria for Selection-Level B:

- Meeting any one of these criteria warrants use of Level B protection.
- PID instrument (such as a MiniRAE 3000 or other comparable instrument) readings in the breathing zone are greater than 50 ppm and less than 100 ppm and benzene is detectable utilizing colorimetric indicator tubes (e.g., Dräeger or Sensidyne).
- Airborne hazards are known to be present but are not identified or quantified.

- The type(s) and atmospheric concentration(s) of toxic substance(s) have been identified and require the highest level of respiratory protection, but a lower level of skin and eye protection. These would-be atmospheres:
    - With IDLH concentrations;
    - Exceeding limits of protection afforded by a full-face, air-purifying respirator; or
    - Containing substances requiring supplied-air PPE, but substances and/or concentrations do not represent a serious skin hazard.
    - The atmosphere contains less than 19.5% oxygen.
- Site operations make it highly unlikely that the small, unprotected area of the head or neck will be contacted by splashes of extremely hazardous substances.
- If work is performed in an enclosed space.

Note that jewelry shall be removed or appropriately secured to prevent it from becoming caught in rotating equipment or unexpectedly snagged on a fixed object. (e.g., wrist watches bracelets, rings, chains and necklaces, open earrings). Do not wear loose clothing and all shoulder length hair should be tied back.

Site-specific PPE ensembles and materials are identified within task specific JSAs located within **Appendix A**, and any upgrades or downgrades of the level of protection (i.e., not specified in the JSA) must be immediately communicated to all Roux personnel and subcontractors, as applicable. PPE is used in accordance with manufacturer's recommendations.

8.5.2 Hearing Conservation

Hearing protection is made available when noise exposures equal or exceed an 8-hour time-weighted average sound level of 85 dBA. Hearing protection is required when the 8-hour time weighted average sound level $\geq$ 85 dBA, or when noise levels exceed 140 dBA at any point or exceeds 115 dBA for at least 15 minutes. Where noise exposure meets or exceeds this level, noise is listed as a physical hazard in the JSA for the tasks/operation, and hearing protection is included as one of the control measures (PPE).

8.6 Tailgate Safety Meetings

A designated Site worker will provide daily safety briefings (e.g., tailgate meetings) including, but not limited to, the following scenarios:

- When new operations are to be conducted;
- Whenever changes in work practices must be implemented; and
- When new conditions are identified and/or information becomes available.

Daily safety briefings shall be recorded on the Roux Daily Tailgate Health and Safety Meeting Log/Daily Site Safety Checklist, and all completed forms will become a part of the project file.

8.7 Spill Containment

Spill containment equipment and procedures should, at a minimum, meet the requirements of the facility's Spill Prevention, Control and Countermeasure Plan, if applicable. Otherwise, spill containment equipment and procedures must be considered depending on the task, including, but not limited to, chemical/product transfer points and handling.

8.7.1 Initial Spill Notification and Response

Any worker who discovers a hazardous substance spill will immediately notify the SHSO. The worker will, to his/her best ability, report the hazardous substance involved, the location of the spill, the estimated quantity of material spilled, the direction/flow of the spill material, related fire/explosion incidents, and any associated injuries without compromising their own safety.

8.7.2 Spill Evaluation and Response

The SHSO is responsible for evaluating spills and determining the appropriate response. When this evaluation is being made, the spill area will be isolated and demarcated to the extent possible. If necessary to protect nearby community members, notification of the appropriate authorities is made by the PM as appropriate. On-Site response is limited to small spills (e.g., <10 gallons); large spills require external emergency responders who will be contacted by the SHSO.

8.8 Decontamination

The decontamination section of the HASP describes how personnel and equipment are decontaminated when they leave the Exclusion Zone. This section also describes how residual waste from decontamination processes is disposed. The site decontamination procedures are designed to achieve an orderly, controlled removal or neutralization of contaminants that may accumulate on personnel or equipment. These procedures minimize worker contact with contaminants and protect against the transfer of contaminants to clean areas of the site and off-site. They also extend the useful life of PPE by reducing the amount of time that contaminants contact and can permeate PPE surfaces. Decontamination is facilitated within the CRZ at this site, if applicable.

8.8.1 Decontamination Procedures for Personnel and PPE

The following are general decontamination procedures established and implemented at this site.

1. Decontamination is required for all workers exiting a contaminated area. Personnel may re-enter the SZ only after undergoing the decontamination procedures described below in the next section.
2. Protective clothing is decontaminated, cleaned, laundered, maintained and/or replaced as needed to ensure its effectiveness.
3. PPE used at this site that requires maintenance or parts replacement is decontaminated prior to repairs, or
4. PPE used at this site is decontaminated or prepared for disposal on the premises. Personnel who handle contaminated equipment have been trained in the proper means to do so to avoid hazardous exposure.
5. This site uses an off-site laundry for decontamination of PPE. The site has informed that facility of the hazards associated with contaminated PPE from this site.
6. The site requires and trains workers that if their permeable clothing is splashed or becomes wetted with a hazardous substance, they will immediately exit the work zone, perform applicable decontamination procedures, shower, and change into uncontaminated clothing.
7. Procedures for disposal of decontamination waste meet applicable local, State, and Federal regulations.

8.8.2 Decontamination Procedures for Equipment

All tools, equipment, and machinery from the EZ or CRZ are decontaminated in the CRZ prior to removal to the SZ. Equipment decontamination procedures are designed to minimize the potential for hazardous skin or inhalation exposure and to avoid cross-contamination and chemical incompatibilities.

General Equipment Decontamination Procedures:

1. Decontamination is required for all equipment exiting a contaminated area. Equipment may re-enter the SZ only after undergoing the equipment decontamination procedures.
2. Vehicles that travel regularly between the contaminated and clean areas of the site are carefully decontaminated each time they exit the EZ and the effectiveness of that decontamination is monitored to reduce the likelihood that contamination will be spread to other parts of the site.
3. Particular attention is given to decontaminating tires, scoops, and other parts of heavy equipment that are directly exposed to contaminants and contaminated soil.
4. Procedures for disposal of decontamination waste shall meet applicable local, State, and Federal regulations.

The following items may be used to decontaminate equipment:

- Fresh water rinse;
- Non-phosphorus detergent wash;
- Acetone rinse;
- Distilled water rinse; and
- A steam cleaner or pressure washer (heavy equipment only).

8.8.3 Monitoring the Effectiveness of Decontamination Procedures

Visual examination and sampling are used to evaluate the effectiveness of decontamination procedures. Visual examination is used to ensure that procedures are implemented as described and that they appear to control the spread of contaminants under changing site conditions. Visual examination is also used to inspect for signs of residual contamination or for contaminant permeation of PPE.

Personnel who work in contaminated areas of the site, either the Contamination Reduction Zone (CRZ) or the Exclusion Zone, are trained in the principles and practices of decontamination described in this section of the HASP and in related SOPs. If site procedures are changed as a result of inspection and monitoring, all affected employees are notified of these changes.

8.9 Confined Space Entry

Confined space entry will not be performed.

The following is a list of the safety requirements for confined space entry at the Site:

- **ROUX PERSONNEL ARE NOT AUTHORIZED TO ENTER AN OSHA PERMIT REQUIRED CONFINED SPACE;**
- Currently the scope of work **DOES NOT** require personnel to enter permitted confined space for this project; and

- Any changes to the field activities that may necessitate confined space entry will be reported to the Project Principal and OHSM.

Confined space is defined as any space, depression, or enclosure that:

- Has limited opening for entry and egress;
- Is large enough for an employee to enter and perform assigned work; and
- Is not intended for continuous occupancy.

A permit required confined space is one that meets the definition of a confined space and has one or more of the following characteristics:

- May contain or produce life-threatening atmospheres due to oxygen deficiency the presence of toxic, flammable, or corrosive contaminants;
- Contains a material that has the potential for engulfment;
- Has an internal configuration that may cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section; and
- Contains any other serious safety or health hazards.

Although Roux personnel will not perform confined space entry, it is expected that subcontractors performing cleaning and mitigation and/or remedial measures activities may be required to enter structures that are considered to be a permit required confined space. Permitting of the confined space as well as hazard mitigation for entry will be completed by the subcontractor in accordance with 29 CFR 1910.146 or 1926.1201-1213 and/or applicable local/client requirements.

8.10 Client and Site-Specific

In addition to the OSHA-specific procedures discussed above, there may be client and site-specific safety procedures that must be adhered to during the performance of remedial activities at the Site.

8.11 Unusual or Significant Risks

Field activities that appear to have unusual or significant risks that cannot be adequately managed with existing risk tools such as LPS, HASPs, traffic safety plans, work permits, design and O&M practices, equipment HAZOPS or other safety tools must be referred to the CHSD to help with the assessment and management of the associated potential safety risks. Examples include the use of explosives for demolition, use of firearms to control wildlife, rappelling, demolition over water, diving, etc.

8.12 Activity-Specific Hazards

In addition to the general hazards discussed above, there are activity-specific hazards associated with each work activity planned for the Site. An activity-specific JSA has been completed for each of the activities planned for the Site. JSAs are provided in **Appendix A**. In the event that new work activities or tasks are planned, JSAs will be developed and implemented prior to performing the new activities. In the absence of a JSA, the personnel performing work must prepare a field JSA and receive clearance from a designated competent safety official prior to performing any task with significant risk. In emergency situations where time is critical SPSAs will be utilized to identify the task, associated hazards and mitigative actions to take.

For lower risk activities (as deemed by the discretion of a Competent Person) where a JSA is determined to not be needed, the individual(s) conducting the activities must perform SPSAs prior to and during the work.

8.12.1 Electrical and Other Utility Assessment and Accommodations

Roux shall perform a site walk to identify any potential overhead electrical or utility lines. All applicable guidelines will be followed in the vicinity of overhead power and utility lines (see Section 8.13.3 below).

Roux has also reviewed all available Site maps showing buried utility lines to identify potential hazards, which revealed that no underground hazards are known to exist in the vicinity of the areas of the Site pertinent to this HASP.

8.12.2 Subsurface Work

Subsurface work activities will require adherence to Roux's Corporate Subsurface Utility Clearance Management program found within **Appendix F**.

8.12.2.1 Excavations and Trenching

Trenching and excavation work activities carried out by Roux and their subcontractors shall comply with applicable OSHA standards (i.e., 29 CFR 1926.650-652). Regional Notification Centers (i.e., Underground Services Alert) shall be notified at least two working days prior to the start of any digging or excavation work per state requirements (i.e., 811-One Call). Personnel responsible for excavation activities will be trained in their job responsibilities. Additionally, for trenches 4 feet or deeper, where employees will enter, the trench needs to have a stairway, ladder or other safe means of egress, and located so that employees do not have to travel farther than 25 feet horizontally. Where employees will enter trenches greater than 5 feet deep, the trench must have some type of protective system or sloped sidewalls appropriately to prevent cave-ins.

The SHSO or other responsible Roux personnel will be present onsite during all Roux contracted excavation and backfill operations and will supplement health and safety monitoring conducted by Subcontractor air quality screening to ensure that appropriate levels of protection and safety procedures are utilized. The proximity of chemical, water, sewer, and electrical lines will be identified by Roux and/or their subcontractor before any subsurface activity or sampling is attempted. Prior to any excavation activities, trees, shrubbery, and other objects that can potentially pose as a hazard during excavation should be supported or removed from the excavation area. The following safe work practices will be implemented during this task.

- The proximity of chemical, water, sewer, and electrical lines will be identified by a facility representative prior to beginning any subsurface activity;
- At the start of every day, a competent person will inspect excavations to evaluate if the area is stable and safe to enter. Inspections will be conducted as needed throughout the excavation operations. If deemed necessary, a competent person may also conduct inspections after rainfall or any other event that can potentially affect the integrity of the excavation. Employees will not enter excavations where water has accumulated until protective measures have been implemented.
- Prior to entering excavations greater than 4 feet in depth, air monitoring for oxygen and hazardous atmospheres must be conducted to assure atmospheric conditions are within normal levels described in Section 8.6. Continuous air monitoring with a standard multi-gas detector (O^2, LEL%, CO, H^2S) shall be used during the course of work within an excavation; if action limits are reached workers shall safely exit the excavation. Upgrades to worker protection should be evaluated with the SHSO and PP in consultation with the CHSD. Emergency rescue equipment, such as breathing apparatuses and safety harnesses connected to an extraction device, will be readily available in the event of hazardous atmospheric conditions;

- While earthmoving, stay out of the excavator's delineated heavy equipment exclusion zone and away from the excavation sides where there is potential for cave in (within excavations that are 6 feet or more in depth, a delineated perimeter 6 feet away from the excavated edge is required);
- During loading and unloading operations, stand away from haul trucks and other vehicles to avoid contact with any falling loads; and
- Traffic cones, caution tape, or other barriers will be set up around the perimeter of the excavation when employees are working along the excavation edge and for any excavation that will be left open overnight or unattended for more than two days.

Maximum Allowable Slopes

Soil or Rock Type	Maximum Allowable Slopes (H:V)[1] for Excavations Less Than 20 Feet Deep[3]
Stable Rock	Vertical (90°)
Type A[2]	3/4 : 1 (53°)
Type B	1 : 1 (45°)
Type C	1 1/2 : 1 (34°)

29 CFR 1926 Subpart P Appendix B Sloping and Benching Table B-1

Notes:

[1] Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

[2] A short-term maximum allowable slope of 1/2H : 1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 meters) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 meters) in depth shall be 3/4H : 1V (53°).

[3] Sloping or benching for excavations greater than 20 feet deep shall be designed and stamped by a registered professional engineer.

Proper stockpiling (i.e., 2 feet minimum distance from the excavation edge), containment, transport, storage, and disposal practices will be utilized and is dependent upon the potential type and amount of waste generated during operations. The location of safety equipment and evacuation procedures will be established prior to initiation of operations according to this HASP.

8.12.3 Heavy Equipment

Use of heavy equipment at the Site will require adherence to Roux's Corporate Heavy Equipment Exclusion Zone Management Program found within **Appendix G**. Additionally, operation of the drill rig/other heavy equipment will maintain clearances from overhead power lines in accordance with 29 CFR 1926.1408 Table A Minimum Clearance Distances provided below.

Minimum Required Clearances for Energized Overhead Power Lines

Nominal System Voltage of Power Line (K V)	Minimum Required Clearance (feet)
0-50	10
51-100	12
101-200	15
201-300	20
301-500	25
501-750	35
751-1000	45

1 kilovolt (KV) = 1,000 volts

8.13 Traffic Control

If Site operations encroach upon public streets or highways and a hazard exists to Site personnel because of traffic conditions, a traffic control plan will be implemented in accordance with the United States Department of Transportation's (DOT's) "Manual on Uniform Traffic Control Devices."

8.14 Sanitation

Sanitation facilities will be provided in accordance with the sanitation standards (29 CFR 1910.141, 29 CFR 1926.51 and 29 CFR 1928.110). Sanitation facilities will be maintained and kept in good conditions at all times.

9. Field Team Review

Each person performing work at or visiting this site shall sign this section after site-specific training is completed and before being permitted to access the CRZ or Exclusion Zone.

I have read and understand this Site-Specific Health and Safety Plan. I will comply with the provision contained therein.

Site/Project: 73-99 Empire Blvd, Brooklyn, NY

Name & Company	Signature	Date

10. Approvals

By their signature, the undersigned certify that this HASP is approved and will be utilized at the 73-99 Empire Blvd Site.

TBD – Site Health and Safety Officer	Date
Nevin Pahlad – Office Health and Safety Manager	Date
Wendy Shen – Project Manager	Date
Charlie McGuckin – Project Principal	Date

TABLES

1. Toxicological Properties of Hazardous Substances Present at the Site

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 280 Bergen Street, Brooklyn, NY.

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
ORGANOCHLORINE PESTICIDES (OCP)									
DDT	50-29-3	TWA 1 mg/m3	TWA 0.5 mg/m3	TWA 1 mg/m3	500 mg/m3	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin; paresthesia tongue, lips, face; tremor; anxiety, dizziness, confusion, malaise (vague feeling of discomfort), headache, lassitude (weakness, exhaustion); convulsions; paresis hands; vomiting; [potential occupational carcinogen]	Eyes, skin, central nervous system, kidneys, liver, peripheral nervous system	White, odorless and tasteless, very stable, water-insoluble, synthetic BP: 260°F Fl.Pt. = 162-171°F LEL: NA UEL: NA
Aldrin	309-00-2	TWA 0.1 mg/m3	TWA 0.25 mg/m3	TWA 0.25 mg/m3	25 mg/m3	Inhalation, ingestion, skin and/or eye contact	headache, dizziness; nausea, vomiting, malaise (vague feeling of discomfort); myoclonic jerks of limbs; clonic, tonic convulsions; coma; hematuria (blood in the urine), azotemia; [potential occupational carcinogen]	Developmemntal, Endocrine, Liver, Immune System, Nervous System,	Colorless to dark-brown crystalline solid with a mild chemical odor. BP: 293°F Fl.Pt. = 150°F LEL: NA UEL: NA
Lindane (gamma-BHC)	58-89-9	TWA 0.5 mg/m3	TWA 0.5 mg/m3	TWA 0.5 mg/m3	50 mg/m3	Inhalation, ingestion, skin and/or eye contact	irritation eyes, skin, nose, throat; headache; nausea; clonic convulsions; resp difficulty; cyanosis; aplastic anemia; muscle spasm; In Animals: liver, kidney damage	Eyes, skin, respiratory system, central nervous system, blood, liver, kidneys	White to yellow, crystalline powder with a slight, musty odor. BP: 614°F Fl.Pt. = 150°F LEL: NA UEL: NA
Dieldrin	860-57-1□	TWA 0.1 mg/m3	TWA 0.25 mg/m3	TWA 0.25 mg/m3	25 mg/m3	Inhalation, ingestion, skin and/or eye contact	headache, dizziness; nausea, vomiting, malaise (vague feeling of discomfort), sweating; myoclonic limb jerks; clonic, tonic convulsions; coma; ; In Animals: liver, kidney damage [potential occupational carcinogen]	Developmemntal, Endocrine, Liver, Immune System, Nervous System,	Colorless to light-tan crystals with a mild, chemical odor. BP: NA (Decomposes) Fl.Pt. = NA LEL: NA UEL: NA
VOLATILE ORGANIC COMPOUNDS (VOCs)									
1,1,1-Trichloroethane	71-55-6	TWA 350 ppm STEL 450 ppm	C 350 ppm (1900 mg/m^3) [15-minute]	TWA 350 ppm (1900 mg/m^3)	700 ppm	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depression, poor equilibrium; dermatitis; cardiac arrhythmias; liver damage	Eyes, skin, central nervous system, cardiovascular system, liver	Colorless liquid with a mild, chloroform-like odor. BP: 165°F Fl.Pt. = NA LEL: 7.5% UEL: 12.5% Combustible Liquid, but burns with difficulty
1,1,2,2-Tetrachloroethane	79-34-5	TWA 1 ppm [skin]	Ca TWA 1 ppm (7 mg/m^3) [skin]	TWA 5 ppm (35 mg/m^3) [skin]	Ca [100 ppm]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Nausea, vomiting, abdominal pain; tremor fingers; jaundice, hepatitis, liver tenderness; dermatitis; leukocytosis (increased blood leukocytes); kidney damage; [potential occupational carcinogen]	Skin, liver, kidneys, central nervous system, gastrointestinal tract	Colorless to pale-yellow liquid with a pungent, chloroform-like odor BP: 296°F Fl.Pt. = NA LEL: NA UEL: NA Noncombustible Liquid
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	TWA 1000 ppm STEL 1250 ppm	TWA 1000 ppm (7600 mg/m3) ST 1250 ppm (9500 mg/m3)	TWA 1000 ppm (7600 mg/m3)	2000 ppm	Inhalation, ingestion, skin and/or eye contact	Irritation skin, throat, drowsiness, dermatitis; central nervous system depression; In Animals: cardiac arrhythmias, narcosis	Skin, heart, central nervous system, cardiovascular system	Colorless to water-white liquid with an odor like carbon tetrachloride at high concentrations. [Note: A gas above 118°F.] BP: 118°F Fl.Pt. = NA LEL: NA UEL: NA
1,1,2-Trichloroethane	79-00-5	TWA 10 ppm [skin]	Ca TWA 10 ppm (45 mg/m3) [skin]	TWA 10 ppm (45 mg/m3) [skin]	Ca [100 ppm]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; central nervous system depression; liver, kidney damage; dermatitis; [potential occupational carcinogen]	Eyes, respiratory system, central nervous system, liver, kidneys	Colorless liquid with a sweet, chloroform-like odor BP: 237°F Fl.Pt. = NA LEL: 6% UEL: 15.5% Combustible Liquid, forms dense soot
1,1-Dichloroethane	75-34-3	TWA 100 ppm	TWA 100 ppm (400 mg/m^3)	TWA 100 ppm (400 mg/m^3)	3,000 ppm	Inhalation, ingestion, skin and/or eye contact	Irritation skin; central nervous system depression; liver, kidney, lung damage	Skin, liver, kidneys, lungs, central nervous system	Colorless, oily liquid with a chloroform-like odor. BP: 135°F Fl.Pt. = 2°F LEL: 5.4% UEL: 11.4% Class IB Flammable Liquid Fl.P. below 73°F and BP at or above 100°F.

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 280 Bergen Street, Brooklyn, NY.

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
1,1-Dichloroethene	75-35-4	TWA 5 ppm	Ca	None	Ca	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, throat; dizziness, headache, nausea, dyspnea (breathing difficulty); liver, kidney disturbance; pneumonitis; [potential occupational carcinogen]	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Colorless liquid or gas (above 89°F) with a mild, sweet, chloroform-like odor BP: 89°F Fl.Pt. = -2°F LEL: 6.5% UEL: 15.5% Class IA Flammable Liquid: Fl.P. below 73°F and BP below 100°F
1,2,3-Trichlorobenzene	87-61-6	Cameo Chemicals Source https://cameochemicals.noaa.gov/chemical/10051	NA	NA	NA	Inhalation, skin absorption, ingestion, skin and/or eye contact	Inhalation may cause irritation of respiratory tract. Irritating to the eyes. May redden skin on contact. Ingestion may cause liver damage.	Skin, eyes, respiratory tract, liver	A white solid with a sharp chlorobenzene odor. Insoluble in water and denser than water. Hence sinks in water Fl.Pt. = 234.9°F
1,2,4-Trichlorobenzene	120-82-1	C 5 ppm	C 5 ppm (40 mg/m3)	None	N.D.	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation eyes, skin, mucous membrane; In Animals: liver, kidney damage; possible teratogenic effects	Eyes, skin, respiratory system, liver, reproductive system	Colorless liquid or crystalline solid (below 63°F) with an aromatic odor BP: 416°F Fl.Pt. = 222°F LEL (302°F): 2.5% UEL (302°F): 6.6% Class IIIB Combustible Liquid: Fl.P. at or above 200°F. Combustible Solid
1,2-Dibromo-3-chloropropane	96-12-8	NA	Ca	TWA 0.001 ppm	Ca	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; drowsiness; nausea, vomiting; pulmonary edema; liver, kidney injury; sterility; [potential occupational carcinogen]	Eyes, skin, respiratory system, central nervous system, liver, kidneys, spleen, reproductive system, digestive system	Dense yellow or amber liquid with a pungent odor at high concentrations. [pesticide] [Note: A solid below 43°F.] BP: 384°F Fl.Pt. = (oc) 170°F LEL: NA UEL: NA Class IIIA Combustible Liquid: Fl.P. at or above 140°F and below 200°F.
1,2-Dibromoethane	106-93-4	None listed Skin	Ca TWA 0.045 ppm C 0.13 ppm [15-minute]	TWA 20 ppm C 30 ppm 50 ppm [5-minute maximum peak]	Ca [100 ppm]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system; dermatitis with vesiculation; liver, heart, spleen, kidney damage; reproductive effects; [potential occupational carcinogen]	Eyes, skin, respiratory system, liver, kidneys, reproductive system	Colorless liquid or solid (below 50°F) with a sweet odor. [fumigant] BP: 268°F Fl.Pt. = 50°F LEL: NA UEL: NA Noncombustible Liquid
1,2-Dichlorobenzene	95-50-1	TWA 25 ppm STEL 50 ppm	C 50 ppm (300 mg/m3)	C 50 ppm (300 mg/m3)	200 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; liver, kidney damage; skin blisters	Eyes, skin, respiratory system, liver, kidneys	Colorless to pale-yellow liquid with a pleasant, aromatic odor. [herbicide] BP: 357°F Fl.Pt. = 1°F LEL: 2.2% UEL: 9.2% Class IIIA Combustible Liquid: Fl.P. at or above 140°F and below 200°F.
1,2-Dichloroethane	107-06-2	TWA 10 ppm	Ca TWA 1 ppm (4 mg/m3) ST 2 ppm (8 mg/m3)	TWA 50 ppm C 100 ppm 200 ppm [5-minute maximum peak in any 3 hours]	Ca [50 ppm]	Inhalation, ingestion, skin absorption, skin and/or eye contact	Irritation eyes, corneal opacity; central nervous system depression; nausea, vomiting; dermatitis; liver, kidney, cardiovascular system damage; [potential occupational carcinogen]	Eyes, skin, kidneys, liver, central nervous system, cardiovascular system	Colorless liquid with a pleasant, chloroform-like odor. [Note: Decomposes slowly, becomes acidic & darkens in color.] BP: 182°F Fl.Pt. = 56°F LEL: 6.2% UEL: 16% Class IB Flammable Liquid Fl.P. below 73°F and BP at or above 100°F.
1,2-Dichloropropane	78-87-5	TWA 10 ppm Dermal Sensitizer (DSEN)	Ca	TWA 75 ppm (350 mg/m3)	Ca [400 ppm]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system; drowsiness, dizziness; liver, kidney damage; In Animals: central nervous system depression; [potential occupational carcinogen]	Eyes, skin, respiratory system, liver, kidneys, central nervous system	Colorless liquid with a chloroform-like odor. [pesticide] BP: 206°F Fl.Pt. = 60°F LEL: 3.4% UEL: 14.5% Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.
1,3-Dichlorobenzene	541-73-1	https://cameochemicals.noaa.gov/chemical/8514				Inhalation, skin absorption, ingestion, skin and/or eye contact	INHALATION: Causes headache, drousiness, unsteadiness. Irritating to mucous membranes. EYES: Severe irritation. SKIN: Severe irritation. INGESTION: Irritation of gastric mucosa, nausea, vomiting, diarrhea, abdominal cramps and cyanosis.		Colorless liquid. Sinks in water. BP: 343°F Fl.Pt. = 146°F LEL: 2.02% UEL: 9.2%
1,4-Dichlorobenzene	106-46-7	TWA 10 ppm	Ca	TWA 75 ppm (450 mg/m3)	Ca [150 ppm]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Eye irritation, swelling periorbital (situated around the eye); profuse rhinitis; headache, anorexia, nausea, vomiting; weight loss, jaundice, cirrhosis; In Animals: liver, kidney injury; [potential occupational carcinogen]	Liver, respiratory system, eyes, kidneys, skin	Colorless or white crystalline solid with a mothball-like odor. [insecticide] BP: 345°F Fl.Pt. = 150°F LEL: 2.5% UEL: NA Combustible Solid, but may take some effort to ignite.

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 280 Bergen Street, Brooklyn, NY.

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
1,4-Dioxane	123-91-1	TWA 20 ppm [skin]	Ca C 1 ppm (3.6 mg/m3) [30-minute]	TWA 100 ppm (360 mg/m3) [skin]	Ca [500 ppm]	Inhalation, skin absorption, ingestion, skin and/or eye contact	irritation eyes, skin, nose, throat; drowsiness, headache; nausea, vomiting; liver damage; kidney failure; [potential occupational carcinogen]	Eyes, skin, respiratory system, liver, kidneys	Colorless liquid or solid (below 53°F) with a mild, ether-like odor. BP: 214°F Fl.Pt. = 55°F LEL: 2.0% UEL: 22% Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F
2-Butanone	78-93-3	TWA 200 ppm STEL 300 ppm	TWA 200 ppm (590 mg/m3) ST 300 ppm (885 mg/m3)	TWA 200 ppm (590 mg/m3)	3000 ppm	inhalation, ingestion, skin and/or eye contact	irritation eyes, skin, nose; headache; dizziness; vomiting; dermatitis	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a moderately sharp, fragrant, mint- or acetone-like odor BP: 175°F Fl.Pt. = 16°F LEL (200°F): 1.4% UEL (200°F): 11.4% Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F
2-Hexanone	591-78-6	TWA 5 ppm STEL 10 ppm [skin]	TWA 1 ppm (4 mg/m3)	TWA 100 ppm (410 mg/m3)	1600 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; peripheral neuropathy: lassitude (weakness, exhaustion), paresthesia; dermatitis; headache, drowsiness	Eyes, skin, respiratory system, central nervous system, peripheral nervous system	Colorless liquid with an acetone-like odor BP: 262°F Fl.Pt. = 77°F LEL: NA UEL: 8.0% Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F
4-Methyl-2-pentanone	108-10-1	TWA 20 ppm STEL 75 ppm	TWA 50 ppm (205 mg/m3) ST 75 ppm (300 mg/m3)	TWA 100 ppm (410 mg/m3)	500 ppm	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, mucous membrane; headache, narcosis, coma; dermatitis; In Animals: liver, kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Colorless liquid with a pleasant odor BP: 242°F Fl.Pt. = 64°F LEL (200°F): 1.2% UEL (200°F): 8.0% Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F
Acetone	67-64-1	TWA 250 ppm STEL 500 ppm	TWA 250 ppm (590 mg/m^3)	TWA 1000 ppm (2400 mg/m^3)	2500 ppm [10% LEL]	Inhalation, ingestion, skin and/or eye contact	irritation eyes, nose, throat; headache, dizziness, central nervous system depression; dermatitis	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a fragrant, mint-like odor BP: 133°F Fl.Pt. = 0°F LEL: 12.8% UEL: 2.5% Class IB Flammable liquid: Fl.P. below 73°F and BP at or above 100°F.
Benzene	71-43-2	TWA 0.5 ppm STEL 2.5 ppm	Ca TWA 0.1 ppm ST 1 ppm	TWA 1 ppm ST 5 ppm	Ca [500 ppm]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]	Eyes, skin, respiratory system, blood, central nervous system, bone marrow	Colorless to light yellow liquid with an aromatic odor [Note: Solid below 42 °F] BP: 176°F Fl.Pt. = 12°F LEL: 1.2% UEL: 7.8% Class IB Flammable liquid. Fl.P. below 73°F and BP at or above 100°F.
Bromochloromethane	74-97-5	TWA 200 ppm	TWA 200 ppm (1050 mg/m3)	TWA 200 ppm (1050 mg/m3)	2000 ppm	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, throat; confusion, dizziness, central nervous system depression; pulmonary edema	Eyes, skin, respiratory system, liver, kidneys, central nervous system	Colorless to pale-yellow liquid with a chloroform-like odor. [Note: May be used as a fire extinguishing agent.] BP: 155°F Fl.Pt. = NA LEL: NA UEL: NA Noncombustible Liquid
Bromodichloromethane	75-27-4	https://cameochemicals.noaa.gov/chemical/16064				Inhalation, ingestion, skin and/or eye contact	Symptoms of exposure to this compound may include irritation of the skin, eyes, mucous membranes and respiratory tract. It may also cause narcosis. Other symptoms may include nausea, dizziness and headache.	Liver and kidney damage. Central nervous system effects may also occur.	Clear colorless liquid BP: 189°F Fl.Pt. = NA LEL: NA UEL: NA
Bromoform	75-25-2	TWA 0.5 ppm	TWA 0.5 ppm (5 mg/m3) [skin]	TWA 0.5 ppm (5 mg/m3) [skin]	850 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system; central nervous system depression; liver, kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Colorless to yellow liquid with a chloroform-like odor. [Note: A solid below 47°F.] BP: 301°F Fl.Pt. = NA LEL: NA UEL: NA Noncombustible Liquid
Bromomethane	74-83-9	TWA 1 ppm [skin]	Ca	C 20 ppm (80 mg/m3) [skin]	Ca [250 ppm]	Inhalation, skin absorption (liquid), skin and/or eye contact (liquid)	Irritation eyes, skin, respiratory system; muscle weak, incoordination, visual disturbance, dizziness; nausea, vomiting, headache; malaise (vague feeling of discomfort); hand tremor; convulsions; dyspnea (breathing difficulty); skin vesiculation; liquid: frostbite; [potential occupational carcinogen]	Eyes, skin, respiratory system, central nervous system	Colorless gas with a chloroform-like odor at high concentrations. [Note: A liquid below 38°F. Shipped as a liquefied compressed gas.] BP: 38°F Fl.Pt. = NA (Gas) LEL: 10% UEL: 16.0% Flammable Gas, but only in presence of a high energy ignition source.

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 280 Bergen Street, Brooklyn, NY.

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Carbon disulfide	75-15-0	TWA 1 ppm [skin]	TWA 1 ppm (3 mg/m3) ST 10 ppm (30 mg/m3) [skin]	TWA 20 ppm C 30 ppm 100 ppm (30-minute maximum peak)	500 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Dizziness, headache, poor sleep, lassitude (weakness, exhaustion), anxiety, anorexia, weight loss; psychosis; polyneuropathy; Parkinson-like syndrome; ocular changes; coronary heart disease; gastritis; kidney, liver injury; eye, skin burns; dermatitis; reproductive effects	Central nervous system, peripheral nervous system, cardiovascular system, eyes, kidneys, liver, skin, reproductive system	Colorless to faint-yellow liquid with a sweet ether-like odor. [Note: Reagent grades are foul smelling.] BP: 116°F Fl.Pt. = -22°F LEL: 1.3% UEL: 50.0% Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.
Carbon tetrachloride	56-23-5	TWA 5 ppm STEL 10 ppm [skin]	Ca ST 2 ppm (12.6 mg/m3) [60-minute]	TWA 10 ppm C 25 ppm 200 ppm (5-minute maximum peak in any 4 hours)	Ca [200 ppm]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; central nervous system depression; nausea, vomiting; liver, kidney injury; drowsiness, dizziness, incoordination; [potential occupational carcinogen]	Central nervous system, eyes, lungs, liver, kidneys, skin	Colorless liquid with a characteristic ether-like odor BP: 170°F Fl.Pt. = NA LEL: NA UEL: NA Noncombustible Liquid
Chlorobenzene	108-90-7	TWA 10 ppm	NA	TWA 75 ppm (350 mg/m3)	1000 ppm	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose; drowsiness, incoordination; central nervous system depression; In Animals: liver, lung, kidney injury	Eyes, skin, respiratory system, central nervous system, liver	Colorless liquid with an almond-like odor BP: 270°F Fl.Pt. = 82°F LEL: 1.3% UEL: 9.6% Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.
Chloroethane	75-00-3	TWA 100 ppm [skin]	Handle with caution in the workplace	TWA 1000 ppm (2600 mg/m3)	3800 ppm [10%LEL]	Inhalation, skin absorption (liquid), ingestion (liquid), skin and/or eye contact	Incoordination, inebriation; abdominal cramps; cardiac arrhythmias, cardiac arrest; liver, kidney damage	Liver, kidneys, respiratory system, cardiovascular system, central nervous system	Colorless gas or liquid (below 54°F) with a pungent, ether-like odor. [Note: Shipped as a liquefied compressed gas.] BP: 54°F Fl.Pt. = NA (gas), -58°F (liquid) LEL: 3.8% UEL: 15.4% Flammable Gas
Chloroform	67-66-3	TWA 10 ppm	Ca ST 2 ppm (9.78 mg/m3) [60-minute]	C 50 ppm (240 mg/m3)	Ca [500 ppm]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; dizziness, mental dullness, nausea, confusion; headache, lassitude (weakness, exhaustion); anesthesia; enlarged liver; [potential occupational carcinogen]	Liver, kidneys, heart, eyes, skin, central nervous system	Colorless liquid with a pleasant odor BP: 143°F Fl.Pt. = -82°F LEL: NA UEL: NA Noncombustible Liquid
Chloromethane	74-87-3	TWA 50 ppm STEL 100 ppm	Ca	TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 3 hours)	Ca [2000 ppm]	Inhalation, skin and/or eye contact (liquid)	Dizziness, nausea, vomiting; visual disturbance, stagger, slurred speech, convulsions, coma; liver, kidney damage; liquid: frostbite; reproductive, teratogenic effects; [potential occupational carcinogen]	Central nervous system, liver, kidneys, reproductive system	Colorless gas with a faint, sweet odor which is not noticeable at dangerous concentrations. [Note: Shipped as a liquefied compressed gas.] BP: -12°F Fl.Pt. = NA (Gas) LEL: 8.1% UEL: 17.4% Flammable Gas
cis-1,2-Dichloroethene	156-59-2	TWA 200 ppm (All isomers)	TWA 200 ppm (790 mg/m3)	TWA 200 ppm (790 mg/m3)	1000 ppm	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, respiratory system; central nervous system depression	Eyes, respiratory system, central nervous system	Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acrid, chloroform-like odor. BP: 118-140°F Fl.Pt. = 36-39°F LEL: 5.6% UEL: 12.8% Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F
cis-1,3-Dichloropropene	10061-01-5	https://cameochemicals.noaa.gov/chemical/20168				Inhalation, ingestion, skin and/or eye contact	Symptoms of exposure to this compound may include local irritation of the eyes skin and respiratory tract; dermatitis, gasping, coughing, substernal pain, extreme respiratory distress, lacrimation, central nervous system depression, skin irritation, acute gastrointestinal distress with pulmonary congestion and edema. It also may cause injury to the liver, kidneys and heart.	Skin, eyes, mucous membranes, liver, kidney, heart	Colorless to amber liquid with a sweetish odor. BP: 219.7°F Fl.Pt. = NA LEL: NA UEL: NA
Cyclohexane	110-82-7	TWA 100 ppm	TWA 300 ppm (1050 mg/m3)	TWA 300 ppm (1050 mg/m3)	1300 ppm [10%LEL]	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system; drowsiness; dermatitis; narcosis, coma	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a sweet, chloroform-like odor. [Note: A solid below 44°F.] BP: 177°F Fl.Pt. = 0°F LEL: 1.3% UEL: 8.0% Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.
Dibromochloromethane	124-48-1	https://cameochemicals.noaa.gov/chemical/16183				Inhalation, ingestion, skin and/or eye contact	Symptoms of exposure to this compound may include irritation of the skin, eyes, mucous membranes and upper respiratory tract. It may also cause fatigue. Other symptoms may include central nervous system effects, lung and cornea irritation and liver and kidney damage. Prolonged exposure can cause nausea, dizziness, headache and narcosis.	Skin, eyes, mucous membranes, upper respiratory tract	Clear colorless to yellow-orange liquid BP: 246-248°F Fl.Pt. = Greater than 200°F LEL: NA UEL: NA

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 280 Bergen Street, Brooklyn, NY.

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Dichlorodifluoromethane	75-71-8	TWA 1000 ppm	TWA 1000 ppm (4950 mg/m3)	TWA 1000 ppm (4950 mg/m3)	15,000 ppm	Inhalation, skin and/or eye contact (liquid)	Dizziness, tremor, asphyxia, unconsciousness, cardiac arrhythmias, cardiac arrest; liquid: frostbite	Cardiovascular system, peripheral nervous system	Colorless gas with an ether-like odor at extremely high concentrations. [Note: Shipped as a liquefied compressed gas.] BP: -22°F Fl.Pt. = NA LEL: NA UEL: NA Nonflammable Gas
Ethyl benzene	100-41-4	TWA 20 ppm	TWA 100 ppm (435 mg/m^3) ST 125 ppm (545 mg/m^3)	TWA 100 ppm (435 mg/m^3)	800 ppm [10%LEL]	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma	Eyes, skin, respiratory system, central nervous system	Colorless liquid with an aromatic odor. BP: 277°F Fl.Pt. = 55°F LEL: 0.8% UEL: 6.7% Class IB Flammable Liquid below 73°F and BP at or above 100°F
Isopropyl benzene	98-82-8	TWA 5 ppm	TWA 50 ppm (245 mg/m3) [skin]	TWA 50 ppm (245 mg/m3) [skin]	900 ppm [10%LEL]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, mucous membrane; dermatitis; headache, narcosis, coma	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a sharp, penetrating, aromatic odor BP: 306°F Fl.Pt. = 96°F LEL: 0.9% UEL: 6.5% Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F
Methyl Acetate	79-20-9	TWA 200 ppm STEL 250 ppm	TWA 200 ppm (610 mg/m3) ST 250 ppm (760 mg/m3)	TWA 200 ppm (610 mg/m3)	3100 ppm [10%LEL]	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; headache, drowsiness; optic nerve atrophy; chest tightness; In Animals: narcosis	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a fragrant, fruity odor BP: 135°F Fl.Pt. = 14°F LEL: 3.1% UEL: 16% Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.
Methylcyclohexane	108-87-2	TWA 400 ppm	TWA 400 ppm (1600 mg/m3)	TWA 500 ppm (2000 mg/m3)	1200 ppm [LEL]	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; dizziness, drowsiness; In Animals: narcosis	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a faint, benzene-like odor BP: 214°F Fl.Pt. = 25°F LEL: 1.2% UEL: 6.7% Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.
Methylene chloride	75-09-2	TWA 50 ppm [skin] STEL 100 ppm	Ca	[1910.1052] TWA 25 ppm ST 125 ppm	Ca [2300 ppm]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; lassitude (weakness, exhaustion), drowsiness, dizziness; numb, tingle limbs; nausea; [potential occupational carcinogen]	Eyes, skin, cardiovascular system, central nervous system	Colorless liquid with a chloroform-like odor. [Note: A gas above 104°F.] BP: 104°F Fl.Pt. = NA LEL: 13% UEL: 23% Combustible Liquid
Methyl-t-butyl ether	1634-04-4	TWA 50 ppm	NA	NA	NA	Inhalation, skin absorption, ingestion, skin and/or eye contact	May cause dizziness or suffocation. Contact may irritate or burn eyes or skin. May be harmful if swallowed.	Eyes, skin	A colorless liquid with a distinctive anesthetic-like odor. BP: 131°F Fl.Pt. = -14°F LEL: NA UEL: NA
o-Xylene	95-47-6	TWA 20 ppm (All isomers)	TWA 100 ppm (435 mg/m3) ST 150 ppm (655 mg/m3)	TWA 100 ppm (435 mg/m3)	900 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis	Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys	Colorless liquid with an aromatic odor BP: 292°F Fl.Pt. = 90°F LEL: 0.9% UEL: 6.7% Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F
Styrene	100-42-5	TWA 10 ppm STEL 20 ppm OTO (ototoxicant)	TWA 50 ppm (215 mg/m3) ST 100 ppm (425 mg/m3)	TWA 100 ppm C 200 ppm 600 ppm (5-minute maximum peak in any 3 hours)	700 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose, respiratory system; headache, lassitude (weakness, exhaustion), dizziness, confusion, malaise (vague feeling of discomfort), drowsiness, unsteady gait; narcosis; defatting dermatitis; possible liver injury; reproductive effects	Eyes, skin, respiratory system, central nervous system, liver, reproductive system	Colorless to yellow, oily liquid with a sweet, floral odor BP: 293°F Fl.Pt. = 88°F LEL: 0.9% UEL: 6.8% Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F
Tetrachloroethene	127-18-4	TWA 25 ppm STEL 100 ppm	Ca Minimize workplace exposure concentrations	TWA 100 ppm C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm	Ca [150 ppm]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]	Eyes, skin, respiratory system, liver, kidneys, central nervous system	Colorless liquid with a mild, chloroform-like odor BP: 250°F Fl.Pt. = NA LEL: NA UEL: NA Noncombustible Liquid, but decomposes in a fire to hydrogen chloride and phosgene

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 280 Bergen Street, Brooklyn, NY.

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Sodium Hydroxide	1310-73-2	Ceiling 2 mg/m^3	C 2 mg/m^3	TWA 2 mg/m^3	10 mg/m^3	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, mucous membrane; pneumonitis; eye, skin burns; temporary loss of hair	Eyes, skin, respiratory system	Colorless to white, odorless solid (flakes, beads, granular form). BP: 2534°F Fl.Pt. = NA LEL: NA UEL: NA Noncombustible Solid, but when in contact with water may generate sufficient heat to ignite combustible materials.
Sulfuric Acid	7664-93-9	TWA 0.2 mg/m^3 (as thoracic particulate mass)	TWA 1 mg/m^3	TWA 1 mg/m^3	15 mg/m^3	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatis; dental erosion; eye, skin burns; dermatitis	Eyes, skin, respiratory system, teeth	Colorless to dark-brown, oily, odorless liquid.[Note: Pure compound is a solid below 51°F. Often used in an aqueous solution.] BP = 554°F Fl.Pt. = NA LEL = NA UEL = NA Noncombustible Liquid, but capable of igniting finely divided combustible materials.
trans-1,2-Dichloroethene	156-60-5	200 ppm (All isomers)	TWA 200 ppm (790 mg/m3)	TWA 200 ppm (790 mg/m3)	1000 ppm	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, respiratory system; central nervous system depression	Eyes, respiratory system, central nervous system	Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acrid, chloroform-like odor. BP: 118-140°F Fl.P: 36-39°F LEL: 5.6% UEL: 12.8% Class IB Flammable Liquid Fl.P. below 73°F and BP at or above 100°F.
trans-1,3-Dichloropropene	10061-02-6	https://cameochemicals.noaa.gov/chemical/18110				Inhalation, ingestion, skin and/or eye contact	Symptoms of exposure to this compound may include local irritation of the eyes skin and respiratory tract, dermatitis, gasping, coughing, substernal pain, extreme respiratory distress, lacrimation, central nervous system depression, acute gastrointestinal distress with pulmonary congestion and edema. It may also cause injury to the liver, kidneys and heart	Skin, eyes, mucous membranes, liver, kidney, heart	A clear colorless liquid with chloroform odor BP: 234°F Fl.P: NA LEL: NA UEL: NA
Toluene	108-88-3	TWA 20 ppm (ototoxicant)	TWA 100 ppm (375 mg/m^3) ST 150 ppm (560 mg/m^3)	TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)	500 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	irritation eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Colorless liquid with a sweet, pungent, benzene-like odor. BP: 232°F Fl.P: 40°F LEL: 1.1% UEL: 7.1% Class IB Flammable Liquid Fl.P. below 73°F and BP at or above 100°F.
Trichloroethene (TCE)	79-01-6	TWA 10 ppm STEL 25 ppm	Ca	TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)	Ca [1000 ppm]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]	Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system	Colorless liquid (unless dyed blue) with a chloroform-like odor. BP: 189°F Fl.Pt. = NA LEL(77°F): 8.0% UEL(77°F): 10.5% Combustible Liquid, but burns with difficulty.
Trichlorofluoromethane	75-69-4	STEL C 1000 ppm	C 1000 ppm (5600 mg/m3)	TWA 1000 ppm (5600 mg/m3)	2000 ppm	Inhalation, ingestion, skin and/or eye contact	Incoordination, tremor; dermatitis; cardiac arrhythmias, cardiac arrest; asphyxia; liquid: frostbite	Skin, respiratory system, cardiovascular system	Colorless to water-white, nearly odorless liquid or gas (above 75°F) BP: 75°F Fl.P: NA LEL: NA UEL: NA Noncombustible Liquid Nonflammable Gas
Vinyl Chloride (chloroethylene)	75-01-4	TWA 1 ppm	Ca	TWA 1 ppm C 5 ppm [15-minute]	Ca (ND)	Inhalation, skin and/or eye contact (liquid)	Lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen]	Liver, central nervous system, blood, respiratory system, lymphatic system	Colorless gas or liquid (below 7°F) with a pleasant odor at high concentrations.[Note: Shipped as a liquefied compressed gas.] BP: 7°F Fl.Pt. = NA (Gas) LEL: 3.6% UEL: 33.0% Flammable Gas
Xylene (m, o & p isomers)	108-38-3, 95-47-6, 106-42-3	TWA 20 ppm	NA	NA	NA	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis	Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys	Colorless liquid with an aromatic odor BP: 282°F, 292°F, 281°F Fl. Pt. 82°F, 90°F, 81°F LEL: 1.1%, 0.9%, 1.1% UEL: 7.0%, 6.7%, 7.0% Class IC Flammable Liquid at or above 73°F and below 100°F.
Zinc Oxide (dust)	7440-66-6	TWA 2 mg/m3 (repsirable) STEL 10 mg/m^3 (respirable)	TWA 5 mg/m^3 C 15 mg/m^3	TWA 15 mg/m^3 (total dust) TWA 5 mg/m^3 (resp dust) TWA 5 mg/m^3 (fume)	500 mg/m^3	Inhalation	Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function	Respiratory system	White, odorless solid. BP: NA Fl.Pt. = NA LEL: NA UEL: NA Noncombustible Solid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 280 Bergen Street, Brooklyn, NY.

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs)									
2-Chloronaphthalene	91-58-7	https://cameochemicals.noaa.gov/chemical/16185				Inhalation, ingestion, skin and/or eye contact	Chloracne, cysts, headache, fatigue, vertigo, anorexia and jaundice		Monoclinic plates or off-white crystalline powder BP: NA Fl.Pt. = NA LEL: NA UEL: NA
2-Methylnaphthalene	91-57-6	TWA 0.5 ppm TLV-SL 3 mg/100 cm2 [skin]	https://cameochemicals.noaa.gov/chemical/20668			Inhalation, ingestion, skin and/or eye contact	Headaches, nausea, vomiting, diarrhea, anemia, jaundice, euphoria, dermatitis, visual disturbances, convulsions and comatose	Skin, eyes, mucous membranes and upper respiratory tract	White crystalline solid Combustible solid BP: 466-468 ° F Fl.Pt. = 208 ° F LEL: NA UEL: NA
Acenaphthene	83-32-9	https://cameochemicals.noaa.gov/chemical/10358				Inhalation, ingestion, skin and/or eye contact	Irritation of the skin, eyes, mucous membranes and upper respiratory tract, vomiting	Skin, eyes, mucous membranes and upper respiratory tract	White needles BP: 534 ° F Fl.Pt. = NA LEL: 0.6% UEL: NA
Acenaphthylene	208-96-8	https://cameochemicals.noaa.gov/chemical/16157				Inhalation, ingestion, skin and/or eye contact			Colorless crystalline solid BP: 509 to 527 ° F at 760 mm Hg Fl.Pt. = NA LEL: NA UEL: NA
Anthracene (as coal tar pitch volatiles)	120-12-7	TWA 0.2 mg/m3 (as Benzene solubles)	Ca TWA 0.1 mg/m3 (cyclohexane-extractable fraction)	TWA 0.2 mg/m3 (benzene-soluble fraction) [1910.1002]	Ca [80 mg/m3]	Inhalation, skin and/or eye contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory system, skin, bladder, kidneys	Black or dark-brown amorphous residue BP: NA Fl.Pt. = NA LEL: NA UEL: NA Combustible Solids
Benzo[a]anthracene	56-55-3	https://cameochemicals.noaa.gov/chemical/16171				Inhalation, injestion, skin and/or eye contact			Colorless leaflets or plates or coarse gold powder with a greenish-yellow fluorescence. May reasonably be expected to be a carcinogen. BP: 815° F at 760 mm Hg Fl.Pt. = NA LEL: NA UEL: NA
Benzo[a]pyrene (as coal tar pitch volatiles)	50-32-8	TWA 0.2 mg/m3 (as Benzene solubles)	Ca TWA 0.1 mg/m3 (cyclohexane-extractable fraction)	TWA 0.2 mg/m3 (benzene-soluble fraction) [1910.1002]	Ca [80 mg/m3]	Inhalation, skin and/or eye contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory system, skin, bladder, kidneys	Black or dark-brown amorphous residue BP: NA Fl.Pt. = NA LEL: NA UEL: NA Combustible Solids
Benzo[b]fluoranthene	205-99-2	None listed	https://cameochemicals.noaa.gov/chemical/16172			Inhalation, injestion, skin and/or eye contact			Needles or yellow fluffy powder BP: NA Fl.Pt. = NA LEL: NA UEL: NA
Benzo[g,h,i]perylene	191-24-2	https://cameochemicals.noaa.gov/chemical/16174				Inhalation, injestion, skin and/or eye contact	Inhalation of material may be harmful. Contact may cause burns to skin and eyes. Inhalation of Asbestos dust may have a damaging effect on the lungs. Fire may produce irritating, corrosive and/or toxic gases. Some liquids produce vapors that may cause dizziness or suffocation. Runoff from fire control may cause pollution.	Lungs, skin, eyes	Colorless to white crystalline solid. Water insoluble. BP: NA Fl.Pt. = NA LEL: NA UEL: NA
Benzo[k]fluoranthene	207-08-9	https://cameochemicals.noaa.gov/chemical/16173				Inhalation, injestion, skin and/or eye contact	When heated to decomposition this compound emits acrid smoke and irritating fumes.		Pale yellow needles or yellow crystalline solid BP: 896° F Fl.Pt. = NA LEL: NA UEL: NA
Chrysene (as coal tar pitch volatiles	218-01-9	TWA 0.2 mg/m3 (as Benzene solubles)	Ca TWA 0.1 mg/m3 (cyclohexane-extractable fraction)	TWA 0.2 mg/m3 (benzene-soluble fraction) [1910.1002]	Ca [80 mg/m3]	Inhalation, skin and/or eye contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory system, skin, bladder, kidneys	Black or dark-brown amorphous residue BP: NA Fl.Pt. = NA LEL: NA UEL: NA Combustible Solids
Dibenzo(a,h)anthracene	53-70-3	https://cameochemicals.noaa.gov/chemical/16192				Inhalation, injestion, skin and/or eye contact	Symptoms of exposure to this compound may include irritation. This compound is harmful if swallowed or inhaled. It may cause irritation. When heated to decomposition it emits acrid smoke, irritating fumes and toxic fumes of carbon monoxide and carbon dioxide.	Lungs	White crystals or pale yellow solid. Sublimes BP: 975° F Fl.Pt. = NA LEL: NA UEL: NA

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 280 Bergen Street, Brooklyn, NY.

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Fluoranthene	206-44-0	https://cameochemicals.noaa.gov/chemical/16213				Inhalation, injestion, skin and/or eye contact	When heated to decomposition this compound emits acrid smoke and fumes.		Light yellow fine crystals BP: 482° F Fl.Pt. = NA LEL: NA UEL: NA
Fluorene	86-73-7	https://cameochemicals.noaa.gov/chemical/16214				Inhalation, injestion, skin and/or eye contact			White leaflets. Sublimes easily under a vacuum. Fluorescent when impure. BP: 563° F Fl.Pt. = NA LEL: NA UEL: NA
Indeno[1,2,3-cd]pyrene	193-39-5	https://cameochemicals.noaa.gov/chemical/16218				Inhalation, injestion, skin and/or eye contact			Yellow crystals BP: 997° F Fl.Pt. = NA LEL: NA UEL: NA
Naphthalene	91-20-3	TWA 10 ppm [skin]	TWA 10 ppm (50 mg/m3) ST 15 ppm (75 mg/m3)	TWA 10 ppm (50 mg/m3)	250 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage	Eyes, skin, blood, liver, kidneys, central nervous system	Colorless to brown solid with an odor of mothballs. [Note: Shipped as a molten solid.] BP: 424°F Fl.P: 174°F LEL: 0.9% UEL: 5.9% Combustible Solid, but will take some effort to ignite
Phenanthrene	85-01-8	https://cameochemicals.noaa.gov/chemical/16236				Inhalation, injestion, skin and/or eye contact	Symptoms following exposure to this compound may include skin sensitization, dermatitis, bronchitis, cough, dyspnea, respiratory neoplasm, kidney neoplasm, skin irritation, and respiratory irritation.	Skin, respiratory tract	Colorless monoclinic crystals with a faint aromatic odor. Solutions exhibit a blue fluorescence. BP: 642° F Fl.Pt. = 340° F LEL: NA UEL: NA
Pyrene (see coal tar pitch volatiles)	129-00-0	TWA 0.2 mg/m3 (as Benzene solubles)	Ca TWA 0.1 mg/m3 (cyclohexane-extractable fraction)	TWA 0.2 mg/m3 (benzene-soluble fraction) [1910.1002]	Ca [80 mg/m3]	Inhalation, skin and/or eye contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory system, skin, bladder, kidneys	Black or dark-brown amorphous residue BP: NA Fl.Pt. = NA LEL: NA UEL: NA Combustible Solids
METALS									
Aluminum	7429-90-5	TWA 1 mg/m3	TWA 10 mg/m^3 (total) TWA 5 mg/m^3 (resp)	TWA 15 mg/m^3 (total) TWA 5 mg/m^3 (resp)	N.D.	Inhalation, skin and/or eye contact	Irritation eyes, skin, respiratory system	Eyes, skin, respiratory system	Silvery-white, malleable, ductile, odorless metal BP: 4221°F Fl.Pt. = NA LEL: NA UEL: NA Combustible Solid, finely divided dust is easily ignited; may cause explosions.
Antimony	7440-36-0	TWA 0.5 mg/m3 (as Sb)	TWA 0.5 mg/m3 [*Note: The REL also applies to other antimony compounds (as Sb).]	TWA 0.5 mg/m3 [*Note: The PEL also applies to other antimony compounds (as Sb).]	50 mg/m3 (as Sb)	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly	Eyes, skin, respiratory system, cardiovascular system	Silver-white, lustrous, hard, brittle solid; scale-like crystals; or a dark-gray, lustrous powder BP: 2975°F Fl.Pt. = NA LEL: NA UEL: NA Noncombustible Solid in bulk form, but a moderate explosion hazard in the form of dust when exposed to flame.
Arsenic	7440-38-2	TWA 0.01 mg/m3	Ca C 0.002 mg/m3 [15-minute]	[1910.1018] TWA 0.010 mg/m3	Ca [5 mg/m3 (as As)]	Inhalation, skin absorption, skin and/or eye contact, ingestion	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen]	Liver, kidneys, skin, lungs, lymphatic system	Metal: Silver-gray or tin-white, brittle, odorless solid BP: Sublimes Fl.Pt. = NA LEL: NA UEL: NA Metal: Noncombustible Solid in bulk form, but a slight explosion hazard in the form of dust when exposed to flame
Barium	7440-39-3	TWA 0.5 mg/m3	0.5 mg Ba/m3 TWA	0.5 mg Ba/m3 TWA	50 mg Ba/m3	Inhalation, ingestion, skin and/or eye contact	Inhalation or contact with vapors, substance or decomposition products may cause severe injury or death. Contact may cause burns to skin, eyes, and mucous membranes. May be toxic by ingestion, inhalation and skin absorption. Used to make other chemicals.	Lungs, skin, eyes, and mucous membrane	A silver to white metallic solid BP: 1337°F Fl.Pt. = NA LEL: NA UEL: NA
Beryllium	7440-41-7	TWA 0.00005 mg/m^3	Ca C 0.0005 mg/m^3	TWA 0.002 mg/m^3 C 0.005 mg/m^3 0.025 mg/m3 [30-minute maximum peak]	Ca [4 mg/m^3 (as Be)]	Inhalation, skin and/or eye contact	Berylliosis (chronic exposure): anorexia, weight loss, lassitude (weakness, exhaustion), chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency; irritation eyes; dermatitis; [potential occupational carcinogen]	Eyes, skin, respiratory system	Hard, brittle, gray-white solid BP: 4532°F Fl.Pt. = NA LEL: NA UEL: NA Noncombustible Solid in bulk form, but a slight explosion hazard in the form of a powder or dust.

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 280 Bergen Street, Brooklyn, NY.

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Cadmium	7440-43-9	TWA 0.01 mg/m^3 total dust TWA 0.002 mg/m^3 (as Cd) respirable fraction	Ca	TWA 0.005 mg/m^3	Ca [9 mg/m3 (as Cd)]	Inhalation, ingestion	Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]	Respiratory system, kidneys, prostate, blood	Silver-white/blue tinged lustrous, odorless solid. BP: 1409°F Fl.Pt. = NA LEL: NA UEL: NA Noncombustible - will burn in powder form
Calcium	7440-70-2	https://cameochemicals.noaa.gov/chemical/309				Inhalation, ingestion, skin and/or eye contact	Contact with eyes or skin produces caustic burns.	Eyes, skin	A silvery, soft metal that turns grayish white on exposure to air. BP: 2714°F Fl.Pt. = NA LEL: NA UEL: NA
Chromium	7440-47-3	TWA 0.5 mg/m^3 (metal) TWA 0.003 mg/m^3 (water-soluble Cr III compounds) TWA 0.0002 mg/m^3 (water-soluble Cr VI compounds) STEL 0.0005 mg/m3 (water-soluble Cr VI compounds)	TWA 0.5 mg/m^3	TWA 1 mg/m^3	250 mg/m^3 (as Cr)	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin; lung fibrosis (histologic)	Eyes, skin, respiratory system	Blue-white to steel-gray, lustrous, brittle, hard, odorless solid. BP: 4788°F Fl.Pt. = NA LEL: NA UEL: NA Noncombustible - will burn in dust form if heated in a flame
Cobalt	7440-48-4	TWA 0.02 mg/m3 [DSEN] [RSEN]	TWA 0.05 mg/m3	TWA 0.1 mg/m3	20 mg/m3 (as Co)	Inhalation, ingestion, skin and/or eye contact	Cough, dyspnea (breathing difficulty), wheezing, decreased pulmonary function; weight loss; dermatitis; diffuse nodular fibrosis; resp hypersensitivity, asthma	Skin, respiratory system	Odorless, silver-gray to black solid BP: 5612°F Fl.Pt. = NA LEL: NA UEL: NA Noncombustible Solid in bulk form, but finely divided dust will burn at high temperatures.
Copper	7440-50-8	TWA 0.2 mg/m^3 (fume) TWA 1 mg/m3 (dusts and mists)	TWA 1 mg/m^3	TWA 1 mg/m^3	100 mg/m^3 (as Cu)	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, nose, pharynx; nasal septum perforation; metallic taste; dermatitis; In Animals: lung, liver, kidney damage; anemia	Eyes, skin, respiratory system, liver, kidneys (increased risk with Wilson's disease)	Reddish, lustrous, malleable, odorless solid. BP: 4703°F Fl.Pt. = NA LEL: NA UEL: NA Noncombustible - powdered form may ignite
Iron (as iron oxide)	7439-89-6	TWA 5 mg/m3 (respirable particulate mass)	TWA 1 mg/m^3	NA	NA	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, mucous membrane; abdominal pain, diarrhea, vomiting; possible liver damage	Eyes, skin, respiratory system, liver, gastrointestinal tract	Appearance and odor vary depending upon the specific soluble iron salt. BP: NA Fl.Pt. = NA LEL: NA UEL: NA Noncombustible Solids
Lead	7439-92-1	TWA 0.05 mg/m3	TWA (8-hour) 0.050 mg/m3	[1910.1025] TWA 0.050 mg/m3	100 mg/m3 (as Pb)	Inhalation, ingestion, skin and/or eye contact	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension	Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue	A heavy, ductile, soft, gray solid BP: 3164°F Fl.Pt. = NA LEL: NA UEL: NA Noncombustible Solid in bulk form
Magnesium	7439-95-4	https://cameochemicals.noaa.gov/chemical/6949				Eye and/or skin contact	Dust irritates eyes in same way as any foreign material. Penetration of skin by fragments of metal is likely to produce local irritation, blisters, and ulcers which may become infected.	Eyes	A light silvery metal BP: 1202°F Fl.Pt. = NA LEL: NA UEL: NA
Manganese	7439-96-5	TWA 0.02 mg/m3 [R] TWA 0.1 mg/m3 [I]	TWA 1 mg/m3 ST 3 mg/m3	C 5 mg/m3	500 mg/m3 (as Mn)	inhalation, ingestion	Manganism; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low-back pain; vomiting; malaise (vague feeling of discomfort); lassitude (weakness, exhaustion); kidney damage	respiratory system, central nervous system, blood, kidneys	A lustrous, brittle, silvery solid BP: 3564°F Fl.Pt. = NA LEL: NA UEL: NA Metal: Combustible Solid
Mercury	7439-97-6	TWA 0.1 mg/m3, as Hg Aryl compounds TWA 0.025 mg/m3 as Hg, inorganic forms including metallic mercury	Hg Vapor: TWA 0.05 mg/m3 [skin] Other: C 0.1 mg/m3 [skin]	TWA 0.1 mg/m3	10 mg/m3 (as Hg)	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria	Eyes, skin, respiratory system, central nervous system, kidneys	Metal: Silver-white, heavy, odorless liquid. [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.] BP: 674°F Fl.Pt. = NA LEL: NA UEL: NA Metal: Noncombustible Liquid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 280 Bergen Street, Brooklyn, NY.

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Nickel	7440-02-0	TWA 1.5 mg/m^3 [elemental] TWA 0.1 mg/m^3 [soluble inorganic compound] TWA 0.2 mg/m^3 [insoluble inorganic compound] TWA 0.1 mg/m^3 [Nickel subsulfide]	Ca TWA 0.015 mg/m^3	TWA 1 mg/m^3	Ca [10 mg/m3 (as Ni)]	Inhalation, ingestion, skin and/or eye contact	Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]	Nasal cavities, lungs, skin	Lustrous, silvery, odorless solid. BP: 5139°F Fl.Pt. = NA LEL: NA UEL: NA Combustible Solid; nickel sponge catalyst may ignite spontaneously in air.
Potassium	9/7/7440	https://cameochemicals.noaa.gov/chemical/4289				Eye and/or skin contact	Will burn skin and eyes	Skin, eyes	Potassium is a soft silvery metal though normally grayish white due to oxidation BP: 1425°F Fl.Pt. = NA LEL: NA UEL: NA
Selenium	7782-49-2	TWA 0.2 mg/m3	TWA 0.2 mg/m3	TWA 0.2 mg/m3	1 mg/m3 (as Se)	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns; In Animals: anemia; liver necrosis, cirrhosis; kidney, spleen damage	Eyes, skin, respiratory system, liver, kidneys, blood, spleen	Amorphous or crystalline, red to gray solid. [Note: Occurs as an impurity in most sulfide ores.] BP: 1265°F Fl.Pt. = NA LEL: NA UEL: NA Combustible Solid
Silver	7440-22-4	TWA 0.1 mg/m3 [Metal, dust, and fume] TWA 0.01 mg/m3 [Soluble compounds, as Ag]	TWA 0.01 mg/m3	TWA 0.01 mg/m3	10 mg/m3 (as Ag)	Inhalation, ingestion, skin and/or eye contact	Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance	Nasal septum, skin, eyes	Metal: White, lustrous solid BP: 3632°F Fl.Pt. = NA LEL: NA UEL: NA Metal: Noncombustible Solid, but flammable in form of dust or powder
Sodium	7440-23-5	https://cameochemicals.noaa.gov/chemical/7794				Skin contact	Severe burns caused by burning metal or by caustic soda formed by reaction with moisture on skin	Skin	A silvery soft metal that becomes grayish white upon exposure to air BP: 1621°F Fl.Pt. = NA LEL: NA UEL: NA
Thallium	7440-28-0	0.02 mg/m3 inhallable particulate matter	TWA 0.1 mg/m3 [skin]	TWA 0.1 mg/m3 [skin]	15 mg/m3 (as Tl)	Inhalation, skin absorption, ingestion, skin and/or eye contact	Nausea, diarrhea, abdominal pain, vomiting; ptosis, strabismus; peri neuritis, tremor; retrosternal (occurring behind the sternum) tightness, chest pain, pulmonary edema; convulsions, chorea, psychosis; liver, kidney damage; alopecia; paresthesia legs	Eyes, respiratory system, central nervous system, liver, kidneys, gastrointestinal tract, body hair	Appearance and odor vary depending upon the specific soluble thallium compound BP: NA Fl.Pt. = NA LEL: NA UEL: NA
Vanadium	7440-62-2	https://cameochemicals.noaa.gov/chemical/16147				Inhalation, skin absorption, ingestion, skin and/or eye contact	Highly toxic, may be fatal if inhaled, swallowed or absorbed through skin. Avoid any skin contact. Effects of contact or inhalation may be delayed. Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution	Skin	Silvery-whitish powder BP: NA Fl.Pt. = NA LEL: NA UEL: NA
Zinc	7440-66-6	https://cameochemicals.noaa.gov/chemical/4814				Inhalation, skin absorption, ingestion, skin and/or eye contact	Inhalation or contact with vapors, substance or decomposition products may cause severe injury or death. May produce corrosive solutions on contact with water. Fire will produce irritating, corrosive and/or toxic gases. Runoff from fire control may cause pollution	Lungs	A grayish powder BP: NA Fl.Pt. = NA LEL: NA UEL: NA
PCBs									
PCBs (total)	11097-69-1, 53469-21-9	TWA 0.5 mg/m3 [skin] TWA 1 mg/m3 [skin]	Ca TWA 0.001 mg/m3 Ca TWA 0.001 mg/m3	TWA 0.5 mg/m3 [skin] TWA 1 mg/m3 [skin]	Ca [5 mg/m3] Ca [5 mg/m3]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen]	Skin, eyes, liver, reproductive system	Colorless to pale-yellow, viscous liquid or solid (below 50°F) with a mild, hydrocarbon odor BP: 689-734°F, 617-691°F Fl.Pt. = NA, NA LEL: NA UEL: NA Nonflammable Liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans, and chlorinated dibenzo-p-dioxins.
Petroleum Hydrocarbons									
Gasoline	86290-81-5	TWA 300 ppm STEL 500 ppm	Ca	None	Ca [N.D.]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, mucous membrane; dermatitis; headache, lassitude (weakness, exhaustion), blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonitis (aspiration liquid); possible liver, kidney damage; [potential occupational carcinogen]	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Clear liquid with a characteristic odor BP: 102°F Fl.Pt. = -45°F LEL: 1.4% UEL: 7.6%

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 280 Bergen Street, Brooklyn, NY.

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties

References

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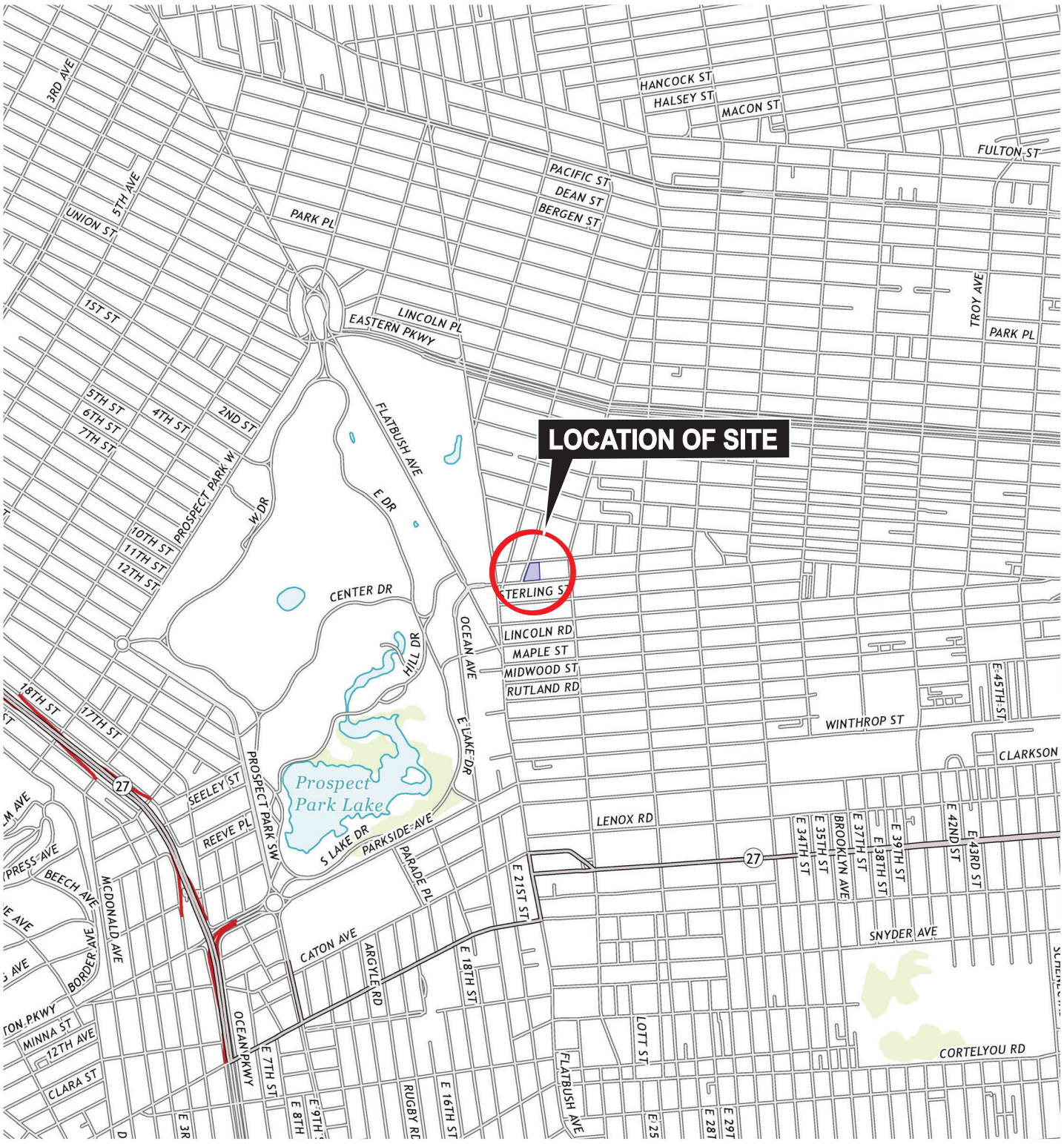
Abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists.
BP – boiling point at 1 atmosphere, °F
C – Ceiling, is a concentration that should not be exceeded during and part of the working exposure.
Ca – Carcinogenic.
CAS# - Chemical Abstracts Service registry number which is unique for each chemical.
DSEN - Dermal Sensitization
Ft Pt. – Flash point
IDLH - Immediately Dangerous to Life and Health concentrations represent the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.
LEL – Lower explosive (flammable) limit in air, % by volume (at room temperature)
mg/m^3 – Milligrams of substance per cubic meter of air
NIOSH - National Institute for Occupational Safety and Health.
OSHA – Occupational Safety and Health Administration
OTO - Ototoxicant
PEL - OSHA Permissible Exposure Limit (usually) a time weighted average concentration that must not be exceeded during any 8 hour work shift of a 40 hr work week.
ppm – parts per million
REL – NIOSH Recommended Limit indicated a time weighted average concentration that must not be exceeded during any 10 hour work shift of a 40 hr work week
RSEN - Respiratory Sensitization
SG - Specific Gravity
STEL – ACGIH Short-term exposure limit (ST)
TLV - ACGIH Threshold Limit Values (usually 8 hour time weighted average concentrations).
TWA – 8-hour, time-weighted average
UEL – Upper explosive (flammable) limit in air, % by volume (at room temperature)
VP - Vapor Pressure

FIGURES

1. Site Location Map
2. Site Plan with Emergency Muster Area
3. Routes to Urgent Care and Hospital



QUADRANGLE LOCATION

SOURCE:
USGS; 2016, Brooklyn, NY
7.5 Minute Topographic Quadrangle

N

0 2000'

Title:

SITE LOCATION MAP

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

ROUX

Compiled by: W.S.	Date: 11DEC25	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	1
Project Mgr.: W.S.	Project No.: 2861.0003Y000	
File: 2861.0003Y147.01.cdr		

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LEGEND

BCP SITE BOUNDARY

N

30' 0 30'

Title:

SITE PLAN WITH EMERGENCY MUSTER AREA

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

ROUX

Compiled by: W.S.	Date: 11DEC25	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	2
Project Mgr: W.S.	Project: 2861.0003Y000	
File: 2861.0003Y147.02.DWG		

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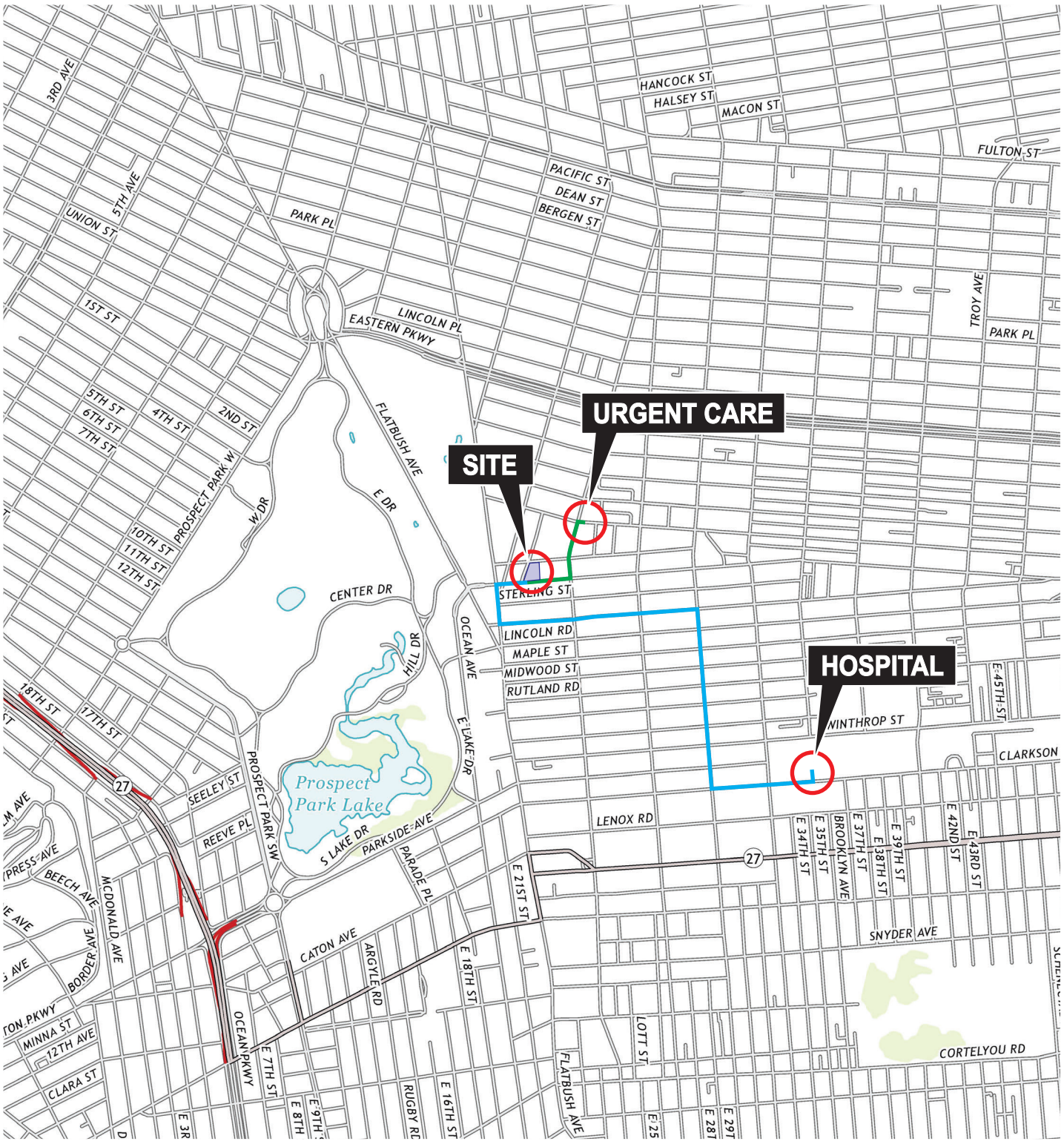

Directions to Proxi Medical Urgent Care, 1655 Bedford Avenue

1. Head east on Empire Boulevard toward Bedford Avenue.
2. Turn left onto Bedford Avenue. Urgent care is on the right.

Directions to Kings County Hospital Center, 451 Clarkson Avenue

1. Head west on Empire Boulevard toward Mckeever Place.
2. Turn left onto Washington Avenue.
3. Turn left onto Lefferts Avenue.
4. Turn right at the third cross street onto Nostrand Avenue/ Toussaint L'ouverture Boulevard.
5. Turn left onto Clarkson Avenue, hospital is on the right.

N

0 2000'

Title:

HOSPITAL AND URGENT CARE ROUTE MAP

73-99 EMPIRE BOULEVARD
BROOKLYN, NEW YORK

Prepared for:

EMPIRE MCKEEVER HEIGHTS LLC

ROUX

Compiled by: W.S.	Date: 11DEC25	FIGURE 3
Prepared by: G.M.	Scale: AS SHOWN	
Project Mgr.: W.S.	Project No.: 2861.0003Y000	
File: 2861.0003Y147.01.cdr		

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APPENDICES

A. Job Safety Analysis (JSA) Forms
B. Safety Data Sheets (SDSs) for Chemicals Used
C. COVID-19 Interim Health and Safety Guidance
D. Heat Illness Prevention Program
E. Personal Protective Equipment (PPE) Management Program
F. Subsurface Utility Clearance Management Program
G. Heavy Equipment Exclusion Zone Policy

APPENDIX A

Job Safety Analysis (JSA) Forms

JOB SAFETY ANALYSIS	Ctrl. No. CVD-19	DATE: 04/10/2023	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
Generic	**Fieldwork**	**Working in Areas Affected by Coronavirus**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Kristina DeLuca	Health and Safety Specialist	Brian Hobbs	CHSD
		Ray Greenidge	Sr. Compliance Mgr.

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES – Leather/cut-resistant in field and nitrile as needed
☒ HARD HAT – In field	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	
☐ LIFELINE / BODY HARNESS	☐ HEARING PROTECTION	☒ PPE CLOTHING – High visibility vest in field	☒ Face Covering
☒ SAFETY GLASSES – In field	☒ SAFETY SHOES – Steel/composite toe in fie		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Cloth face covering, nitrile gloves, hand soap, water source, hand sanitizer, disinfectant spray and disinfectant wipes.

Commitment to Safety – All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

SOCIAL DISTANCING: Maintain 6' of distance between yourself and all other people at all times. If you do not believe the scope of work can be conducted while maintaining this distance, contact your Project Manager immediately.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Project Preplanning	N/A	• Review and follow COVID-19 CDC, Roux, Client and local orders/protocols. • Ensure all workers are fit for duty - anyone feeling sick should remain at home even if symptoms do not align with COVID-19. If a worker has been in contact with someone potentially positive or positive for COVID-19, contact your Office Manager. • Determine PPE needs and ensure adequate supply of disinfectant wipes/spray, soap and water or hand sanitizer at Site. Due to high demands and limited supply, plan ahead. • Use the minimum number of employees necessary to safely complete the work.
2. Mobilization	**Exposure:** Becoming infected or infecting co-workers	**Personal/Rental/Roux Owned Vehicle** • Do not carpool, unless all individuals are fully vaccinated. • Verify workers/other people are not approaching vehicle prior to exiting the vehicle. Maintain 6' of distance from general public, as appropriate. **Public Transportation** • Public transit should not be used unless absolutely necessary. Consider renting a car rather than taking public transit. If public transit is required, wear appropriate face covering/mask and apply social distancing (6 ft). Wash hands or use hand sanitizer immediately after. **Hotel Stay (Refer to COVID-19 H&S Guidance for more info)** • If a hotel stay is deemed necessary for the given field work, ensure that you clean your room upon initial arrival. • Place the "Do Not Disturb" placard on the room while away and limit housekeeping services to the extent feasible during your stay to minimize the reintroduction and spread of the virus from others. Wash hands or use hand sanitizer often.
3. Tailgate Meeting	**Exposure:** Becoming infected or infecting co-workers	• Perform outside or indoors in areas with ample ventilation. • If unvaccinated, maintain at least a 6+ ft distance between you and others. • Discuss primary infection prevention measures listed below. • Discuss COVID-19 symptoms with coworkers and subcontractors to ensure fitness for duty. Anyone exhibiting signs or symptoms should be instructed to leave the Site, contact your Project Manager.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards, energy source; Energy Source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

4. Site Activities	**Exposure:** Becoming infected or infecting co-workers	• Coordinate field activities at the beginning of the day (i.e. Tailgate meeting) to minimize time spent in crowded spaces or overlap while completing job tasks. • Don cloth face coverings as appropriate. • Apply social distancing (6+ ft) when interacting with others if unvaccinated. If anyone comes within 6 ft of you while conducting work and your work prevents you from moving away, politely ask them to move back. If others are unable to move from your space, stop work and leave area. • Minimize shaking hands or touching others. • Minimize sharing of equipment or other items with co-workers and subcontractors unless wearing appropriate PPE (e.g. nitrile gloves), as appropriate. • If anyone is experiencing COVID-19 signs or symptoms in your vicinity, stop work and leave the area. • Do not work in areas with limited ventilation with others. • Cover your mouth and nose with tissue or paper towel or with your elbow when coughing or sneezing and wash hands or use hand sanitizer immediately after. If sick contact SHSO/PM and leave Site immediately. • Clean work surfaces/areas with approved cleaners you're responsible for (ex: desk, office doorknob, computer, etc.) at least daily. • Avoid public spaces and going out to eat by bringing your own lunch to the Site. If performing work in high density urban areas, it is recommended all food must be consumed at or in your vehicle or within designated work trailer. Wash hands or use hand sanitizer before eating and immediately after.

Primary Infection Prevention Measures

- Wash your hands often with soap and water for at least 20 seconds.
  - If soap and water are not available, use an alcohol-based sanitizer that contains at least 60% alcohol. Key times to wash hands include after blowing your nose, coughing or sneezing, after using the restroom, and before eating or preparing food.
- Do not touch your eyes, face, nose and mouth with unwashed hands.
- Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow. Throw potentially contaminated items (e.g. used tissues) in the trash.
- Avoid close contact/secondary contact with people and potentially contaminated surfaces.
  - Apply appropriate social distance (6+ feet).
  - Minimize handshaking/touching others and use caution when accessing public spaces.
- Clean frequently touched surfaces daily. Commonly touched items can include but are not limited to tables, doorknobs, light switches, countertops, handles, desks, phones, keyboard, toilets, sinks and field equipment. If surfaces are dirty, they should be cleaned with soap and water prior to disinfection. If surface cannot be cleaned/disinfected, then wash hands or use sanitizer as soon as possible.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB SAFETY ANALYSIS	Ctrl. No. GEN-003	DATE 4/10/2023	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Construction - Excavation**	**Backfilling Excavation & Compaction**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
David Kaiser	Project Engineer	Brian Hobbs	CHSD
Edward Lacina	Senior Construction Manager		

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Leather/ cut-resistant level 2
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER _____
☐ LIFELINE / BODY HARNESS	☒ HEARING PROTECTION	☒ PPE CLOTHING: reflective DOT approved safety	
☒ SAFETY GLASSES	☒ SAFETY TOE BOOTS		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Payloader, Backhoe, Dump Trucks, Mechanical gas powered tampers, Excavator with hydraulic tamper. APR when tamping if dust present. Two-way radios.

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs.

EXCLUSION ZONE (EZ): Maintain Minimum Heavy Equipment Exclusion Zone (HEEZ) around equipment and loads while it is in motion. The HEEZ must be greater than the swing zone of any moving part of the equipment, tip zone of the equipment, fall zone of the equipment and contents, distance that debris may travel during demolition activities and/or foot print of a structure to be demolished.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Pre-construction meeting: Review proposed excavation locations	**1a. CONTACT:** Potential for contact with subsurface utilities and above ground utilities	1a. Call state 811 for mark out service and one call ticket. 1a. Obtain private utility mark out service as necessary. 1a. Review and mark proposed excavations w/white paint. 1a. Identify all "Critical" zones. A Critical zone is any area within 10 feet of any operating utility. 1a. Complete subsurface clearance checklist. 1a. Soft dig must be conducted within 2 lateral feet of any suspected underground utility. 1a. Protection of aboveground utilities identified as being located within the work zone must be coordinated w/ client and utility owner.
2. Secure Work Area	**2a. CONTACT:** Potential for personnel to enter the work area. Potential for equipment to contact, or crush personnel. **2b. EXERTION:** Potential for muscle strain or tear while installing traffic cones and barrel	2a. Ensure work area is secure and inform others of work activity. Establish a HEEZ using 42" traffic cones, barrels & snow fencing or telescoping poles. Use of flag persons to maintain clear traffic and to minimize motorist confusion during set-up of new traffic pattern. HEEZ to include tip/swing radius of equipment. 2a. Dump Truck/Excavator/Payloader/Backhoe equipment to be set-up by personnel who are familiar with machinery. Spotters shall be in place for all equipment. and to control access to the HEEZ 2a. Truck wheels are chocked when driver is not in truck and engine shut off. 2a. Personnel shall stay out of the exclusion zone (10' minimum or greater than the equipment boom) while equipment is maneuvering. 2b. Keep back straight, keep load close to the body and bend knees while lifting and working. If over 50 lbs., use 2 or more laborers for lifting or use of equipment.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

3. Backfilling excavation, and compaction	**3a. CONTACT:** Traffic and live equipment. . **3b. EXPOSURE:** Fumes from gas powered tamper **3c. FALL:** Slips, trips, fall hazards. **3d. OVEREXERTION:** Muscle strain, or tear. **3e. EXPOSURE:** Noise from tamper. Dust inhalation.	3a. Equipment and trucks shall be isolated from other workers, subcontractors and third party traffic with 42" traffic cones, barricades, snow fencing or telescoping poles, and/or Jersey barriers. Spotters shall direct dump truck for placement of fill near excavation. Pay loader/ Excavator, as directed by spotter, shall move fill into trench where it shall be placed in layers and compacted by mechanical means. 3a. Spotters will wear florescent vests at all times. 3a. Spotters will remain out of the exclusion zone, line-of-fire from equipment and third-party vehicles. 3a. Spotters and operators will have radios for communication, when other visual and/or hand signals are insufficient. 3a. Locate all overhead utilities. All personnel and machinery should maintain a minimum 10' distance from overhead electric lines. Refer to OSHA chart for distances and voltage. 3a. For excavations engineered (shored, sloped, benched} all personnel, equipment, and materials must remain a minimum of 2 feet from edge of excavation. 3b. Fueling of all equipment will be done outside of work area in a well-ventilated area. Refueling will be done only after a 2-5-minute cool down. 3c. Work area will be clean and free of any debris to remove slip, trip and fall hazards. All tools will be kept in designated areas. Insure work area is well illuminated. 3c. Workers should only be working in areas that have been leveled with a machine. 3c. All persons working at elevations over 6' shall use a guardrail system or personal fall arrest system while around excavation. 3d. Keep knees bent and back straight while transferring/ lifting/lowering tamper from elevated areas. Utilize a co-worker to avoid staining muscles. 3d. Keep knees bent and back straight while maneuvering tamper. Utilize a co-worker to avoid staining muscles. 3e. Workers will wear hearing protection during compaction tamper activities. 3e. Wear NIOSH approved dust mask for personal comfort. If dust is visible for extended time, limit by wetting down area. 3e. If dust continues stop work and evaluate if increase in APR is needed with approval and clearance.
4. Secure/leave site.	**4a. FALL:** Slip, trip, fall	4a. Clear work area of all debris and store all equipment in designated areas/containers before opening to traffic. 4a. Replace fencing and barricades as needed to secure path before opening roadway or area up to traffic(vehicle, pedestrian and/or bicycle).

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB SAFETY ANALYSIS	Ctrl. No. GEN-004	DATE 4/10/2023	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Construction - Concrete and Asphalt**	**Concrete Form Assembly and Concrete Pouring**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
David Kaiser	Senior Engineer	Brian Hobbs	CHSD

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☒ AIR PURIFYING RESPIRATOR	☒ GLOVES: Cut resistant and Nitrile/Latex
☒ HARD HAT	☒ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☒ OTHER: Chaps, dust mask
☐ LIFELINE / BODY HARNESS	☒ HEARING PROTECTION	☒ PPE CLOTHING: reflective DOT approved safety	
☒ SAFETY GLASSES	☒ SAFETY TOE BOOTS: Steel /composite toe boots		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Wheel Barrow, Trowels, Concrete Floats and Hand Tools (Extension Poles), Waterproof Boot Covers, Traffic Cones, Caution Tape, Portable Eye Wash Station

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs.

EXCLUSION ZONE (EZ): Maintain Minimum Heavy Equipment Exclusion Zone around equipment and loads while it is in motion. The HEEZ must be greater than the swing zone of any moving part of the equipment, tip zone of the equipment, fall zone of the equipment and contents, distance that debris may travel during demolition activities and/or foot print of a structure to be demolished.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Set-up work zone	**1a. CONTACT:** Moving equipment, third party traffic.	1a. Secure work area using barricades/barrels/cones and caution tape/safety fence. Use flagmen to control third party traffic. **Maintain minimum heavy equipment exclusion zone (EZ)** around equipment and live loads. 1a. When machines are operating, all workers will remain outside of EZ unless operator is in "HANDS OFF" mode.
2. Assembly of concrete forms (i.e. plywood, lumber, rebar, etc.)	**2a. CONTACT:** Contacting materials being lowered into work area. Potential for cuts and abrasions and to be contacted by nails while assembling. **2b. EXERTION:** Muscle strain. **2c. EXPOSURE:** Noise, dust, fumes. **2d. CAUGHT:** Pinch points, caught between, Crushed	2a. Workers will keep fingers and limbs out of the line-of-fire of tools, equipment and live loads. Workers will use inspected rigging and only attach rigging to manufacturer installed lifting points. Loads will be controlled with non-conductive tag lines from outside the EZ. Wear hard hat. See JSA for applicable cutting tool. 2b. When transporting and working with forms, workers will keep backs straight, knees bent, and loads close to their body. Any load more than 50 lbs., will be lifted by two or more workers or a mechanical lifting device. 2c. Workers will wear hearing protection, face shields and chaps when using all power tools. Fuel powered tools will be fueled away from the work zone in a well-ventilated area. Refueling will be done after a minimum cool down period of 5 minutes. See JSA for applicable cutting tool. 2d. Keep hands away from rigging while hooking/unhooking materials; wear cut resistant gloves.
3. Setup concrete trucks and chute	**3a. CONTACT/CAUGHT:** Potential for truck to contact personnel, fingers to be pinched while setting up chutes. Contact with overhead power lines. **3b. OVEREXERTION:** Strain, pulled muscles.	3a. Spotters will guide concrete trucks into position; wheel chocks will be set before work begins when trucks are parked. Workers will stay out of exclusion zone until truck is parked and secured. Keep hands clear of potential pinch points when assembling chutes. 3a. A minimum clearance of 10 feet shall be maintained from all overhead power lines. That distance may be reduced if shielding is in place or it is determined that lines are low voltage. Refer to site-specific HASP. 3b. All workers will keep back straight and bend their knees when lifting. Two workers or mechanical means will be used when load exceeds 50 lbs.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
4. Pour concrete into forms	**4a. CONTACT:** Splashing from wet concrete.	4a. Portable eye wash stations shall be set up nearby for easy access; wear safety glasses. Nitrile or latex gloves and water proof boots or boot covers shall be worn to eliminate skin contact with concrete. Any concrete splashed onto non-waterproof clothing shall be removed to avoid skin irritation.
	4b. EXPOSURE: Concrete dust.	4b. Stand upwind while mixing dry concrete. Use dust mask or air purifying respirator to avoid silica inhalation.
5. Concrete finishing work with hand tools and/or vibrate to settle and remove air from poured cement,	**5a. ENERGY SOURCE:** Potential for personnel to be exposed to live electricity.	5a. Electrical tools shall be inspected for defects prior to being used. Any extension cords shall be heavy duty rated and be free from defects (no exposed wires). All electrical connections shall be connected to GFCI outlets. Generators shall be run in well ventilated locations.
	5b. OVEREXERTION: Potential muscle strain while vibrating cement, stepping over forms/rebar reinforcements. During use of hand tools to finish concrete, worker can overextend to reach far end of poured area.	5b. Constantly check/observe where you are walking; wear composite or steel-toed boots. Keep back straight and knees bent while settling concrete with vibrator. 5b. If worker needs to reach the far end of a poured area with finishing tools, they shall use extension poles and not over reach to maintain balance. Maintain even footing while using finishing tools. Use spotter during extension pole use.
	5c. CONTACT: Potential hand tools with extension poles/handles to contact nearby workers/pedestrians/vehicles/overh ead power lines.	5c. During use of hand tools to finish poured concrete workers will alert work crew. If utilizing extension poles/handles worker will use a spotter to make sure no contact is made with other workers, pedestrians, vehicles or overhead power lines.
6. Cleanup of work area and tools.	**6a. CONTACT/FALL:** Potential slip, trip, and fall on materials and tools left in the work area.	6a. Place additional materials and tools in designated storage areas. Remove any garbage from the work area.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-005	DATE 4/10/2023	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Construction**	**Cutting with Gas-powered Saw, Sawzall or Plasma Cutter**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Ray Greenidge	Sr. Compliance Manager	Brian Hobbs	CHSD

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☒ REFLECTIVE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☒ FACE SHIELD (gas powered saw and plasma cutter) ☒ HEARING PROTECTION ☒ SAFETY SHOES: Steel-toed boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent Long sleeved shirt and / or reflective safety vest	☒ GLOVES: Cut-resistant, leather, nitrile ☒ OTHER: Chaps for gas powered saw. Welding suit for plasma cutting.

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Sawzall/extension cord

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Set up/ Secure work area.	**1a. CONTACT:** Personnel could enter the work area	1a. Establish the work zone using 42" cones, caution tape, or fixed rigid barrier. Inform others of work activity.
2. Precutting procedure.	**2a. CONTACT:** Improper blade, malfunctioning guards, unsecured materials, flying debris	2a. Inspect all equipment for defects, replace or service if not functioning optimally. Check that all guards are working and in place, replace if missing. Ensure that blades are sharp and clean to avoid binding and/or burning. Cut on flat/secure work surfaces. Do not cut badly warped wood or boards with knots or nails. 2a. Unplug saw before handing it off to another person. 2a. Wear safety glasses, long-sleeved shirt and leather gloves. Utilize job specific PPE such as welding jacket or chaps when using gas powered saw or a plasma cutter.
	2b. EXPOSURE: Loud noises, dust, bright UV light	2b. When using gas powered saw, wet down area to be cut prior to cutting if high dust levels are anticipated. 2b. Wear hearing protection. Wear a dust mask if large amounts of dust are expected; cut upwind if possible. 2b. When plasma cutting, wear a face shield with shaded glasses rated to block UV light generated by the plasma cutter.
	2c. ENERGY SOURCE: Potential for electric shock	2c. Inspect extension cord for damage. If damaged, tag out and repair / replace. Do not operate saw while standing in water. Ensure GFCI protection at outlet or via attachment. 2c. Ensure all electrical equipment is rated for the task.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Saw Cutting.	**3a. CONTACT:** Fingers could be cut, lacerated or amputated by reciprocating blade; also flying debris and sparks	3a. Cut away from body. Keep fingers away from moving blade. No loose clothing. Never leave saw running unattended. Unplug saw before changing blades or making adjustments / repairs. Set-up barrier to contain sparks. Cut on flat/secure work surfaces. 3a. Wear Safety glasses 3a. Ensure that the saw blade stops rotating/reciprocating before placing saw on the ground.
	3b. CONTACT: Amputation and line of fire injury.	3b. Maintain a minimum 15-foot exclusion zone and ensure that operator and other personnel are kept out of the line-of-fire of the equipment.
	3c. FALL: Tripping hazards caused by cutting/grinding debris, extension cords.	3c. Keep debris generated in designated storage containers. Keep work area free of Slip, Trip and Fall hazards. 3c. Do not route extension cords through walking/working path.
	3d. EXERTION/ERGONOMICS: Lifting heavy or awkward materials may cause muscle strain.	3d. Maintain Proper Body Position while operating lifting and moving with equipment. Keep load close to body, knees bent, and back straight. 3d. Take frequent breaks or switch personnel if cutting for an extended period of time.
	3e. EXPOSURE: Personnel may be exposed to fire hazard during Hot Work Activities.	3e. Complete Hot Work Permit, Designate Fire Watch. 3e. Conduct work zone inspection: – Verify that all combustible or flammable materials or equipment fuel sources have been removed from within 35 feet of the proposed hot work. – If combustible or flammable materials or equipment fuel sources have not been removed from within 35 feet of the hot work, verify that engineering and procedural controls have been emplaced: curtains, blankets, wetting, ventilation. 3e. Two 20-lb. Type ABC Fire extinguishers required. 3e. Conduct continuous air monitoring / Lower Explosive Limit (LEL) screenings. Action Level: 10% of the LEL. 3e. If ambient air concentrations exceed LEL Action Levels, STOP WORK and contact supervisor. 3e. Wear hard hat, long sleeved-shirt and safety glasses. Utilize job specific PPE such as welding jacket or chaps and welding glasses when using gas powered saw or a plasma cutter.
4. Secure area when leaving tools unattended.	**4a. CONTACT:** Unauthorized personnel may enter the work area	4a. Unplug saw when not being used. Store equipment in designated storage areas when not being used.
	4b. FALL: Slip/trip/fall	4b. Store tool in designated storage location when it is not being used, secure all extension cords, keep all equipment out of walkways. 4b. Keep work area free of Slip, Trip and Fall Hazards.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-007	DATE 4/10/2023	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**General Site Activity**	**Driving**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Valerie Sabatasso	Project Scientist	Brian Hobbs	CHSD

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Leather/ cut-resistant level 2
☒ HARD HAT: when outside vehicle	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER _____
☐ LIFELINE / BODY HARNESS	☒ HEARING PROTECTION	☒ PPE CLOTHING: high visibility vest, when outside vehicle	
☒ SAFETY GLASSES:when outside vehicle	☒ SAFETY TOE BOOTS: when outside vehicle		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Motor Vehicle (i.e. car, truck, SUV)

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Driving to/leaving Site	**1a. CONTACT:** Severe injury/disability, property damage, monetary loss (insurance premiums, deductibles, loss of license/job) caused by collision with or struck by other vehicles, obstructions, pedestrians, animals, etc. *Common factors that may lead to CONTACT incident, but not limited to: • distracted driving (cell phone, GPS, radio, billboards, "rubber necking") • lack of situational awareness • unfamiliarity with traffic patterns/road layout • weather conditions (wet/icy roads, hydroplaning, black ice) • weariness • high speeds • obstructed vision (solar glare, debris on windshield, blind spots, large vehicle at the front) • changes in travel pathway (construction, snow banks, non-operational signals, potholes, detours, special events) • improper vehicle maintenance (non-operational signal light, worn tires, cracked windshield, ineffective wipers) • loose or unsecure objects	1a. PLAN AHEAD – review/make yourself familiar with maps and driving directions before beginning the drive to the Site. Do not attempt to drive and review maps/directions at the same time. Pull over and stop your vehicle before looking at maps/directions. 1a. Complete a basic vehicle inspection before driving. Verify Inspection and Registration are current, tires and wipers are in good condition, all lights are functional, all glass/mirrors are undamaged, the horn is functional, roof/hood/trunk are free from accumulated snow and visibility is not impaired due to snow/ice/frost/fog on windows. 1a. Do not hang items in car that can obstruct your view or become projectiles in a collision. 1a. Do not get distracted using touch screen radios or GPS units built into newer models. Keep your eyes on the road and stay alert. 1a. Follow posted speed limits and obey traffic signals and roadway signs. 1a. Always wear your seat belt and shoulder harness when driving. 1a. When driving around large vehicles and trucks, maintain extra space as these vehicles may not be able to see a smaller car too close. 1a. Follow the "Rules of the Road" including: using your turn signals, coming to a complete stop, and allowing vehicles the right of way (yield) when they are when traffic laws require. 1a. Apply the Smith Five Keys® of safe driving • Aim High in Steering® - Expand eye lead time to a minimum of 15 seconds • Get the Big Picture® - Maintain proper a 4 second minimum following distance at all times - Scan mirrors every 5-8 seconds to achieve a circle of awareness - Position your vehicle so you can see relevant/non-relevant objects • Keep Your Eyes Moving® - Try to maintain about 180 degrees of visibility - Avoid blank and fixed stares. Avoid focusing on one object for more than 2 seconds • Leave Yourself an Out® - Avoid traveling in traffic clusters - Surround yourself with space - Anticipate the actions of others

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Driving to/leaving Site (cont'd)	**1a. CONTACT:** Severe injury/disability, property damage, monetary loss (insurance premiums, deductibles, loss of license/job) caused by collision with or struck by other vehicles, obstructions, pedestrians, animals, etc.	• Make Sure They See You® - Maintain eye contact with on-coming vehicles/pedestrians - Use warning devices (e.g., hand signals, high-lights, horns etc.) - Proper timing is essential 1a. Do not perform reconnaissance or inspections while driving. Your vehicle should be parked in a safe location when viewing or surveying the Site and vicinity 1a. Avoid sudden turns and stops. Don't drive recklessly – be in control of vehicle at all times. 1a. In inclement weather, first determine if work can be POSTPONED. Otherwise, plan according to weather conditions including checking forecast along entirety of travel route (especially, for long distances). Reduce speed as road conditions warrant. Travelling with winter car equipment in the winter is strongly recommended (i.e., shovel, scraper, brush, blanket, extra clothing, flashlight, bag of sand). If your vehicle has 4-wheel drive, review the operators manual and understand operating procedure prior to engaging 4-wheel drive. If at any point on your drive weather becomes too severe to proceed safely pull over if safe to do so or seek nearest cover (e.g., overpass) 1a. If feeling drowsy or sleepy, do not drive. Pull over in a safe place to rest if you experience any signs of drowsiness. Make sure to get adequate sleep the night before an early drive. 1a. Never operate a vehicle under the influence of alcohol or illegal substances or medications affecting your performance. 1a. Keep your eyes on the road. Do not call or talk on cellular phones. Pull over to a safe location if you must answer or make a call. 1a. When parking, pull-through when possible. If backing is required visually inspect area to ensure it is free from obstructions prior to backing in and relying solely on mirrors; use spotters when available.
2. Entering/Exiting Vehicle.	**2a. CAUGHT:** Personal injury (broken fingers/hand) while entering or exiting vehicles **2b. FALL:** Personal injury (twisted ankle, deep contusion, concussion, broken wrist/arm, etc.) from slip/fall on uneven or unstable or slippery surface while exiting/entering vehicle **2c. CONTACT:** Severe injury/disability, property damage, monetary loss (insurance premiums, deductibles, loss of license/job) caused by collision with or struck by other vehicles, obstructions, pedestrians, animals, etc.	2a. Open and close doors slowly. Never put hands or feet in between door and vehicle to avoid pinch points. 2b. When exiting the vehicle make sure your feet are on firm footing and weight is evenly distributed before exiting/standing. In inclement weather use hands to support yourself, by holding the car door and/or steering wheel, when exiting the vehicle. 2c. Check both directions for traffic before opening door. Do not exit vehicle if traffic does not permit you to exit safely 2c. Check anticipated path of door prior to opening, do not open door into any obstructions (e.g., bollards, high curbing)

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-011	DATE: 4/10/2023	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
Generic	**Construction - Excavation**	**Excavation / Trenching**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
David Kaiser	Senior Engineer	Brian Hobbs	CHSD
Tim Unalp	SHSO		

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Leather or cut resistant
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER
☒ LONG SLEEVED SHIRT	☒ HEARING PROTECTION	☒ PPE CLOTHING: Fluorescent reflective vest or high visibility long sleeved clothing	
☐ LIFELINE / BODY HARNESS	☒ SAFETY SHOES: Steel-toe boots		
☒ SAFETY GLASSES			

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Jackhammer, Excavator, Backhoe, Hand Tools, Photoionization Detector, barrels, 42" traffic cones, snow fencing, telescoping poles, temporary chain link fence, ladders, shovels, digging bars, power tools (cut-off saw), Two-way radios, Sheeting, Trench box, Retractable lanyard, Harness

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Pre-Clearance Protocol.	**1a. CONTACT:** Damage to underground utility.	1a. Confirm that (if applicable) "Call Before You Dig" and local utility companies were contacted prior to trenching in order to confirm utility mark outs. Must have a case # before digging.
	1b. ENERGY SOURCE/CONTACT: Property damage; Pressurized water mains may cause lacerations or broken bones. Pressurized gas mains may explode causing serious injury, or death. Underground electric may cause severe burns, shock, or death.	1b. Pre-clearing of the trenching location must be conducted to a minimum of 5 vertical feet below the ground surface (10 feet minimum for Critical Zone) using soft digging methods or hand tools (shovel and non-metallic dig bar) prior to trenching. Supervisor should be contacted to discuss appropriate pre-clearing depth. **1b. Complete subsurface clearance checklist**.
	1c. FALL: Slip, Trip or Fall may cause muscle strains or tears, abrasions, lacerations, or broken bones.	1c. Be aware of the conditions when walking or loading equipment and working. Walk within established pathway avoiding uneven surfaces. Remove potential slip/trip/fall hazards.
2. Set up work zone.	**2a. CONTACT/CAUGHT:** Cuts/lacerations from equipment. Broken bones from contact by vehicle.	2a. Isolate work area from hazards with cones, barricades, and snow fencing, telescoping poles or temporary chain link fence. Utilize a flag person when necessary (i.e., third party traffic in area). Install traffic signs in roadways and for detours. Spotters will maintain and enforce exclusion zone.
	2b. FALL: Slip, Trip or Fall may cause muscle strains or tears, abrasions, lacerations, or broken bones.	2b. See 1c.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Trenching Activity.	**3a. CONTACT:** Serious injury including broken bones, muscle strains or tears, and possibly death due to contact with machine.	3a. Spotter(s) required for all heavy equipment operation. No worker shall be allowed inside the exclusion zone or along the trench/excavation area while any equipment is in operation. A minimum exclusion zone greater than the length of the equipment boom must be established. Workers only allowed in exclusion zone if the operator is in "Hands Off "mode. Operator will not operate equipment until worker is out of exclusion zone. Spotters and operators will have radios for communication, when either loses sight of one another, and/or in case of emergency.
	3b. FALL: Slip, Trip or Fall may cause muscle strains or tears, abrasions, lacerations, or broken bones	3b. Any trench/excavation deeper than 3' must have a ladder within 25' of any worker in the excavation. At least 3'(rungs) of the ladder shall be above the top of the excavation. All spoil piles shall be maintained 2' minimum from edge of excavation. 3b. Any trench/excavation deeper than 6' must have fall protection, retractable lanyard for ladder use, and 42" high guardrails along the edge of the trench/excavation.
	3c. EXPOSURE: Noise, Dust, Concrete- Asphalt, petroleum hydrocarbon vapors may cause damage to ears and lungs	3c. Air monitoring using a calibrated photoionization detector (PID) will be used to monitor the breathing zone of the work area. If a reading of >5ppm is recorded, the oversight personnel must temporarily cease work and instruct all Site personnel to step away from the area of elevated readings.
4. Setting Trench protections if necessary.	**4a. CAUGHT:** Injury due to contact with failed trench, may include muscle strains or tears, abrasions or lacerations, broken bones and possibly death.	4a. To prevent cave-ins and avoid caught by/between, excavations over 4' in depth, unless working in stable rock, shall have engineer approved shoring, sheeting or trench box. Top of protection shall be at least 2' above top of excavation.
	4b. CONTACT/CAUGHT: Injury due to rigging activities and entering exclusion zone during lifting and/or transport of shoring/trench box/material may include muscle strains or tears, abrasions or lacerations, broken bones and possibly death.	4b. Use only inspected rigging with 2, 3 or 4 lift points; wear cut-resistant gloves. Rigging to be hooked up to factory installed hook up points on equipment. Control load with non-conductive tag lines with workers out of exclusion zone. Don't stand underneath suspended load; wear steel toed boots and hard hat.
	4c. FALL: Possible injury due to fall into excavation may include muscle strains or tears, abrasions or lacerations, or broken bones.	4c. Shoring to be set and sides will be backfilled to avoid fall hazards before workers are allowed to enter area. Operator will be in "HANDS OFF" mode before workers enter work area to unhook rigging. An inspected ladder extending 3' above top of the shoring will be used to enter and exit the excavation. Workers will use three points of contact when using the ladder.
5. Secure/Leave Site. If backfilling, see excavation backfilling and compaction JSA for potential hazards and critical actions.	**5a. FALL:** Potential Slip, Trip or Fall - may cause muscle strains or tears, abrasions or lacerations, or broken bones.	5a. See 1c. 5a. All open excavations must be backfilled or secured prior to departure with steel plates, orange construction fence or temporary chain link fencing.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB SAFETY ANALYSIS	Ctrl. No. GEN-018	DATE: 4/10/2023	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description) :
GENERIC	**Construction**	**Installing and Working on Scaffolding**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Tom Henderson	Senior Scientist	Brian Hobbs	CHSD
Nick Cuomo	Senior Technician		

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☒ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☐ HEARING PROTECTION ☒ SAFETY SHOES: Safety-toed boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Reflective vest, Long sleeve shirt	☒ GLOVES: Leather, Level 2 Cut Resistant ☒ OTHER: Personal Fall Arrest System (PFAS) or Fall Prevention System (PFS)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment: Caution tape, 42"-high cones/barricades, scaffolding, ladders, signage, and hand tools.

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs

EXCLUSION ZONE (EZ): Maintain Minimum Heavy Equipment Exclusion Zone around equipment and loads while it is in motion. The HEEZ must be greater than the swing zone of any moving part of the equipment, tip zone of the equipment, fall zone of the equipment and contents, distance that debris may travel during demolition activities and/or foot print of a structure to be demolished.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Secure work zone.	**1a. CONTACT:** Struck By pedestrian and/or vehicular traffic entering the work area.	1a. Define work **EZ** around scaffold construction area excluding equipment staging areas. Expand EZ for tip over distance, if needed. Use 42" cones, barricades, "Caution" tape, and warning signage. Communicate task to surrounding workers. Only designated workers donned with required standard PPE (including Level 2 cut-resistant gloves) allowed entry to EZ.
	1b. FALL: Slip/trip/fall hazards in EZ.	1b. Remove material and equipment obstructions from walkways and store in designated staging areas.
	1c. EXPOSURE: Potential hazardous atmosphere.	1c. Conduct air monitoring using direct-reading instruments.
	1d. ENERGY SOURCE: Electrocution (if applicable).	1d. Conduct LO/TO procedures; Engage Public Utility to cover, relocate, or remove overhead electric lines prior to Work Zone entry. Follow HASP and OSHA Standard 1926.451(f)(6) for required specific clearance distances.
2. Unload scaffolding components.	**2a. CONTACT:** Lacerations, cuts, and abrasions.	2a. Wear ANSI Level 2 cut-resistant gloves if pre-work material inspection yields sharp edges.
	2b. CAUGHT-CRUSHED: Fingers / hands in pinch points.	2b. Position your fingers/hands where they can't be caught between a lifted load and adjacent objects. Wear leather gloves to protect from pinching/crushing.
	2c. FALL: Fall from height; Trip/fall while moving equipment into position.	2c. Ascend/descend materials from/onto delivery truck-bed using 3-points of contact; If the truck bed does not have a built-in ladder, use an A-frame step ladder of sufficient height that the worker will not need to use the top 2 steps;
		2c. Keep materials, scaffolding, and hand tools in designated staging area(s) until needed to avoid clutter and trip hazards.
	2d. ERGONOMICS: Strain from moving material into position.	2d. Use buddy system or lifting-apparatus when lifting materials heavier than 50-lbs. Use proper lifting techniques including straight back, bent knees, load-weight near body, don't reach/extend load away while handling/moving components, avoid twisting.
3. Inspect scaffolding components prior to set-up.	**3a. FALL:** From damaged or malfunctioning scaffold components.	3a. Designate **Competent Person (CP)** for this task:_____ (insert name above). **CP** responsibilities**:** - Remains on-site for all phases of scaffold work. - Inspects scaffold components including wheels, brakes, connections, pins, framing, platforms, guard rails, and ladders per OSHA 1926 subsection L. - Trains workers to erect the scaffold structure, hazard-recognition, scaffold's safe use, fall prevention / protection, load capacities, falling objects, electrical hazards, access, maintenance, operation, repair, dis-assembly, use of ties/braces, inspection. - Uses only manufacturer-supplied braces and hardware (no substitutions). - Removes damaged components from service. - Tags scaffold to alert workers of its condition.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
4. Scaffold assembly (erecting / moving scaffolding from ground level).	**4a. CONTACT:** STRUCK-BY materials/ tools/ equipment falling from scaffold platform causing bone fractures, lacerations, cuts, abrasions.	4a. **Maintain 10' EZ** minimum or tip-over radius (where possible) around the scaffold erection area; Set up scaffolding on firm, level surfaces. Use leveling jacks to provide stable base and eliminate scaffold movement. 4a. Wheeled-base scaffold wheels to remain locked except during relocation. Workers must disembark with tools during repositioning, and then relock wheels. 4a. While working over 6ft, ensure that hand tools and equipment are securely tied off using rated rope or a lanyard to prevent contact with ground workers. 4a. Use only manufacturer-supplied braces and hardware (no substitutions). 4a. When hoisting materials overhead to workers verify rope is free of rips or tears and has appropriate weight rating. Verify materials are securely fastened with rope. 4a. Wear required PPE including hard hat, safety glasses, reflective vest, safety-toe boots, long sleeve shirt, PFAS harness with lanyard attached to approved anchor points.
	4b. CAUGHT-CRUSHED: Pinch point during scaffold assembly.	4a. Use manufacturer-approved platforms (18"-width minimum) or marked, scaffold-grade planking so that the working platform surface is filled between the front uprights and the guardrails. 4a. Gaps between the uprights/platforms/planks not to exceed 1". 4" high toe-boards are required to prevent objects from falling from decking to lower levels. 4b. Keep fingers/limbs away from pinch points and frame-work connections during assembly. Wear leather gloves for hand protection.
	4c. FALL: From Ladder / End-frame / Stair access to platform while ascending / descending Fall due to Elevated Platform Failure Fall from elevation. Fall due to Scaffold failure.	4c. Use ladder / built-in scaffolding end-frame steps / stairs to ascend and descend scaffolding, ***NOT*** cross-bracing. Ladders must be inspected, clear scaffolding platform by a 3'-minimum, and be tied-off. Maintain 1:4 slope ratio, 3-points of contact while ascending/descending, with weight centered between rails. Install swing gates at scaffold staircases (if staircases are used). 4c. Use only "Scaffold-Grade" marked planking; Planking to overlap frame-work edges 6"-12" ***only***; Install cross braces in all sections except access and material-delivery points; Scaffolding to be tied into work-face for every 30' in elevation; Working platform must be within 14" from work-face. 4c. Personal Fall Arrest Systems (PFAS) to be used above 6'; Fall protection anchor point installations (excluding the scaffold being worked from) prioritized after platform assembly and used; Calculate that fully deployed PFAS will not allow user to touch the ground during potential falls. 4c. If scaffold tiers are erected above workers *and* OSHA compliant top-rails (42"), mid-rails (21"), toe-boards (4") are employed, safety harnesses are not required; CP conducts final inspection of completed scaffold structure prior to use verifying correct assembly/securement, pins are in "locked" position.
	4d. EXERTION: Muscle strain while moving/lifting materials.	4d. Employ buddy system or lifting-apparatus when lifting materials heavier than 50-lbs; Use proper lifting techniques including straight back, bent knees, load/weight near body, don't reach/extend/twist with load while handling components.
	4e. ENERGY SOURCE: Electrocution (if applicable)	4e. Verify that no energy sources (electric wires, cables) either contact scaffolding or come within OSHA/HASP specified distances of workers or scaffold. Use LO/TO to ensure that hazardous energy cannot be transmitted to the conductive scaffold framework prior to assembly.
5. Working on scaffolding.	**5a. CONTACT:** Struck-by objects falling from scaffolding / ladder.	5a. See JOB STEP 4a; Remove unnecessary tools/materials from scaffolding, returning them to designated staging areas. Inspect work zone for head-knocker and trip hazards.
	5b. FALL: Fall from elevation. Fall during scaffold collapse due to overloading. Slip/fall due to slick surfaces.	5b. See JOB STEP 4c; **CP** to conduct daily, pre-work, scaffold inspection; Workers climbing on scaffolding will use 3-points of contact; Ensure PFAS lanyards secured to approved anchor points (excluding the scaffold being worked from, or other scaffold-framework-struts). **CP** to review manufacturer's weight-loading specifications / restrictions for workers and materials, communicate limitations to the work crew, and periodically verify adherence to the specifications. **CP** and workers to inspect/assess for slick, wet, or iced (outdoor) surfaces continually during use due to changing conditions, mitigate hazards, and/or restrict access and post warnings.
6.Disassemble scaffolding.	**6a. CONTACT:** Struck-by falling tools / materials.	6a. Clear scaffolding of debris, tools, and materials prior to dismantling; Dismantle scaffolding by working backwards from the farthest point towards the access location; Plan/verify a route of egress prior to dismantling.
	6b. FALL: Slip/trip hazards resulting from inadequate house-keeping.	6b. Remove fall protection (mid-rail, top-rail) only after removing cross braces; Ensure that all personnel are aware that the particular tier of scaffolding is being dismantled; If fall protection anchor points have been removed, maintain safe distances from scaffolding platform edges, and only under a Supervisor's observation.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-019	DATE: 4/10/2023	☐NEW ☒REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Site Reconnaissance**	**Site Walk and Inspection**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Sara Barrientos	Project Geologist	Brian Hobbs	Corporate Health and Safety Director
Tim Unalp	SHSO	Joe Duminuco	Executive Vice President

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION: ear plugs as necessary ☒ SAFETY SHOES: Steel or composite toed	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: High-visibility vest or high-vis outerwear	☒ GLOVES: Leather/cut-resistant/chemical resistant ☒ OTHER: Tyvek and rubber boots as necessary, dust mask as necessary

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment: Site map, emergency contact list, documentation of urgent care/hospital routes and / or guide familiar with Site, operating cell phone or walkie-talkie if Site allows, and bug spray.

Commitment to Safety – All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

EXCLUSION ZONE (EZ): Maintain Minimum Heavy Equipment Exclusion Zone around equipment and loads while it is in motion. The HEEZ must be greater than the swing zone of any moving part of the equipment, tip zone of the equipment, fall zone of the equipment and contents, distance that debris may travel during demolition activities and/or foot print of a structure to be demolished.

SITE SECURITY: Prior to site inspection verify appropriate method to address Site Security concerns as it relates to potential criminal activity, homeless population, and/or isolation concerns. Work with the Project Principal and/or Project Manager to address appropriately.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Check in with Site contact.	**1a. CONTACT/EXPOSURE/FALL:** Personal injury caused by lack of awareness of site-specific hazards.	1a. Inquire about hazards and other activities taking place at the Site. 1a. Inform Site contact of work scope, timeline and location(s). 1a. Discuss emergency evacuation procedures and muster points with Site contact.
2. Traversing the Site	**2a. CONTACT:** Property damage and personal injury caused by obstructions/vehicles or unauthorized personnel at remote Sites.	2a. All equipment must be stowed and secured prior to moving. 2a. Maintain speed limit as posted on-site. 2a. When possible, drive on established roadways. 2a. Yield to all pedestrians. 2a. Use pull-through spots or back into parking spots. 2a. Don high visibility clothing/safety vest. If working at remote Site, add orange accessories during hunting season.
	2b. FALL: Uneven terrain and weather conditions. Overgrown shrubs and vines. Equipment in the work zone.	2b. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 2b. When possible, use established pathways and walk on stable, secure ground. 2b. Communicate traversing hazards with others.
	2c. OVEREXERTION: Muscle strain while carrying equipment.	2c. When carrying equipment to/from work area, use proper lifting techniques; keep back straight, lift with legs, keep load close to body, never reach with a load. Ensure that loads are balanced to reduce the potential for muscle strain. Use the buddy system or mechanical means to maneuver items heavier than 50-lb. If necessary, make multiple trips to carry equipment.
	2d. EXPOSURE: Biological hazards – ticks; bees/wasps; poison ivy; insects; (Ticks are most active any time the temperature is above freezing, typically from March to November.)	2d. Inspect area to avoid contact with biological hazards. 2d. Ticks: • Treat outer clothing including pants, shirts, socks, boots and hats the evening before with Permethrin (allowing at least two hours before use). • Apply DEET to exposed skin before travelling to the Site and reapply after two hours. • Check for ticks during and after work. 2d. Bees: • Use bee spray as appropriate to deter/eliminate bees.

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	2e. EXPOSURE: Heat Stress & Cold Stress. Personal injury from working in inclement weather conditions.	• Protect exposed skin with insect repellent. 2d. Poison Ivy: • Identify areas of poison ivy and spray with weed killer. Don Tyvek and rubber boots while traversing poison ivy areas. • If skin contacts poison ivy, wash skin thoroughly with soap and water. 2e. Wear sunscreen with SPF 15 or greater on exposed skin whenever 30 minutes or more of sun exposure is expected. 2e. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). Take breaks as needed. 2e. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). Take breaks as needed. 2e. Wear appropriate rain gear as needed. 2e. Take frequent breaks if tired, wet, or cold/hot. Drink water. 2e. If lightning is observed, wait 30 minutes after last thunder boom/lightning bolt in a sheltered location (car acceptable) before starting work again.
3. Walking near heavy equipment and machinery.	**3a. CONTACT:** Personal injury from Site and roadway traffic. Personal injury from flying debris **3b. OVEREXERTION:** Personal injury from lifting/moving/rotating equipment. **3c. EXPOSURE:** Hearing damage from noise generating equipment/processes. Inhalation/exposure to hazardous vapors and or dust. **3d. EXPOSURE:** Working in a remote area.	3a. See 2a. 3a. Maintain an exclusion zone of at least 10'-25' feet from all engaged equipment. 3a. Keep body parts out of the line-of-fire of pinch points. 3a. Wear appropriate PPE always. 3b. See 2c. 3c. Wear hearing protection if >85 dBA. (i.e. noise levels which require you to raise your voice to communicate) 3c. Always wear leather gloves when handling any tools or equipment. 3c. Always wear appropriate PPE based off chemicals present. 3d. Use the "buddy system" whenever possible. If working alone, contact PM upon arrival/departure, as well as during work activities prior to commencing work if applicable. 3d. Always carry a communication device (i.e., cell phone, walkie-talkie) or directional (i.e., map, compass, etc.) when traversing remote areas. 3d. If available, follow Lone Worker Protocol/Procedure.
4. Working in adverse weather conditions.	**4a. EXPOSURE:** Heat Stress & Cold Stress. Personal injury from working in inclement weather conditions.	4a. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). Take breaks as needed. 4a. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). Take breaks as needed. 4a. Wear appropriate rain gear as needed. 4a. Take frequent breaks if tired, wet, or cold/hot. Drink water. 4a. If lightning is observed, wait 30 minutes after last thunder boom/lightning bolt in a sheltered location (car acceptable) before starting work again.
5. Departing Site.	**5a. EXPOSURE:** Exposure to unnecessary hazards should personnel believe Roux is on-Site during an emergency and conduct a search.	5a. Sign out or notify Site contact and Roux Project Manager of your departure.

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JOB SAFETYANALYSIS Ctrl. No. GEN-020	DATE: 04/11/2023	☐NEW ☒REVISED	PAGE 1 of 2

JSA TYPE CATEGORY: **GENERIC**	WORK TYPE: **Gauging & Sampling**	WORK ACTIVITY (Description): **Soil Sampling**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
MaryBeth Lyons	Project Scientist	Brian Hobbs	CHSD
Tim Unalp	SHSO		

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES ☒ FLAME RESISTANT CLOTHING (as needed)	☐ GOGGLES ☐ FACE SHIELD: ☒ HEARING PROTECTION: (as needed) ☒ SAFETY SHOES: Composite-toe or steel toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Leather, Nitrile and cut resistant ☒ OTHER: Insect repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Recommended Equipment: 42" traffic cones, caution tape, trowel

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs.

EXCLUSION ZONE (EZ): Maintain Minimum Heavy Equipment Exclusion Zone around equipment and loads while it is in motion. The HEEZ must be greater than the swing zone of any moving part of the equipment, tip zone of the equipment, fall zone of the equipment and contents, distance that debris may travel during demolition activities and/or foot print of a structure to be demolished.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Secure location	**1a. CONTACT:** Personnel and vehicular traffic may enter the work area.	1a. If in an area with foot or vehicle traffic, delineate the work area with 42" traffic cones and/or caution tape to prevent exposure to traffic and inform others of work activity. 1a. Wear reflective vest and/or high visibility clothing. 1a. Face the direction of any vehicular traffic. Position vehicle to protect worker from traffic. 1a. Communicate work activity with adjacent work areas.
	1b. FALL: Tripping/falling due to uneven terrain or entry/exit from excavations.	1b. Inspect pathways and work area for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions. 1b. Use established pathways and walk on stable, secure ground. 1b. Stage equipment and tools in a convenient, stable, and orderly manner. Store equipment at lowest potential energy. 1b. Roux employees should stay 5 feet from in-progress excavations and trenches. Should entry to an excavation be required (when stabilization is complete), ladders must be employed for steep embankments, excavations, pits, and trenches.
	1c. EXPOSURE: Exposure to sun and excessive heat, possibly causing sunburn, heat exhaustion or heat stroke. Exposure to cold temperatures possibly causing cold stress. Skin burn as a result of fire, if applicable. Exposure to explosive vapors due to tank farm operations. Exposure to airborne dust due to high wind speeds. Biological hazards - ticks, bees/wasps, poison ivy, thorns, insects, etc.	1c. Wear sunscreen with an SPF 15 or greater whenever 30 minutes or more of exposure is expected. 1c. Use a tent to shade the work area from direct sunlight particularly when warm temperatures are expected. 1c. Be aware of the location of all Site personnel. 1c. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). 1c. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). 1c. Take breaks for rest and water as necessary. Move to an area that is well shaded or a climate controlled area (i.e., car, site trailer, etc.). 1c. No open flames/heat sources. 1c. Conduct air monitoring and ensure that harmul vapor concentrations are within the levels detailed in the Site Specific HASP. Follow procedures detailed in HASP for exceedances. 1c. Flame retardant clothing must be worn when specified by Site policy. 1c. Cell phones should be disabled when specified by Site policy. 1c. Pre-treat field clothing with Permethrin prior to site visit to kill ticks and insects. 1c. Wear long sleeved shirts and tuck in (or tape) pant legs into socks or boots to prevent ticks from reaching skin. 1c. Spray insect repellant containing DEET on exposed skin when working in overgrown areas of the Site. 1c. Inspect area to avoid contact with biological hazards. 1c. Wear cut-resistant gloves when handling branches, shrubs, etc. that may lie within the walking path. 1c. Wear spoggles if the average wind speeds are above 15 mph. 1c. Personnel shall examine themselves and co-worker's outer clothing for ticks periodically when onsite. 1c. If skin comes in contact with poison ivy, wash skin thoroughly with soap and water. If rash persists after washing, immediately notify your supervisor, the OM and OHSM for possible consultation with a physician at an approved Occupational Health Clinic.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
2. Collect Soil Sample	**2a. CONTACT:** Personal injury from pinch points, cuts, and abrasions from sampling equipment tools, and material within soil sample. Personal injury from contact with moving equipment while sampling. Personal injury from contact with glass sample jars.	2a. Wear cut-resistant (i.e., Kevlar) gloves under chemical-resistant (nitrile) disposable gloves when handling soil samples and sampling jars. 2a. Where possible, use trowel or equivalent tool to avoid contact with soil. 2a. If sampling from bucket of heavy equipment, ensure all equipment is off and operator utilizes the “show me your hands” policy. 2a. See 1a.
	2b. EXPOSURE: Exposure to contamination (impacted soil) and/or lab preservatives.	2b. Wear chemical-resistant (nitrile) disposable gloves over cut resistant gloves to protect hands when handling samples; use containment material or plastic sheeting to protect surrounding areas. 2b. Wear safety glasses to protect eyes from dust or air-borne contaminants that may results from disturbing the soil. 2b. Where possible, remain upgradient from sample location if collecting soil sample from stockpile, drill rig, etc. to avoid breathing contaminant vapors, if they are present. 2b. When collecting soil sample from hand auger, put large zip lock bag over entire auger to prevent spillage of soil on to the ground. 2b. Open sample jars slowly and fill carefully to avoid contact with preservatives.
	2c. EXERTION: Exertion due to repetitive motion and ergonomics.	2c. Utilize a table or raised surface for soil sampling if multiple soil samples are going to be taken to minimize repetitive bending motion.
3. Decontaminate equipment	**3a. EXPOSURE/CONTACT:** Contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated vapors and/or soil). **3b. EXPOSURE:** Chemicals in cleaning solution including ammonia.	3a. Wear chemical-resistant (nitrile) disposable gloves and safety glasses. 3a. Use an absorbent pad to clean spills. 3a. Properly dispose of used materials/PPE in provided drums in designated drum storage area. 3a. Remain upwind of sample and avoid breathing contaminant vapors, if they are present. 3b. Wear chemical-resistant (nitrile) disposable gloves and safety glasses. 3b. Work on the upwind side of decontamination area. 3b. Use an absorbent pad to clean spills. 3b. Properly dispose of used materials/PPE in provided drums in designated drum storage area. Ensure that all drums are properly labeled and secured.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-025	DATE: 04/11/2023	☐ NEW ☒ REVISED	PAGE 1 of 1

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
Generic	**General**	**Trucking**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Lauren Dolginko	Project Geologist	Brian Hobbs	CHSD
Tim Unalp	SHSO		

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Leather or cut resistant
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER
☐ LONG SLEEVED SHIRT	☐ HEARING PROTECTION	☒ PPE CLOTHING: Fluorescent reflective vest or high visibility long sleeved clothing	
☐ LIFELINE / BODY HARNESS	☒ SAFETY SHOES: Steel-toe boots		
☒ SAFETY GLASSES			

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Heavy equipment (i.e. trucks)

COMMITMENT TO SAFETY- All personnel onsite will actively participate in Hazard recognition and mitigation throughout the day by verbalizing SPSAs.

EXCLUSION ZONE (EZ): Maintain Minimum Heavy Equipment Exclusion Zone around equipment and loads while it is in motion. The HEEZ must be greater than the swing zone of any moving part of the equipment, tip zone of the equipment, fall zone of the equipment and contents, distance that debris may travel during demolition activities and/or foot print of a structure to be demolished.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Set up work zone.	**1a. CONTACT:** Personal injury/property damage caused by obstruction/vehicle.	1a. Establish work zone for manifesting/paperwork by communicating with workers before task begins. Maintain a minimum **Exclusion Zone (EZ)** around all heavy equipment.
2. Loading of truck.	**2a. CONTACT:** Rolling Vehicle could cause bodily harm.	2a. All commercial vehicles without an operator must have their engines off and wheels chocked. Truck and loading area should be on level and stable ground.
	2b. CONTACT: Machine or load may crush personnel, property or machinery.	2b. All machines (Excavator, Lull, Backhoe) must have a spotter. Spotter must communicate contact hazards such as other personnel in the work area, objects in the machine's blind spot, and overhead lines to the operator. Spotter and operator should have 2-way radios or established hand signals to communicate when needed. 2b. Loads must not be swung over other vehicles or personnel. 2b. Maintain **EZ** around all equipment.
	2c. CONTACT: Load shifting during travel.	2c. Secure all loads prior to moving the truck with chains or straps or cribbing. 2c. Any loose soil or debris should be cleaned off truck sides prior to truck mobilization. 2c. All truck beds must be secured prior to traveling.
3. Dumping loads.	**3a. CONTACT:** Truck may flip sideways or backwards.	3a. All workers must stay behind and away from the side of trucks that are dumping to avoid contact with flying debris and the truck potentially tipping sideways or backwards. EZ must be maintained equal to the height of bed while lifted.
4. Exchanging paperwork with truck driver.	**4a. CONTACT/CAUGHT:** Broken bones from contact by vehicle.	4a. Truck driver should exit truck with proper PPE, using the three-point stance, and enter the established work zone to complete paperwork. If Site-specific safety prohibits drivers from exiting the truck, wait until truck is finished loading, with engine turned off, before approaching truck. 4a. Always establish eye contact with driver prior to approaching truck. 4a. Confirm sides of truck have been cleaned/brushed off prior to approaching truck.
	4b. FALL: Slip, Trip or Fall may cause muscle strains or tears, abrasions or lacerations, or broken bones.	4b. Survey walking route to identify slip/trip/fall hazards. Avoid icy/wet surfaces. Remove slip/trip/fall hazards if present. 4b. Communicate with driver and spotter prior to approaching truck. Maintain **EZ** around all heavy equipment.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards, energy source; Energy Source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

APPENDIX B

Safety Data Sheets (SDSs) for Chemicals Used

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

1 Identification of the substance/mixture and of the supplier

1.1 Product identifier

Trade Name: Alconox
Synonyms:
Product number: Alconox

1.2 Application of the substance / the mixture : Cleaning material/Detergent

1.3 Details of the supplier of the Safety Data Sheet

Manufacturer
Alconox, Inc.
30 Glenn Street
White Plains, NY 10603
1-914-948-4040

Supplier
Not Applicable

Emergency telephone number:
ChemTel Inc
North America: 1-800-255-3924
International: 01-813-248-0585

2 Hazards identification

2.1 Classification of the substance or mixture:

In compliance with EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments.

Hazard-determining components of labeling:
Tetrasodium Pyrophosphate
Sodium tripolyphosphate
Sodium Alkylbenzene Sulfonate

2.2 Label elements:

Skin irritation, category 2.
Eye irritation, category 2A.

Hazard pictograms:

Signal word: Warning

Hazard statements:
H315 Causes skin irritation.
H319 Causes serious eye irritation.

Precautionary statements:
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 If on skin: Wash with soap and water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P321 Specific treatment (see supplemental first aid instructions on this label).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P501 Dispose of contents and container as instructed in Section 13.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

Additional information: None.

Hazard description

Hazards Not Otherwise Classified (HNOC): None

Information concerning particular hazards for humans and environment:

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

Classification system:

The classification is according to EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments, and extended by company and literature data. The classification is in accordance with the latest editions of international substances lists, and is supplemented by information from technical literature and by information provided by the company.

3 Composition/information on ingredients

3.1 Chemical characterization : None

3.2 Description : None

3.3 Hazardous components (percentages by weight)

Identification	Chemical Name	Classification	Wt. %
CAS number: 7758-29-4	Sodium tripolyphosphate	Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	12-28
CAS number: 68081-81-2	Sodium Alkylbenzene Sulfonate	Acute Tox. 4; H303 Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	8-22
CAS number: 7722-88-5	Tetrasodium Pyrophosphate	Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	2-16

3.4 Additional Information : None.

4 First aid measures

4.1 Description of first aid measures

General information: None.

After inhalation:

Maintain an unobstructed airway.

Loosen clothing as necessary and position individual in a comfortable position.

After skin contact:

Wash affected area with soap and water.

Seek medical attention if symptoms develop or persist.

After eye contact:

Rinse/flush exposed eye(s) gently using water for 15-20 minutes.

Remove contact lens(es) if able to do so during rinsing.

Seek medical attention if irritation persists or if concerned.

After swallowing:

Rinse mouth thoroughly.

Seek medical attention if irritation, discomfort, or vomiting persists.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

4.2 Most important symptoms and effects, both acute and delayed

None

4.3 Indication of any immediate medical attention and special treatment needed:

No additional information.

5 Firefighting measures

5.1 Extinguishing media

Suitable extinguishing agents:

Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition.

For safety reasons unsuitable extinguishing agents : None

5.2 Special hazards arising from the substance or mixture :

Thermal decomposition can lead to release of irritating gases and vapors.

5.3 Advice for firefighters

Protective equipment:

Wear protective eye wear, gloves and clothing.
Refer to Section 8.

5.4 Additional information :

Avoid inhaling gases, fumes, dust, mist, vapor and aerosols.
Avoid contact with skin, eyes and clothing.

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures :

Ensure adequate ventilation.
Ensure air handling systems are operational.

6.2 Environmental precautions :

Should not be released into the environment.
Prevent from reaching drains, sewer or waterway.

6.3 Methods and material for containment and cleaning up :

Wear protective eye wear, gloves and clothing.

6.4 Reference to other sections : None

7 Handling and storage

7.1 Precautions for safe handling :

Avoid breathing mist or vapor.
Do not eat, drink, smoke or use personal products when handling chemical substances.

7.2 Conditions for safe storage, including any incompatibilities :

Store in a cool, well-ventilated area.

7.3 Specific end use(s):

No additional information.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

8 Exposure controls/personal protection

8.1 Control parameters :

7722-88-5, Tetrasodium Pyrophosphate, OSHA TWA 5 mg/m3.

8.2 Exposure controls

Appropriate engineering controls:

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling.

Respiratory protection:

Not needed under normal conditions.

Protection of skin:

Select glove material impermeable and resistant to the substance.

Eye protection:

Safety goggles or glasses, or appropriate eye protection.

General hygienic measures:

Wash hands before breaks and at the end of work.
Avoid contact with skin, eyes and clothing.

9 Physical and chemical properties

Appearance (physical state, color):	White and cream colored flakes - powder	**Explosion limit lower**: **Explosion limit upper**:	Not determined or not available. Not determined or not available.
Odor:	Not determined or not available.	**Vapor pressure at 20°C**:	Not determined or not available.
Odor threshold:	Not determined or not available.	**Vapor density**:	Not determined or not available.
pH-value:	9.5 (aqueous solution)	**Relative density**:	Not determined or not available.
Melting/Freezing point:	Not determined or not available.	**Solubilities**:	Not determined or not available.
Boiling point/Boiling range:	Not determined or not available.	**Partition coefficient (n-octanol/water)**:	Not determined or not available.
Flash point (closed cup):	Not determined or not available.	**Auto/Self-ignition temperature**:	Not determined or not available.
Evaporation rate:	Not determined or not available.	**Decomposition temperature**:	Not determined or not available.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

Flammability (solid, gaseous):	Not determined or not available.	**Viscosity**:	a. Kinematic: Not determined or not available. b. Dynamic: Not determined or not available.
Density at 20°C:	Not determined or not available.		

10 Stability and reactivity

10.1 Reactivity : None

10.2 Chemical stability : None

10.3 Possibility hazardous reactions : None

10.4 Conditions to avoid : None

10.5 Incompatible materials : None

10.6 Hazardous decomposition products : None

11 Toxicological information

11.1 Information on toxicological effects :

Acute Toxicity:

Oral:

: LD50 > 5000 mg/kg oral rat - Product .

Chronic Toxicity: No additional information.

Skin corrosion/irritation:

Sodium Alkylbenzene Sulfonate: Causes skin irritation. .

Serious eye damage/irritation:

Sodium Alkylbenzene Sulfonate: Causes serious eye irritation .

Tetrasodium Pyrophosphate: Rabbit - Risk of serious damage to eyes .

Respiratory or skin sensitization: No additional information.

Carcinogenicity: No additional information.

IARC (International Agency for Research on Cancer): None of the ingredients are listed.

NTP (National Toxicology Program): None of the ingredients are listed.

Germ cell mutagenicity: No additional information.

Reproductive toxicity: No additional information.

STOT-single and repeated exposure: No additional information.

Additional toxicological information: No additional information.

12 Ecological information

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

12.1 Toxicity:

Sodium Alkylbenzene Sulfonate: Fish, LC50 1.67 mg/l, 96 hours.
Sodium Alkylbenzene Sulfonate: Aquatic invertebrates, EC50 Daphnia 2.4 mg/l, 48 hours.
Sodium Alkylbenzene Sulfonate: Aquatic Plants, EC50 Algae 29 mg/l, 96 hours.
Tetrasodium Pyrophosphate: Fish, LC50 - other fish - 1,380 mg/l - 96 h.
Tetrasodium Pyrophosphate: Aquatic invertebrates, EC50 - Daphnia magna (Water flea) - 391 mg/l - 48 h.

12.2 Persistence and degradability: No additional information.

12.3 Bioaccumulative potential: No additional information.

12.4 Mobility in soil: No additional information.

General notes: No additional information.

12.5 Results of PBT and vPvB assessment:

PBT: No additional information.

vPvB: No additional information.

12.6 Other adverse effects: No additional information.

13 Disposal considerations

13.1 Waste treatment methods (consult local, regional and national authorities for proper disposal)

Relevant Information:

It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities. (US 40CFR262.11).

14 Transport information

14.1 UN Number: None
ADR, ADN, DOT, IMDG, IATA

14.2 UN Proper shipping name: None
ADR, ADN, DOT, IMDG, IATA

14.3 Transport hazard classes:
ADR, ADN, DOT, IMDG, IATA

Class: None
Label: None
LTD. QTY: None

US DOT
Limited Quantity Exception: None

Bulk:
RQ (if applicable): None
Proper shipping Name: None
Hazard Class: None
Packing Group: None
Marine Pollutant (if applicable): No additional information.

Non Bulk:
RQ (if applicable): None
Proper shipping Name: None
Hazard Class: None
Packing Group: None
Marine Pollutant (if applicable): No additional information.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

Comments: None	**Comments:** None
14.4 Packing group: ADR, ADN, DOT, IMDG, IATA	None
14.5 Environmental hazards :	None
14.6 Special precautions for user:	None
Danger code (Kemler):	None
EMS number:	None
Segregation groups:	None

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

14.8 Transport/Additional information:

Transport category:	None
Tunnel restriction code:	None
UN "Model Regulation":	None

15 Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture.

North American

SARA

Section 313 (specific toxic chemical listings): None of the ingredients are listed.
Section 302 (extremely hazardous substances): None of the ingredients are listed.

CERCLA (Comprehensive Environmental Response, Clean up and Liability Act) Reportable

Spill Quantity: None of the ingredients are listed.

TSCA (Toxic Substances Control Act):

Inventory: All ingredients are listed.
Rules and Orders: Not applicable.

Proposition 65 (California):

Chemicals known to cause cancer: None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females: None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males: None of the ingredients are listed.

Chemicals known to cause developmental toxicity: None of the ingredients are listed.

Canadian

Canadian Domestic Substances List (DSL):
All ingredients are listed.

EU

REACH Article 57 (SVHC): None of the ingredients are listed.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

Germany MAK: Not classified.

Asia Pacific

Australia

Australian Inventory of Chemical Substances (AICS): All ingredients are listed.

China

Inventory of Existing Chemical Substances in China (IECSC): All ingredients are listed.

Japan

Inventory of Existing and New Chemical Substances (ENCS): All ingredients are listed.

Korea

Existing Chemicals List (ECL): All ingredients are listed.

New Zealand

New Zealand Inventory of Chemicals (NZOIC): All ingredients are listed.

Philippines

Philippine Inventory of Chemicals and Chemical Substances (PICCS): All ingredients are listed.

Taiwan

Taiwan Chemical Substance Inventory (TSCI): All ingredients are listed.

16 Other information

Abbreviations and Acronyms: None

Summary of Phrases

Hazard statements:

H315 Causes skin irritation.
H319 Causes serious eye irritation.

Precautionary statements:

P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 If on skin: Wash with soap and water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P321 Specific treatment (see supplemental first aid instructions on this label).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P501 Dispose of contents and container as instructed in Section 13.

Manufacturer Statement:

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

NFPA: 1-0-0

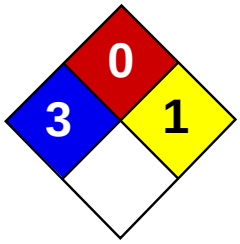
Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

HMIS: 1-0-0



Material Safety Data Sheet
Hydrochloric acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: Hydrochloric acid

Catalog Codes: SLH1462, SLH3154

CAS#: Mixture.

RTECS: MW4025000

TSCA: TSCA 8(b) inventory: Hydrochloric acid

CI#: Not applicable.

Synonym: Hydrochloric Acid; Muriatic Acid

Chemical Name: Not applicable.

Chemical Formula: Not applicable.

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Hydrogen chloride	7647-01-0	20-38
Water	7732-18-5	62-80

Toxicological Data on Ingredients: Hydrogen chloride: GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth. Repeated or prolonged exposure to the substance can produce target

organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: of metals

Explosion Hazards in Presence of Various Substances: Non-explosive in presence of open flames and sparks, of shocks.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
Non combustible. Calcium carbide reacts with hydrogen chloride gas with incandescence. Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine. Rubidium acetylene carbides burns with slightly warm hydrochloric acid. Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas spontaneously flammable in air is evolved. Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammble gas. Cesium acetylene carbide burns hydrogen chloride gas. Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute. Reacts with most metals to produce flammable Hydrodgen gas.

Special Remarks on Explosion Hazards:

Hydrogen chloride in contact with the following can cause an explosion, ignition on contact, or other violent/vigorous reaction: Acetic anhydride AgClO + CCl4 Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium hydroxide, Calcium carbide Ca3P2 Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylene diamine Ethylene imine, Fluorine, HClO4 Hexalithium disilicide H2SO4 Metal acetylides or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U3P4 , Vinyl acetate. Silver perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:
Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, organic materials, metals, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
CEIL: 5 (ppm) from OSHA (PEL) [United States] CEIL: 7 (mg/m3) from OSHA (PEL) [United States] CEIL: 5 from NIOSH CEIL: 7 (mg/m3) from NIOSH TWA: 1 STEL: 5 (ppm) [United Kingdom (UK)] TWA: 2 STEL: 8 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Pungent. Irritating (Strong.)

Taste: Not available.

Molecular Weight: Not applicable.

Color: Colorless to light yellow.

pH (1% soln/water): Acidic.

Boiling Point:
108.58 C @ 760 mm Hg (for 20.22% HCl in water) 83 C @ 760 mm Hg (for 31% HCl in water) 50.5 C (for 37% HCl in water)

Melting Point:
-62.25°C (-80°F) (20.69% HCl in water) -46.2 C (31.24% HCl in water) -25.4 C (39.17% HCl in water)

Critical Temperature: Not available.

Specific Gravity:
1.1- 1.19 (Water = 1) 1.10 (20%and 22% HCl solutions) 1.12 (24% HCl solution) 1.15 (29.57% HCl solution) 1.16 (32% HCl solution) 1.19 (37% and 38%HCl solutions)

Vapor Pressure: 16 kPa (@ 20°C) average

Vapor Density: 1.267 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.25 to 10 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility: Soluble in cold water, hot water, diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, water

Incompatibility with various substances:
Highly reactive with metals. Reactive with oxidizing agents, organic materials, alkalis, water.

Corrosivity:
Extremely corrosive in presence of aluminum, of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Reacts with water especially when water is added to the product. Absorption of gaseous hydrogen chloride on mercuric sulfate becomes violent @ 125 deg. C. Sodium reacts very violently with gaseous hydrogen chloride. Calcium phosphide and hydrochloric acid undergo very energetic reaction. It reacts with oxidizers releasing chlorine gas. Incompatible with, alkali metals, carbides, borides, metal oxides, vinyl acetate, acetylides, sulphides, phosphides, cyanides, carbonates. Reacts with most metals to produce flammable Hydrogen gas. Reacts violently (moderate reaction with heat of evolution) with water especially when water is added to the product. Isolate hydrogen chloride from heat, direct sunlight, alkalies (reacts vigorously), organic materials, and oxidizers (especially nitric acid and chlorates), amines, metals, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure) Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid. Adsorption of Hydrochloric Acid onto silicon dioxide results in exothmeric reaction. Hydrogen chloride causes aldehydes and epoxides to violently polymerize. Hydrogen chloride or Hydrochloric Acid in contact with the folloiwng can cause explosion or ignition on contact or

Special Remarks on Corrosivity:

Highly corrosive. Incompatible with copper and copper alloys. It attacks nearly all metals (mercury, gold, platinium, tantalum, silver, and certain alloys are exceptions). It is one of the most corrosive of the nonoxidizing acids in contact with copper alloys. No corrosivity data on zinc, steel. Severe Corrosive effect on brass and bronze

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
Acute oral toxicity (LD50): 900 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1108 ppm, 1 hours [Mouse]. Acute toxicity of the vapor (LC50): 3124 ppm, 1 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. May cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth.

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of ingestion, . Hazardous in case of eye contact (corrosive), of inhalation (lung corrosive).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Doses (LDL/LCL) LDL [Man] -Route: Oral; 2857 ug/kg LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects (fetoxicity). May affect genetic material.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Corrosive. Causes severe skin irritation and burns. Eyes: Corrosive. Causes severe eye irritation/conjuntivitis, burns, corneal necrosis. Inhalation: May be fatal if inhaled. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation of hydrochloric acid fumes produces nose, throat, and larryngeal burning, and irritation, pain and inflammation, coughing, sneezing, choking sensation, hoarseness, laryngeal spasms, upper respiratory tract edema, chest pains, as well has headache, and palpitations. Inhalation of high concentrations can result in corrosive burns, necrosis of bronchial epithelium, constriction of the larynx and bronchi, nasospetal perforation, glottal closure, occur, particularly if exposure is prolonged. May affect the liver. Ingestion: May be fatal if swallowed. Causes irritation and burning, ulceration, or perforation of the gastrointestinal tract and resultant peritonitis, gastric hemorrhage and infection. Can also cause nausea, vomitting (with "coffee ground" emesis), diarrhea, thirst, difficulty swallowing, salivation, chills, fever, uneasiness, shock, strictures and stenosis (esophogeal, gastric, pyloric). May affect behavior (excitement), the cardiovascular system (weak rapid pulse, tachycardia), respiration (shallow respiration), and urinary system (kidneys- renal failure, nephritis). Acute exposure via inhalation or ingestion can also cause erosion of tooth enamel. Chronic Potential Health Effects: dyspnea, bronchitis. Chemical pneumonitis and pulmonary edema can also

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Hydrochloric acid, solution UNNA: 1789 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Hydrochloric acid Illinois toxic substances disclosure to employee act: Hydrochloric acid Illinois chemical safety act: Hydrochloric acid New York release reporting list: Hydrochloric acid Rhode Island RTK hazardous substances: Hydrochloric acid Pennsylvania RTK: Hydrochloric acid Minnesota: Hydrochloric acid Massachusetts RTK: Hydrochloric acid Massachusetts spill list: Hydrochloric acid New Jersey: Hydrochloric acid New Jersey spill list: Hydrochloric acid Louisiana RTK reporting list: Hydrochloric acid Louisiana spill reporting: Hydrochloric acid California Director's List of Hazardous Substances: Hydrochloric acid TSCA 8(b) inventory: Hydrochloric acid TSCA 4(a) proposed test rules: Hydrochloric acid SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid SARA 313 toxic chemical notification and release reporting: Hydrochloric acid CERCLA: Hazardous substances.: Hydrochloric acid: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):
R34- Causes burns. R37- Irritating to respiratory system. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 1

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

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SAFETY DATA SHEET

Isobutylene

Section 1. Identification

GHS product identifier : Isobutylene

Chemical name : 2-methylpropene

Other means of identification : 1-Propene, 2-methyl-; Isobutene; Isobutylene; 1-Propene, 2-methyl- (isobutene); 1, 1-Dimethylethylene; Isopropylidenemethylene; iso-Butene; i-Butene; 2-Methylpropylene; 2-Methyl-2-propene; 2-Methyl-1-propene

Product type : Gas.

Product use : Synthetic/Analytical chemistry.

Synonym : 1-Propene, 2-methyl-; Isobutene; Isobutylene; 1-Propene, 2-methyl- (isobutene); 1, 1-Dimethylethylene; Isopropylidenemethylene; iso-Butene; i-Butene; 2-Methylpropylene; 2-Methyl-2-propene; 2-Methyl-1-propene

SDS # : 001031

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

24-hour telephone : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : FLAMMABLE GASES - Category 1
GASES UNDER PRESSURE - Liquefied gas

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Extremely flammable gas.
May form explosive mixtures with air.
Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.

Precautionary statements

General : Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position. Approach suspected leak area with caution.

Prevention : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Response : Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

Storage : Protect from sunlight. Store in a well-ventilated place.

Disposal : Not applicable.

Hazards not otherwise classified : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : 2-methylpropene

Other means of identification : 1-Propene, 2-methyl-; Isobutene; Isobutylene; 1-Propene, 2-methyl- (isobutene); 1, 1-Dimethylethylene; Isopropylidenemethylene; iso-Butene; i-Butene; 2-Methylpropylene; 2-Methyl-2-propene; 2-Methyl-1-propene

Product code : 001031

CAS number/other identifiers

CAS number : 115-11-7

Ingredient name	%	CAS number
Isobutylene	100	115-11-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Section 4. First aid measures

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid breathing gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Use only non-sparking tools. Avoid contact with eyes, skin and clothing. Empty containers retain product residue and can be hazardous. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F). Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Isobutylene	**ACGIH TLV (United States, 3/2017).** TWA: 250 ppm 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Section 8. Exposure controls/personal protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Gas. [Compressed gas.]

Color : Colorless.

Odor : Characteristic.

Odor threshold : Not available.

pH : Not available.

Melting point : -140.7°C (-221.3°F)

Boiling point : -6.9°C (19.6°F)

Critical temperature : 144.75°C (292.6°F)

Flash point : Closed cup: -76.1°C (-105°F)

Evaporation rate : Not available.

Flammability (solid, gas) : Extremely flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and oxidizing materials.

Lower and upper explosive (flammable) limits : Lower: 1.8%
Upper: 9.6%

Vapor pressure : 24.3 (psig)

Vapor density : 1.94 (Air = 1)

Specific Volume (ft ^{3}/lb) : 6.6845

Gas Density (lb/ft ^{3}) : 0.1496 (25°C / 77 to °F)

Relative density : Not applicable.

Solubility : Not available.

Solubility in water : 0.26 g/l

Partition coefficient: n-octanol/water : 2.34

Auto-ignition temperature : 465°C (869°F)

Decomposition temperature : Not available.

Viscosity : Not applicable.

Flow time (ISO 2431) : Not available.

Molecular weight : 56.12 g/mole

Aerosol product

Heat of combustion : -45029034 J/kg

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Incompatible materials : Oxidizers

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Isobutylene	LC50 Inhalation Vapor	Rat	550000 mg/m³	4 hours

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Section 11. Toxicological information

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Isobutylene	2.34	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Section 12. Ecological information

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1055	UN1055	UN1055	UN1055	UN1055
UN proper shipping name	ISOBUTYLENE	ISOBUTYLENE	ISOBUTYLENE	ISOBUTYLENE	ISOBUTYLENE
Transport hazard class(es)	2.1	2.1	2.1	2.1	2.1
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Additional information

DOT Classification : **Limited quantity** Yes.
Quantity limitation Passenger aircraft/rail: Forbidden. Cargo aircraft: 150 kg.
Special provisions 19, T50

TDG Classification : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2).
Explosive Limit and Limited Quantity Index 0.125
ERAP Index 3000
Passenger Carrying Ship Index Forbidden
Passenger Carrying Road or Rail Index Forbidden
Special provisions 29

IATA : **Quantity limitation** Passenger and Cargo Aircraft: Forbidden. Cargo Aircraft Only: 150 kg.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined

Clean Air Act (CAA) 112 regulated flammable substances: Isobutylene

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Refer to Section 2: Hazards Identification of this SDS for classification of substance.

State regulations

Massachusetts : This material is listed.

New York : This material is not listed.

New Jersey : This material is listed.

Pennsylvania : This material is listed.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : This material is listed or exempted.

Canada : This material is listed or exempted.

China : This material is listed or exempted.

Europe : This material is listed or exempted.

Japan : **Japan inventory (ENCS)**: This material is listed or exempted.
Japan inventory (ISHL): Not determined.

Malaysia : Not determined.

New Zealand : This material is listed or exempted.

Philippines : This material is listed or exempted.

Republic of Korea : This material is listed or exempted.

Section 15. Regulatory information

Taiwan : This material is listed or exempted.

Thailand : Not determined.

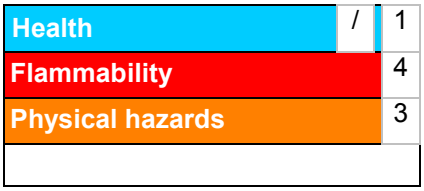
Turkey : Not determined.

United States : This material is listed or exempted.

Viet Nam : Not determined.

Section 16. Other information

Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

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National Fire Protection Association (U.S.A.)

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Procedure used to derive the classification

Classification	Justification
FLAMMABLE GASES - Category 1 GASES UNDER PRESSURE - Liquefied gas	Expert judgment Expert judgment

History

Date of printing : 5/10/2018

Date of issue/Date of revision : 5/10/2018

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Version : 0.02

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973

Section 16. Other information

as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

APPENDIX C

COVID-19 Interim Health and Safety Guidance

COVID-19 INTERIM HEALTH AND SAFETY GUIDANCE

CORPORATE HEALTH AND SAFETY MANAGER	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**03/2020**
REVISION DATE	:	**09/21/2022**
REVISION NUMBER	:	**9**

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1. PURPOSE

This guidance has been implemented to establish work practices, administrative procedures, and engineering controls to minimize potential exposure to SARS-CoV-2, the virus that causes COVID-19. The following guidance has been developed based on local, state and federal recommendations/requirements regarding COVID-19. The purpose of this document is to supplement existing site-specific Health and Safety Plans (HASPs) and provide interim health and safety guidance to minimize potential exposure to SARS-CoV-2. Should additional scientific information or regulatory information change, this document shall be updated accordingly.

2. SCOPE AND APPLICABILITY

This guidance covers all Roux employees and the subcontractors that Roux oversees. Site specific HASPs shall be developed to incorporate elements of mitigative measures against COVID-19 exposure. If work cannot be carried out in compliance with this guidance, the project shall be further evaluated by the Project Principal (PP), Office Manager (OM), and Corporate Health and Safety Director (CHSD) prior to work authorization.

Roux subcontractors are required to review, comply with, and implement Roux's COVID-19 Interim Health and Safety Guidance while on Site. Subcontractors may implement additional preventative measures as they see fit. All work shall be conducted in a manner consistent with the federal, state, and local guidance as it relates to COVID-19.

3. BACKGROUND

What is COVID-19?

COVID-19 is a respiratory disease caused by SARS-CoV-2, a coronavirus discovered in 2019. The virus spreads mainly from person to person through respiratory droplets produced when an infected person coughs, sneezes, or talks. Some people who are infected may not have symptoms. Multiple variants of the virus that causes COVID-19 are circulating globally. There are currently several vaccines which have been developed which are authorized, recommended and effective at protecting you from getting sick.

What are the symptoms of COVID-19?

Reported illnesses have ranged from mild symptoms to severe illness and death for confirmed COVID-19 cases. Symptoms may appear 2 to 14 days following exposure to the virus. People with these symptoms or combinations of symptoms may have COVID-19:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea

This list is not all possible symptoms. The CDC will continue to update this list as they learn more about the virus. For an updated symptom list please reference the following link for CDC Symptoms of Coronavirus.

If someone develops emergency warning signs for COVID-19, they should be instructed to get medical attention immediately. Emergency warning signs can include those listed below; however, this list is not all inclusive. Please consult your medical provider for any other symptoms that are severe or concerning.

- Trouble breathing
- Persistent pain or pressure in the chest
- New confusion
- Inability to wake or stay awake
- Pale, gray, or blue-colored skin, lips, or nail beds, depending on skin tone

How does COVID-19 spread?[1]

Individuals who are within close contact (within 6 feet) of a person with COVID-19 or have direct contact with that person are at greatest risk of infection.

COVID-19 spreads in three main ways:

- Breathing in air when close to an infected person who is exhaling small droplets and particles that contain the virus.
- Having these small droplets and particles that contain virus land on the eyes, nose, or mouth, especially through splashes and sprays like a cough or sneeze.
- Touching eyes, nose, or mouth with hands that have the virus on them.

Transmission of SARS-CoV-2 from inhalation of virus in air farther than six feet from an infectious source can occur.

Some infections can be spread by exposure to virus in small droplets and particles that can linger in the air for minutes to hours. These viruses may be able to infect people who are further than 6 feet away from the person who is infected or after that person has left the space. This kind of spread is referred to as **airborne transmission** and is an important way that infections like tuberculosis, measles, and chicken pox are spread. Per published reports, factors that increase the risk of SARS-CoV-2 infection under these circumstances include:

- Enclosed spaces with inadequate ventilation or air handling within which the concentration of exhaled respiratory fluids, especially very fine droplets and aerosol particles, can build-up in the air space.
- Increased exhalation of respiratory fluids if the infectious person is engaged in physical exertion or raises their voice (e.g., exercising, shouting, singing).
- Prolonged exposure to these conditions, typically more than 15 minutes.

Spread from contact with contaminated surfaces or objects is less common.

Respiratory droplets can also land on surfaces and objects. It is possible that a person could get COVID-19 by touching a surface or object that has the virus on it and then touching their own mouth, nose, or eyes. Spread from touching surfaces is not thought to be a common way that COVID-19 spreads.

4. TRAINING REQUIREMENTS

All employees with potential exposure to COVID-19 shall be provided training that incorporates COVID-19 exposure mitigation strategies, such as implementation of proper social distancing, personal hygiene (e.g., handwashing), as well as disinfection procedures, as outlined by CDC guidelines.

5. EXPOSURE RISK POTENTIAL

Worker risk of occupational exposure to COVID-19 can vary from very high, high, medium, or lower (caution) risk. This level of exposure is dependent on several factors, which can include industry type; need for contact within 6 feet of people known to be or suspected of being infected with COVID-19; density of work environment; and industrial setting (i.e., healthcare building, occupied interior work area, minimal ventilation).

Provided below is background risk level information taken from the U.S. Department of Labor Occupational Safety and Health Administration Guidance on preparing workplaces for COVID-19. Risk evaluations for each project shall be conducted by the PP and OM in consultation with the CHSD to ensure Roux employees and subcontractors remain within the lower exposure (caution) category. If it is identified there is a medium exposure risk or higher, further evaluation and mitigative measures shall be evaluated to reduce overall exposure risk prior to work authorization.

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1 How COVID-19 Spreads https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html#edn1

Very High Exposure Risk (Activities not conducted by Roux)

Very high exposure risk includes occupations/work activities with high potential for exposure to known or suspected sources of COVID-19 during specific medical, postmortem, or laboratory procedures. This can include but is not limited to:

- Healthcare workers (e.g., doctors, nurses, dentists, paramedics, emergency medical technicians) performing aerosol-generating procedures (e.g., intubation, cough induction procedures, bronchoscopies, some dental procedures and exams, or invasive specimen collection) on known or suspected COVID-19 patients.
- Healthcare or laboratory personnel collecting or handling specimens from known or suspected COVID-19 patients (e.g., manipulating cultures from known or suspected COVID-19 patients).
- Morgue workers performing autopsies, which generally involve aerosol-generating procedures on the bodies of people who are known to have, or suspected of having, COVID-19 at the time of their death.

High Exposure Risk (Activities not conducted by Roux)

High exposure risk occupations/work activities include exposure to known or suspected COVID-19 positive individuals. This can include but not limited to:

- Healthcare delivery and support staff (hospital staff who must enter patients' rooms) exposed to known or suspected COVID-19 patients.
- Medical transport workers (ambulance vehicle operators) moving known or suspected COVID-19 patients in enclosed vehicles.
- Mortuary workers involved in preparing bodies for burial or cremation of people known to have, or suspected of having, COVID-19 at the time of death.
- Those who have frequent or sustained contact with coworkers, including under close working conditions indoors or in poorly ventilated spaces in various types of industrial, manufacturing, agriculture, construction, and other critical infrastructure workplaces.
- Those who have frequent indoor or poorly ventilated contact with the general public, including workers in retail stores, grocery stores or supermarkets, pharmacies, transit and transportation operations, law enforcement and emergency response operations, restaurants, and bars.

Medium Exposure Risk

Medium exposure risk occupations/work activities include those that require frequent and/or close contact with (i.e., within 6 feet for a cumulative total of 15 minutes or more over a 24-hour period)) people who may be infected with COVID-19, but who are not known or suspected to be COVID-19 positive. For most of our worksites, it is assumed there is on-going community transmission for COVID-19. Therefore, workers who work at sites and may have contact with the general public, other contractors, high-population-density work environments (i.e., greater than 10 people) fall within medium exposure risk group category. This can include, but is not limited to, sampling events that require two or more workers to collect and log samples in close contact or work occurring in an interior space with limited ventilation and several workers present.

Lower Exposure Risk (Caution)

Lower exposure risk (caution) occupations/work activities are those that do not require close contact (within 6 feet for a cumulative total of 15 minutes or more over a 24-hour period) with other people. During these activities, there is limited contact (i.e., within 6 feet of) the general public or other workers. Workers in this category have minimal occupational contact with the public and other coworkers. This includes construction oversight that does not require close contact, sampling or gauging events performed by one worker and our remote workers as well as office workers who do not have frequent close contact with coworkers, clients, or the public.

6. CDC FULLY VACCINATED GUIDANCE

You are up to date with your COVID-19 vaccines if you have completed a COVID-19 vaccine primary series and received the most recent booster dose recommended for you by CDC. Additional information concerning vaccinations can be found at the following link.

7. COVID-19 HEALTH SCREENING

7.1 Roux Employees

Depending on local/state/client requirements, Roux employees may self-attest to a COVID-19 Daily Health Questionnaire that is to be completed at home through a mobile application on scheduled workdays. The purpose of this program is to ensure business continuity as well as mitigate any potential exposure to our employees and others if it is determined employees are at-risk for contracting COVID-19. As part of this self-attestation, all employees are required to take their temperatures daily at home to confirm they do not have a fever (≥ 100.4). Employees who answer yes to any of these questions are instructed to contact their Office Manager and/or Department Head immediately and should not enter the office or go to a field site. Information shall be used to determine appropriate internal response in consultation with the Human Resources Director (HRD) and CHSD.

Below, you will find our COVID-19 Daily Health Questionnaire that all Roux employees are required to self-attest to **every scheduled workday by 9:30 AM.** If employees do not promptly fill out the questionnaire by the time listed above, there will be additional follow up by HR, H&S, and/or OMs.

According to the U.S. Centers for Disease Control and Prevention & the World Health Organization, COVID-19 Symptoms include:

- *Fever (≥100. 4°F) or chills*
- *Cough*
- *Shortness of breath or difficulty breathing*
- *Fatigue*
- *Muscle or body aches*
- *Headache*
- *New loss of taste or smell*
- *Sore throat*
- *Congestion or runny nose*
- *Nausea or vomiting*
- *Diarrhea*

Have you experienced any of the COVID-19 related symptoms noted above in the last 14 days? Please Note: We do not expect employees to answer "yes" to the symptoms question if these are symptoms you normally experience due to another condition or medication.

- *Yes*
- *No*

Have you been in close contact with someone who is suspected or confirmed to have COVID-19 or who is under investigation for COVID-19 within the last 14 days? * Close contact as defined by the CDC is being within 6 feet of someone who has COVID-19 for a cumulative total of 15 minutes or more over a 24-hour period.*

- *Yes*
- *No*

Have you traveled outside of the country, been on a cruise ship and/or traveled to areas within the United States which have state mandated travel restrictions in the last 14 days?

- *Yes*
- *No*

Have you tested positive for COVID-19 within the last 14 days?

- *Yes*
- *No*

7.2 Subcontractors

Depending on local/state/client requirements, Subcontractors who shall perform work onsite may be required to attest to the fitness of their work crew on a daily basis. This requires each worker to self-assess by asking themselves the four questions listed in the section above and also contained within the Roux Subcontractor Work Crew COVID-19 Daily Health Attestation. If any crew member answers "Yes" to any of the questions, that worker is not to report to the field site and should seek proper medical advice in accordance with local, state and federal guidelines. In addition if required by local/state/client requirements, the Sub-Contractor shall self-attest to vaccination status in order for the Field Team to ensure conformance with updated guidance for fully vaccinated individuals should state/local/client requirements allow. See Section 6. CDC Fully Vaccinated Guidance.

On a daily basis, the subcontractor supervisor must provide the Subcontractor Work Crew COVID-19 Daily Health Attestation complete with the names of all work crew fit to be on the Site for that day (i.e., who have answered "No" to all questions on the self-assessment) to Roux's Project Manager or Site Supervisor. The Subcontractor must notify Roux if there have been any "Yes" responses daily. Subcontractors shall not be required to provide the name or any other personal information of any employee who has answered "Yes" to any of the self-assessment questions, however, the Subcontractor should provide the date and times that the employee has been onsite in the prior 14 days. Records shall be maintained within the project files indicating health screening has been performed, records shall be retained for not less than 14 days following the date of submission. The Roux Subcontractor Work Crew COVID-19 Daily Health Check Attestation can be found within Appendix A.

8. SELF-ISOLATION & QUARANTINE

8.1 Self-Isolation

What if I am asked to self-isolate at home and when can I return from home isolation?

Depending on the situation, if you are COVID-19 positive or suspected to have COVID-19, employees may be required to self-isolate in their homes, as per CDC or local health department guidelines. Roux shall follow CDC guidance in areas where local/state requirements allow. The following table below outlines CDC isolation guidance.

Day 0 is your first day of symptoms or a positive viral test. Day 1 is the first full day after your symptoms developed or your test specimen was collected. If you have COVID-19 or have symptoms, isolate for at least 5 days.

IF YOU Tested positive for COVID-19 or have symptoms, regardless of vaccination status:	**Stay home for at least 5 days** Stay home for 5 days and isolate from others in your home. Wear a well-fitted mask if you must be around others in your home.	**Ending isolation if you had symptoms** End isolation after 5 full days if you are fever-free for 24 hours (without the use of fever-reducing medication) and your symptoms are improving. **Ending isolation if you did NOT have symptoms** End isolation after at least 5 full days after your positive test. **If you were severely ill with COVID-19** You should isolate for at least 10 days. Consult your doctor before ending isolation.	**Take precautions until Day 10** **Wear a mask** Wear a well-fitted mask for 10 full days any time you are around others inside your home or in public. Do not go to places where you are unable to wear a mask. **Avoid travel** **Avoid being around people who are at high risk**

8.2 Quarantine

Employees may be required to self-quarantine due to potential exposure with a suspected and/or confirmed COVID-19 positive individual as well as recent travel as per local/state guidelines. Consult with your OM regarding whether your situation requires quarantine following close contact. People in quarantine should stay home, separate themselves from others, monitor their health, and follow directions from their state or local health department.

8.2.1 Travel Related Quarantine/Testing

All travel out of state must be communicated with the OM and/or Department Head prior to departure. Please note, some federal/state/local entities require submissions of traveler health forms and potentially require additional testing for COVID-19. It is expected all Roux employees will comply with such federal/state/local travel requirements.

9. WORKPLACE CONTROLS

During the project planning phase, worksite evaluations shall be carried out by the PP and OM in consultation with the CHSD to determine risk exposure levels for work activities. If it is determined there is a high exposure risk level or higher, additional workplace controls shall be evaluated and implemented as required in addition to the basic infection prevention measures outlined below in Section 10. Additional workplace controls can include engineering controls (i.e., ventilation, physical barriers), administrative controls (i.e., minimizing contact between workers, rotating shifts, site specific training), and additional personal protective equipment (i.e., respiratory protection). If exposure risk cannot be mitigated, potential project postponement may be necessary at the discretion of the OM in consultation with the CHSD.

A Job Safety Analysis (JSA) has been developed and is provided in Appendix B, which summarizes and applies concepts within this guidance, including the infection prevention measures listed below. This JSA shall be required for all fieldwork in areas where there is community-based transmission of COVID-19.

10. INFECTION PREVENTION MEASURES

The following is basic infection prevention and personal hygiene practices which shall be implemented for all Roux field activities as well as in the office setting.

- ***Personal Hygiene***
  - Wash your hands often with soap and water for at least 20 seconds.
    - If soap and water are not available, use an alcohol-based sanitizer that contains at least 60% alcohol.
    - Key times to wash your hands include after blowing your nose, coughing or sneezing, after using the restroom, and before eating or preparing food.
  - Do not touch your eyes, face, nose and mouth with unwashed hands.
  - Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow.
  - Throw potentially contaminated items (e.g., used tissues) in the trash.
- ***Avoid Close Contact/Secondary Contact with People and Potentially Contaminated Surfaces***
  - Apply appropriate social distance (6+ feet), as appropriate.
  - Do not work in areas with limited ventilation with other Site workers (e.g., small work trailer which lacks HVAC system).
  - Morning tailgate/safety meetings are recommended to occur outside or in well ventilated work trailers.
  - Contact your lab/equipment vendor to confirm equipment is properly disinfected prior to being shipped.
  - Do not carpool with others unless all individuals are comfortable with traveling together.
  - For company owned vehicles limit sharing of vehicles with coworkers. If unable to limit sharing of company owned vehicles, properly clean vehicle before driving with a focus on commonly touched surfaces (e.g., steering wheels, shifters, buttons, etc.).
  - Use caution when using public restrooms, portable toilets. Use paper towel as a barrier when touching door handles and faucets.
- ***Cleaning and Disinfecting***
  - Clean high touched surfaces daily. Examples of high-touch surfaces include: counters, tables, doorknobs, handles, stair rails, desks, toilets, faucets, and sinks. In most situations, regular cleaning (at least once a day) is enough to sufficiently remove virus that may be on surfaces. However, if certain conditions apply, you may choose to disinfect after cleaning. When there is no confirmed or suspected COVID-19 cases known to have been in a space, cleaning once a day is usually enough to sufficiently remove virus that may be on surfaces and help maintain a healthy facility.
  - You may want to either clean more frequently or choose to disinfect in addition to cleaning in shared spaces if the space:
    - Is a high traffic area, with a large number of people,
    - Is poorly ventilated,
    - Does not provide access to handwashing or hand sanitizer, or
    - The space is occupied by individuals at increased risk for severe illness.

If a someone who tested or is presumed COVID-19 positive and has been in your facility within the last 24 hours, you should clean and disinfect the space. This will be done in consultation with the CHSD.

The following outlines cleaning and disinfection protocols for specific types of surfaces as required. Please consult with the CHSD when developing site-specific cleaning and disinfection protocols.

- ***Hard (Non-porous) Surfaces***
  - If surfaces are dirty, they should be cleaned with a detergent/soap and water prior to disinfection.
  - Refer to the manufacturer's instructions to ensure safe and effective use of the product and wear appropriate personal protective equipment (e.g., gloves, safety glasses, face shield).
  - Many products require:
    - Keeping surface wet for a period of time (i.e., contact time).
      - Refer to manufacturer's instructions outlining adequate contact time.
    - Precautions such as wearing gloves and making sure you have good ventilation during use of the product.
  - Disposable gloves should be removed aseptically and discarded after cleaning. Wash hands immediately following removal of gloves. Refer to Appendix C for how to remove gloves aseptically.
  - If products on EPA List N: Disinfectants for Coronavirus (COVID-19) are not available, bleach solutions can be used if appropriate for the surface and will be effective against coronaviruses when properly diluted.
    - Most household bleach contains 5%–9% sodium hypochlorite. Do not use a bleach product if the percentage is not in this range or is not specified, such as some types of laundry bleach or splash-less bleach as these are not appropriate for disinfection.
    - Follow the directions on the bleach bottle for preparing a diluted bleach solution. If your bottle does not have directions, you can make a bleach solution for disinfecting by mixing:
      - 5 tablespoons (1/3 cup) of bleach per gallon of room temperature water; OR
      - 4 teaspoons of bleach per quart of room temperature water.
    - Follow the manufacturer's application instructions for the surface. If instructions are not available, leave the diluted bleach solution on the surface for at least 1 minute before removing or wiping. This is known as the "contact time" for disinfection. The surface should remain visibly wet during the contact time.
    - Ensure proper ventilation during and after application (for example, open windows).
    - Never mix household bleach (or any disinfectants) with any other cleaners or disinfectants. This can cause vapors that may be very dangerous to breathe in.
    - Make a new diluted bleach solution daily. Bleach solutions will not be as effective after being mixed with water for over 24 hours. Products with EPA-approved emerging viral pathogen claims are expected to be effective against COVID-19. Follow the manufacturer's instructions for all cleaning and disinfecting products (e.g., concentration, application method and contact time, etc.).
- ***Soft (Porous) Surfaces***
  - For soft (porous) surfaces, remove visible contamination if present and clean with appropriate cleaners indicated for use on the surfaces. After cleaning:
    - Launder items as appropriate in accordance with the manufacturer's instructions. If possible, launder using the warmest appropriate water setting for the item and dry items completely; or
    - Use products with the EPA-approved emerging viral pathogens that claim they are suitable for porous surfaces.

- ***Electronics***
  - For electronics such as tablets, touch screens, keyboards, remote controls, etc. remove visible contamination if present.
    - Follow the manufacturer's instructions for all cleaning and disinfection products.
    - Consider use of wipeable covers for electronics.
    - If no manufacturer guidance is available, consider the use of alcohol-based wipes or sprays containing at least 70% alcohol to disinfect touch screens. Dry surfaces thoroughly to avoid pooling of liquids.
- ***Linens, Clothing, and Other Items that Go in the Laundry***
  - Although it is unlikely field clothing would become potentially contaminated with COVID-19, it is recommended that field staff regularly launder field clothing following any field event upon returning home.
  - In order to minimize the possibility of dispersing the virus from potentially contaminated clothing, do not shake dirty laundry.
  - Wash items as appropriate in accordance with the manufacturer's instructions. If possible, launder items using the warmest appropriate water setting for the items and dry items completely.
  - Clean and disinfect hampers or other containers used for transporting laundry according to guidance listed above.
- ***Office/Site Specific-Cleaning and Disinfection Protocols***
  - Each office and long-term field site shall develop internal cleaning and disinfecting practices, which can be broken into three categories: routine cleaning; enhanced cleaning and disinfecting; and deep cleaning and disinfecting.
  - In the instance there is someone who is suspected or confirmed positive for COVID-19 and has worked at the office or field site within the last 24 hours, deep cleaning and disinfecting shall be considered. The CHSD shall work with the OM and Office Health and Safety Manager (OHSM) to evaluate site-specific measures that shall be carried out prior to deep cleaning and disinfecting. If more than 24 hours have passed since the person who is sick or diagnosed with COVID-19 has been in the space, cleaning shall be carried out. You may choose to also disinfect depending on certain conditions and in consultation with the CHSD.
  - If deep cleaning and disinfection is carried out the following will be considered:
    - Closing off all areas potentially affected and wait at least several hours before you clean and disinfect.
    - Areas should remain closed off until cleaning and disinfecting takes place; if able, ventilation shall be increased in the space (e.g., opening doors, windows, increasing CFM).

11. FACE COVERINGS

The CDC recommends the use of face coverings/masks in public settings where other social distancing measures are difficult to maintain. Masks are required on planes, buses, trains and other forms of public transportation traveling into, within, or out of the United States and in U.S. indoor transportation hubs such as airports and stations. The use of face coverings is to supplement and NOT replace the existing practices outlined above.

Based on existing studies and on-going recommendations and/or requirements from federal, state, and local entities, Roux is recommending the use of face coverings, when appropriate. Appropriate use is defined when local authorities or clients require the use of face coverings in conjunction with established social distancing, or if an employee elects to use a cloth covering on their own accord. Roux will provide appropriate face coverings that shall meet the basic requirements outlined by the CDC guidance.

Face Coverings (i.e., masks) should:

- Have two or more layers;
- Completely cover the nose and mouth;
- Fit snugly against the sides of the face and not have any gaps; and
- Have a nose wire to prevent air from leaking out of the top of the mask.

When donning and doffing the face covering, individuals should avoid touching their eyes, nose, and mouth. Following removal of the face covering, employees should wash their hands immediately using the guidelines described in Section 10 Infection Prevention Measures-Personal Hygiene above. Face coverings should be routinely washed depending on the frequency of use.

APPENDIX A

Roux Subcontractor Work Crew
COVID-19 Daily Health Screening Questionnaire

Subcontractor Work Crew
COVID-19 Daily Health Attestation

Date:
Company Name:
Supervisor Name: Signature:
Project Name:
Site Address:
Number of Workers on site:

Prior to entry onto a field site, the following questions shall be asked by the Subcontractor Supervisor to their work crew. **Subcontractors and Field Teams shall self-attest to vaccination status in order to ensure compliance with state/local guidance for fully vaccinated and unvaccinated individuals.**

It is preferred this questionnaire is completed for each individual prior to their arrival at the field site. If the answer to any of these questions is YES, the worker is not to report to the field site and seek proper medical advice, in accordance with CDC Guidelines. **The Subcontractor Supervisor must provide this form on a daily basis to the Roux primary contact for the project and notify Roux of any YES responses.**

1. Have you experienced any signs/symptoms of COVID-19 such as fever (≥100.4°F), cough, shortness of breath, chills, fatigue, muscle/body aches, headache, new loss of taste or smell, sore throat, congestion or runny nose, nausea/vomiting or diarrhea in the last 5 days?

2. Have you been in close contact* with someone who is suspected or confirmed to have COVID-19 or who is under investigation for COVID-19 within the last 5 days?

*Close contact as defined by the CDC is being within 6 feet of someone who has COVID-19 for a cumulative total of 15 minutes or more over a 24-hour period. Those who are up to date on COVID-19 vaccinations or had confirmed COVID-19 within the past 90 days (you tested positive using a viral test) you do not need to quarantine.

3. Have you traveled outside of the country, been on a cruise ship and/or traveled to areas within the United States which have state mandated travel restrictions in the last 5 days?

4. Have you tested positive for COVID-19 within the last 5 days?

Please list the crew member's names on site for the day.

1.	8.
2.	9.
3.	10.
4.	11.
5.	12.
6.	13.
7.	14.

APPENDIX B

Job Safety Analysis-Working in Areas Affected by COVID-19

JOB SAFETY ANALYSIS	Ctrl. No. CVD-19	DATE: 01/10/2022	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
Generic	**Fieldwork**	**Working in Areas Affected by Coronavirus**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Kristina DeLuca	Health and Safety Specialist	Brian Hobbs	CHSD

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES – Leather/cut-resistant in field and nitrile as needed
☒ HARD HAT – In field	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	
☐ LIFELINE / BODY HARNESS	☐ HEARING PROTECTION	☒ PPE CLOTHING – High visibility vest in field	☐ OTHER
☒ SAFETY GLASSES – In field	☒ SAFETY SHOES – Steel/composite toe in fie		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Face covering/mask, nitrile gloves, hand soap, water source, hand sanitizer, disinfectant spray and disinfectant wipes.

Commitment to Safety – All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

SOCIAL DISTANCING: Maintain 6' of distance between yourself and all other people at all times. If you do not believe the scope of work can be conducted while maintaining this distance, contact your Project Manager immediately.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Project Preplanning	N/A	• Review and follow COVID-19 CDC, Roux, Client and local orders/protocols. • Ensure all workers are fit for duty - anyone feeling sick should remain at home even if symptoms do not align with COVID-19. If a worker has been in contact with someone potentially positive or positive for COVID-19, contact your Office Manager. • Determine PPE needs and ensure adequate supply of disinfectant wipes/spray, soap and water or hand sanitizer at Site. Due to high demands and limited supply, plan ahead. • Use the minimum number of employees necessary to safely complete the work.
2. Mobilization	**Exposure:** Becoming infected or infecting co-workers	**Personal/Rental/Roux Owned Vehicle** • Avoid carpooling, unless all individuals are up to date on vaccinations. • Verify workers/other people are not approaching vehicle prior to exiting the vehicle. Maintain 6' of distance from general public, as appropriate. **Public Transportation** • Public transit should not be used unless absolutely necessary. Consider renting a car rather than taking public transit. If public transit is required, wear appropriate face covering/mask and apply social distancing (6 ft). Wash hands or use hand sanitizer immediately after. **Hotel Stay (Refer to COVID-19 H&S Guidance for more info)** • If a hotel stay is deemed necessary for the given field work, ensure that you clean your room upon initial arrival. • Place the "Do Not Disturb" placard on the room while away and limit housekeeping services to the extent feasible during your stay to minimize the reintroduction and spread of the virus from others.. Wash hands or use hand sanitizer often.
3. Tailgate Meeting	**Exposure:** Becoming infected or infecting co-workers	• Perform outside or indoors in areas with ample ventilation. • If unvaccinated, maintain at least a 6+ ft distance between you and others. • Discuss primary infection prevention measures listed below. • Discuss COVID-19 symptoms with coworkers and subcontractors to ensure fitness for duty. Anyone exhibiting signs or symptoms should be instructed to leave the Site, contact your Project Manager.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards, energy source; Energy Source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

4. Site Activities	**Exposure:** Becoming infected or infecting co-workers	• Coordinate field activities at the beginning of the day (i.e. Tailgate meeting) to minimize time spent in crowded spaces or overlap while completing job tasks. • Don face coverings as appropriate. • Apply social distancing (6+ ft) when interacting with others if unvaccinated. If anyone comes within 6 ft of you while conducting work and your work prevents you from moving away, politely ask them to move back. If others are unable to move from your space, stop work and leave area. • Minimize shaking hands or touching others. • Minimize sharing of equipment or other items with co-workers and subcontractors unless wearing appropriate PPE (e.g. nitrile gloves), as appropriate. • If anyone is experiencing COVID-19 signs or symptoms in your vicinity, stop work and leave the area. • Do not work in areas with limited ventilation with others. • Cover your mouth and nose with tissue or paper towel or with your elbow when coughing or sneezing and wash hands or use hand sanitizer immediately after. If sick contact SHSO/PM and leave Site immediately. • Clean work surfaces/areas with approved cleaners you're responsible for (ex: desk, office doorknob, computer, etc.) at least daily. • Avoid public spaces and going out to eat by bringing your own lunch to the Site. If performing work in high density urban areas, it is recommended all food must be consumed at or in your vehicle or within designated work trailer. Wash hands or use hand sanitizer before eating and immediately after.

Primary Infection Prevention Measures

- Wash your hands often with soap and water for at least 20 seconds.
  - If soap and water are not available, use an alcohol-based sanitizer that contains at least 60% alcohol. Key times to wash hands include after blowing your nose, coughing or sneezing, after using the restroom, and before eating or preparing food.
- Do not touch your eyes, face, nose and mouth with unwashed hands.
- Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow. Throw potentially contaminated items (e.g. used tissues) in the trash.
- Avoid close contact/secondary contact with people and potentially contaminated surfaces.
  - Apply appropriate social distance (6+ feet).
  - Minimize handshaking/touching others and use caution when accessing public spaces.
- Clean frequently touched surfaces daily. Commonly touched items can include but are not limited to tables, doorknobs, light switches, countertops, handles, desks, phones, keyboard, toilets, sinks and field equipment. If surfaces are dirty, they should be cleaned with soap and water prior to disinfection. If surface cannot be cleaned/disinfected, then wash hands or use sanitizer as soon as possible.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

APPENDIX C

How to Remove Gloves

How to Remove Gloves

To protect yourself, use the following steps to take off gloves

1

Grasp the outside of one glove at the wrist. Do not touch your bare skin.

2

Peel the glove away from your body, pulling it inside out.

3

Hold the glove you just removed in your gloved hand.

4

Peel off the second glove by putting your fingers inside the glove at the top of your wrist.

5

Turn the second glove inside out while pulling it away from your body, leaving the first glove inside the second.

6

Dispose of the gloves safely. Do not reuse the gloves.

7

Clean your hands immediately after removing gloves.

Heat Illness Prevention Program

HEAT ILLNESS
PREVENTION PROGRAM

CORPORATE HEALTH AND SAFETY DIRECTOR	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**10/2019**
REVISION DATE	:	**03/2023**
REVISION NUMBER	:	**2**

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1. PURPOSE

Roux Associates, Inc. and its affiliated **companies**, Roux Environmental Engineering and Geology, D.P.C, and Remedial Engineering (collectively, "Roux") has established this heat illness prevention program to assist in preventing workplace accidents, injuries, and illnesses associated with temperature extremes. Roux is committed to taking every precaution to protect employees who might be exposed to heat stress, including establishing safe work practices, heat illness prevention controls, and emergency preparedness, which will be detailed in this plan.

2. SCOPE AND APPLICABILITY

Roux's Heat Illness Prevention Program applies to all employees who may be exposed to heat stress in the field.

3. ROLES AND RESPONSIBILITIES

The Heat Illness Prevention Program Administrator for Roux is the Corporate Health and Safety Director (CHSD), Brian Hobbs, CIH, CSP. The daily administration of the program is delegated to the Operations Manager (OM) and Office Health and Safety Manager (OHSM). The CHSD has the authority, responsibility, and overall accountability for the comprehensive implementation of this program.

All managers and supervisors shall implement and maintain the heat illness prevention program in work areas where there is a potential for heat stress.

Management Responsibilities

Management (i.e., Project Managers, Project Principals, OM) must provide the following to promote compliance and foster a good safety culture:

- Comply with applicable standards.
- Inform employees of the provisions of the heat illness prevention program and ensure understanding.
- Provide sufficient water, shade, rest areas, and other heat illness controls for employees.
- Assist with establishing work practices to minimize heat stress risks, such as acclimatization, required rest periods, employee monitoring, and strategic scheduling.
- Encourage employees to report hazardous conditions or heat illness symptoms.
- Provide training to any employee who could possibly be exposed to the risk of heat illness.

Employee Responsibilities

Employees are expected to actively participate in the organization's heat illness prevention program, which includes the following responsibilities:

- Receive appropriate training with regards to heat stress.
- Understand core concepts of heat illness prevention and follow guidelines to mitigate risks.
- Recognize the signs and symptoms of heat illness and immediately report them.
- Cooperate with workplace inspections and incident investigations.

Effective Communication

All Roux employees shall be accountable for ensuring there is effective communication with both the field team and their subcontractors. Communication between Roux employees project leads (e.g., Project Principal, Project Managers) and subcontractors (if applicable) will be established and maintained, so that employees can quickly contact should there be a change in condition or someone at the Site exhibits signs/symptoms of heat stress. These

types of incidents would follow Roux's Incident Investigation and Reporting Management Program 2.12 and Roux's Injury Illness Prevention Program 2.22.

4. HAZARD IDENTIFICATION AND ASSESSMENT

Prior to scheduled field work, the project team shall ensure a hazard assessment is conducted as it relates to heat stress. This will include a determination of how much heat and exertion employees are likely to be exposed to based on the work activity.

Factors that can increase heat stress can include the following:

- Temperatures at the work site;
- Humidity;
- A lack of air movement or exchange;
- The amount of time employees spend working in the heat;
- The time of day work takes place;
- Sources of radiant heat (e.g., sunlight, fire, or hot furnace);
- Work activities that produce heat (e.g., welding);
- Physical contact with warm or hot objects or liquids;
- The clothing and PPE employees are required to wear; and/or
- Physically strenuous work.

Results of the hazard analysis should be used to determine appropriate controls for mitigating heat stress, whenever possible, for planning acclimatization and for developing work schedules that rotate workers to limit employee exposure. Typically, the Site Supervisor (SS) or Site Health and Safety Officer (SHSO) shall conduct worksite observations to assure all employees follow heat illness prevention procedures and that hazards are sufficiently controlled. However, all employees should be continuously evaluating work site conditions and be able to recognize heat stressors in order to prevent heat illnesses.

5. TRAINING

All Roux employees shall be trained on the topics listed below prior to beginning work, which may potentially expose workers to heat stress.

Training Topics

- The environmental, behavioral, and personal risk factors for heat illness, such as radiant heat sources, exertion, clothing and PPE, and use of alcohol or drugs.
- Types of heat illnesses, common symptoms, and appropriate emergency response for each.
- The knowledge that mild symptoms may quickly become more severe or life-threatening.
- The importance of immediately reporting any signs or symptoms of heat illness to the supervisor.
- The employer's responsibility to provide shade, water, access to first aid, and cool-down rests during work and the employee's freedom to exercise their rights under this standard without fear of retaliation.
- The employer's heat stress plan and its procedures:
  - Procedures for employees who are newly assigned to work in high heat areas.

  - The organization's acclimatization methods, as applicable.
  - Heat wave procedures.
  - Heat illness and emergency response, including contact information.
- The importance of frequent consumption of water and the taking of rest breaks.
- How heat illness prevention applies to employees' specific tasks.

Increasing Training Effectiveness:

- The SS/SHSO will hold daily tailgates with the field team to go over daily work tasks and basic safety information including Job Safety Analysis (JSA) review as well as incorporate elements such as current weather and effects on the work activities for the day.
- If a heat wave or high heat is anticipated, OHSMs and/or OMs will provide communications to Roux employees prior to their shifts and remind them of any special high heat procedures.

6. DRINKING WATER

Employees shall be given access to potable drinking water. Access to water will be provided as near as possible to where employees are working, and there shall be enough locations so employees will have sufficient water. Water should be fresh and pure, free of taste or smell that would discourage employees from drinking, comfortably cool, and obtained from an approved source.

The recommendation is that during warm or hot weather, employees drink four 8-ounce glasses of water, or a total of one quart per hour, throughout the entire work shift. Easy access to sufficient potable drinking water throughout the work shift encourages employees to drink.

During a heat wave, water shall be replenished more often to keep available and cool. Water containers (and all spouts and levers) must be kept clean. If able, provide single use drinking cups with appropriate waste receptacle. Accessible sanitation facilities shall also be maintained at work Sites as appropriate.

SS/SHSO are responsible for the following:

- Drink sufficient water before, during, and after work shifts to maintain hydration.
- Encourage frequent drinking of small amounts of water throughout the shift. In high heat environments, remind field staff and subcontractors that drinking extra water may be necessary.
- Discourage the choosing of drinks with caffeine or sugar that may possibly dehydrate employees instead of water. Also, discourage the drinking of alcohol.
- Monitor the water supply.
- If employees become dehydrated and are unable to alleviate symptoms with the steps below, get them immediate medical attention.

Field Staff/Subcontractors are responsible for the following:

- Drink sufficient water before, during, and after work shifts to maintain hydration. Drink up to 4 cups of water per hour, especially during hot weather.
- Be aware that in high heat situations, you may need to drink more water.
- Monitor yourself and others for signs of dehydration. If you feel dehydrated:
  - Follow Roux's Incident Notification Flowchart;

- Rest in the shaded resting area; and
- Drink water in small amounts, but frequently.

7. ACCESS TO SHADE

Access to shaded areas will be provided to Roux staff, as needed. Employees are encouraged to use these areas when they feel overheated. Roux's SS/SHSO shall oversee the proper implementation of shaded areas and will communicate these locations on a daily basis with the Field Team.

Depending on the Site, shaded areas can include the following:

- Pop-up Tents
- Canopies
- Umbrellas
- Structures mechanically ventilated or open to air movement
  - Garage
- Conex mounted RV canopies
- Full and thick tree canopies that block direct sunlight
- Buildings
- Enclosed areas only if they provide cooling comparable to shade in open air
  - Vehicles with air conditioning

Shaded Area Requirements

Shade shall be strong enough to cool employees down and other shadows should not be visible in the shade. Shade will be provided by Roux when the air temperature exceeds 80°F. If the temperature is less than 80°F, shade will be available and provided upon request. The SS/SHSO will monitor conditions to determine when the air will exceed (and is exceeding) 80°F. For most Sites, air will be monitored hourly and shade will be setup immediately if 80°F is exceeded.

Shade shall be located as close as practical to areas where employees are working and is easily accessible. These areas will be considered safe and free from other hazards. Shaded areas should be large enough to accommodate all employees who are on a break, resting, or recovering without crowding. Should natural vegetation be used for shade, the SS/SHSO will evaluate shade for effectiveness.

Field Staff Responsibilities

Field Staff should take ordinary rest breaks in the shaded areas and monitor themselves for signs of heat stress, and go to the shaded area when they need to cool down. Any issues or problems with shaded areas should be reported to the SS/SHSO for the Site.

If shaded areas are used for a preventative cool-down, the SS/SHSO will ensure the affected employees will remain in the shade until they begin to feel better. The SS/SHSO will continue to monitor the employees and ask them if they are experiencing symptoms of a heat illness. Employees shall not be sent back to work before symptoms have ended and at a minimum at least 10 minutes of rest.

8. MONITORING AND SCHEDULING

Monitoring

The SS/SHSO and Field Team will continue to monitor themselves and others for signs of heat illness. The SS/SHSO will monitor when the air temperature exceeds 80°F. Throughout the summer, weather and temperature will be monitored at least two weeks ahead, and the work schedule will be planned to accommodate the expected weather.

Scheduling

Scheduling accommodations may include:

- Working during cooler hours of the day
- Working at night
- Stopping work early
- Rescheduling work activities
- Increasing frequency of breaks

In general, strenuous work activities shall be rescheduled to the coolest parts of the day.

Special precautions are required for temperatures above 80°F, 95°F, and heat waves. These precautions are provided in sections below.

9. ACCLIMATIZATION AND NEW EMPLOYEE PROCEDURES

Roux requires employees to be acclimatized in order for them to better tolerate heat in the workplace. Acclimatization is the physical process of adapting to a different thermal environment, allowing a better toleration of heat. Acclimatization procedures require gradual exposure that gives the employee time to adjust to each level of exposure. Acclimatization is essential for new employees, but is necessary for all employees when the temperature significantly changes. Heat stress is much more likely if these procedures are not followed.

The SS/SHSO is responsible for observing new employees during their first 14 days of employment in high heat areas.

Re-acclimatization is necessary if employees are absent from high heat environments for a week or more or the temperature increases significantly.

10. HEAT WAVE AND EXTREME HEAT PROCEDURES

Heat Wave Procedures

A heat wave is defined as consistent temperatures over 80°F or if the temperature is 10° higher than the average daily temperatures in the preceding 5 days.

SS/SHSO and Project Management (e.g., PP, PM) shall closely observe and monitor employees during a heat wave. The Field Teams should institute a ratio of one SS to 20 or fewer employees, a mandatory buddy system, or a consistent practice for supervisors to check on employees. Pre-shift meetings to review high heat procedures with employees will be carried out to emphasize work rest schedules, drinking water, shade, etc.

Extreme Heat Procedures

When work site temperatures equal or exceed 95°F, the employer will enact extreme heat procedures:

- Employees will be closely observed by the SS/SHSO for signs of heat illness. New employees will be supervised for acclimatization.
- Effective communication and monitoring will be assured through the use of periodic check ins with the SS/SHSO via phone. Communications between employees and Project Management (e.g., PP/PM) will be established and maintained. Mandatory 10-minute break periods are required for every two hours worked. SS/SHSO must enforce this rule.
- Pre-shift safety tailgate meetings will occur to review procedures and to remind employees to drink water and take cool-down rests if needed. SS/SHSO shall remind employees to rest and drink water. Employees should drink more water than usual.

11. EMERGENCY RESPONSE PROCEDURES

Roux is dedicated to providing prompt appropriate care for all employees who report or show symptoms of heat illness. If an employee shows signs of heat illness, they will be monitored and shall not be left alone or sent home without being offered first aid or emergency medical services. If on-Site personnel require any medical treatment, the following steps will be taken:

1. Notify Roux's Project and Corporate Management Team for any work-related injury and/or illness occurrence, and communicate with the contracted Occupational Health Care Management Provider, AllOne Health (AOH), immediately following the notifications provided above.
2. Based on discussions with the Project Team, Corporate Management, and the AOH evaluation, if medical attention beyond onsite First Aid is warranted, transport the injured / ill person (IP) to the Urgent Care Center, or notify the Fire Department or Ambulance Emergency service and request an ambulance or transport the victim to the hospital, and continue communications with Corporate Management Team. An Urgent Care/Hospital Route map with locations and directions are provided within Site Specific Health and Safety Plans.
3. First aid medical support will be provided by onsite personnel trained and certified in First Aid, Cardio Pulmonary Resuscitation (CPR), Automatic External Defibrillation (AED), and Blood-Borne Pathogens (BBP) Awareness, until relieved by emergency medical services (EMS).
4. The SHSO and Project Manager will perform a Loss Investigation (LI) and the Project Team will complete the final Loss Report.

12. HEAT-RELATED ILLNESSES

Heat Stress

Heat stress is a significant potential hazard and can be associated with heavy physical activity and/or the use of personal protective equipment (PPE) in hot weather environments. For these reasons, the company will provide potable drinking water and access to shade or other areas of relief (i.e., air-conditioned vehicles, work trailers). Supervisors, prior to supervising personnel in the field as well as all personnel involved with the field work of a project, are trained in this HASP that includes preventing heat-related illnesses and the below procedures in response to heat-related symptoms and illness. Since much of our work is dependent upon environmental factors beyond our control, we must closely monitor air temperature and humidity and be aware of avoiding radiant heat sources and providing as much air circulation as possible wherever we work. Physical factors that need to be evaluated as part of our Job Safety Analysis (JSA) reviews include the level of physical activity and duration of work and the type (i.e., color, weight breathability) of the clothing we select. In addition, personal factors such as age, weight, fitness, drug/alcohol use, and prior history of heat-related illness need to be considered.

Heat cramps are brought on by prolonged exposure to heat. As an individual sweats, water and salts are lost by the body, resulting in painful muscle cramps. The signs and symptoms of heat stress are as follows:

- Severe muscle cramps, usually in the legs and abdomen;
- Exhaustion, often to the point of collapse; and
- Dizziness or periods of faintness.

First aid treatment includes, but is not limited to, shade, rest, and fluid replacement. Typically, the individual should recover within one-half hour while being monitored constantly. If the individual has not improved substantially within 30 minutes and the body temperature has not decreased, the individual should be transported to a hospital for medical attention.

Heat Exhaustion

Heat exhaustion may occur in a healthy individual who has been exposed to excessive heat while working or exercising. The circulatory system of the individual fails as blood collects near the skin to rid the body of excess heat through transference. The signs and symptoms of heat exhaustion are as follows:

- Rapid and shallow breathing;
- Weak pulse;
- Cold and clammy skin with heavy perspiration;
- Skin appears pale;
- Fatigue and weakness;
- Dizziness; and
- Elevated body temperature.

First aid treatment include, but is not limited to, cooling the victim, elevating the feet, and replacing fluids. If the individual is not substantially improved within 30 minutes and the body temperature has not decreased, the individual should be transported to the hospital for medical attention.

Heat Stroke

Heat stroke occurs when an individual is exposed to excessive heat and stops sweating. This condition is classified as a MEDICAL EMERGENCY requiring immediate cooling of the victim and transport to a medical facility. The signs and symptoms of heat stroke are as follows:

- Dry, hot red skin;
- Body temperature approaching or above 105 degrees F;
- Confusion, altered mental state, slurred speech;
- Seizures;
- Large (dilated) pupils; and
- Loss of consciousness – the individual may go into a coma.

First aid treatment requires immediate cooling and transportation to a medical facility. Heat stress is a significant hazard if any type of protective equipment (semi-permeable or impermeable) that prevents evaporative cooling is worn in hot weather environments.

13. OTHER HEAT CONTROLS

Clothing and PPE

Employees should choose clothing that is reflective, light-colored, lightweight, loose-fitting and breathable. Clothing should cover the exposed parts of the body. In direct sun, hard hats with a brim or bill may be helpful. Should specialized cooling garments be applicable, please consult with your OM/OHSM/CHSD.

Managing Employee Risk Factors

It is recommended that employees are aware of how their health can affect their risk of heat stress. The following increases ones risk for a heat related illness:

- A poor level of physical fitness
- Obesity
- Chronic or acute illnesses
- Conditions such as diabetes, heart disease, or high blood pressure
- Certain medications, such as diuretics
- Age (60+)

Employees should:

- Maintain their health outside of work
- Be aware of the effects of medications
- Drink adequate amounts of water
- Eat light, cool meals during work shifts and save heavy meals until after the shift is over
- Do not skip meals: food helps replace electrolytes when sweating
- Take breaks as needed
- Do not consume alcohol prior to working in a hot environment

APPENDIX E

Personal Protective Equipment (PPE) Management Program

PERSONAL PROTECTIVE EQUIPMENT
MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY DIRECTOR	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**01/2019**
REVIEW DATE	:	**03/2023**
REVISION NUMBER	:	**4**

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1. PURPOSE

Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C., and Remedial Engineering (collectively, "Roux") has instituted the following program to establish guidelines for the selection of personal protective equipment (PPE) for use by Roux personnel performing field activities in hazardous environments. PPE is not meant to be a substitute for engineering, work practice, and/or administrative controls, but PPE should be used in conjunction with these controls to protect employees in the workplace. Clothing, body coverings, and other accessories designed to prevent worker exposure to workplace hazards are all types of PPE. To ensure adequate PPE employee-owned PPE is evaluated on a case-by-case basis to insure its adequacy, maintenance and sanitation.

2. SCOPE AND APPLICABILITY

These guidelines apply to all PPE selection decisions to be made in implementing the Roux program. The foundations for this program are the numerous Occupational Health and Safety Administration (OSHA) standards related to PPE cited in 29 CFR 1910 Subpart I, 29 CFR 1926 Subpart E, and the hazardous environment work employee protection requirements under the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) standard at 29 CFR 1910.120 and 1926.65. To ensure hazard assessments are documented, the levels of protection, types of protection, and tasks requiring protection are covered in site-specific Health and Safety Plans (HASPs) and Job Safety Analyses (JSAs).

3. PROCEDURES

Due to the varied nature of site activities and the different potential hazards associated with different sites, several aspects must be considered when selecting PPE. The following text describes PPE selection logic and provides guidelines and requirements for the appropriate selection and use of PPE.

3.1 Introduction

To harm the body, chemicals must first gain entrance. The intact skin and respiratory tract are usually the first body tissues that are exposed to chemical contaminants. These tissues provide barriers to some chemicals but in many cases, are damaged themselves or are highly permeable by certain chemical compounds. PPE therefore is used to minimize or eliminate chemical compounds from coming into contact with these first barrier tissues.

The proper selection of equipment is important in preventing exposures. The Project Manager (PM) or health and safety personnel making the selection will have to take several factors into consideration. The level of protection, type, and kind of equipment selected depends on the hazardous conditions. In some cases, additional selection factors include cost, availability, compatibility with other equipment, and performance. An accurate assessment of all these factors must be made before work can be safely carried out.

3.1.1 Training

Training shall be provided to all field-based employees in the proper use and care of PPE. Training shall include, but is not limited to, the initial 40-hour HAZWOPER training, annual 8-hour HAZWOPER refresher training, and site-specific PPE training. The training program includes when PPE is necessary; what types of PPE are necessary; how to don, doff, adjust and wear PPE; the limitations of PPE; the proper care, maintenance, useful life and disposal of PPE. In addition, retraining shall be conducted when workplace changes require a change in PPE when an employee demonstrates a lack of knowledge or improper use of PPE is identified. Training certifications are provided to employees that include the date of training and certification subject.

3.2 Types of PPE

The type and selection of PPE must meet certain general criteria and requirements as required under OSHA 29 CFR 1910.132 (General Industry) and 1926.95 (Construction). In addition to these general requirements, specific requirements and specifications exist for some types of PPE that form the basis of the protective clothing scheme. All manufacturer's recommendations for PPE care and use shall be followed. All PPE shall be maintained in a sanitary and reliable condition. Additionally, proper fit and/or size shall be evaluated to ensure adequate protection for all employees. Should PPE become defective, it shall be immediately removed from service and discarded.

The following is a list of the common types of specific PPE and the specific requirements for the PPE type, where applicable:

1. Hard Hats - Regulated by 29 CFR 1910.135 and 1926.100; and, specified in ANSI Z89.1.
2. Face Shields and Safety Glasses - Regulated by 29 CFR 1910.133 and 1926.102; and, specified in ANSI Z87.1.
3. Respiratory Protection - Regulated by 29 CFR 1910.134 and 1926.103.
4. Hand Protection - Not specifically regulated.
5. Foot Protection - Regulated by 29 CFR 1910.136 and 1926.96; and, specified in ANSI Z41.1.
6. Protective Clothing (e.g., fully encapsulated suits, aprons) - Not specifically regulated.

3.3 Protective Clothing Selection Criteria

3.3.1 Chemicals Present

The most important factor in selecting PPE is the determination of what chemicals the employee may be exposed to. On field investigations, the number of chemicals may range from a few to several hundred. The exact chemicals or group of chemicals present at the site (certain groups tend to require similar protection) can be determined by collecting and analyzing samples of the air, soil, water, or other site media. When data are lacking, research into the hazardous materials used or stored at the site can be used to infer potential chemical exposures on the site.

The most appropriate clothing shall be selected once the known, or suspected chemicals have been identified and taken into consideration based on the type of work to be performed.

Protective garments are made of several different substances for protection against specific chemicals. There is no universal protective material. All will decompose, be permeated by, or otherwise fail to protect under given circumstances. Fortunately, most manufacturers make guides to the use of their products (i.e., Dupont's Tyvek™ Permeation Guide). These guides are usually for gloves and coveralls and typically provide information regarding chemical degradation rates (failure of the material to maintain structural integrity when in contact with the chemical), and may provide information on the permeation rate (whether or not the material allows the chemical to pass through). When permeation tables are available, they shall be used in conjunction with degradation tables to determine the most appropriate protective material for the specific chemical hazard(s).

During most site work, chemicals are usually in mixed combinations, and the protective materials are not in continuous contact with pure chemicals for long periods of time; therefore, the selected material may be adequate for the particular chemical of most concern and type of work being performed, yet not the "best" protecting material for all site chemicals and activities. Selection shall depend upon the most hazardous

chemicals based on their hazards and concentrations. Sometimes layering (i.e., using several different layers of protective materials) affords the best protection.

3.3.2 Concentration of the Chemical(s)

One of the major criteria for selecting protective material is the concentration of the chemical(s) in air, liquid, and/or solid state. Airborne and liquid chemical concentrations should be compared to the OSHA standards and/or American Conference of Governmental Industrial Hygienists (ACGIH) and National Institute for Occupational Safety and Health (NIOSH) guidelines to determine the level of skin or other absorptive surface (e.g., eyes) protection needed. While these standards are not designed specifically for skin exposed directly to the liquid, they may provide skin designations indicative of chemicals known to have significant skin or dermal absorption effects. For example, airborne levels of PCBs on-site may be low because it is not very volatile, so the inhalation hazard may be minimal; however, PCB-containing liquid coming in direct contact with the skin may cause overexposure. Thus, PCBs have been assigned a skin designation in both the OSHA and ACGIH exposure limit tables.

3.3.3 Physical State

The characteristics of a chemical may range from nontoxic to extremely toxic, depending on its physical state. Inorganic lead in soil would not be considered toxic to site personnel, unless it became airborne, since it is generally not absorbed through the intact skin. However, organic lead in a liquid could be readily absorbed through the skin. Soil is frequently contaminated with hazardous materials. Concentrations will vary from a few parts per million to nearly one hundred percent by volume. The degree of hazard is dependent on the type of soil and concentration of the chemical. Generally speaking, "dry" soils that have not become airborne do not pose a hazard to site personnel if they take minimal precautions, such as wearing some type of lightweight gloves.

3.3.4 Length of Exposure

The length of time a material is exposed to a chemical increases the probability of a breakthrough. Determinations of actual breakthrough times for short-term exposures indicate that several different materials can be used that would be considered inadequate under long-term exposures. It should be kept in mind that during manufacturer’s permeation testing, a pure (100% composition) liquid is usually placed in direct contact with the material producing a worst-case situation.

3.3.5 Abrasion

When selecting protective clothing, the job the employee is engaged in must be taken into consideration. Persons moving drums or performing other manual tasks may require added protection for their hands, lower chest and thighs. The use of leather gloves and a heavy apron over other normal protective clothing will help prevent damage to the normal PPE, and thus reduce worker exposures.

3.3.6 Dexterity

Although protection from skin and inhalation hazards is the primary concern when selecting PPE, the ability to perform the assigned task must be maintained. For example, personnel cannot be expected to perform work that requires fine dexterity if they must wear a thick glove. Therefore, the PPE selection process must consider the task being performed and provide PPE alternatives or techniques that allow dexterity to be maintained while still protecting the worker (e.g., wearing tight latex gloves over more bulky hand protection to increase dexterity).

3.3.7 Ability to Decontaminate

If disposable clothing cannot be used, the ability to decontaminate the materials selected must be taken into consideration. Once a chemical makes contact with the material, the PPE must be cleaned before it can be reused. If the chemical has completely permeated the material, the clothing cannot be adequately decontaminated, and the material should be discarded.

3.3.8 Climactic Conditions

The human body works best with few restraints from clothing. Protective clothing adds a body burden by increasing weight, restricting movement, and preventing the body's natural cooling process. In severe situations, a modified work program must be used.

Some materials act differently when they are very hot and very cold. For example, PVC becomes almost brittle in very cold temperatures. If there are any questions about the stability of the protective materials under different conditions, the manufacturer should be contacted prior to using PPE in the field.

3.3.9 Work Load

Like climactic conditions, the type of work activity may affect work duration and the ability of personnel to perform certain tasks. Similarly, the amount of protective materials a person wears will affect their ability to perform certain tasks. For example, a person in a total encapsulating suit, even at 72°F, cannot work for more than a short period of time without requiring a break.

The work schedule should be adjusted to maintain the health of the employees. Modified work practices may include allowing more time for individual job tasks and implementing work/rest cycles per NIOSH and ACGIH thermal stress recommendations. Special consideration should be given to the selection of clothing that both protects the worker and adds the least burden when personnel are required to perform strenuous tasks. Excessive bodily stress frequently represents the most significant hazard encountered during field work.

3.4 Types of Protective Materials

1. Cellulose or Paper: suitable for nuisance dusts and coarse fibers.
2. Natural and Synthetic Fibers
    a. Tyvek™: suitable small sized hazardous particles, including lead, asbestos, and mold.
    b. Tychem™: suitable for a variety of hazards from light liquid splashes to heavy exposures of industrial chemicals and agents.
    c. Nomex™: suitable for flame-resistance, radiation resistance, acids, alkalis, fluorocarbon refrigerants (CFCs), and non-polar solvents.
3. Elastomers
    a. Polyethylene: suitable for polar substances and solvents.
    b. Saran™ : suitable for flame-resistance, acids, alkalis, oils, and organic solvents.
    c. Polyvinyl Chloride (PVC): suitable for alcohols, oils, inorganic acids, alkalis, and salts.
    d. Neoprene: suitable for polar/non-polar substances, petroleum mixtures, and ≤ 200 F heat resistance.
    e. Butyl Rubber: suitable for polar substances and solvents.
    f. Viton: suitable for non-polar substances, petroleum mixtures, and ≤ 200 F heat resistance.

g. Nitrile: suitable for polar/non-polar substances and petroleum mixtures.

3.5 Protection Levels

3.5.1 Level A Protection

Level A protection (a fully encapsulated suit) is used when skin hazards exist or when there is no known data that positively rule out skin and other absorption hazards. Per the Roux Respiratory Protection Management Program, Roux employees are not authorized to enter an IDLH atmosphere; therefore, the program does not allow the use of supplied-air respirators (SARs) or self-contained breathing apparatus (SCBA). At no time will Level A work be performed without the consent of the CHSD and OM.

The following conditions suggest a need for Level A protection:

- Confined facilities where probability of skin contact is high;
- Sites containing known skin hazards;
- Sites with no established history to rule out skin and other absorption hazards;
- Atmosphere immediately dangerous to life and health (IDLH) through the skin absorption route;
- Site exhibiting signs of acute mammalian toxicity (e.g., dead animals, illnesses associated with past entry into site by humans);
- Sites at which sealed drums of unknown materials must be opened;
- Total atmospheric readings on the Photoionization Detector (PID), Flame Ionization Detector (FID), and similar instruments indicate 500 to 1,000 ppm of unidentified substances; and
- Extremely hazardous substances (e.g., cyanide compounds, concentrated pesticides, Department of Transportation Poison "A" materials, suspected carcinogens and infectious substances) are known or suspected to be present and skin contact is possible.

The following items constitute Level A protection:

- Open circuit, pressure-demand self-contained breathing apparatus (SCBA);
- Totally encapsulated suit;
- Gloves, inner (surgical type);
- Gloves, outer;
- Chemical protective;
- Boots, chemical protective, steel toe and shank;
- Radiation detector (if applicable); and
- Communications.

3.5.2 Level B Protection

Level B protection is utilized when the highest level of respiratory protection is needed but hazardous material exposure to the few unprotected areas of the body is unlikely.

The following conditions suggest a need for Level B protection:

- The type and atmospheric concentration of toxic substances have been identified and they require the highest level of respiratory protection;

- IDLH atmospheres where the substance or concentration in the air does not present a severe skin hazard;
- The type and concentrations of toxic substances do not meet the selection criteria permitting the use of air-purifying respirators; and
- It is highly unlikely that the work being done will generate high concentrations of vapors, gases or particulates, or splashes of materials that will affect the skin of personnel.

Personal protective equipment for Level B includes:

- Open circuit, pressure-demand SCBA;
- Chemical protective clothing:
- Overalls and long-sleeve jacket; or
- Coveralls;
- Gloves, inner (surgical type); gloves, outer, chemical protective;
- Boots, chemical protective, steel toe, and shank; and
- Communications optional.

3.5.3 Level C Protection

Level C protection is utilized when both skin and respiratory hazards are well defined, and the criteria for using negative pressure respirators have been fulfilled (i.e., known contaminants and contaminant concentrations, acceptable oxygen levels, approved filter/cartridge available, known cartridge service life, etc.). Level C protection may require an emergency escape respirator during specific initial entry and site reconnaissance situations or when applicable after that.

Personal protective equipment for Level C typically includes:

- full facepiece air-purifying respirator;
- emergency escape respirator (optional);
- chemical protective clothing:
  - overalls and long-sleeved jacket; or
  - coveralls;
- gloves, inner (surgical type);
- gloves, outer, chemical protective; and
- boots, chemical protective, steel toe, and shank.

3.5.4 Level D Protection

Level D is the basic work uniform. Personal protective equipment for Level D includes:

- Coveralls;
- Safety boots/shoes;
- Eye protection;
- Hand protection;

- Reflective traffic safety vest (mandatory for traffic areas or railyards);
- Hard hat (with face shield is optional); and
- Emergency escape respirator is optional.

3.5.5 Level E Protection

Level E protection is used when radioactivity above 10 millirems per hour (mrems/hr) is detected at the site. Personal protective equipment for Level E includes:

- Coveralls;
- Air purifying respirator (i.e., P100 or equivalent);
- Time limits on exposure;
- Appropriate dermal protection for the type of radiation present, and
- Radiation dosimetry and ambient monitoring.

3.5.6 Additional Considerations

Fieldwork will contain a variety of situations due to chemicals in various concentrations and combinations. These situations may be partially ameliorated by following the work practices listed below:

1. Foot protection is needed on every site. If the ground to be worked on is contaminated with liquid, and it is necessary to walk in the chemicals, some sort of protective shoe coverings or "booties" can be worn over the boots. Shoe coverings should be designed with soles to help prevent slips. Using disposable shoe coverings when contacting liquid contamination can cut down on overall decontamination requirements. If non-liquids are to be encountered, a Tyvek™ bootie could be used. The advantage of booties is questionable if the ground contains any sharp objects. Boots should be worn with either cotton or wool socks to help absorb perspiration.
2. If the site situation requires the use of hard hats, chin straps should be used if a person will be stooping over where his/her hat may fall off. Respirator straps should not be placed over the hard hats, as this will affect the fit of the respirator.

   Some types of protective materials conduct heat and cold readily. In cold conditions, natural material clothing should be worn under protective clothing. Protective clothing should be removed prior to allowing a person "to get warm." Applying heat, such as with a space heater, to the outside of the protective clothing may drive contaminant permeation. In hot weather, under clothing will absorb sweat. It is recommended that workers use all cotton undergarments.
3. Body protection should be worn and taped to prevent anything from running into the top of the boot. Gloves should be worn and taped to prevent substances from entering the top of the glove. Duct tape is preferred, but masking tape can be used. When aprons are used, they should be taped across the back for added protection. However, this should be done in such a way that the person has mobility.
4. Atmospheric conditions such as precipitation, temperature, wind direction, humidity, wind velocity, and pressure determine the behavior of contaminants in air or the potential for volatile materials to become airborne. These parameters should be considered in determining the need for and the level of protection.
5. A program must be established for periodic air monitoring during site operations. Without an air monitoring program, any changes to air quality would go undetected and might jeopardize on-site personnel. Monitoring can be done with various types of air pumps and filtering devices followed by laboratory analysis of the filtration media, personnel dosimeters, and periodic walk-throughs by personnel carrying real-time direct-reading survey instruments.

6. For operations in the exclusion zone, different levels of protection may be selected, and various types of chemical-resistant clothing may be worn. This selection should be based on the job function, reason for being in the area, and the potential for skin contact with, or inhalation of, the chemicals present.
7. Escape masks must be readily available when levels of respiratory protection do not include a SCBA and the possibility of an IDLH atmosphere exists. The use and placement of escape masks should be made on a case-by-case basis. Escape masks should be strategically located at the site in areas that have higher possibilities of vapors, gases or particulates.

APPENDIX F

Subsurface Utility Clearance Management Program

SUBSURFACE UTILITY CLEARANCE MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY DIRECTOR	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**01/2019**
REVIEW DATE	:	**03/2023**
REVISION NUMBER	:	**3**

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APPENDICES

Appendix A – Roux Subsurface Utility Clearance Checklist

Appendix B – Utility Verification/Site Walkthrough Record

Appendix C – Private Utility Technology Applications and Considerations

1. PURPOSE

Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C., and Remedial Engineering (collectively, "Roux") has instituted the following program for completing proper utility mark-outs and for conducting subsurface clearance activities. This establishes a method to ensure, to the greatest extent possible, that utilities have been identified and contact and/or damage to underground utilities and other subsurface structures will be avoided. For the purpose of this program, a structure is defined as any underground feature that may present a potential source(s) of energy, such as, but not limited to, utility vaults, bunkers, piping, electrical boxes, wires, conduits, culverts, utility lines, underground tanks, and ducts.

2. SCOPE AND APPLICABILITY

The Subsurface Utility Clearance Management Program applies to all Roux employees, its contractors, and subcontractors. Employees are expected to follow this program for all intrusive work involving Roux or other personnel (e.g., contractors/subcontractors) working for Roux unless the client's requirements are more stringent. Intrusive work activities can include, but are not limited to, digging or scraping the ground surface, including, but not limited to, excavation; test pitting or trenching; soil vapor sampling or the installation of soil borings, soil vapor monitoring points and wells, or monitoring wells; and drilling within concrete slabs on grade.

Deviation from the program, regardless of the specific work activity or location, must be pre-approved based on the client's site knowledge, experience, site conditions, and additional documentation on the site. Any exceptions shall be documented through Roux Subsurface Variance Form located within the Roux Health & Safety Application or through OKTA. Approval is required by the Project Principal (PP) and the Operations Manager (OM) in consultation with the Office Health and Safety Manager (OHSM) or Corporate Health and Safety Director (CHSD) prior to mobilization. Depending on the work location, more stringent federal, state, local, or client requirements may apply. It is the responsibility of the Project Team to identify such requirements prior to mobilization.

3. PROCEDURES

3.1 Before Intrusive Activities/Job Planning Process

Obtain, review, and field verify relevant historical site data that may include: as-builts/site plans; easement/right-of-way information; historical aerial photos/development plans; local/state permitting records; previous site investigation/boring logs; and/or interviews with site representative/client.

If there is the potential for unexploded ordinances or munitions, consultation with your OM and CHSD is required prior to site operations.

During the project kick-off meeting for intrusive activities, the Project Manager (PM) will review the Roux Subsurface Utility Clearance Checklist and Utility Verification (Appendix A) / Site Walkthrough Record (Appendix B) and the below bullet points with the project field team:

- Review the work scope to be performed with the site owner/tenant to determine if it may impact any utilities;
- Determine the need for utility owner companies to be contacted or to have their representatives on site;

- Where mark-outs terminate at the property boundary, consider the use of private utility locating / GPR / geophysical-type services. Use of private utility locating firms, however, does not eliminate the legal requirement for the subcontractor (e.g., driller, excavation firm) to submit a request for Public Utility Mark-outs. Also, the information provided by the service may be inaccurate and unable to locate subsurface utilities and structures in urban areas, landfills, urban fill areas and below reinforced slabs, etc. They should not be relied upon as the only means of performing utility clearance;
    - A mark-out is defined as the process of contracting with a competent and qualified company to confirm the presence or absence of underground utilities and structures. This process will clearly mark-out and delineate utilities that are identified so that intrusive work activities can be performed without causing disturbance or damage to the subsurface utilities and structures. After utility mark-outs are completed the soft Digging must completed prior to intrusive work.
- Documented description of the dig site, which is included in the project's Health and Safety Plan (HASP), and one call report will be maintained in the field and distributed amongst Roux personnel, its contractors, and subcontractors; and
- Documentation of the actual placement of mark outs in the field shall be collected using dated pictures, videos and/or sketches with distance from markings to fixed objects. All documentation shall be maintained within the project file.

3.2 Utility Mark Out

- Ensure the Mark-out / Stake-out Request Information Sheet (or one-call report) is complete and accurate for the site, including address and cross streets, and review for missing utilities.
    - Note: utility mark-out organizations do not have contracts with all utilities and it is often necessary to contact certain utilities separately, such as the local water and sewer authorities.
- Have written confirmation prior to mobilizing to the site that the Project Team or Roux personnel performing the intrusive activity has correctly completed the mark-out notification process, including requesting mark-outs, waiting for mark-outs to be applied to ground surfaces at the site, and receiving written confirmation of findings (via fax or email) from utility operators for all known or suspected utilities in the proposed area of intrusive activity, and provided utility owner written confirmation to Roux personnel for review and project files documentation.
- Do not begin any intrusive activity until all utility mark-outs have been completed (i.e., Did all utilities mark-out the site?) and any unresolved mark-out issues are finalized. Perform a site walk to review the existing utilities and determine if the utility locators have located said utilities.

  (Note: The Tolerance Zone is defined as three feet plus half of the diameter or half of the greatest dimension (for elliptical sewers, duct banks, and other non-cylindrical utilities) of a utility and three feet from the outside edge of any subsurface structure.)
- For non-subscribing utility owners or if public one-call service is not available, perform due diligence and request further information regarding utility type, construction details, location and burial depth directly from public service providers/utility owners. Request utility mark-out by each public service provider/utility owner as applicable. Confirm contact and response by each public utility owner on the Subsurface Utility Clearance Checklist.
- If utilizing a Private Markout, ensure the contractor has a plan regarding what types of technology will be used based on Table 1 in Appendix C: Private Utility Technology Applications and Considerations. If possible, it is recommended that multiple technologies are used to sweep each location/work area. Use tracer wire to locate the utility (when tracer wires are present). Record the results of the private utility mark-out on the Utility Verification/Site Walkthrough Record form.

3.3 Site Visit/Utility Walkthrough

Before mobilization with the subcontractor or during the pre-work safety tailgate with the subcontractor, perform a site walkthrough after utility mark-outs have been completed to determine whether additional potential hazards are present and look for visible signs of utilities that may be present. Outlined below are considerations regarding a site walk before intrusive activities.

- Identify overhead utilities that may impede equipment mobilization or work zones to ensure adequate clearance distance, as specified within the site-specific Health and Safety Plan (HASP).

The presence of any of the following may indicate potential subsurface structures:

- Locations of buildings, equipment, and features like area lights, signs, sprinkler systems, phones, drains, natural gas meters, manholes, etc.;
- Warning tape, which is often a sign of underground services;
- Material like pea gravel, sand, or other non-native materials can indicate the presence of tanks or lines or any deviations from the established native soil or backfill conditions;
- Red concrete, which is often used for electrical duct banks;
- Evidence of damaged utilities, such as piping materials, insulation, or odors present in the work area; and
- Other utilities including fire hydrants, electrical transformers, pipeline markers, valve covers, steam lines, and valve box covers, clean-outs, etc.

By observing the path between the main service line and the connection point, it may be possible to determine the likely routing of on-site utilities. However, this method should not be relied upon solely, and proper risk mitigation strategies should be in place before proceeding with any ground disturbance activities.

For sites with potential underground storage tanks present (UST) the following guidance applies:

- Identify if the product piping is either rigid or flexible.
- Conduct a visual examination of the tank field, observation wells, dispensers, vent stacks, and UST fill points to determine their location.
- Locate and become familiar with the emergency shutoff button/switch, if present.
- Determine the orientation, arrangement, and location of the tanks, as well as their size and capacity, through the examination of visible features at grade, such as fill ports and extractor covers, and by consulting any available as-built drawings.

3.4 Guidance on Preferred Methods of Clearing the Subsurface

At least one of the methods listed below should be carried out during pre-clearing activities. The Project Team is responsible for evaluating risks associated with the Scope of Work to determine which method is selected.

The following approaches shall be considered and implemented based on the Scope of Work.

- Soft Digging
    - This is the preferred method of utility clearance when clearing higher-risk utilities. Soil should be cleared through the use of a vacuum truck/equivalent, an accompanying air knife (preferred), or a water lance to break up and loosen the soil for removal with the vacuum.

- Hand Digging
  - Soil should be broken up and removed using a shovel or other appropriate hand tools without excessive force. Limit the use of dig bars or other tools that, if used incorrectly, can significantly damage utilities.
- Hand Augering
  - The hand auger must be turned slowly without excessive force. Rounded edge augers are preferred. Hand augers should not be used in pea stone/pea gravel where utilities may be present and could potentially be damaged by the hand auger. The abrupt absence of soil recovery in a hand auger could indicate utilities as pea gravel or sand may have spilled out of the auger (exception: native soil conditions that typically result in poor hand auger recoveries).

3.4.1 Guidance for Tools and Equipment

Personnel performing pre-clearance activities shall keep tools and equipment in safe working order and be properly inspected before use. If tools or equipment are broken, they will be tagged and removed from service. The following specify additional guidelines regarding tools and equipment:

- Hand digging tools must have a non-conductive handle, such as fiberglass, wood, or composite, or fully insulated handles and potential contact surfaces.
- Blades on shovels and post-hole diggers should have rounded or blunt edges.
- Pick axes or pointed spades should not be used for physical clearance.
- Crow bars, pinch bars, or pry bars should not be used to break hardened soil or backfill, except when authorized by the SS lead to loosen materials like bricks or larger stones.
- Electric-powered equipment must have ground fault protection.
- Should there be refusal or difficulty with advancing hand tools, the contractor shall stop work and notify the Roux SS/SHSO immediately.

3.5 During Intrusive Activities

Remove any surface coverings (i.e., pavement, brush, debris, etc.) to ensure workers have clear visibility of the work area and subsurface conditions. Avoid mechanical jack hammering over known lines unless they are de-energized, locked-out/tagged-out and potential repairs are planned or if the utility has been completely disconnected prior.

Install Pre-Clearance exploratory test holes using one of the techniques, as outlined in Section 3.4, for the first 5-ft below land surface (BLS) at each location before conducting intrusive mechanized activities.

- The size of the pre-clearance exploratory test hole should be, at a minimum, twice the diameter of any downhole tool or boring device. Note: Pre-Clearance exploratory test holes should be defined in the SOW/proposal provided to the client to prevent project delays and to allow adequate time for PM and PP to evaluate alternative approaches for the project. Alternative approaches will need to be pre-approved by the OM.
- For direct push applications (CPT, Geoprobe®, etc.) the borehole clearance diameter shall be at least 125% of the diameter of the largest tool being pushed through the subsurface (e.g., tip, rod, sampler, etc.), to the minimum required depth.
- For excavations, all utilities need to be marked and then exposed by hand following the protocols in this program. Pre-clearing for excavations may be performed by the “moat” technique (i.e., soft Digging around the perimeter). In these cases, dig in small lifts (<12” for first 5 feet) using a dedicated spotter.)

- For Tolerance Zone work, unless otherwise agreed upon with the Utility Operator, work within the tolerance zone requires verification by means of pre-clearance test holes specified in Section 3.4 to expose the utility. Once structures have been verified, a minimum clearance of three feet must be maintained between the utility and any powered equipment. If considered a high risk utility, additional requirements may be necessary and required by the Operator of the utility. Consultation with the OM and CHSD may be appropriate.

The PM, field team lead or personnel performing oversight is to:

- Ensure the mark-out remains valid. (In certain states, there are limits regarding the duration of time after the mark-out was applied to the ground surface work can be started or interrupted.) Additionally, the mark-outs must be maintained, documented, and in many cases, refreshed periodically to be considered valid. This will be accomplished through calls to the one call center.
- Ensure intrusive activities are only performed within the safe boundaries of the mark-out as detailed in the One-Call Report.
- Halt all work if intrusive activities have resulted in the discovery of an unmarked utility. Roux personnel shall notify the facility owner/operator and the one call center. All incidents such as this will be reported as per Roux Incident Investigation and Reporting Management Program.
- Halt all work if intrusive activities must take place outside of the safe boundaries of a mark-out and only proceed after new mark-outs are performed.
- Halt the intrusive activities and immediately consult with the PP if an unmarked utility is encountered.
- Completing any subsurface utility incident reports that are necessary.
- If a utility cannot be found as marked, Roux personnel shall notify the facility owner/operator directly or through the one-call center. Following notification, the excavation/mechanical intrusive work may continue unless otherwise specified in state law.
- Contractors/subcontractors must contact the one-call center to refresh the ticket when the excavation continues past the life of the ticket. State law dictates ticket life; however, at a maximum, ticket life shall not exceed 20 working days.

3.6 Stop Work Authority

Each Roux employee has Stop Work Authority that he or she will execute upon determination of any imminent safety hazard, emergency situation, or other potentially dangerous situation, such as hazardous weather conditions. This Stop Work Authority includes subsurface clearance issues such as the adequacy of a mark-out or identification during intrusive operations of an unexpected underground utility. Authorization to proceed with work will be issued by the PM/PP in consultation with the OHSM after such action is reviewed and resolved. The PM will initiate and execute all management notifications and contact emergency facilities and personnel when this action is appropriate.

Appendix A - Roux Subsurface Utility Clearance Checklist

Roux Subsurface Utility Clearance Checklist ***Date of Revision: 3/2023***

Work site set-up and work execution

ACTIVITY	Yes	No	N/A	COMMENTS INCLUDING JUSTIFICATION IF RESPONSE IS NO OR NOT APPLICABLE
Daily site safety meeting conducted, SPSAs performed, JSAs reviewed, appropriate work permits obtained (if applicable).				
HASP is available and reviewed by site workers / visitors.				
Subsurface Utility Clearance Procedure has been reviewed with all site workers.				
Mechanical intrusive work activities may not be performed at any location without authorization from the Roux Site Supervisor (SS). Clearance activities may not be performed at any location unless the SS is physically present.				
Work area secured; traffic control established as needed. Emergency shut-off switch located. Fire extinguishers / other safety equipment available as needed.				
Utility mark-outs (public / private) clear and visible. Provide Excavator's Stake-Out Reference Number / Request Date / Time.				
Tolerance zone work identified. Intrusive work activities cannot be performed in areas that are in direct conflict with any markings made by public or private locators.				
Unless the PP & OM authorizes it, all boreholes and test pit locations must be physically cleared before using mechanized equipment. Required minimum physical clearance depths and diameters are as follows: • Physically clear to a depth of 5 feet bls. • The size of the pre-clearance exploratory test hole must be, at a minimum, twice the diameter of any downhole tool or boring device. • For direct push applications (CPT, Geoprobe®, etc.) the borehole clearance diameter shall be at least 125% to the diameter of the largest tool being pushed through the subsurface (e.g., tip, rod, sampler, etc.).				
Work execution plan reviewed and adhered to (ground disturbance methods, clearance depths, any special utility protection requirements, or any other execution requirements; especially for Tolerance Zone work).				

Mechanical intrusive work is prohibited within 3-feet distance in all directions from subsurface structures that will be intentionally exposed during pre-clearance. Any removal of material within 3-feet of the subsurface structure may only proceed by hand using non-conductive tools/compressed air if authorized by state law and the owner/operator of the utility.				
All equipment onsite must maintain the appropriate horizontal distance from any point on the equipment to the nearest overhead electrical power line. Refer to site-specific HASP and local/utility company requirements.				
Verbal endorsement received from Roux PM and OM for any required field deviations to work execution plan.				

Key Reminders for Execution

The Subsurface Utility Clearance Protocol should be referenced to determine all requirements while executing subsurface work. The bullet points below are intended as general reminders only and should not be relied upon solely.

- The size of the pre-clearance exploratory test hole must be at a minimum twice the diameter of any downhole tool or boring device.
- For direct push applications (CPT, Geoprobe®, etc.) the borehole clearance diameter shall be at least 125% to the diameter of the largest tool being pushed through the subsurface (e.g., tip, rod, sampler, etc.), to the minimum required depth.
- The tolerance zone is defined as three feet plus half of the diameter or half of the greatest dimension (for elliptical sewers, duct banks, and other non-cylindrical utilities) of a utility and three feet from the outside of any subsurface structure.
- For excavations, all utilities need to be marked and then exposed by hand, following the protocols in this program. Pre-clearing for excavations may be performed by the “moat” technique (i.e., soft digging around the perimeter). In these cases, dig in small lifts (<12” for first five feet) using a dedicated spotter.) For Tolerance Zone work, unless otherwise agreed upon with the Utility Operator, work within the tolerance zone requires verification by means of hand-dug test holes to expose the utility. Once structures have been verified, a minimum clearance of three feet must be maintained between the utility and any powered equipment.

Appendix B - Utility Verification/Site Walkthrough Record

Employee Name:_____

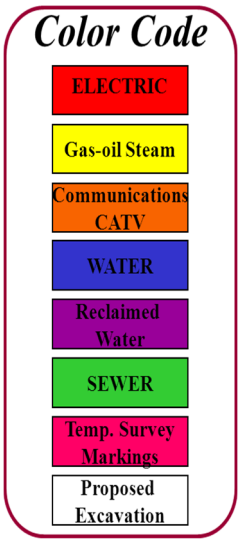
Date: _____

Instructions: For each utility suspected at the job site, indicate the location on the job site, approximate burial depth, and means of detecting the utility. Leave blank if that utility is not believed to be present.

Utility	Description of Utility Location Identified Onsite	Approx. Depth (bls)	Method / Instrumentation used to determine Utility Location	Utility Owner Response (Date/Time)	Mark Out Indicates (Clear / Conflict)
Electrical Lines					
Gas Lines					
Pipelines					
Steam Lines					
Water Lines					
Sanitary and Stormwater Sewer lines					
Pressured Air-Lines					
Tank Vent Lines					
Fiber Optic Lines					
Underground Storage Tanks					
Phone Lines/ Other					

* bls - below land surface

Site Sketch Showing Utilities:



Other Comments / Findings:

Completed by: _____

Signature: _____ Date: _____

Appendix C – Private Utility Technology Applications and Considerations

Technology ⇒ Utility/Object ⇓	Radio Frequency Electro-Magnetic Detector (connection to utility, or induction without connection)	Radio Frequency Electro-Magnetic Detector (passive sweep)	Ground Penetrating Radar (GPR)⊙	Acoustic Plastic Pipe Locator	Beacon, Sonde or Conductive Rodder Insertion	EM-61 (time domain electromagnetics) Ξ	
Power/Instrument Line (Energized/Signaled) □	✱ G	G	G	R	R	G	
Power Line (Non-energized) □	✱ G	R	G	R	R	G	
Sewer/Water Line (Metallic) □	✱ G	Y	G	Y	G	G	
Sewer/Water Line (Non-metallic)	R	R	G	G	✱ G	R	
Instrument / Telecomm Lines (Non-energized)	✱ G	R	G	R	R	Y Only if metallic	
Hydrocarbon Transmission Line (Pipeline)◆ □	✱ G	R	G	R	R	G	
Metallic/Non-Metallic Line (with Tracer Wire)	✱ G	Y	G	Y	Y	G metallic	Y non-metallic
Metallic/Non-Metallic Line (without Tracer Wire)	G metallic	R non-metallic	R	✱ G	Y	Y	G metallic	R non-metallic
Metal or Fiberglass UST	R	R	✱ G	R	R	G metallic	R non-metallic

Additional Considerations

Technology ⇒ Variable ⇓	Radio Frequency Electro-Magnetic Detector	Ground Penetrating Radar (GPR)⊙	Acoustic Pipe Locator	Beacon, Sonde, or Conductive Rodder Insertion	EM-61 Ξ
Moist Soil	G	Y	G	G	G
Dry Soil	Y	G	Y	G	G
Clay	Y	R	G	G	G
Concrete w/Rebar	R	Y	G	G	R
Long Horizontal Profile	G	G	G	G	G
Short Horizontal but Deep Vertical Profile	Y	G	R	R	G
Access to Line✚	G	N/A	G	G	G
No Access to Line✚	G (induction or passive) R (direct connect)	G	R	R	G G
Ferrous Metal	G	G	G	G	G
Non-ferrous Metal	Y	G	G	G	G
Adjacent or crossing conductive utility(ies)	Y	N/A	N/A	N/A	Y

Each site will be unique. Do not use this table as the sole criteria for technology selection. Use it as a starting point to assess available, applicable technology(s).

✱ Indicates best technology for given object. Site structures, rebar in concrete, shallow groundwater tables, perched storm water, etc. can significantly affect performance and reliability of any electro/magnetic method. Other utilities which cross or are adjacent to the target line can cause the EM signal to bleed or jump to the other utility line.

□ Metallic lines that have power running through them or can be connected to a tracer signal generator.

◆ Natural gas pipeline locating technicians must be trained/certified (in the U.S. requires DOT and Office of Pipeline Safety standards, other regions may have similar certification or requirements).

⊙ Most sensitive to interpretation. The skill, training and experience of operator are critical.

Ξ Emerging technology with limited availability.

✚ Access: induce unique electronic signature, apply acoustical impulse or insert conductive rodder/beacon/sonde.

Green Generally, an applicable technology **Yellow** May or may not be applicable **Red** Not generally applicable

APPENDIX G

Heavy Equipment Exclusion Zone Policy

HEAVY EQUIPMENT EXCLUSION ZONE MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY DIRECTOR	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**01/2019**
REVIEWED DATE	:	**03/2023**
REVISION NUMBER	:	**2**

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3. PROCEDURES 1
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1. PURPOSE

The Exclusion Zone Management Program aims to establish the minimum clearance distance that must be maintained between workers and heavy equipment while equipment is in operation (i.e., engaged or moving). The intent is to have no personnel or equipment entering the Exclusion Zone while the equipment is in operation or moving to ensure that Roux and Subcontractor employees are unnecessarily exposed to the hazards of the equipment.

2. SCOPE AND APPLICABILITY

This Management Program applies to all Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C., and Remedial Engineering (collectively, "Roux") employees and their subcontractors performing fieldwork and are potentially exposed to heavy equipment. Heavy equipment includes, but is not necessarily limited to, excavation equipment, drill rigs, vacuum trucks, forklifts, lull telehandlers, man lifts, bobcats, delivery trucks, etc.

3. PROCEDURES

As specified in the following sections of this program, Exclusion Zones must be established and maintained during activities involving the movement/operation of heavy equipment. The Exclusion Zone requirements apply to all personnel on the site but are primarily focused on personnel required to work near the equipment. The exclusion zone is in effect when heavy equipment is moving or engaged (e.g., movement of an arm or bucket of an excavator, rotation of an auger, lifting of a load with a forklift, raising/lowering of a man lift, etc.).

1. The Exclusion Zone must meet the following minimum requirements:
   - A minimum distance of 10 feet from all heavy equipment and loads being moved by the equipment;
   - Greater than the swing/reach radius of any moving part on the heavy equipment (i.e., for large equipment, this may mean an exclusion zone distance larger than 20 feet);
   - Greater than the fall zone of equipment and their contents; and
   - Greater than the tip-over distance of the heavy equipment.

   The size of the Exclusion Zone will need to be determined on a task-specific basis considering the size of the heavy equipment in use and the task being performed. Prior to all heavy equipment operations, the Exclusion Zone(s) distance must be specifically identified in the Job Planning Process and incorporated in the pre-job tailgate meeting with the subcontractor(s), including any updates to our Job Safety Analysis (JSA).
2. The spotter (or another authorized individual) should be responsible for enforcing the Exclusion Zone and not conducting any other task. The spotter should be positioned immediately outside of the Exclusion Zone within a clear line of sight of the equipment operator. The spotter must signal the operator to stop work if anyone or anything has the potential to enter or compromise the Exclusion Zone. The operator should stop work if the spotter is not within their line of sight. If a spotter must be within the Exclusion Zone, they must be in a designated area outside the swing/tip radius, fall zone, line of fire of lifted loads, etc. If multiple pieces of equipment are being used, one spotter may be adequate so long as there is a clear line of sight and the spotter can control the zone(s). Radios would be required since hand signals would not be adequate if two pieces of equipment were running.

3. If an individual must enter the Exclusion Zone, the designated Spotter must signal the Equipment Operator to stop the equipment. Once the equipment is no longer moving (e.g., movement of an arm of an excavator is STOPPED, lifting of a load with a forklift STOPPED, raising/lowering of a man lift is STOPPED, etc.), the operator must bring the boom/arm to the ground ensuring a “Zero Energy State” and DISENGAGE THE CONTROLS and STOP and SIGNAL BY “SHOWING HIS HANDS.” This signal will indicate that it is safe for the person to enter the limits of the Exclusion Zone to perform the required activity. The equipment must remain completely stopped/disengaged until all personnel exited the Exclusion Zone's boundaries and the designated Spotter has signaled by “SHOWING HIS HANDS” to the Equipment Operator that it is safe to resume operations.
4. When entering the limits of the Exclusion Zone, personnel must, at a minimum:
    - Establish eye contact with the operator and approach the heavy equipment in a manner that is in direct line of sight to the Equipment Operator;
    - Never walk under any suspended loads or raised booms/arms of the heavy equipment; and
    - Identify a travel path free of Slip/Trip/Fall hazards.
5. The Exclusion Zone should be delineated using cones with orange snow fences or solid poles between the cones, barrels, tape, or other measures. For work in rights-of-way, rigid barriers, such as Jersey barriers or temporary chain link fences, should be used. For certain types of widespread or moving/mobile equipment operations, such delineation may not be practicable around equipment or individual work areas. In such instances, it is expected that the entire operation will be within a larger secure work area or that additional means will be utilized to ensure the security of the work zone.

All subcontractors who provide heavy equipment operations to field projects must implement a program that meets or exceeds the expectations described above as well as any additional requirements that may be required on a client or site-specific basis. Logistics involving heavy equipment should be understood and discussed prior to the field event during the job planning phase.

3.1 Exceptions

It is recognized that certain heavy equipment activities may require personnel to work within the limits of the Exclusion Zone as specified in this program. Such activities may include certain excavation clearance tasks, drill crew activities, or construction tasks. However, any such activity must be pre-planned, emphasizing limiting the amount and potential exposure of any activity required within the zone. The critical safety steps to mitigate the hazards associated with working within the Exclusion Zone must be defined in the JSA and potentially other project-specific plans (i.e., critical lift plans, etc.), and approved by the Roux Project Principal (PP), Office Health and Safety Manager (OHSM) and client representative, if required, prior to implementation.

4. TRAINING

Many Roux projects have different requirements that are client-specific or site-specific in nature. However, all Roux employees are provided initial training, as well as annually thereafter, on our Heavy Equipment Exclusion zone policy.

5. STOP WORK AUTHORITY

All Roux employees and their subcontractors have stop-work authority. Upon initial hire, all Roux employees are provided initial safety orientation, including stop work authority. All Roux employees and subcontractors are encouraged to stop work whenever any task or operation presents unreasonable risk or employees are

unsure how to carry out work safely. This includes upon observing any questionable safety-related behavior or condition, they are to stop work immediately and discuss the behavior or condition with the individual(s) involved. Upon stopping work, the following actions will be taken:

- Notify the affected parties to include the Project Manager (PM) and Site Health and Safety Officer (SHSO);
- Work to correct the situation or not proceed until the situation is corrected by the PM or SHSO;
- Resume work only when told to proceed by either the PM or SHSO;
- The SHSO will document the Stop-Work intervention in the field logbook;
- Stop-Work interventions will be reported to the PP for review to ensure the interventions are closed; and
- The PP will share learnings from the interventions, as appropriate, throughout the firm, to demonstrate the importance of the Stop-Work interventions.

Please note: Any form of retribution or intimidation directed at any individual or company for exercising their right to issue a stop work authority will not be tolerated.

APPENDIX J

Community Air Monitoring Plan

Revised Community Air Monitoring Plan

73-99 Empire Boulevard
73-99 Empire Boulevard
Brooklyn, New York 11225
Tax Block 1306 Lot 28
NYSDEC Site #C224343

May 28, 2026

Prepared for:

Empire McKeever Heights LLC
505 Flushing Avenue
Brooklyn, New York 11205

Prepared by:

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   1.4 Available Suppression Techniques 3
   1.5 Reporting 3

Table

1. Action Limit Summary for VOCs and Particulates

Appendix

A. NYSDOH Generic Community Air Monitoring Plan and Special Requirements for Work within 20 Feet of Potentially Exposed Individuals or Structures

B. Action Limit Report

1. Introduction

Roux Environmental Engineering and Geology, D.P.C. (Roux) on behalf Empire McKeever Heights LLC (the "Volunteer"), have developed a project specific Community Air Monitoring Plan (CAMP) to implement real time monitoring at the Site, which occupies Tax Lot 28 of Tax Block 1306, during remedial construction activities.

The monitoring program will be implemented at all times during which earth disturbance activities are occurring. The CAMP is designed to provide a measure of protection for the downwind community and on-Site workers not directly involved with the subject work activities from potential airborne contaminant releases as a direct result of the remedial activities. This plan is consistent with the New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan (included as Appendix A), which is included as Appendix 1A of the New York State Department of Environmental Conservation (NYSDEC) "DER-10 Technical Guidance for Site Investigation and Remediation (DER-10)," dated May 3, 2010.

The specifics of the CAMP are presented in the following four (4) sections:

- 1.1 VOC Monitoring Approach
- 1.2 Particulate Monitoring Approach
- 1.3 Meteorological Monitoring Approach
- 1.4 Available Suppression Techniques

1.1 VOC Monitoring Approach

Total VOC concentrations in air will be monitored continuously at a location downwind of the remedial activities during all ground intrusive activities. An upwind monitoring station will be set up adjacent to where remedial activities are occurring. The VOC monitoring equipment will be located at temporary monitoring stations that will be established daily based on Site logistics and weather conditions. One fixed monitoring station may be deployed to be located adjacent to any sensitive receptor in accordance with the Special requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures (see Appendix A).

The monitoring work will be conducted using MiniRAE 3000 (or equivalent) portable VOC monitors, or similar type monitors, for all VOC monitoring. The equipment will be calibrated at least once daily using isobutylene as the calibration gas. One (1) upwind, one (1) downwind monitor and one fixed monitor will be deployed each day. Each monitoring unit is equipped with an audible alarm to indicate exceedance of the action levels (as defined below and summarized in Table 1).

The equipment is capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total VOCs at the downwind perimeter of the Site exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If the ambient air concentration of total VOCs at the downwind perimeter of the Site persists at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of VOCs identified, suppression techniques employed to abate emissions, and monitoring continued. After these steps, work activities can resume if the total organic vapor level at the Site perimeter is below 5 ppm over the background concentration for the 15-minute average. If levels are in excess

of 25 ppm above background, identified contributing ground-intrusive activities will be halted and vapor suppression techniques will be evaluated and modified until monitoring indicates VOC levels at the Site perimeter are below 5 ppm over background. Once VOC levels are below 5 ppm at the Site perimeter, work will resume with continued monitoring.

- If the 15-minute average of total VOCs concentrations at the fixed location station exceeds 1 ppm above background levels, work activities must be halted within the relevant work area, the source of vapors identified, corrective actions implemented to abate emissions, and monitoring continued.
- All 15-minute readings will be recorded and be available for State Regulator (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will be recorded. If an exceedance of the action level occurs, an Action Limit Report (ALR) will be completed, identifying the monitoring device location, the measured VOC level, the activity causing the exceedance, meteorological conditions, and the corrective actions taken, as provided in Appendix B. Additionally, the NYSDEC and NYSDOH will be notified within 24 hours of the VOC ALR generation. Daily monitoring equipment locations and meteorological conditions will also be documented on the daily CAMP Monitoring Location Plan. All documentation will be kept on file at the Site.

1.2 Particulate Monitoring, Response Levels and Actions

Particulate concentrations will be monitored continuously at temporary particulate monitoring stations set up at upwind, downwind and fixed locations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action levels (as defined below and summarized in Table 1). Monitoring equipment will be MIE Data Ram monitors or equivalent. A minimum of one (1) upwind, one (1) downwind and one fixed monitor will be deployed each day, equipped with an omni-directional sampling inlet and a PM-10 sample head. The data logging averaging period will be set to 15-minutes with time and date stamp recording. Alarm averaging will be set at 90 micrograms per cubic meter ($\mu g/m^3$) per 15-minute period. This setting will allow proactive evaluation of Site conditions prior to reaching Action Levels of 100 $\mu g/m^3$ above background. The equipment will be outfitted with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. The monitoring will be used to compare values to the following:

- If the downwind PM-10 particulate level is 100 µg/m3 greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the Site, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 µg/m3 above the upwind level and provided that no visible dust is migrating from the Site.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 µg/m3 above the upwind level, work must be stopped, a re-evaluation of activities initiated, and dust suppression techniques modified. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 µg/m3 of the upwind level and in preventing visible dust migration.
- If the 15-minute average of total particulate concentrations at the fixed location station exceeds 150 µg/m3 above background levels, work activities will be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 µg/m3 or less above background levels.

All 15-minute readings will be recorded and be available for State Regulator (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will be recorded. If an exceedance of the action level occurs, an ALR will be completed, identifying the monitoring device location, the measured particulate concentration, the activity causing the exceedance, meteorological conditions, and the

corrective actions taken, as provided in Appendix B. Daily monitoring equipment locations will also be documented on the daily CAMP Monitoring Location Plan. All documentation will be kept on file at the Site.

1.3 Meteorological Monitoring

Wind speed (estimated) and wind direction, will be approximated based on field observations of onsite personnel. Meteorological data consisting of temperature, barometric pressure, and relative humidity will be recorded in the field book based upon publically available information from local weather stations.

1.4 Available Suppression Techniques

Odor Control

Due to the nature of the project, with intrusive activities occurring, the potential for generation of nuisance odors and the need for odor control may be necessary. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project.

All necessary means will be employed to prevent on- and off-Site nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) use of chemical odorants in spray or misting systems; and, (e) use of staff to monitor odors in surrounding neighborhoods.

Dust Control

Due to the nature of the project, the potential for generation of nuisance dust and the need for dust control may be necessary. Dust suppression will be achieved through the use of water for wetting excavation areas, if required. Water will be available on-site at suitable supply and pressure for use in dust control.

1.5 Reporting

All recorded monitoring data will be downloaded, and field logged periodically, including action limit reports (if any) and daily CAMP monitoring location plans. All records will be maintained onsite and available for NYSDEC/NYSDOH review. A summary of CAMP findings, including excursions, will be provided in the Daily Reports. All CAMP monitoring records will be included in the overall Final Engineering Report that will be submitted to the NYSDEC and NYSDOH and will include all of the CAMP data collected, daily monitoring station location maps, and copies of the ALRs (if any). If an ALR is generated due to VOC exceedances, the NYSDEC and NYSDOH will be notified within 24 hours of the exceedance.

TABLE

Action Limit Summary for VOCs and Particulates

Table 1. Action Limit Summary for VOCs and Particulates, 73-99 Empire Boulevard, Brooklyn, NY

Contaminant	Downwind Action Levels*	Action/Response
Volatile Organic Compounds (VOCs) (Monitoring Via Photoionization Detector and Odor Observation)	< 5 ppm	1. Resume work with continuing monitoring.
	5 ppm < level < 25 ppm	1. Work activities must be temporarily halted, source vapors must be identified, suppression techniques employed to abate emissions and monitoring continued. 2. After these steps, if VOC levels (200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or structure, whichever is less) is below 5 ppm over background, resume work.
	> 25 ppm	1. Identified contributing ground intrusive activities must be halted and vapor suppression techniques must be evaluated and modified until monitoring indicates VOC levels below the action level. 2. After these steps, if VOC levels (half the distance to the nearest potential receptor or structure) are below 5 ppm over background, resume work.
Particulates (Monitoring Via Particulate Meter and Observation)	< 100 ug/m^3	1. If dust is observed leaving the work area, then dust control techniques must be implemented or additional controls used.
	100 ug/m3 < level < 150 ug/m^3	1. Employ dust suppression techniques. 2. Work may continue with dust suppression techniques provided that downwind PM-10 particulate concentration do not exceed 150 ug/m^3 above the upwind level and provided that no visible dust is migrating from the work area.
	> 150 ug/m^3	1. STOP work 2. Re-evaluate activities, modify dust suppression techniques. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 ug/m^3 of the upwind level and in preventing visible dust migration.

* Instantaneous readings above background. Particulate readings are based on the respirable (PM-10) fraction. Background readings are taken at upwind locations relative to Work Areas or Exclusion Zones.

APPENDIX A

NYSDOH Generic Community Air Monitoring Plan and Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative - pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m_3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m_3 or less at the monitoring point.

- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

Special Requirements for Indoor Work with Co-Located Residences or Facilities
Unless a self -contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under “Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures” except that in this instance “nearby/occupied structures” would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.

APPENDIX B

Action Limit Report

ACTION LIMIT REPORT

Project Location: 73-99 Empire Boulevard, Brooklyn, New York
Tax Block 1306 Lot 28

Date: _____ Time: _____

Name: _____

Contaminant: PM-10: _____ VOC: _____

Wind Speed: _____ Wind Direction: _____

Temperature: _____ Barometric Pressure: _____

DOWNWIND DATA

Monitor ID #: _____ Location: _____ Level Reported: _____

Monitor ID#: _____ Location: _____ Level Reported: _____

UPWIND DATA

Monitor ID #: _____ Location: _____ Level Reported: _____

Monitor ID#: _____ Location: _____ Level Reported: _____

BACKGROUND CORRECTED LEVELS

Monitor ID #: _____ Location: _____ Level Reported: _____

Monitor ID#: _____ Location: _____ Level Reported: _____

ACTIVITY DESCRIPTION

CORRECTIVE ACTION TAKEN

APPENDIX K

Quality Assurance Project Plan/ Field Sampling Plan

Quality Assurance Project Plan/ Field Sampling Plan

73-99 Empire Boulevard
73-99 Empire Boulevard
Brooklyn, New York 11225
Tax Block 1306 Lot 28
NYSDEC Site #C224343

December 18, 2025

Prepared for:

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1. Introduction

Roux Environmental Engineering and Geology, D.P.C. (Roux), on behalf of Empire McKeever Heights LLC (the "Volunteer"), has prepared this Quality Assurance Project Plan/Field Sampling Plan (QAPP/FSP) to describe the measures that will be taken to ensure that the data generated during performance of the Remedial Action (RA) at the 73-99 Empire Boulevard Site, located at 73-99 Empire Boulevard, Brooklyn, New York are of quality sufficient to meet project-specific data quality objectives (DQOs). This QAPP/FSP also includes field sampling procedures.

This QAPP/FSP was prepared in accordance with the guidance provided in NYSDEC Technical Guidance DER-10 Technical Guidance for Site Investigation and Remediation (DER-10), the NYSDEC BCP Guide, and the United States Environmental Protection Agency's (USEPA's) Guidance for the Data Quality Objectives Process (EPA QA/G 4).

1.1 Purpose

The QAPP/FSP describes in detail the field sampling and quality assurance/quality control (QA/QC) methods to be used during soil sampling tasks performed during the RA.

This QAPP/FSP provides guidelines and procedures to be followed by field personnel during performance of sampling during the RA. Information contained in this QAPP/FSP relates to:

- sampling objectives (Section 2);
- project organization (Section 3);
- sample media, sampling locations, analytical suites, sampling frequencies and analytical laboratory (Section 4);
- field sampling procedures (Section 5);
- sample handling, sample analysis, and quality assurance/quality control (Section 6); and
- site control procedures and decontamination (Section 7).

2. Sampling Objectives

The sampling program is designed to meet the data quality objectives (DQOs) set forth in the DER-10. Specifically, analytical parameters selected for each sample, as described in Section 4, are comprehensive, and are intended to meet the following objectives:

- Analyze confirmation bottom samples; and
- Analyze confirmation sidewall samples.

Sampling procedures are discussed in Section 5 of this QAPP/FSP. A discussion of the DQOs and quality assurance/quality control is provided in Section 6.

3. Project Organization

A general and generic summary of the overall management structure and responsibilities of project team members are presented below. Professional profiles for the team are provided in Attachment 1.

Project Principal

Charles J. McGuckin, P.E. will serve as Project Principal. The Project Principal is responsible for defining project objectives and bears ultimate responsibility for the successful completion of the remediation.

Remedial Engineer

The Remedial Engineer for this project will be Charles J. McGuckin, P.E. The Remedial Engineer is a registered professional engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the RA and future remedial program for the Site. The Remedial Engineer will certify in the Final Engineering Report (FER) that the remediation activities were observed by qualified environmental professionals under her supervision as well as any other relevant provisions of ECL 27-1419 have been achieved in full conformance with the RA.

Project Manager

Wendy Shen of Roux will serve as Project Manager. The Project Manager will provide overall management for the implementation of the scope of work and will coordinate all field activities. The Project Manager is also responsible for data review/interpretation and report preparation.

Field Team Leader

The Field Team Leader will be determined prior to the start of work. The Field Team Leader bears the responsibility for the successful execution of the field program. The Field Team Leader will direct the activities of the technical staff in the field, as well as all subcontractors. The Field Team Leader will also assist in the interpretation of data and in report preparation. The Field Team Leader reports to the Project Manager.

Laboratory Project Manager

Laboratory analysis will be completed by Alpha Analytical Laboratories of Westborough, MA and Mansfield, MA, NYSDOH Environmental Laboratory Accreditation Program (ELAP)-certified laboratories (11148 and 11627, respectively). The Laboratory Project Manager is Jennifer Byrnes. The Laboratory Project Manager is responsible for sample container preparation, sample custody in the laboratory, and completion of the required analysis through oversight of the laboratory staff. The Laboratory Project Manager will ensure that QA procedures are followed and that an acceptable laboratory report is prepared and submitted. The Laboratory Project Manager reports to the Project Principal and Project Manager.

Quality Assurance Officer

David Kaiser, P.E. of Roux will serve as the Quality Assurance Officer (QAO) for this project. The QAO is responsible for conducting reviews, inspections, and audits to ensure that the data collection is conducted in accordance with the FSP and QAPP. The QAO's responsibilities range from ensuring effective field equipment decontamination procedures and proper sample collection to the review of all laboratory analytical data for completeness and usefulness. The QAO reports to the Project Manager and makes independent recommendations to the Field Team Leader.

4. Sample Media, Locations, Analytical Suites, and Frequency

The media to be sampled during the remedial action include soil and fill materials. Sampling locations, analytical suites, and frequency is provided below and shown in Tables 1 and 2. Specifics regarding the collection of samples at each location and for each task are provided in Section 5 of this QAPP/FSP.

4.1 Endpoint Soil Sampling

The documentation samples for the remedial action are described in the RAWP and include the proposed samples to be collection during the remedial construction. The proposed samples to be collected are described below.

Bottom Confirmation Sampling

Bottom confirmation sampling will be conducted at a frequency of one sample per approximately 900 square feet of excavation area. The frequency of bottom sampling proposed for this alternative per the guidance provided in NYSDEC DER-10 5.4. Confirmation samples will be collected following completion of onsite excavation for remedial and redevelopment purposes in order to confirm the remaining onsite soil quality. Confirmation samples will be analyzed for the full suite of parameters (VOCs, SVOCs, metals, pesticides, PCBs, and ECs). Locations of endpoint samples for Remedial Alternative 1 are shown in Figure 11 of the RAWP.

Sidewall Confirmation Sampling

As part of the remedial action, sidewall confirmation endpoint samples will be collected to properly confirm the remaining sidewall soil quality. Sidewall samples will be collected at a frequency of one sidewall sample per 30 linear feet. The frequency of sidewall sampling proposed for this alternative is consistent with the guidance provided in NYSDEC DER-10 5.4. Locations of endpoint samples for Remedial Alternative 1 are shown in Figure 11 of the RAWP.

A total of 42 bottom confirmation samples (BCS) and 11 sidewall confirmation samples (SCS), will be collected at the Site within the Track 1 area. Samples will be distributed throughout the Site, in a grid-like fashion, and will be biased toward impacts, if any are observed.

The bottom and sidewall confirmation samples will be tested for the Part 375 list of parameters including:

- Part 375 VOC;
- Part 375 Base neutral acids (BNA)/SVOCs;
- Part 375 Pesticides;
- Part 375 PCBs;
- Part 375 Metals (including hexavalent chromium);
- Total Cyanide; and
- Emerging Contaminants *

*Emerging Contaminants (ECs) list includes 1,4-Dioxane and the 40 Per- and Polyfluoroalkyl Substances (PFAS) which include the 40 compounds listed in the most recent April 2023 NYSDEC guidance Sampling, Analysis, and Assessment of Per-and Polufluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs (NYSDEC April 2023 Guidance) is included as an attachment to this QAPP/FSP. PFAS in soil will be analyzed via USEPA EPA Method 1633A.

1,4-Dioxane in soil will be analyzed by USEPA EPA Method 8270D. Soil samples placed on hold at the laboratory will not be analyzed for PFAS. The 40 PFAS are:

- Perfluorobutanesulfonic acid
- Perfluoropentansulfonic acid
- Perfluorohexanesulfonic acid
- Perfluoroheptanesulfonic acid
- Perfluorooctanesulfonic acid
- Perfluorononanesulfonic acid
- Perfluorodecanesulfonic acid
- Perfluorododecanesulfonic acid
- Perfluorobutanoics acid
- Perfluoropentanoic acid
- Perfluorohexanoic acid
- Perfluoroheptanoic acid
- Perfluorooctanoic acid
- Perfluorononanoic acid
- Perfluorodecanoic acid
- Perfluoroundecanoic acid
- Perfluorododecanoic acid
- Perfluorotridecanoic acid
- Perfluorotetradecanoic acid
- 1H,1H, 2H, 2H-Perfluorohexane sulfonic acid
- 1H,1H, 2H, 2H-Perfluorooctane sulfonic acid
- 1H,1H, 2H, 2H-Perfluorodecane sulfonic acid
- Perfluroroctanesulfonamide
- N-methyl perfluorooctanesulfonamide
- N-ethyl perfluorooctanesulfonamide
- N-methyl perfluorooctanesulfonamidoacetic acid
- N-ethyl perfluorooctanesulfonamidoacetic acid
- N-methyl perfluorooctanesulfonamidoethanol
- N-ethyl perfluorooctanesulfonamidoethanol
- Hexafluoropropylene oxide dimer acid
- 4,8-Dioxa-3H-perfluorononanoic acid
- Perfluoro-3-methoxypropanoic acid
- Perfluoro-4-methoxybutanoic acid
- Nonafluoro-3,6-dioxaheptanoic acid
- 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
- 11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
- Perfluoro(2-ethoxyethane)sulfonic acid
- 3-Perfluoropropyl propanoic acid
- 2H,2H,3H,3H-Perfluorooctanoic acid
- 3-Perfluoroheptyl propanoic acid

All PFAS compounds, listed above, in soil will be analyzed and reported to 0.5 microgram per kilogram (ug/kg). 1,4-Dioxane will be analyzed and reported to 0.1 milligram per kilogram (mg/kg).

4.2 Offsite Backfill/On-Site Reuse Soil Sampling

Although not planned, onsite soil may be reused for backfill. For offsite fill/on-Site reuse soil materials requiring chemical testing, the following samples shall be collected:

- One sample for pre-qualification chemical testing at the source location, including the following:
  1. Chemical testing shall be performed at a minimum for the parameters listed in Table 375-6.8(a) of the latest revision of Part 375. Samples will be analyzed for the same parameters and by the same methods listed in Section 4.1.
  2. Backfill/on-Site reuse soil materials excluding those materials that do not require sampling as described below, shall meet criteria presented in Section 2.0.
  3. Backfill/on-Site reuse soil materials that exceed the criteria presented in Section 2.0 shall not be imported to the Site without prior approval of the NYSDEC.
  4. The backfill/on-Site reuse soil material will be free of extraneous debris or solid waste.
  5. If the NYSDEC agrees that the material originated from a virgin source, then a minimum of one sample (i.e., the pre-qualification sample) will be collected and analyzed per source.

- If the source is not virgin, the sampling frequency will comply with DER-10 Table 5.4(e)10 shown below:

Table 5.4(e)10 Recommended Number of Soil Samples for Soil Imported To or Exported From a Site			
Contaminant	**VOCs**	**SVOCs, Inorganics & PCBs/Pesticides**	
Soil Quantity (cubic yards)	**Discrete Samples**	**Composite**	**Discrete Samples/Composite**
0-50	1	1	3-5 discrete samples from different locations in the fill being provided will comprise a composite sample for analysis
50-100	2	1	
100-200	3	1	
200-300	4	1	
300-400	4	2	
400-500	5	2	
500-800	6	2	
800-1000	7	2	
➢ 1000	Add an additional 2 VOC and 1 composite for each additional 1000 Cubic yards or consult with DER		

The source of the offsite fill/on-Site reuse soil must be documented by the supplier, including the location where the fill/on-Site reuse soil was obtained and a brief history of the site that is the source of the fill.

Samples of offsite backfill/on-Site reuse soil will be analyzed for the same list of parameters in Section 4.1.

All PFAS compounds, listed above, in soil will be analyzed and reported to 0.5 ug/kg. 1,4-Dioxane will be analyzed and reported to 0.1 mg/kg.

The following materials may be imported, without chemical testing, to be used as backfill beneath pavement, buildings or as part of the site cover, provided that it contains less than 10 percent by weight material that would pass through a size 80 sieve and consists of:

- gravel, rock or stone, consisting of virgin material from a permitted mine or quarry; or
- recycled concrete or brick from a NYSDEC registered construction and demolition debris processing facility if the material conforms to the requirements of Section 304 of the 2002 New York State Department of Transportation Standard Construction and Materials Volume 1.

5. Field Sampling Procedures

This section provides a detailed discussion of the field procedures to be used during sampling of the various media being evaluated as part of the RA implementation (i.e., soil and fill material). As discussed, the sample locations are shown on Figure 11 and additional information including intervals to be sampled and sample rationale is provided in the RAWP. Additional details regarding sampling procedures and protocols are described in Roux's relevant Standard Operating Procedures (SOPs), which are provided in Attachment 2.

5.1 Soil Sampling

Details for the collection of soil samples is provided below. Additional necessary precautions will be taken when sampling for ECs in the field, incuding but not limited to:

- Using the proper field clothing or personal protective equipment (i.e., no materials will contain Gore-Tex or Tyvek);
- Avoid sampling equipment components/containers making contact with aluminum foil, low density polyethylene (LDPE), glass, or polytetrafluoroethylene materials;
- Following PFAS field sampling guidelines (i.e., using sampling materials made from high density polyethylene [HDPE], silicon, or stainless steel and avoid using equipment containing Teflon and using sharpies, permanent markers, adhesives, and waterproof/plastic clipboards and notebooks); and
- Utilizing regular ice cubes for sample presevation and only Alconox for decontamination.

5.1.1 Bottom and Sidewall Confirmation Sampling

Bottom and sidewall confirmation soil samples will be collected from the intervals summarizedin Table 20 of the RAWP. The soil will be observed for lithology and evidence of contamination (e.g., staining, odors, and/or visible free product) and placed immediately thereafter into large Ziploc® bags for recording headspace using a PID. After a minimum of 15 minutes for equilibration with the headspace in the Ziploc® bag, each sample will be screened for organic vapors using a PID equipped with a 10.6 eV lamp. Samples for possible VOC analysis will be placed in a laboratory-supplied jar or encore sampler prior to screening, due to the potential for loss of VOCs through volatilization. These samples will be placed in the laboratory-supplied containers and shipped to the laboratory under chain of custody procedures in accordance with Roux's SOPs in Attachment 2.

5.2 Offsite Backfill/On-Site Reuse Soil Sampling

Although not planned, onsite soil may be reused for backfill. All imported fill/on-Site reuse soil material samples will be collected using pre-cleaned stainless steel sampling tools (i.e., trowels, spatulas, etc.) or new Ziploc® bags. In general, where composite samples are required for offsite fill/on-Site reuse soil material samples, composite samples will be collected from a minimum of three locations across the stockpiled materials. The exception is for VOC samples, which will be collected as grab samples.

6. Sample Handling and Analysis

To ensure quality data acquisition and collection of representative samples, there are selective procedures to minimize sample degradation or contamination. These include procedures for preservation of the samples, as well as sample packaging, shipping procedures, and QA/QC.

6.1 Field Sample Handling

A discussion of the proposed number and types of samples to be collected during each task, as well as the analyses to be performed, can be found in Section 4 of this QAPP/FSP. The types of containers, volumes, and preservation techniques for the aforementioned testing parameters are presented in Table 3.

6.2 Sample Custody Documentation

The purpose of documenting sample custody is to ensure that the integrity and handling of the samples is not subject to question. Sample custody will be maintained from the point of sampling through the analysis (and return of unused sample portion, if applicable).

Each individual collecting samples is personally responsible for the care and custody of the samples. All sample labels should be pre-printed or filled out using waterproof ink. The technical staff will review all field activities with the Field Team Leader to determine whether proper custody procedures were followed during the field work and to decide if additional samples are required.

All samples being shipped offsite for analysis must be accompanied by a properly completed chain of custody form. The sample numbers will be listed on the chain of custody form. When transferring the possession of samples, individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents transfer of custody of samples from the sampler to another person, to/from a secure storage area, and to the laboratory.

Samples will be packaged for shipment and dispatched to the appropriate laboratory for analysis with a separate signed custody record enclosed in each sample box or cooler. Shipping containers will be locked and/or secured with strapping tape in at least two locations for shipment to the laboratory.

6.3 Sample Shipment

If sample shipment is necessary, sample packaging and shipping procedures are based upon USEPA specifications, as well as DOT regulations. The procedures vary according to potential sample analytes, concentration, and matrix and are designed to provide optimum protection for the samples and the public. Sample packaging and shipment must be performed using the general outline described below.

All samples will be shipped within 24 hours of collection and will be preserved appropriately from the time of sample collection. A description of the sample packing and shipping procedures is presented below:

1. Prepare cooler(s) for shipment:
    - tape drain(s) of cooler shut;
    - affix “This Side Up” arrow labels and “Fragile” labels on each cooler; and
    - place mailing label with laboratory address on top of cooler(s).
2. Arrange sample containers in groups by sample number.

3. Ensure that all bottle labels are completed correctly. Place clear tape over bottle labels to prevent moisture accumulation from causing the label to peel off.
4. Arrange containers in front of assigned coolers.
5. Place packaging material approximately at the bottom of the cooler to act as a cushion for the sample containers.
6. Arrange containers in the cooler so that they are not in contact with the cooler or other samples.
7. Fill remaining spaces with packaging material.
8. Ensure all containers are firmly packed in packaging material.
9. If ice is required to preserve the samples, ice cubes should be repackaged in Ziploc® bags and placed on top of the packaging material.
10. Sign chain of custody form (or obtain signature) and indicate the time and date it was relinquished to courier as appropriate.
11. Separate chain of custody forms. Seal proper copies within a large Ziploc® bag and tape to inside cover of cooler. Retain copies of all forms.
12. Close lid and latch.
13. Secure each cooler using custody seals.
14. Tape cooler shut on both ends.
15. Relinquish to overnight delivery service as appropriate. Retain air bill receipt for project records. (Note: All samples will be shipped for "NEXT A.M." delivery).

6.4 Quality Assurance/Quality Control

David Kaiser, P.E. will review the analytical data for quality assurance and quality control in accordance with NYSDEC standards. The professional profile for David Kaiser is provided in Attachment 1. A laboratory SOP for analysis of PFAS is included in Attachment 2.

The primary intended use for the Remedial Action data is to confirm if remediation has been performed in accordance with the RAWP at the Site. The primary DQO of the soil program, therefore, is that data be accurate and precise, thus, representative of the actual Site conditions. Accuracy refers to the ability of the laboratory to obtain a true value (i.e., compared to a standard) and is assessed through the use of laboratory quality control (QC) samples, including laboratory control samples and matrix spike samples, as well as through the use of surrogates, which are compounds not typically found in the environment that are injected into the samples prior to analysis. Precision refers to the ability to replicate a value and is assessed through both field and laboratory duplicate samples.

Sensitivity is also a critical issue in generating representative data. Laboratory equipment must be of sufficient sensitivity to detect target compounds and analytes at levels below NYSDEC standards and guidelines whenever possible. Equipment sensitivity can be decreased by field or laboratory contamination of samples, and by sample matrix effects. Assessment of instrument sensitivity is performed through the analysis of reagent blanks, near-detection-limit standards, and response factors. Potential field and/or laboratory contamination is assessed through use of trip blanks, method blanks, and equipment rinse blanks (also called "field blanks"). Field blanks for PFAS will be collected at a minimum frequency of one per day.

Table 1 lists the requirements for field and laboratory QC samples that will be analyzed to assess data accuracy and precision, as well as to determine if equipment sensitivity has been compromised. Table 2 lists the number/type of field and QA/QC samples that will be collected during the Remedial Action. Table 3 lists the preservation, holding times and sample container information.

All RAWP "assessment" analyses (i.e., Part 375, ECs) will be performed in accordance with the NYSDEC Analytical Services Protocol (ASP), using USEPA SW 846 methods.

All laboratory data are to be reported in NYSDEC ASP Category B deliverables and will be delivered to NYSDEC in electronic data deliverable (EDD) format as described on NYSDEC's website (http://www.dec.ny.gov/chemical/62440.html) and recent updated procedures enacted in November 2018. A Data Usability Report will be prepared meeting the requirements in Section 2.2(a)1.ii and Appendix 2B of DER-10 for all data packages generated for the SRI. The DUSR will be prepared by James Hauri, a independent data validator. Validator resume is included in Attachment 1.

7. Site Control Procedures

Site control procedures, including decontamination and waste handling and disposal, are discussed below. Site control procedures have been developed to minimize both the risk of exposure to contamination and the spread of contamination during field activities at the Site. All personnel who come into designated work areas, including contractors and observers, will be required to adhere strictly to the conditions imposed herein and to the provisions of a Site-Specific Health and Safety Plan (HASP). The HASP is included as Appendix I to the RAWP.

7.1 Decontamination

In an attempt to avoid the spread of contamination, all drilling and sampling equipment must be decontaminated at a reasonable frequency in a properly designed and located decontamination area. Detailed procedures for the decontamination of field and sampling equipment are included in Roux's SOPs for the Decontamination of Field Equipment located in Attachment 2. The location of the decontamination area will be determined prior to the start of field operations. The decontamination area will be constructed to ensure that all wash water generated during decontamination can be collected and containerized for proper disposal.

Only "PFAS-free" water will be used for decontamination of sample equipment onsite. Only Alconox will be used as decontamination detergent (Liquinox shall not be used).

7.2 Waste Handling and Disposal

All waste materials (drill cuttings, decontamination water, etc.) generated during sampling will be consolidated, and stored in appropriate labeled bulk containers (drums, etc.), and temporarily staged at an investigation derived waste storage area on-site. Roux will then coordinate waste characterization and disposal by appropriate means.

TABLES

1. Field and Laboratory QC Summary
2. Remedial Action Sampling Summary
3. Preservation, Holding Times, and Sample Containers

Table 1. Field and Laboratory QC Summary

QC Check Type	Minimum Frequency	Use
Field QC		
Duplicate	1 per matrix per 20 samples or SDG*	Precision
Trip Blank	1 per VOC cooler	Sensitivity
Field Blank (non-PFAS)	1 per matrix per 20 samples	Sensitivity
Field Blank (PFAS)	1 per matrix per day	Sensitivity
Laboratory QC		
Laboratory Control Sample	1 per matrix per SDG	Accuracy
Matrix Spike/Matrix Spike Duplicate/Matrix Duplicate**	1 per matrix per SDG	Accuracy/Precision
Surrogate Spike	All organics samples	Accuracy
Laboratory Duplicate	1 per matrix per SDG	Precision
Method Blank	1 per matrix per SDG	Sensitivity

Notes:

* SDG - Sample Delivery Group - Assumes a single extraction or preparation

** Provided to lab by field sampling personnel

PFAS - Per- and Polyfluoroalkyl Substances

Table 2. Remedial Action Sampling Summary

Sample Medium	Target Analytes	Field Samples	Replicates[1]	Trip Blanks[2]	Field Blanks[1]	Matrix Spikes[1]	Spike Duplicates[1]	Total No. of Samples
Bottom Confirmation Soil Samples	Part 375 VOCs	42	3	15	3	3	3	69
	Part 375 SVOCs	42	3	0	3	3	3	54
	Part 375 Pesticides	42	3	0	3	3	3	54
	Part 375 PCBs	42	3	0	3	3	3	54
	TAL Metals	42	3	0	3	3	3	54
	PFAS, 1,4 dioxane	42	3	0	15	3	3	66
Sidewall Confirmation Soil Samples	Part 375 VOCs	11	2	5	2	1	1	22
	Part 375 SVOCs	11	2	0	2	1	1	17
	Part 375 Pesticides	11	2	0	2	1	1	17
	Part 375 PCBs	11	2	0	2	1	1	17
	TAL Metals	11	2	0	2	1	1	17
	PFAS, 1,4 dioxane	11	2	0	5	1	1	20

Totals are estimated based on scope of work as written, actual sample quantities may vary based on field conditions. QA/QC sample quantities will be adjusted accordingly.

[1] Based on 1 per day for PFAS or 1 per 20 samples or 1 per Sample Delivery Group for all other parameters.

[2] Based on 1 cooler per day. Assumes up to 15 sampling events conducted over time as the excavation progress.

USEPA - United States Environmental Protection Agency

VOCs - Volatile Organic Compounds

SVOCs - Semivolatile Organic Compounds

PCBs - Polychlorinated Biphenyls

PFAS - Per- and Polyfluoroalkyl Substances

TAL - USEPA Contract Laboratory Program Target Analyte List

Table 3. Preservation, Holding Times and Sample Containers

Analysis	Matrix	Bottle Type	Preservation(a)	Holding Time(b)
Part 375 Metals (total) SW-846 6010D	Soil Water	8 oz wide mouth glass, teflon lined cap 250 mL plastic, teflon lined cap	Cool to 4°C Nitric acid	180 days, Hg 28 days
Mercury SW-846 7471B	Soil Water	2 oz wide mouth glass, teflon lined cap 500 mL plastic bottle	Cool to 4°C Cool to 4°C	
Hexavalent Chromium	Soil	2 oz wide mouth glass, teflon lined cap	Cool to 4°C	30 days from sample collection to extraction; 7 days following extraction
SW-846 7196A	Water	500 mL plastic bottle	Cool to 4°C	24 hours from sample collection
Total Cyanide SW-846 9010C	Soil Water	4 oz wide mouth glass, teflon lined cap 250 mL plastic bottle	Cool to 4°C NaOH	14 days from sample collection 14 days from sample collection
PFAS via EPA 1633A	Soil	One 8 oz HDPE bottle One 2 oz HDPE bottle	Cool to 4°C	14 days to extract, 40 days to analysis
PFAS via EPA 1633A	Water	Two, 250 mL HDPE bottles	Cool to 4°C	14 days from sample collection
1,4-Dioxane via 8270D 1,4-Dioxane via 8270D-SIM	Soil Water	4 oz wide mouth glass, teflon lined cap Two, 250 mL amber glass	Cool to 4°C Cool to 4°C	14 days to extract, 40 days to analysis 7 days from sample collection
TO-15	Air	6 liter 8-hour runtime Summa canister	None	14 days from sample collection
Part 375				
Part 375 Volatile Organic Compounds (VOCs)	Soil	Three 5 gram Encore samplers One 2 oz plastic bottle, teflon lined cap	Cool to 4°C	48 hours, or 14 days if extruded into sealed vial and either frozen to -7 degrees C or extruded into methanol
SW-846 8260C	Water	Three 40mL VOA vials, teflon lined cap	Hydrochloric Acid	14 days from sample collection
Part 375 Semivolatile Organic Compounds (SVOCs) SW-846 8270D	Soil Water	8 oz wide mouth glass, teflon lined cap Two 250 milliliter amber glass, teflon lined cap	Cool to 4°C	14 days to extract, 40 days to analysis 7 days to extract, 40 days to analysis
Part 375 Pesticides SW-846 8081B	Soil Water	8 oz wide mouth glass, teflon lined cap Two 120 milliliter amber glass, teflon lined cap	Cool to 4°C	14 days to extract, 40 days to analysis 7 days to extract, 40 days to analysis
Part 375 Polychlorinated biphenyls (PCBs) SW-846 8082A	Soil Water	8 oz wide mouth glass, teflon lined cap Two 120 milliliter amber glass, teflon lined cap	Cool to 4°C	14 days to extract, 40 days to analysis 7 days to extract, 40 days to analysis

(a) All soil and groundwater samples to be preserved in ice during collection and transport

(b) Days from date of sample collection.

PFAS - Per- and Polyfluoroalkyl Substances

USEPA - United States Environmental Protection Agency

ATTACHMENTS

1. Professional Profiles
2. NYSDEC PFAS Guidance
3. Roux's Standard Operating Procedures
4. Laboratory Standard Operating Procedures

ATTACHMENT 1

Professional Profiles

PROFESSIONAL PROFILE

CONTACT INFORMATION

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209 Shafter Street
Islandia, NY 11749

EDUCATION

BCE, Civil Engineering,
University of Delaware, 1987
MBA, Management, Adelphi
University, 1992

PROFESSIONAL LICENSES

Professional Engineer:
New York, New Jersey, Pennsylvania, Rhode Island, Connecticut, Vermont, Virginia, North Carolina, Ohio, Michigan, and Montana

Charles J. McGuckin, PE

Vice President | Principal Engineer

EXPERIENCE SUMMARY

Over thirty years of experience: Principal, Senior and Project Engineer with Roux Associates, Inc.; President of Remedial Engineering, P.C.; and Design Engineer at Dvirka and Bartilucci Consulting Engineers.

TECHNICAL SPECIALTIES

Engineering design of soil and groundwater remediation systems. Brownfields clean-up plans, stormwater studies, and engineered natural treatment systems.

REPRESENTATIVE PROJECTS

- Principal Engineer for remedial investigation scoping, fate and transport analysis, and feasibility study preparation for a 1300+ acre Former Aluminum Smelter USEPA Superfund Site, Montana. Due to the size, complexity, and unique exposure areas of the Site it was broken up into multiple decision units including landfills, percolation ponds, operational areas, river area, soil, and groundwater. The contaminants of concern included metals, PAHs, cyanide, and fluoride. Remedial technologies evaluated in detail included landfill capping, groundwater extraction and treatment, pond and river dredging, soil excavation, slurry wall containment, in situ stabilization, and in situ groundwater treatment. Detailed effectiveness, implementability, and cost evaluations were prepared to support preferred remedial alternatives for each decision unit.
- Principal Engineer for remedial action implementation for a 2.5-acre former subway transit power station along the Gowanus Canal, Brooklyn, New York. The project remedial action was completed under an extremely tight deadline to obtain the certificate of completion under the NYSDEC BCP program. The project also involves close coordination with USEPA due to the adjacent canal superfund status. The investigation required in depth review of historic facility operations and sampling of subsurface tunnel structures. The remedy included excavation of PCB impacted soils, LNAPL recovery, shoreline stabilization, concrete scarification, sewer cleaning and capping. The project has required close coordination with the development team to ensure management of impacted materials in conformance with the Site Management Plan.
- Principal Engineer for the preparation of field implementation plans, construction monitoring, and Engineers Certification Report for a former manufactured gas Plant (MGP) site in West Chelsea, Manhattan, New York. The site was one of the first projects completed under the NYS Brownfields Clean-up Program. The remedy included soil excavation and offsite thermal treatment, a sheet pile barrier wall, a vapor barrier, and basement ventilation system. A comprehensive air monitoring program was conducted due to the concerns over coal tar residue emissions and odors on the surrounding community. The remedy was incorporated into the design and construction of the headquarters office building of an international media company.
- Principal engineer for the preparation of the feasibility study, IRM plans, and remedial design/remedial action plans for a 40-acre former manufacturing facility in Rensselaer, New York. IRM Soil remediation included excavation of over 10,000 cubic yards of CVOC and metals source material for disposal at multiple facilities based on waste characteristics. Basement cleaning was performed in three large buildings to remove accumulated process sludges. Lagoon closure plans included sediment removal, dewatering, soil washing, and soil capping. The final remedy for the site includes a groundwater perimeter containment trench and 40 gpm treatment system for metals and VOCs and a 9-acre vegetated cap for a former landfill.

- Principal Engineer for the feasibility studies and remedial action work plans for multiple operable units of a large railyard located in Sunnyside, Queens, New York under the NYSDEC Inactive hazardous waste program. For the former engine house and maintenance area unit, pre-design studies included product plume thickness data collection and modeling, ex situ biopiles treatment, in situ enhanced bioremediation, and in situ chemical oxidation. The final design consisted of decontamination and removal of structures, excavation of hot spot soils for PCBs and lead, UST closures, a dual phase high vacuum extraction system and in situ bioremediation.
- Project Engineer for the design and construction management of a 600 gpm groundwater extraction and treatment system to prevent offsite migration at a petroleum storage and pipeline transfer facility in Providence, Rhode Island. The treatment system was designed to remove iron, BTEX, and naphthalene from the groundwater to below surface water discharge standards for the Providence River. The system processes consisted of equalization, aeration, de-aeration, flocculation, clarification, air stripping, dual media filtration, granular activated carbon adsorption (liquid and vapor phase), and sludge thickening and dewatering. The system included an outfall diffuser designed in accordance with the CORMIX computer model.
- Senior Engineer responsible for the design, construction management, and O&M of a 60,000-gpd constructed wetlands treatment system for a former manufacturing facility in Virginia. The 16-acre treatment system was designed within an existing phragmites wetland to remove zinc and iron from landfill leachate prior to discharge to an adjacent creek. The treatment system consisted of alkalinity producing cells, toxic ponds, compost and limestone berms, anaerobic cells, and aerobic cells. The design included a 400-foot reinforced earthen dike together with hydraulic control structures and piping to maintain cell water levels and flow rates. The system also includes a pump station and force main for both effluent discharge and irrigation purposes. Joint wetlands and local permit approvals were obtained for the project.
- Senior Engineer for the performance of a feasibility study and remedial design for the closure of a concrete oil/water separator filled with refinery sludge and demolition materials impacted with lead at a former refinery in Providence, Rhode Island. Remedial alternatives were developed and evaluated including capping and containment using a perimeter slurry wall, sheet piling or concrete wall sealing; excavation and disposal; and in situ solidification. The capping and containment using a slurry wall alternative was selected for implementation of the remedial design. The design consisted of removal and replacement of existing monitoring wells, sealing of separator wall openings, a 2-acre multi-layer cap, a 1200-foot long by 30-foot deep soil-bentonite slurry wall, and a perimeter drainage swale. The multi-layer cap included a 40-mil HDPE geomembrane and a geosynthetic clay liner. The slurry wall was keyed into the existing clay confining layer beneath the separator. The design incorporated disposal of an additional 10,000 cubic yards of petroleum impacted soil under the cap.
- Principal Engineer for environmental consulting support services for a large landfill O&M contract under review by the New York City Department of Investigation. The work entailed reviewing the scope of routine vs. non-routine work performed over a one-year period for compliance with contract requirements. The O&M Work included routine cover maintenance, groundwater and gas monitoring, landfill gas extraction, major system repairs and waste handling. Memos of findings were prepared assessing acceptability of work, compliance with permit regulations and providing recommendations for improvements.
- Principal Engineer for the independent engineering review of change orders for the New York MTA Office of the Inspector General associated with electric utility substations reconstruction damaged during the 2012 Superstorm Sandy. The cost review focused on contracting procedures, waste classification of impacted structures and soils, proper waste management and disposal. Findings were compiled in a report to determine if costs were legitimate and justifiable and providing recommendations for improved specifications for bidding and of management waste handling contracts.
- Principal Engineer for remedial action plan implementation oversight and certification for the CornellTech campus development on Roosevelt Island, New York. The first phase of the campus development included lead paint and ACM abatement and demolition of the former Goldwater Hospital, construction of six main campus buildings, new utilities, roadways, and lawn/landscaped areas. Responsibilities include oversight of soil/subsurface structures excavation handling, disposal, and reuse; community air monitoring; dewatering permit compliance; and SWPPP inspections.
- Senior and Principal Engineer for the decommissioning and decontamination of a pharmaceutical facility covering seven city blocks as a part of a NYSDEC Voluntary Cleanup Agreement in Brooklyn, New York. The former office and laboratory complex would be decontaminated for reuse as a school and small business space. Multiple other buildings were demolished. Responsibilities included preparation of interior abatement plans to address mercury, lead and PCBs in building materials and review of Interim Remedial Measure (IRM) work plans for lead, benzene and mercury-contaminated soil excavation and disposal. Groundwater remediation design

included air sparge/soil vapor extraction, in situ oxidation and a reactive barrier wall using colloidal carbon and ZVI.

- Principal Engineer for the performance of a Brownfields Demonstration Pilot Program in the Hamlet of New Cassel for the Town of North Hempstead, New York. Under an EPA grant, Roux Associates created an inventory of 50 potential commercial/industrial properties within New Cassel and evaluated these properties based on perceived contamination and potential for redevelopment/reuse. Eight sites exhibiting the greatest potential for redevelopment were selected to perform Phase I Environmental Site Assessments. Of these eight sites, four sites were selected for Brownfield Site investigations to identify the nature and extent of contamination in soil and groundwater and provide potential remedial alternatives and cleanup costs to revitalize these properties. The Brownfields Demonstration Pilot Program also included community outreach activities to promote a unified approach to the redevelopment of Brownfields in new Cassel.
- Principal Engineer responsible for engineering certification of all remediation activities related to the seven-city-block Barclay's Arena and Atlantic Yards redevelopment in Brooklyn, New York. This multi-billion-dollar redevelopment includes the Arena, which will be focal point of the largest redevelopment project in Brooklyn, consisting of an urban complex of housing, commercial and retail space, as well as several acres of landscaped public open space. The existing properties being redeveloped are residential, commercial, and industrial properties, including a large railroad yard. Engineering certification included multiple RAWPs under NYSDEC Spills Program, UST removals, soil excavation, in situ groundwater treatment and remedy oversight services. The project also includes ACM abatement, building demolition, soil pre-waste-classification, coordination (with the receiving facilities), and oversight of the removal of 1,000,000 cubic yards of soil (~550,000 yards removed to date), representing one of the largest excavation and soil removal projects performed in New York City.
- Principal Engineer responsible for the preparation of the remediation completion report at Captain's Cove former municipal landfill State Superfund Site located in Glen Cove, New York. This work has been performed in accordance with Title 3 of the NYS Environmental Quality Bond Act under contract to the City of Glen Cove. Design elements included excavation plans, radiological waste monitoring, demo debris and waste separation and screening, dewatering water management, waste disposal, and site restoration. Additional work included the delisting of a six acre "clean" portion of the site to allow the development of a ferry terminal and esplanade and development of alternative cleanup standards consistent with future site uses. Site remediation will accommodate site redevelopment as a commercial waterfront and operating ferry service and seaport area.
- Principal Engineer providing program management of interior building materials surveys for 22 residential buildings along the south shore of long island under an Army Corps of Engineers contract for dune reconstruction. Building materials surveys included testing and analysis of suspect contaminants and reporting in support of building abatement and demolition planning. Testing was completed using multiple teams on a tight timeline to meet project schedule requirements.
- Principal Engineer for the remediation of a former Manufactured Gas Plant (MGP) facility in Brooklyn, NY, including oversight of the excavation of both the former gasholders, and adjacent contaminated hotspots requiring offsite thermal desorption of over 30,000 tons of coal tar impacted soil. Directed the Community Air Monitoring Program (CAMP) specific to the MGP impacted soil removal, as required by both New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH). Remedial activity met all substantive requirements of the NYSDEC approved Remedial Action Work Plan for the Site. The remedy included design of a passive subsurface vapor monitoring/recovery system for a 500,000 sq. ft. retail structure in Brooklyn, NY. The system design integrated a perforated piping system complemented by a protective vapor barrier below the structural floor slab to monitor and mitigate volatile organic compound vapors. Multiple vapor barrier options were evaluated to determine the optimum design based on the site conditions.
- Principal Engineer providing expert settlement support services to a county municipality in New York State. The case involved an EPA Order for underground storage tank (UST) compliance for over 50 county operated facilities with over 125 USTs. The project involved the field inventory of the USTs at each facility and development of both Interim and final compliance plans to comply with EPA, NYSDEC and local UST regulations. Detailed cost estimates were prepared for multiple scenarios for upgrading USTs including tightness testing, manway repairs, leak detection and overfill protection monitoring systems, UST removal and replacement, and new piping. The upgrade evaluation and negotiations included incorporation of Supplemental Environmental Project (SEPs) in accordance with EPA requirements. SEPs included centralized monitoring systems for leak detection and inventory control.
- Principal Engineer for preparation of a site management plan for redevelopment of a former watch case factory in Sag Harbor, New York. The primary engineering controls for the former factory conversion to a residential building consisted of a vapor barrier and an active sub slab depressurization system

(SSDS) to address chlorinated VOCs. The SSDS system was complicated due to the existing 100-year-old structure. A unique raised floor approach was designed to allow for the SSDS installation. The system design, approved by NYSDEC and NYSDOH includes multiple legs, dual blowers, low vacuum alarms and monitoring points.

- Principal Engineer for the Remedial Action Work Plan (RAWP) for redevelopment of a shopping center in the Bronx, New York. The RAWP elements included soil and groundwater management plans, stormwater management, air monitoring and vapor mitigation systems. To address vapor intrusion, active sub slab depressurization systems were designed for two pad buildings. One system for a new retail building construction and one retrofit system for an existing building to be used as a restaurant. Closure reports were prepared and certified documenting all remediation work and approved by NYC Mayor's Office of Environmental Remediation (OER).
- Principal Engineer for the preparation of a preliminary remedial design for the remediation and restoration of a pond and surface water tributaries to Canaan Lake that have been impacted from leachate generated from an upgradient former municipal landfill located in Holtsville, New York. Completed a preliminary remedial design for the construction of a compost-based permeable reactive barrier for the removal and treatment of leachate prior to discharge to the surface water, followed by restoration of the surface water body and surrounding wetlands. The project included development of a long term remedial strategy to reduce rainfall infiltration into the landfill and minimize leachate generation. Current plans to reduce rainfall infiltration include the planting of 3,250 hybrid poplars, regrading and lining of drainage swales, and the resurfacing of low lying areas consistent with recreational facilities.
- Principal Engineer for final capping elements and wetlands restoration work and completion of the Final Engineering Report for an inactive hazardous waste site in Syracuse, New York. The project included onsite consolidation of lead impacted waste; 7-acre landfill cap with vegetated layer, cover soil, and geomembrane; stormwater runoff controls; reconstruction of wastewater ponds; and an 8-acre wetland restoration. An O &M Plan was prepared and implemented consisting of groundwater, surface water and landfill gas monitoring, and annual cap and wetland inspections.
- Principal Engineer for the preparation of the remedial action work plan for an 11-acre former Department of Defense owned Site that manufactured airplane parts along Hempstead Harbor in Manorhaven, New York. The project is regulated under the NYSDEC Voluntary Cleanup Program. The remedial design consisted of both soil vapor extraction/air sparging and in situ enhanced bioremediation systems for Site groundwater impacted by chlorinated VOCs. The final remedial design and site management plan are expected to include soil capping, vapor barriers and passive ventilation systems to be incorporated into a residential redevelopment with waterfront access.
- Senior Engineer for the performance of a stormwater runoff evaluation for a manufacturing facility in Watertown, New York. Roux Associates was retained as third party to evaluate the drainage design and construction elements for an industrial landfill cap. The evaluation was performed for the facility owner in support of potential litigation arising from onsite building flooding incidents following a severe snow and rainstorm event. The scope of work included an evaluation of the existing onsite storm sewer system capacity, calculation of runoff flow rates for the 300-acre contributing area, review of landfill cap surface drainage design, review of erosion control measures implemented during construction, and analysis of specific flooding incident causes. The runoff analyses were performed using the TR 55 Method for three conditions: pre-capped, capping under construction prior to establishment of vegetation, and final vegetated cap design. Recommendations were made to improve the site drainage including design of surface drainage swales, temporary berms and sediment traps during construction and modification of snow handling practices.
- Principal Engineer for the management of a soil and groundwater remediation system for a nationwide overnight delivery distribution center in Brooklyn, New York as part of the NYSDEC Voluntary Cleanup Program. A risk-based remedial approach that called for the remediation of "hot spot" source area soils, and mass-reduction of VOCs was successfully utilized for the Site. As a result, the focus of remediation was on reducing the mass of VOCs in on-site groundwater to a level where natural attenuation would be effective in remediation of VOCs. To address the contamination in the source area, a soil vapor extraction (SVE) and air sparge (AS) system consisting of 8 SVE wells and 17 AS wells was designed, constructed, operated and maintained for a period of approximately 3 years. Permanent shutdown of the system was approved by the NYSDEC.
- Senior Engineer for the design and construction management of a soil remediation and stormwater management project at a 16-acre former pesticide warehouse facility in Dayton, New Jersey. The Site was redeveloped for storage and trailer parking. The project consisted of consolidation of pesticide contaminated soils; asphalt capping of the 3.5-acre contaminated soils area; stormwater collection, conveyance, and detention; and site regrading. The evaluation included TR-55 runoff modeling for pre and post capping and development conditions. The storm sewer system consisted of

multiple catch basins, over 2,000 linear feet of reinforced concrete pipe ranging in size from 15 to 30 inches, and a recharge basin. A Soil Erosion and Sedimentation Control Plan and a NJPDES General Permit were prepared for the project.

- Project Principal for the performance of LNAPL remediation studies at the New Jersey Transit former Lake Street Bus Garage in Newark, New Jersey. The studies involved evaluating remedial alternatives for free product recovery, performance of an LNAPL recovery pilot test and cost estimating. A RAWP and engineering design plans were prepared for both the bus garage and the adjacent park properties. The remedy included excavation of the source area, horizontal recovery wells, a vertical recovery trench, in situ oxidation injections and product recovery using vacuum extraction.
- Senior Engineer for the performance of a stormwater management analysis for a 28-acre industrial landfill in Virginia. The principal objective of the study was to identify engineering controls to minimize stormwater runoff to a metals-contaminated sediment impoundment. The study included TR-55 runoff modeling and storage analyses for multiple detention ponds. Three engineering control alternatives were identified including landfill cap regrading, diversion using berms and swales, and diking and weir raising.
- Senior Engineer for the investigation, design, and construction management of the closure of a 2-acre fire-water supply pond and modification of the stormwater conveyance system at a former manufacturing facility in Williamsburg, Virginia. The investigation phase of the project was focused on determining the sources and loading of metals influent to the pond. Field activities included examination of the existing stormwater drainage system, sub watershed delineation, groundwater monitoring, and installation of automatic stormwater sampling devices. The final design included 400 feet of open concrete channels, 250 feet of culvert replacement, slip lining of 370 feet of 36-inch RCP culvert, reconstruction of five catch basins, placement of 10,000 cubic yards of clay fill within the pond and regrading of existing drainage ditches. Erosion control measures and slope stabilization were also included as well as the design of a special outlet structure for minimizing erosion at the outfall.
- Project Principal for the investigation and closure of five USTs at the New Jersey Transit Broad Street Station site in Summit, New Jersey. Tank sizes ranged from 20,000 to 30,000-gallon capacity. UST closure program completed in accordance with the NJDEP Technical Requirements for Site Remediation. Closure report prepared and submitted to the NJDEP and subsequent issuance of a No Further Action letter from the NJDEP.
- Project Engineer of the underground storage tank (UST) program for a major retail chain store in the New York, New Jersey, and Pennsylvania region. Responsibilities included preparation of a UST management plan based on federal, state, and local regulations and costs to prioritize UST maintenance. The tank designs included plans and specifications for the removal and replacement, or upgrading, of USTs to meet regulatory requirements. The engineering design involved fuel requirements for dual heating and back-up generator usage, mechanical pumping equipment and fire wall design.
- Project Engineer for the design and construction management of a 1,000 sq. ft. hazardous and flammable materials storage facility in Syosset, New York. The facility included concrete secondary containment dikes, access ramps, sprinkler system modifications, and lighting. The separate flammable materials area included 2-hour fire rated concrete block walls and doors, ventilation equipment and a fire alarm system. Permitting services were performed for the Nassau County Department of Health, the Nassau County Fire Marshall, and the Building Department.
- Project Engineer for the design of a 2,000 sq. ft. hazardous waste storage facility in Astoria, New York. Prior to construction, demolition of an existing building was required and included removal of asbestos and lead paint. The project included driving treated timber piles and excavation and removal of contaminated soil and groundwater. The structure consisted of a steel frame with a metal standing seam roof system, decorative masonry block walls, and a roll-up door. Temporary and permanent fencing were required along with concrete sidewalk replacement.
- Senior Engineer providing construction management services in support of the BNYCP Cogeneration Facility construction and Brooklyn Navy Yard facility decommissioning. Work included preparation of construction management plans, supervision of soil, concrete, and sediment disposal activities, asbestos surveys, and PCB sampling and analysis work. A NYCDEP wastewater discharge permit was prepared for the million gallon per day stream condensate and wastewater backwash flow rate.
- Project Principal for performing remedial alternative cost estimating for a New Jersey Transit site in Montclair, New Jersey, which is to be redeveloped as a firehouse. A cost estimate prepared by another consultant was reviewed as part of the scope of work. The proposed remedial alternative for the site consisted of excavation and disposal of PAH-impacted fill material and capping. The alternative remedy proposed by Roux Associates was a more risk-based approach, resulting in a cost savings of approximately $100,000 for New Jersey Transit.

- Project Engineer for the design and construction management of cap repair and drainage improvement measures for an industrial hazardous waste landfill in Tennessee. Components of the design included replacement of the primary clay cover material, temporary and permanent erosion and sedimentation control measures, and a lined drainage channel to minimize the generation of landfill leachate. The project included the performance of a focused feasibility study to characterize the flow, quality, and treatability of the leachate. A feasibility study was also performed in order to evaluate constructed wetlands remedial technology as a method of effective and economical treatment of leachate.
- Senior Engineer for the remedial design and construction management of a 7-acre off-spec asphalt waste pond at a former refinery in New England. The asphalt material exhibited a low load bearing capacity combined with a viscous, tacky surface. An in situ solidification mix design was developed consisting of liquification using hot water and a 2-stage lime kiln dust reagent injection and mixing step. Gravel was added to the mix when the existing subgrade material was of insufficient bearing capacity. Solidified material was tested for unconfined compressive strength, durability, and TCLP. The final cover material consisted of a 6-inch vegetated layer.
- Principal Engineer for the performance of LNAPL remediation studies for a former bus maintenance facility and a segment of a Metropolitan Subway System in Newark, New Jersey. The studies involved evaluating groundwater and soil monitoring data, performance of LNAPL recovery pilot tests, evaluation of remedial alternatives and cost estimating. Recommendations included the use of mobile high vacuum extraction methods to collect LNAPL while minimizing capital expenditures and permanent low vacuum extraction methods to minimize odors to subway cars and surrounding communities.

Litigation Support Experience

- Project Engineer for the evaluation of remedial investigations and remedial cost estimates for a 30-acre former book publishing facility in Poughkeepsie, New York. The evaluation included the review of Phase I and Phase II investigation reports, remedial investigation (RI) and feasibility study (FS) reports, and the remedial investigation work plan. The findings included the presence of chlorinated volatile organic compounds in the soil and groundwater as well as identification of underground storage tanks. Deficiencies were identified in both the RI and FS reports by comparing with the NYSDEC's required criteria and recommendations were proposed for the RI work plan to further delineate source areas. Based on the remedial investigation review, revised costing assumptions were made, and remedial cost estimates were prepared totaling $3.6 million.
- Project Engineer for the evaluation of expected remedial costs for nine hazardous waste sites, two of which are federal superfund sites. The evaluation of both single and multiple PRP sites was performed to identify costs for an insurance claim. The expected remedial costs for nine sites, which include landfills or facility surface impoundments, totalled approximately $65 million. Remedial plans evaluated for multiple site operable units included groundwater pump and treat, alternative water supply systems, soil/sludge in situ solidification and treatment, and wetlands restoration. Additional work included evaluating invoices for site work previously performed and allocating expenses into their appropriate operable unit and work type, i.e., defense or indemnity.

Water Treatment Experience

- Senior Engineer for the engineering design of a 10 gpm groundwater recovery and treatment system at a former tank farm in Rhode Island. The recovery system included a 200-foot slotted HDPE horizontal well, a 400-foot coated concrete swale and curbing, and a series of seepage collection points manifolded to a common receiving structure. The entire system was designed for passive recovery and gravity flow transmission targeting free-product seepage areas. The treatment system consisted of a collection sump retrofitted within an existing separator, a coalescing plate oil/water separator, a surge tank, a bag filter, and carbon adsorption units. The project included a permit modification for discharge to the Providence River.
- Design Engineer for the design and start-up operation of a 2 mgd packed tower aeration system for potable water in Williston Park, New York. The primary contaminants were trichloroethane and tetrachloroethene which were stripped below drinking water standards. The design process included full scale pilot testing to assure proper removal levels.
- Design Engineer for the design, construction, and start-up operation of a 5 mgd industrial cooling water treatment system utilizing mechanical surface aeration. The system consisted of two lined aeration basins operating in series with floating mechanical aerators to remove volatile organic contaminants to levels suitable for recharge into the Long Island groundwater aquifer. The primary contaminants were 1,1-dichloroethene, trichloroethane, tetrachloroethene and vinyl chloride.
- Design Engineer for the design and construction of a 4 mgd granular activated carbon system for potable water in Hempstead, New York. The primary contaminants consisted of more than 8 volatile and semi volatile organic compounds. Responsibilities included site inspection for the installation of the six vessels containing 20,000 lbs. of carbon in each. The

system was designed for 99.9% removal efficiency with two units operating in series.

Constructed Wetlands Experience

- Senior engineer for the conceptual design of a constructed wetlands stormwater treatment system for a coal handling freight railroad facility in Norfolk, Virginia. The design consists of treatment of contaminated stormwater runoff generated from maintenance and fuel handling areas onsite. The design treatment performance objective is the reduction of total suspended solids, oil and grease, and selected metals to levels below the SPDES permit discharge standards established for two of the site's outfalls discharging to the Elizabeth River. The 3 acre system consists of a passively operated 200,000 gpd subsurface-type constructed wetlands with a low visual impact and specialized structural design to meet the needs of a busy railyard facility. Additional design components include stormwater bypass structures, jacking beneath tracks, a grit chamber, a lift station, and outfall modifications. A joint wetlands permit will be prepared for the project.
- Senior Engineer for the feasibility study, conceptual design, and construction of four constructed wetlands units and sedimentation basin for a stormwater treatment system along Cedar Swamp Creek for the City of Glen Cove, New York. The project consisted of review of stormwater studies of the 12 square mile contributing watershed, compilation of USGS water quality and flow data, evaluation of stormwater treatment methods and best management practices and optimum site selection along the creek. The constructed wetlands design included a forebay, high and low marsh cells, a micropool, and stormwater bypass structures for removal of sediment, nitrogen, phosphorus, and trace metals during first flush events. Final design for the first 1.8 acre constructed wetlands unit was completed and performance of construction management is ongoing. Design activities include structural and hydraulic design tasks with specific emphasis on storm water bypass. The design has been integrated into an into an intermodal transportation project with the addition of bicycle and walking paths. NYSDEC and Army Corps permits were obtained for the project.
- Project Engineer for the design of a 7,000 gpd subsurface flow-type constructed wetlands treatment system for a refinery site in Rhode Island. The system was designed to treat a surface-water stream impacted by petroleum hydrocarbons. The system's high aesthetic, low visual impact appeal was ideal for its golf course setting. Both phragmites SPP and Typha SPP wetland species were incorporated in the design in order to assess the biodegradation/biotransformation processes effectiveness. A growth and maturation plan and a treatment evaluation plan were developed in order to evaluate the system performance.
- Lead Engineer responsible for technical review of a design for modifications to a constructed wetlands system in Nicholas County, West Virginia. The system was designed to treat the leachate from a solid waste landfill at a maximum capacity of 30 gpm. The complete water-tight treatment system consisted of a sedimentation basin, stabilization basin, a series of three wetland cells and a finishing ditch. The wetland cells consisted of a double liner system with leachate collection piping overlaid with stone fill and a matrix of plant life. The technology combines physical, geochemical, and biological removal mechanisms operating simultaneously.

Permitting/Compliance Plans

- Project Engineer for the preparation of a Spill Prevention Control and Countermeasure (SPCC) Plan and a Storm Water Pollution Prevention Plan (SWPPP) for an 850-acre petroleum storage terminal in New England. The SPCC Plan involved the inventory of 50 bulk storage tanks and miscellaneous storage vessels and an assessment of barge loading areas, truck loading racks, additive loading areas, pumping stations, and a network of aboveground pipelines. The SWPPP encompassed an inventory and surveying of the existing storm sewer system, an evaluation of oil/water separator performance and identification of storm water management controls and practices.
- Project Engineer for the design of modifications to multiple discharge facilities along the Providence and Runnins Rivers in Rhode Island. Permitting activities were performed with the following agencies: Rhode Island Department of Environmental Management (RIDEM) Pollutant Discharge Elimination System (RPDES), RIDEM Division of Freshwater Wetlands, Coastal Resources Management Council (CRMC), and the Army Corps of Engineers.

Sanitary Experience

- Design Engineer for the evaluation of a municipal sanitary sewer system consisting of approximately 70 miles of piping ranging in size from 8 inches to 16 inches, in Garden City, New York. The sewer system was evaluated for existing and proposed flow capacity, surcharging, infiltration of groundwater, inflow of storm water, root encroachment, and sewer breaks. Evaluation methods consisted of hydraulic profile analysis, television inspection of piping, field inspection of manholes, and flow measurement. Sewer upgrading methods were evaluated including direct replacement, manhole restoration and pipe slip lining, and a rehabilitation program was implemented.
- Design Engineer for the City of Glen Cove's industrial wastewater pretreatment program which was established to monitor significant industrial users discharging to the city's wastewater treatment plant to minimize upsets to the

biological treatment mechanisms. The program work included annual facility inspections, wastewater discharge sampling, review and evaluation of quarterly self-monitoring results, calculation of discharge penalty fees, preparation of annual monitoring reports for each facility and development of wastewater discharge permits to comply with City regulations.

- Design Engineer for a heavy metals study for the municipal sanitary sewer system in the City of Glen Cove, New York. The heavy metals study consisted of the development and performance of a city-wide sewer sampling program to identify the sources of heavy metals loadings on the wastewater treatment plant. The evaluation included industrial sources, scavengers, non-industrial sources, the plant operation itself, and review of existing heavy metal studies. Recommendations were provided for minimization of loadings and pretreatment to protect the plant operations.

Stormwater Experience

- Design Engineer for the evaluation and conceptual design of a water management plan for a 200-acre proposed office complex in Bethpage, New York. The design included inlets, piping and recharge basin sizing for peak storm water runoff flows as well as a system of architectural ponds and level control structures. For dry periods, the design included flow controls connected to an existing cooling water system to maintain pond levels and for utilization as a water supply for an irrigation sprinkler system during the growing season.
- Design Engineer for the design of a municipal storm drainage system for a 200-acre contributing area in Garden City, New York. The purpose of the drainage system was to alleviate severe flooding problems for eight homes located in a local low point of a residential neighborhood. The system included over 4,800 linear feet of reinforced concrete piping ranging in size from 12 to 60 inches. Design considerations included hydraulic gradient analysis, inlet capacity, utility crossings, minimization of removals of established trees, a county road crossing, utilization of existing structures and piping, and a headwall discharge to a recharge basin. Additional design items included pavement restoration, service line relocations, curbs and sidewalks, and maintenance and protection of traffic.

Site Assessment Experience

- Senior Engineer for coordination and review of Phase I environmental site assessments for five large research and development complexes located throughout the eastern United States for a major chemical company. The site assessments were performed for due diligence prior to engaging in long-term property lease agreements. The site assessments evaluated chemical storage and handling areas and previous site usage.
- Senior Engineer for coordination and review of Phase I environmental site assessments for 12 properties associated with tennis centers acquisition on Long Island, New York. The properties were either active tennis center facilities or vacant parcels available for new construction. All site assessments were conducted in accordance with ASTM standards for commercial real estate transactions. Primary concerns identified were USTs, drum storage areas, and unauthorized dumping.
- Project Manager representing a group of banks investing in a 20 acre commercial property in Westchester, New York. The onsite soil was contaminated with several volatile and semi volatile organics. Performed an evaluation of the remediation plan which included onsite biological treatment of soils and aeration and oil water separation of groundwater.

Water Main Experience

- Project Engineer for the design of over 6,000 feet of ductile iron water main in sizes from 4 to 16 inches for Town of Hempstead, New York Department of Water and the Nassau County, New York Department of Public Works. The designs included wet and dry connections to existing mains, fittings, valves, copper services and fire hydrants. Restoration work included replacement of asphalt pavement, concrete sidewalk and curbs, and grass areas.
- Design Engineer for the design and construction management of over 10,000 feet of ductile iron water main in sizes from 6 to 12 inches for the Town of Wallkill, New York. The designs included booster pump station upgrades, a stream crossing, a wetlands crossing, jacking of 36-inch casing beneath a state highway, air release chambers, copper service re-connections, fire hydrants, valves, and appurtenances. Restoration work included wetlands restoration, backfilling, and regrading within a NYSDOT right-of-way and grass and pavement replacement.
- Design Engineer for the design and construction management of upgrades to a 3.7 mgd potable water booster pump station for the Town of Wallkill, New York. The design featured the replacement of a hydropneumatic tank and pump system with three larger capacity centrifugal pumps. The upgrades were performed while maintaining the pump station service. The pump station revisions included piping, pump pads, shut-off valves, silent check valves, pressure relief valves, gauges, ventilation equipment and a motor control center.

Feasibility Study Experience

- Senior Engineer for the performance of a feasibility study and remedial design of a free product containment and recovery system at a former refinery in New England. The areal extent of the free-product plume was approximately 10 acres with a measured thickness of up to eight feet. Pilot testing activities consisted of pump tests, baildown tests, and funnel and gate

systems with and without sheeting. The selected remedial alternative consisted of re-routing and repair of active storm sewer piping, closure-in place of a former 72-inch storm drain using clay fill material to form a barrier wall, and installation of multiple recovery trenches totaling 450 linear feet. The recovery trenches were installed to a depth of 14 feet using a deep trenching machine and were completed with gravel, horizontal perforated piping, recovery wells, and monitoring wells to accommodate both passive and active product recovery pumping equipment. Product recovery enhancement pilot testing was also performed by using non-ionic surfactants, mechanical reworking of soil and vacuum extraction methods.

- Project Engineer for the performance of a feasibility study for the containment of a free-product plume beneath a refinery site in Rhode Island. The feasibility study included analysis of groundwater modeling, bench and pilot scale treatability studies, groundwater quality characterization, identification and screening of discharge alternatives, and treatment process evaluations. The work also included the evaluation of the discharge of treatment system effluent to several receptors including groundwater, wetlands, sanitary sewers, and storm sewers. Discharge requirements were evaluated for process water, off-gas air, and residual wastes. Several treatment processes were also evaluated including metals precipitation and sludge dewatering, VOC and SVOC removal, and off-gas treatment. Preferred alternatives for each process were selected for remedial design development.
- Project Engineer for the performance of a feasibility study for a hazardous waste landfill located at a Superfund site in Tennessee. The feasibility study focused on the characterization and quantification of landfill leachate consisting of chlorinated organic compounds as well as proprietary pesticide compounds. The remedial technologies which were evaluated included leachate collection alternatives, onsite treatment alternatives and offsite disposal methods. An analysis was performed for onsite treatment technologies which included constructed wetlands, biological fluidized bed reactor, and granular activated carbon adsorption. The technologies were assembled into four feasible remedial alternatives and treatability studies were recommended to confirm the suitability of selected processes.

PROFESSIONAL AFFILIATIONS

National Society of Professional Engineers

American Society of Civil Engineers

WEF Hazardous Waste Committee, 1996–1998

PUBLICATIONS

Assessment and Remediation of Off-Spec Asphalt Disposal Areas - Co-authored, Contaminated Soils, Volume 3, Amherst Scientist Publishers, 1998

Use of a Subsurface Flow Constructed Wetlands for Collection and Removal of Water Containing BTEX, Co-authored, Proceedings of the 2000 Petroleum Hydrocarbons and Organic Chemicals in Groundwater Conference, National Ground Water Association

ROUX

PROFESSIONAL PROFILE

Wendy Shen
Senior Engineer

TECHNICAL SPECIALTIES

Management of construction and remediation projects, including Brownfield redevelopment, building construction, excavation and disposal of impacted soil, engineering services for the investigation, design, construction, and operation and maintenance of remedial systems for the treatment of contaminated soil and groundwater.

EXPERIENCE SUMMARY

Twenty three years of experience: Senior Engineer, Project Engineer, Staff Engineer, and Staff Assistant Engineer with Roux.

CREDENTIALS

M.S. in Environmental Engineering, Polytechnic University, Brooklyn, New York, 2001
B.S. in Chemical Engineering, Universidade Federal do Rio Grande do Sul, Brazil, 1997
OSHA 40 Hour Health and Safety Course, 2000
OSHA 8 Hour Refresher Courses

KEY PROJECTS

- Senior Engineer responsible for the management of investigation and remediation various Brownfields redevelopment sites containing hazardous and non-hazardous soils in New York City and surrounding. These projects included investigation, implementation of in situ waste characterization sampling program, Interim Remedial Measures, Remedial Action Work Plans, which included excavation of soils below grade and management of soils including transportation and disposal and coordination with various disposal facilities. Most of these sites were accepted into the New York City Office of Environmental Remediation (NYC OER) Brownfield Cleanup Program (BCP) or the New York State BCP.
- Senior Engineer responsible for the management of a former manufactured gas plant (MGP) project in Brooklyn, New York. Responsibilities include investigation, preparation and implementation of the remedial action plan, waste characterization, submittals review, management and tracking of project budget and schedule, regulatory reporting, and coordination with project team.
- Senior Engineer responsible for scheduling at a large petroleum remediation project in Brooklyn, New York. Responsibilities included management of all present and future tasks to be completed including operations and maintenance, remedial investigation, design and construction, facility upgrades, special operations, permitting and compliance tracking, health and safety, audits/assessments, sampling and regulatory reporting.
- Project Engineer for the remediation of soil and groundwater at 100+ facilities owned and/or operated by various city agencies in New York City. Activities included preparation of administrative/contractual requirements, work plans, and monitoring reports, cost estimates, proposals, engineering support, and construction oversight.
- Project Engineer for the design of an air sparge and soil vapor extraction system in Andover, Massachusetts.
- Project Engineer for the remediation of soil and groundwater at a former chemical manufacturing company in Rensselaer, New York. Activities included construction oversight, preparation of reports including Feasibility Study, Interim Remedial Measures, Community Air Monitoring Plans, Sampling Plans, Bid Review, Invoice Review, and various field investigations.
- Project Engineer for an investigation and remediation at a former petroleum refinery in Buffalo, New York. Responsible for assisting in the preparation of multiple work plans and reports of results for field investigations including soil borings and sampling, well installation, and groundwater sampling. Also responsible for reviewing and assisting in the preparation of activities related to the operation of the remediation systems at the Site, including maps, evaluation summaries, plans and compliance monitoring reports.
- Project Engineer for the closure of an underground storage tank (UST) at a shipping facility in Queens, New York. Activities included preparation of cost estimate, work plans, and field management.
- Project and Resident Engineer for the soil remediation of the Captain's Cove Condominiums Site, a federal NPL site, located in Glen Cove, New York. Activities include: supervision of Contractor's activities, regulatory interaction, compile daily field reports, manage laboratory database for excavated and reclaimed soil, shop drawing review, change order preparation, and Health and Safety compliance. Site remediation was completed in September 2001 to accommodate site redevelopment as a commercial waterfront and operating seaport area. Currently managing OM&M groundwater monitoring program at the Site.
- Staff Engineer for a 450-gpm, dual-phase, product recovery system in Greenpoint, Brooklyn, New York. Tasks include: operation and maintenance of groundwater recovery and treatment system and free product recovery system. Also assisted in reviewing drawings and specs related to installation of aboveground storage tanks.
- Staff Engineer for the remediation of soil and groundwater at a former chemical company facility in Brooklyn, New York, using a Soil Vapor Extraction and Air Sparging System. Tasks include: review of performance data for air sparge system,

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operation and maintenance for the SVE/AS System, progress report preparation, and monthly groundwater sampling.

- Staff Engineer for a divestment assessment at a service station in Stratford, Connecticut. Tasks include: oversight, soil sampling, FOIA investigation, coordination with subcontractor and regulatory agencies, and preparation of letters and reports.
- Resident Engineer for the soil remediation at a former chemical company facility in Dayton, New Jersey. Activities include: construction oversight, Health and Safety compliance, field sampling, and completion report preparation.
- Responsible for assisting in preparing cost estimates, proposals, feasibility studies, interim remedial measures, remedial action plans, health and safety plans, and technical specifications for a variety of soil and groundwater remedial objectives.
- Student/Research Assistant at Laboratory of Polymers, Universidade Federal do Rio Grande do Sul, POA, Brazil. Performed experiments on the metallization of plastics using polyaniline.
- Intern/Researcher at Laboratory of Research and Development at a petrochemical company, Ipiranga Petroquimica, Brazil. Conducted laboratory tests involving additives used in polymers and responsible for quality control/assurance of products.

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EDUCATION
PhD, Environmental Engineering, University of California, 2001
MS, Environmental Science (concentration in environmental chemistry), Indiana University, 1993
BA, Biochemistry, University of Texas, 1991

James Hauri, PhD

Senior Scientist I

EXPERIENCE SUMMARY
Dr. Hauri is a broad-based environmental scientist with more than thirty years of experience in environmental science, engineering, and chemistry. His professional experience includes Roux, Senior Scientist I (2022 – present); Assumption University, Associate Professor (tenured), (2007-2012, 2014-2022) and Assistant Professor (2001-2007); Exponent, Senior Scientist (2012-2015); Harvard University, School of Public Health, Visiting Scientist (part time: 2008-2012); CH2M-Hill, Environmental Consultant (2001); San Francisco Estuary Institute, Intern, (1997-1998); and Southwest Research Institute, Scientist (1993-1994).

TECHNICAL SPECIALTIES
Dr. Hauri's multidisciplinary background has included field sampling, environmental analytical chemistry, toxicity testing and data analysis. Much of his work has explored the nexus between the chemistry and ecotoxicity of environmental contaminants.

Dr. Hauri's areas of expertise include:

- Heavy metal speciation and toxicology;
- Environmental data analysis;
- Validation of environmental lab data;
- Analysis of ecotoxicology data; and
- Aquatic chemistry and contamination.

REPRESENTATIVE PROJECTS

- **Deep Water Horizon Oil Spill.** Evaluated the appropriateness of new methods to solubilize oil used with toxicity tests during the DWH spill. Compared the composition and concentration changes in polycyclic aromatic hydrocarbons (PAHs) associated with the new preparatory methods with field collected samples in order to determine if the toxicity tests performed were relevant to the actual toxicity expected to be seen in the field. Performed a literature review of case studies or laboratory experiments quantifying cardiotoxicity in fish due to early life stage exposure to oil. The review considered both functional and morphological cardiotoxic endpoints due to exposure to three tricyclic polyaromatic hydrocarbons (PAHs): dibenzothiophene, fluorene, and phenanthrene. This review was combined with PAH concentrations from samples taken from the Gulf of Mexico during the Deep Water Horizon oil spill in order to determine whether enough data was available to make an injury assessment for fish in the Gulf of Mexico impacted by the oil spill.
- **Alameda Corridor Transportation Authority (ACTA).** Provided technical expertise to gain a unique temporary discharge waiver for a multi-billion-dollar construction project in California. ACTA gained a waiver to discharge dewatering effluent during construction into the LA-Long Beach Harbor. The waiver regulated the effluent based on bioavailable (labile) metal concentration rather than total or dissolved concentrations, and then the project ensured non-detect labile metal concentration via the addition of EDTA.
- **Insurance Client.** Evaluated historical reports and contemporarily collected chemical data to help determine responsibility for a regional airport with contaminated groundwater from historical (1940s-1970s) use of chlorinated solvents as part of both military and civilian airport operations. Considered historical solvent use and disposal practices at airports along with fate and transport chemistry of chlorinated solvents in soil and water to create conceptual site model for airport. Helped to create rebuttal to adverse consultant reports, as well as prepared principal and insurance lawyer for deposition and trial testimony.
- **Industrial Client.** Evaluated historical reports as well as analyzed organic and metal data from more recently collected samples to determine potential responsibility among several industrial sources for superfund contaminated lake sediments. Evaluated the analysis by adverse consultants and helped to create rebuttal to adverse consultant reports.

- **Industrial Client.** Evaluated historical operations and waste disposal processes of products containing PFAS in the context of available (at the time) knowledge of PFAS as well as standard of practice for disposal across the industry.
- **Agricultural Health Study.** Part of the field team in Iowa and North Carolina that collected multi-media samples from farms and the farming population over several weeks for a multi-agency study that explored potential causes of cancer among farmers and their families. Part of the analytical team that analyzed collected samples for a suite of pesticides with the data used to inform how the

REPRESENTATIVE EXPERT RETENTIONS/APPEARANCES

Analytical Environmental Chemistry

- Knurr, B. and J. Hauri (2021) Connecting Bomb Calorimetry to Environmental Issues: Two Bomb Calorimetry Experiments. Presented at the Fall ACS National Meeting, August 22-26. Atlanta, GA.
- Hauri, J. and B. Niece. (2018) Fingerprinting White Wines with Excitation-Emission Matrix Fluorescence. Poster presented at the Fall ACS National Meeting, August 19-23. Boston, MA.
- Hauri, J. (2017) Variation to the Excitation-Emission Matrix Fluorescence Characterization of Allochthonous Dissolved Organic Carbon due to pH changes. Poster presented 38th Annual Society of Environmental Toxicology and Chemistry National Meeting, 12 - 16 November, Minneapolis, MN.
- J. Hauri and K. Wierzbicki. (2011) Excitation-Emission Matrix Fluorescence Characterization of Dissolved Organic Carbon Leached from Leaves from Various Tree Species. Poster presented at the Society of Environmental Toxicology and Chemistry National Meeting, 13 - 17 November, Boston, MA.
- Miller, M. and J.F. Hauri. (2005) Development of an HPLC/UV Method for the Detection of Ibuprofen in River Water. Poster presented at the National Conference on Undergraduate Research, April 21-23, Lexington, VA.
- Parnass, K. and J.F. Hauri. (2004) Development of an HPLC/UV Method for the Measurement of Environmentally Relevant Concentrations of Ibuprofen. Poster presented at the North Atlantic Regional Chapter of the Society of Environmental Toxicology and Chemistry Meeting, June 9-11, Portsmouth, RI.

Chemistry and Toxicology

- S. Kane Driscoll, J. Hauri, K. Kulacki, A. M. Morrison, M. McArdle, A. Schierz, K. Yozzo, and M. Edwards. (2016) The Influence of Mixing Energy on the Concentration and Composition of Oil in Laboratory Toxicity Tests. Poster presented 37th Annual Society of Environmental Toxicology and Chemistry National Meeting, 6 - 10 November, Orlando, FL.
- Yozzo, K. S. Kane Driscoll, J. Hauri, M. McArdle, and A.M. Morrison. (2016) Review of Current Literature of Cardiotoxicity of Oil to Early Life Stages of Fish and the Use in Injury Assessments. Presentation at 37th Annual Society of Environmental Toxicology and Chemistry National Meeting, 6 - 10 November, Orlando, FL.
- Kane Driscoll, S., R. Wells Whittlesey, J. Hauri, K. Kulacki, A. Schierz, T.L. Morse, A.M. Morrison, and K. Yozzo. (2016) The Influence of Mixing energy on the Concentration, Composition, Toxicity, and Relevance of the Laboratory Toxicity Tests. Poster presented at the Gulf of Mexico Oil Spill and Ecosystem Science Conference. 1-4 February, Tampa Bay, Fl.
- Frazier, K., K. Cushing, and J. Hauri (2010) A visual documentation of acute toxicity in zooplankton. Poster presented at the North Atlantic Regional Chapter of the Society of Environmental Toxicology and Chemistry Meeting, June 2-4, Narragansett, RI.
- Hauri, J.F. and A.J. Horne. (2002) Copper toxicity reduction via EDTA addition: a real-world application. Presentation at the Society of Environmental Toxicology and Chemistry National Meeting, 16 - 20 November, Salt Lake City, UT.
- Hauri, J.F. and A.J. Horne. (2002) Copper toxicity reduction via EDTA addition: a real-world application. Poster presented at the American Chemical Society National Meeting, 18-22 August, Boston, MA.
- Hauri, J.F., K.D. Zoh, A. Steding, and A.J. Horne. (1999) Trinitrotoluene toxicity reduction to Ceriodaphnia dubia by humic acid complexation. Poster presented at the 19th NALMS Annual Meeting, 1-4 December, Reno, Nevada.
- Hauri, J.F., and A.J. Horne. (1997) Toxicity and chemistry of copper in urban runoff from San Francisco Bay creeks. Presented before the CALMS Annual Meeting, November, California.
- Hauri, J.F., and A.J. Horne. (1997) Influence of food on bioavailability of copper in the 7-day Ceriodaphnia dubia bioassay. Poster presented at the 18th SETAC Annual Meeting, 16-27 November, San Francisco, California.
- Hauri, J.F., and A.J. Horne. (1997) Toxicity and chemistry of copper in urban runoff from San Francisco Bay creeks. Presented before the 17th NALMS Annual Meeting, 2-6 December, Houston, Texas

Misc. Environmental Chemistry

- Drumm, E., and J. Hauri (2020) Analysis of Existing Water Quality Datasets of Lake Quinsigamond, Massachusetts. Poster accepted at North Atlantic Regional Chapter of the Society of Environmental Toxicology and Chemistry Meeting, April 13-14, Avery Point, CT. Accepted, but conference was cancelled.
- Hauri, J. (2007) Adapting research for laboratory experiments in undergraduate environmental chemistry courses. Presented at the 234th ACS National Meeting, August 19-23, Boston, MA.
- Kulevich, S. J. Van Doren, and J. Hauri. (2006) Green arsenic remediation. Presented at the 231st ACS National Meeting, March 26-30, Atlanta, GA.
- Hauri, J. and B. Niece. (2005) Removal of Ibuprofen through a Wastewater Treatment Plant. Poster presented Society of Environmental Toxicology and Chemistry National Meeting, 14 - 17 November, Baltimore, MD.
- Hauri, J.F., P. Frank, and A.J. Horne. (1999) Acid mine drainage in rural and urban environments. Presented before the 19th NALMS Annual Meeting, 1-4 December, Reno, Nevada.

PROFESSIONAL AFFILIATIONS

American Chemistry Society (ACS)

Society of Environmental Toxicology and Chemistry (SETAC)

NAC SETAC – board of directors 2005-2008, VP 2008-2009, Pres 2009-2010

PUBLICATIONS

Analytical Environmental Chemistry

Knurr, B. and J.F. Hauri. (2020) An Alternative to Recycling: Measurement of Combustion Enthalpies of Plastics via Bomb Calorimetry. Journal of Chemical Education. V.97, pp 1465-1469.

Niece, B. and J.F. Hauri. (2013) Determination of Mercury in Fish: A Low-Cost Implementation of Cold-Vapor Atomic Absorbance for the Undergraduate Environmental Chemistry Laboratory. Journal of Chemical Education. V.90 (14), pp 487–489.

Hauri, J. and B. Niece. (2011) Leaching of silver from silver-impregnated food containers. Journal of Chemical Education. V.88 (10), pp 1407–1409.

Chemistry and Toxicology

Hauri, J.F. and A.J. Horne. (2006) Copper toxicity reduction via EDTA addition: a real-world application. Water Environment Research. v. 78, pp. 2508-2513.

Hauri, J.F. and A.J. Horne. (2004) Reduction in Labile Copper in the 7 Day Ceriodaphnia dubia Toxicity Test due to the interaction with zooplankton food. Chemosphere. v. 56, pp. 717-723.

Misc. Environmental Chemistry

Hauri, J.F., C. Daughton, and R. Klaper. (2016) The Challenge: Establishing Policy in an Uncertain World: What can be done to address emerging environmental contaminants having indeterminate or subtle ecological or human impacts? Environmental Toxicology and Chemistry. V.35(2), pp. 266-270.

Hauri, J.F. and L.A. Schaider. (2009) Remediation of Acid Mine Drainage with Sulfate Reducing Bacteria. Journal of Chemical Education. v. 86 (2), pp. 216-218. Other Publications

Lincoln, R., C. Amarasiriwardena, J. Shine, A. Ettinger, C. Paciorek, J. Hauri, R. Wright, J. Spengler (2011) Meconium as a biomarker for prenatal metals exposure: Methodological considerations and variations in serial samples over time (Diss. Chapter). Biomarkers of Metals Exposure in Two High-Risk Communities. School of Public Health, Harvard University.

Hauri, J.F. (1998) Scoping study of air deposition monitoring information relevant to water quality of San Francisco Bay, Final Report. Bay Area Stormwater Management Agencies Association.

Hauri, J.F., and Alex J. Horne. (1997) Bioavailability and toxicity of heavy metals in urban runoff in simulated natural conditions. University of California Water Resources Center.

PROFESSIONAL PROFILE

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EDUCATION
BS, Civil Engineering, Hofstra University, 2006

PROFESSIONAL LICENSES
Professional Engineer (NY), 2017
Fundamentals of Engineering EIT, 2006

David E. Kaiser, PE

Senior Engineer I

EXPERIENCE SUMMARY
Seventeen years of experience: Senior Engineer, Project Engineer, Staff Engineer with Roux; previously Design Engineer with Bohler Engineering.

TECHNICAL SPECIALTIES
Engineering services including development and review of design drawings, implementation of design, development of technical specifications, review of construction submittals, development of SWPPPs, field management and site safety of various heavy construction projects, and civil/remediation engineering construction management. Designs have included sub slab depressurization systems, soil vapor extraction systems, stormwater drainage systems, NYCDEP sewer system, NYCDOB/DOT sidewalk project, and remedial system design. Additional services including budget management, permitting, project coordination, project scheduling, development of bid packages and cost estimating. Field management and construction oversight of heavy equipment construction including sewer construction, drainage construction, crane lift activities and remedial construction activities. Environmental site assessments focusing on soil, soil vapor, groundwater, and excavation dewatering investigations.

REPRESENTATIVE PROJECTS

- **Soil Vapor Mitigation Systems Design.** Senior Engineer for the design and development of sub slab depressurization systems (SSDS) and soil vapor extraction systems (SVES) for various sites including residential, commercial, and industrial in Suffolk County, Nassau County and New York City Boroughs. Project sites have included system design for new construction buildings, retrofit system for existing buildings and existing system takeovers with troubleshooting and optimization. Designs included strategic layouts and coordination with architects and MEPs to reduce piping conflicts; head loss calculations to ensure adequate vacuum influence on the sub slab via SSDSs comprised of solid headers, perforated laterals and suction points; blower and in-line fan design and sizing appropriate for anticipated head loss and building configuration; and accompanying vapor barrier system to prevent vapor intrusion.

- **Suffolk County Drywell Closure.** Senior Engineer for the planning and coordination of closing existing drywell structures serving as sanitary and industrial retention basins for an industrial facility. The project consisted of developing a sampling plan for the site, coordinating sampling and inspection of existing sanitary and industrial drywells in accordance with Suffolk County Department of Health Services Article 12, SOP No. 9-95 Pumpout and Soil Cleanup Criteria. Following the sampling event, a summary of results was prepared and sent to the SCDHS for review. Due to exceedances that were present within the septic tanks, a remedial action work plan was developed to identify the required steps for successful closure which included coordinating the SCDHS field inspection, extraction of contaminated liquids and solids, and proper disposal of the waste.

- **SPDES Outfall Control Structure Design and Construction.** Senior Engineer for the design and construction of a new SPDES outfall control structure utilizing a precast concrete vault formerly used as a subgrade tank enclosure in Brooklyn, NY. Design included retrofitting an existing precast concrete tank vault to serve as an effluent control structure; and a poured in place concrete compound weir wall to allow control of effluent, flow monitoring to SPDES outfall as well as prevent tidal influx from backflowing into the system. Construction required the management of several trades both landside and waterside to perform an SOE, custom concrete pour for compound weir, dewatering, new steel bulkhead penetration, and sealing of the entire system.

- **NYSDEC Spills Project Remediation.** Senior Engineer for the development, implementation and reporting of Remedial Action Work Plan for a former gasoline retail facility in Greenwich, NY. Remediation included: UST removal, excavation and disposal of approximately 7,000 tons of petroleum hydrocarbon impacted soil via a complex slide rail SOE system, and application of approximately 8,000 pounds of oxygen release compound (ORC) to the groundwater zone across the excavation to enhance the *in situ* aerobic bioremediation.
- **Shooting Range Lead Sampling and Abatement.** Senior Engineer for the development, implementation and reporting of Lead Sampling and Abatement of an indoor state government operated shooting range. Sampling and abatement included: review of surface wipe sampling, live fire air monitoring, assessment of results in accordance with OSHA Action Levels and Permissible Exposure Limits, coordination and management of cleaning and abatement of the range with post-cleaning clearance sampling.
- **Property Drainage System Design and Construction.** Project Engineer for the design and development of a new on-site stormwater treatment system located at a former petroleum terminal in Brooklyn, NY. Design included drainage improvements and modifications for the former petroleum terminal to support ongoing remediation activities that were being conducted to facilitate the future closure of an existing in-ground oil/water separator and removal of associated piping, and to support the anticipated long-term remedy for, and potential future redevelopment of, the subject property. The proposed drainage modifications included the installation of new drainage structures, Contech treatment structures and conveyance piping to collect and treat stormwater runoff within the property, and bypass the existing in-ground oil/water separator, prior to discharging the stormwater via an existing SPDES outfall.
- **Oil/Water Separator Closure.** Project Engineer for engineering support and review for the closure of an existing in-ground oil/water separator at a former petroleum terminal in Brooklyn, NY. The closure and abandonment of the oil/water separator was deemed the long-term remedy as approved by the NYSDEC. The oil/water separator was originally constructed in the early 1900s and has served the property by providing stormwater runoff treatment. The closure project includes the following tasks: dewatering and treatment of separator water; excavation of existing sludge in separator; dewatering and drying/stabilization of the sludge removed; power washing of interior; backfill and compaction of clean fill inside separator; removal of all existing above grade structures including catwalks, guardrails and piping; proper shipping and disposal of sludge contents; installation of a final cover system consisting of a geosynthetic clay liner (GCL) and filter fabric barrier; and final site grading.
- **Utility Tunnel Extension.** Project Engineer for construction management of a utility tunnel extension and modification project. The project consisted of installation of a precast concrete stairway access to an existing utility tunnel, installation of a structural slab to span the tunnel extension, installation of a new base slab, installation of cast-in-place concrete walls and top slab, installation of sidewalks and relocation of all existing system piping and conduits. The work was performed in accordance with the requirements of the New York City Department of Buildings (NYCDOB) and the New York City Department of Transportation (NYCDOT).
- **Treatment System Building Upgrades.** Project Engineer for the review and implementation of engineering drawings for a metals removal system upgrade to an existing 450-gpm groundwater treatment system. The upgrades consisted of: relocating and reinstalling the existing oil/water separator tank on a steel spacer via crane; lifting and installing the existing 10,000 gallon equalization tank to be repurposed as a filter backwash solids removal tank; lifting and installing prefabricated concrete pads with a subbase of Geogrid BX1200 and 6” of aggregate size number 57 (as per NYCDDC Highway Specifications and ASTM C33) compacted to 95% Standard Proctor, under proposed tank locations; locating a new 20,000 gallon equalization/aeration tank on the new pad; installing of new blower motor and enclosure; and installing of new piping and appurtenances.
- **Recovery Well Construction.** Staff Engineer for the construction of aspects of a dual-phase free-phase petroleum product (free-product) and groundwater recovery well at a former petroleum terminal in Brooklyn, NY. Groundwater extracted from the recovery well would be conveyed through 4-inch diameter high density polyethylene standard dimension ratio 11 (HDPE SDR 11) piping and connected to an existing 6-inch HPDE SDR 11 force main piping network that transports the groundwater to an existing on-site groundwater treatment system. Any free-product recovered would be sent to an existing 2,000 gallon above ground storage tank (AST) via 1-inch double wall product piping. Electrical and signal conduits were routed to an existing well house where the system control components were housed.
- **Treatment System Building Roof Rehabilitation and Platform Installation.** Project/Staff Engineer for providing engineering design, review, and construction management of the rehabilitation of a roof and installation of an internal platform in an existing remediation groundwater treatment system building located at a former petroleum terminal in Brooklyn, NY. The roof rehabilitation project included the

replacement of approximately 1,200 square feet of stainless steel decking, insulation and waterproofing. The project also included the construction of three new skylights and access ladders. The platform installation project included the installation of new steel members and fiberglass reinforced polymer (FRP) molded grating within the existing remediation groundwater treatment to provide a working platform for on-site technicians. The new steel members were bolted to existing infrastructure to limit on-site welding and the platform was installed with tubular steel handrails. Responsibilities included: ensuring that the development of the plans and technical specifications were in accordance with the New York City Construction Codes, New York State Building Standards and Codes, various ASTM standards, American Institute of Steel Construction (AISC) "Code of Standard Practice for Steel Buildings and Bridges," and Steel Structures Painting Council (SSPC) Publications.

- **NYCDEP Private Storm and Sanitary Sewer System.** Project/Staff Engineer for the design and development of a New York City Department of Environmental Protection (NYCDEP) Private Storm and Sanitary Sewer System located at a former petroleum terminal in Brooklyn, NY. The sewer system comprised of over 2,600 LF of sewer in Greenpoint Brooklyn over two phases of construction. During the duration of this project responsibilities included: develop/revise NYCDEP sewer design plans and construction notes, address NYCDEP comments and markups, develop Bill of Materials, develop cost estimates, develop technical specifications, develop bid package, ensure compliance with NYCDEP and NYCDOT specifications and requirements, develop/revise NYCDOT Builder's Pavement Plan (BPP), develop NYCDOT Maintenance and Protection of Traffic plans, conduct/participate in design construction meetings, review subcontractor submittals and cut sheets, address NYCDEP punch list items, management/oversight/coordination of subcontractor construction activities.
- **NYCDOB/NYCDOT Sidewalk Installation.** Project/Staff Engineer for the design, development, and installation of over 4,000 linear feet of new sidewalks over various phases located at a former petroleum terminal in Brooklyn, NY. The design, development, and installation of these sidewalks were in accordance with the New York City Department of Buildings and New York City Department of Transportation specifications and details of construction. During the duration of these projects my major responsibilities included: develop/revise NYCDOT Builder's Pavement Plans, develop cost estimates, develop technical specifications, develop bid package, ensure compliance with NYCDOB and NYCDOT specifications and requirements, develop NYCDOT Maintenance and Protection of Traffic plans, conduct/participate in design construction meetings, ensure proper installation and testing of sidewalks in accordance with NYCDOB and NYCDOT, management/oversight/coordination of subcontractor construction activities.
- **Sub Slab Depressurization System.** Staff Engineer for the design and construction of two sub slab depressurization systems (SSDS) located within the footprint of a petroleum remediation site where a new building was proposed to be built. These projects were part of an Interim Remedial Measure (IRM) Action Plan as approved by the NYSDEC to provide a preventative proactive measure to address potential soil vapor issues. The SSDSs were designed to operate passively; however, header piping was installed to allow for the installation of the necessary equipment if an active system was required. The SSDSs consisted of ¾-inch gravel with 4-inch diameter polyvinyl chloride (PVC) schedule 40 well screen used as soil gas collection piping and 6-inch diameter solid PVC used as the header piping. A vapor barrier/waterproofing membrane and nonwoven geotextile fabric were installed between the venting layer and the floor slab. All penetrations through the floor slab were sealed using a silicone based waterproof sealant. The scope of work included excavation and trench work for the SSDS; placement of pipe bedding; jointing and installation of the pipe fittings, valves, and appurtenances; installation of pipe sleeves and mechanical seals; and installation of nonwoven geotextile fabric and silicone based waterproof sealant.
- **Remediation System Signal Network Utility Expansion Oversight and Management.** Staff Engineer and Field Manager for the completion of a signal communication network expansion as part of a petroleum remediation system. My responsibilities included oversight of a subcontractor while installing level sensors within the product pull boxes to improve the safety of the system operations by continuously monitoring the underground product piping network for potential leaks, and programming, testing and verification of operation of sensors. The scope of work also included the installation of signal and control wiring from recovery well houses to subsurface vaults through existing conduit located beneath New York City streets located in Greenpoint Brooklyn. The signal expansion was part of an effort to integrate the sensor/components within the vaults with the existing remediation system's programmable logic controllers (PLCs). The scope of work also included: development of programming to integrate input infrastructure to existing PLCs, development of human machine interface (HMI) screens to allow for remote viewing at the system control buildings, and installation of power supplies and other apparatuses as required for the operation of the new infrastructure. My responsibilities for this work included: subcontractor management, submittal and cut

sheet review, scheduling management, 3rd party coordination, and construction meetings.

- **New York City Transit Plan Submission.** Staff Engineer for researching, preparing, and submitting New York City Transit (NYCT) Plans for various sites to seek approval for drilling and other subsurface activities in proximity to NYC Subways. The scope of work included visiting the Microfilm Room at the NYCT Office to obtain copies of the as-built plans, roof plans, profiles, sections, and alignments adjacent to the properties that our clients were proposing to perform subsurface work. Using these plans, develop proposed boring location plans and cross section plans, overlaying the NYCT plans to determine the proposed distance to adjacent NYCT structures. Ensured that these plans had the most up to date NYCT construction notes since these drawing became part of the projects' contract drawings. Submitted the plans and fees to the NYCT and coordinated with the NYCT inspectors assigned to each project ensuring that all requirements and questions were satisfied. Procured the associated NYCT approvals and distributed to the client so that they may proceed.
- **Stormwater Pollution Prevention Plan (SWPPP) Reports.** Staff Engineer for preparing and submitting Stormwater Pollution Prevention Plans (SWPPP) for various residential and commercial development sites in New York City and Long Island. The scope of work included preparation of SWPPP Reports in accordance with the most current New York State Department of Environmental Conservation (NYSDEC) regulations at the time including the 'General Permit for Stormwater Discharges from Construction Activity' and the 'New York State Stormwater Management Design Manual.' Preparation of the SWPPP Reports included: summarizing the site history and project description, soil geology, potential pollutants, erosion and sediment control practices, inspection and maintenance procedures, water quantity and water quality control plans, construction sequence scheduling, and the Notice of Intent (NOI) for each project as required by the NYSDEC.
- **Former Petroleum Storage Wetland and Canal Remediation Site.** Staff Engineer for daily construction oversight of subcontractors as a field manager and implementation of the site-specific health and safety plan as a Community Air Monitoring Program manager. The scope of work included conducting an on-site Community Air Monitoring Program monitoring for airborne dust and VOCs that were potentially generated by remedial and construction work activities. Stopping work and implementing best engineering/control practices if action levels were exceeded. Recording and providing QA/QC analysis of on-site weather and air monitoring data, as well as ensuring the proper operation of all instruments/monitors on a daily basis. Inspections were conducted of three on-site aboveground API concrete oil/water separators. Stormwater Pollution Prevention Plan (SWPPP) inspections were performed, ensuring compliance with NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and daily reports were generated which would comprehensively document daily work activities and CAMP data and exceedances.
- **Land Development Site Plan Preparation.** Design Engineer for the design and development of residential, commercial, and industrial site plan packages for Suffolk County, Nassau County and New York City Boroughs. Site plan packages for the various municipalities within Suffolk County, Nassau County and New York City included components such as: zoning analysis, site removals plan, site design and construction documents, water, and sewer system design (detention and retention systems), site grading and drainage plans, and lighting analysis and design.

PROFESSIONAL TRAININGS

OSHA 40-Hour HAZWOPER Training: 2008

OSHA 30-Hour Construction Safety Training: 2011

OSHA 10-Hour Construction Safety Training: 2018

NYSDOT Hazardous Materials Awareness Training: 2017

NYSDEC Erosion and Sediment Control Training: 2016

Loss Prevention Systems Training Certification: 2008

ATTACHMENT 2

NYSDEC PFAS Guidance Emerging Contaminants

NEW YORK STATE OF OPPORTUNITY.

Department of Environmental Conservation

SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Under NYSDEC's Part 375 Remedial Programs

April 2023

www.dec.ny.gov

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ERRATA SHEET for

SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) Under NYSDEC's Part 375 Remedial Programs Issued January 17, 2020

Citation and Page Number	Current Text	Corrected Text	Date
Title of Appendix I, page 32	Appendix H	Appendix I	2/25/2020
Document Cover, page 1	Guidelines for Sampling and Analysis of PFAS	Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs	9/15/2020
Data Assessment and Application to Site Cleanup Page 3	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published	Until such time as Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published	3/28/2023
Water Sample Results Page 3	PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water if PFOA or PFOS is detected in any water sample at or above 10 ng/L (ppt) and is determined to be attributable to the site, either by a comparison of upgradient and downgradient levels, or the presence of soil source areas, as defined below.	NYSDEC has adopted ambient water quality guidance values for PFOA and PFOS. Groundwater samples should be compared to the human health criteria of 6.7 ng/l (ppt) for PFOA and 2.7 ng/l (ppt) for PFOS. These guidance values also include criteria for surface water for PFOS applicable for aquatic life, which may be applicable at some sites. Drinking water sample results should be compared to the NYS maximum contaminant level (MCL) of 10 ng/l (ppt).Analysis to determine if PFOA and PFOS concentrations are attributable to the site should include a comparison between upgradient and downgradient levels, and the presence of soil source areas, as defined below.	3/28/2023
Soil Sample Results Page 3	Soil cleanup objectives for PFOA and PFOS have been proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values:	NYSDEC will delay adding soil cleanup objectives for PFOA and PFOS to 6 NYCRR Part 375-6 until the PFAS rural soil background study has been completed. Until SCOs are in effect, the following are to be used as guidance values:	3/28/2023
Protection of Groundwater Page 3	PFOA (ppb) 1.1 PFOS (ppb) 3.7	PFOA (ppb) 0.8 PFOS (ppb) 1.0	3/28/2023

Citation and Page Number	Current Text	Corrected Text	Date
Footnote 2 Page 3	The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).	The Protection of Groundwater values are based on the above referenced ambient groundwater guidance values. Details on that calculation are available in the following document, prepared for the February 2022 proposed changes to Part 375 (https://www.dec.ny.gov/docs/remediation_hudson_pdf/part375techsupport.pdf). The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).	3/28/2023
Testing for Imported Soil Page 4	If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable.	If the concentrations of PFOA and PFOS in leachate are at or above the ambient water quality guidance values for groundwater, then the soil is not acceptable.	3/28/2023
Routine Analysis, page 9	"However, laboratories analyzing environmental samples…PFOA and PFOS in drinking water by EPA Method 537, 537.1 or ISO 25101."	"However, laboratories analyzing environmental samples…PFOA and PFOS in drinking water by EPA Method 537, 537.1, ISO 25101, or Method 533."	9/15/2020
Additional Analysis, page 9, new paragraph regarding soil parameters	None	"In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (EPA Method 9060), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils."	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Data Assessment and Application to Site Cleanup Page 10	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFAS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Target levels for cleanup of PFAS in other media, including biota and sediment, have not yet been established by the DEC.	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.	9/15/2020
Water Sample Results Page 10	PFAS should be further assessed and considered as a potential contaminant of concern in groundwater or surface water (…) If PFAS are identified as a contaminant of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.	PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water (…) If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Soil Sample Results, page 10	"The extent of soil contamination for purposes of delineation and remedy selection should be determined by having certain soil samples tested by Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed for PFAS. Soil exhibiting SPLP results above 70 ppt for either PFOA or PFOS (individually or combined) are to be evaluated during the cleanup phase."	"Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values. " [Interim SCO Table] "PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP. As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference: https://www.nj.gov/dep/srp/guidance/rs/daf.pdf. "	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Testing for Imported Soil Page 11	Soil imported to a site for use in a soil cap, soil cover, or as backfill is to be tested for PFAS in general conformance with DER-10, Section 5.4(e) for the PFAS Analyte List (Appendix F) using the analytical procedures discussed below and the criteria in DER-10 associated with SVOCs. If PFOA or PFOS is detected in any sample at or above 1 µg/kg, then soil should be tested by SPLP and the leachate analyzed for PFAS. If the SPLP results exceed 10 ppt for either PFOA or PFOS (individually) then the source of backfill should be rejected, unless a site-specific exemption is provided by DER. SPLP leachate criteria is based on the Maximum Contaminant Levels proposed for drinking water by New York State's Department of Health, this value may be updated based on future Federal or State promulgated regulatory standards. Remedial parties have the option of analyzing samples concurrently for both PFAS in soil and in the SPLP leachate to minimize project delays. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.	Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable. PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Footnotes	None	[1] TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances. [2] The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the soil cleanup objective for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).	9/15/2020
Additional Analysis, page 9	In cases… soil parameters, such as Total Organic Carbon (EPA Method 9060), soil…	In cases… soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil…	1/8/2021
Appendix A, General Guidelines, fourth bullet	List the ELAP-approved lab(s) to be used for analysis of samples	List the ELAP- certified lab(s) to be used for analysis of samples	1/8/2021
Appendix E, Laboratory Analysis and Containers	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by ISO Method 25101.	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101	1/8/2021
Water Sample Results Page 9	"In addition, further assessment of water may be warranted if either of the following screening levels are met: a. any other individual PFAS (not PFOA or PFOS) is detected in water at or above 100 ng/L; or b. total concentration of PFAS (including PFOA and PFOS) is detected in water at or above 500 ng/L"	Deleted	6/15/2021

Citation and Page Number	Current Text	Corrected Text	Date
Routine Analysis, Page XX	Currently, New York State Department of Health's Environmental Laboratory Approval Program (ELAP)… criteria set forth in the DER's laboratory guidelines for PFAS in non-potable water and solids (Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids).	Deleted	5/31/2022
Analysis and Reporting, Page XX	As of October 2020, the United States Environmental Protection Agency (EPA) does not have a validated method for analysis of PFAS for media commonly analyzed under DER remedial programs (non-potable waters, solids). DER has developed the following guidelines to ensure consistency in analysis and reporting of PFAS.	Deleted	5/31/2022
Routine Analysis, Page XX	LC-MS/MS analysis for PFAS using methodologies based on EPA Method 537.1 is the procedure to use for environmental samples. Isotope dilution techniques should be utilized for the analysis of PFAS in all media.	EPA Method 1633 is the procedure to use for environmental samples.	
Soil Sample Results, Page XX	Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6	Soil cleanup objectives for PFOA and PFOS have been proposed in an upcoming revision to 6 NYCRR Part 375-6	
Appendix A	"Include in the text… LC-MS/MS for PFAS using methodologies based on EPA Method 537.1"	"Include in the text ….EPA Method 1633"	
Appendix A	"Laboratory should have ELAP certification for PFOA and PFOS in drinking water by EPA Method 537, 537.1, EPA Method 533, or ISO 25101"	Deleted	
Appendix B	"Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1"	"Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633"	

Citation and Page Number	Current Text	Corrected Text	Date
Appendix C	"Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1"	"Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633"	
Appendix D	"Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1"	"Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633"	
Appendix G		Updated to include all forty PFAS analytes in EPA Method 533	
Appendix H		Deleted	
Appendix I	Appendix I	Appendix H	
Appendix H	"These guidelines are intended to be used for the validation of PFAS analytical results for projects within the Division of Environmental Remediation (DER) as well as aid in the preparation of a data usability summary report."	"These guidelines are intended to be used for the validation of PFAS using EPA Method 1633 for projects within the Division of Environmental Remediation (DER)."	
Appendix H	"The holding time is 14 days…"	"The holding time is 28 days…"	
Appendix H, Initial Calibration	"The initial calibration should contain a minimum of five standards for linear fit…"	"The initial calibration should contain a minimum of six standards for linear fit…"	
Appendix H, Initial Calibration	Linear fit calibration curves should have an R^2 value greater than 0.990.	Deleted	
Appendix H, Initial Calibration Verification	Initial Calibration Verification Section	Deleted	
Appendix H	secondary Ion Monitoring Section	Deleted	
Appendix H	Branched and Linear Isomers Section	Deleted	

Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs

Objective

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) performs or oversees sampling of environmental media and subsequent analysis of PFAS as part of remedial programs implemented under 6 NYCRR Part 375. To ensure consistency in sampling, analysis, reporting, and assessment of PFAS, DER has developed this document which summarizes currently accepted procedures and updates previous DER technical guidance pertaining to PFAS.

Applicability

All work plans submitted to DEC pursuant to one of the remedial programs under Part 375 shall include PFAS sampling and analysis procedures that conform to the guidelines provided herein.

As part of a site investigation or remedial action compliance program, whenever samples of potentially affected media are collected and analyzed for the standard Target Analyte List/Target Compound List (TAL/TCL), PFAS analysis should also be performed. Potentially affected media can include soil, groundwater, surface water, and sediment. Based upon the potential for biota to be affected, biota sampling and analysis for PFAS may also be warranted as determined pursuant to a Fish and Wildlife Impact Analysis. Soil vapor sampling for PFAS is not required.

Field Sampling Procedures

DER-10 specifies technical guidance applicable to DER's remedial programs. Given the prevalence and use of PFAS, DER has developed "best management practices" specific to sampling for PFAS. As specified in DER-10 Chapter 2, quality assurance procedures are to be submitted with investigation work plans. Typically, these procedures are incorporated into a work plan, or submitted as a stand-alone document (e.g., a Quality Assurance Project Plan). Quality assurance guidelines for PFAS are listed in Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS.

Field sampling for PFAS performed under DER remedial programs should follow the appropriate procedures outlined for soils, sediments, or other solids (Appendix B), non-potable groundwater (Appendix C), surface water (Appendix D), public or private water supply wells (Appendix E), and fish tissue (Appendix F).

QA/QC samples (e.g. duplicates, MS/MSD) should be collected as specified in DER-10, Section 2.3(c). For sampling equipment coming in contact with aqueous samples only, rinsate or equipment blanks should be collected. Equipment blanks should be collected at a minimum frequency of one per day per site or one per twenty samples, whichever is more frequent.

Analysis and Reporting

The investigation work plan should describe analysis and reporting procedures, including laboratory analytical procedures for the methods discussed below. As specified in DER-10 Section 2.2, laboratories should provide a full Category B deliverable. In addition, a Data Usability Summary Report (DUSR) should be prepared by an independent, third-party data validator. Electronic data submissions should meet the requirements provided at: https://www.dec.ny.gov/chemical/62440.html.

DER has developed a *PFAS Analyte List* (Appendix G) for remedial programs to understand the nature of contamination at sites. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. If lab and/or matrix specific issues are encountered for any analytes, the DER project manager, in consultation with the DER chemist, will make case-by-case decisions as to whether certain analytes may be temporarily or permanently discontinued from analysis at each site. As with other contaminants that are analyzed for at a site, the *PFAS Analyte List* may be refined for future sampling events based on investigative findings.

Routine Analysis

EPA Method 1633 is the procedure to use for environmental samples. Reporting limits for PFOA and PFOS in aqueous samples should not exceed 2 ng/L. Reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 µg/kg. Reporting limits for all other PFAS in aqueous and solid media should be as close to these limits as possible. If laboratories indicate that they are not able to achieve these reporting limits for the entire *PFAS Analyte List*, site-specific decisions regarding acceptance of elevated reporting limits for specific PFAS can be made by the DER project manager in consultation with the DER chemist. Data review guidelines were developed by DER to ensure data comparability and usability (Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids).

Additional Analysis

Additional laboratory methods for analysis of PFAS may be warranted at a site, such as the Synthetic Precipitation Leaching Procedure (SPLP) and Total Oxidizable Precursor Assay (TOP Assay).

In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils.

SPLP is a technique used to determine the mobility of chemicals in liquids, soils and wastes, and may be useful in determining the need for addressing PFAS-containing material as part of the remedy. SPLP by EPA Method 1312 should be used unless otherwise specified by the DER project manager in consultation with the DER chemist.

Impacted materials can be made up of PFAS that are not analyzable by routine analytical methodology. A TOP Assay can be utilized to conceptualize the amount and type of oxidizable PFAS which could be liberated in the environment, which approximates the maximum concentration of perfluoroalkyl substances that could be generated if all polyfluoroalkyl substances were oxidized. For example, some polyfluoroalkyl substances may degrade or transform to form perfluoroalkyl substances (such as PFOA or PFOS), resulting in an increase in perfluoroalkyl substance concentrations as contaminated groundwater moves away from a source. The TOP Assay converts, through oxidation, polyfluoroalkyl substances (precursors) into perfluoroalkyl substances that can be detected by routine analytical methodology.[1]

[1] TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances.

Commercial laboratories have adopted methods which allow for the quantification of targeted PFAS in air and biota. The EPA's Office of Research and Development (ORD) is currently developing methods which allow for air emissions characterization of PFAS, including both targeted and non-targeted analysis of PFAS. Consult with the DER project manager and the DER chemist for assistance on analyzing biota/tissue and air samples.

Data Assessment and Application to Site Cleanup

Until such time as Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.

Water Sample Results

NYSDEC has adopted ambient water quality guidance values for PFOA and PFOS. Groundwater samples should be compared to the human health criteria of 6.7 ng/l (ppt) for PFOA and 2.7 ng/l (ppt) for PFOS. These human health criteria should also be applied to surface water that is used as a water supply. This guidance also includes criteria for surface water for PFOS applicable for aquatic life, which may be applicable at some sites. Drinking water sample results should be compared to the NYS maximum contaminant level (MCL) of 10 ng/l (ppt). Analysis to determine if PFOA and PFOS concentrations are attributable to the site should include a comparison between upgradient and downgradient levels, and the presence of soil source areas, as defined below.

If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.

Soil Sample Results

NYSDEC will delay adding soil cleanup objectives for PFOA and PFOS to 6 NYCRR Part 375-6 until the PFAS rural soil background study has been completed. Until SCOs are in effect, the following are to be used as guidance values:

Guidance Values for Anticipated Site Use	PFOA (ppb)	PFOS (ppb)
Unrestricted	0.66	0.88
Residential	6.6	8.8
Restricted Residential	33	44
Commercial	500	440
Industrial	600	440
Protection of Groundwater[2]	0.8	1.0

PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These

[2] The Protection of Groundwater values are based on the above referenced ambient groundwater guidance values. Details on that calculation are available in the following document, prepared for the February 2022 proposed changes to Part 375 (https://www.dec.ny.gov/docs/remediation_hudson_pdf/part375techsupport.pdf). The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).

additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP.

As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference: https://www.nj.gov/dep/srp/guidance/rs/daf.pdf.

Testing for Imported Soil

Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above the ambient water quality guidance values for groundwater, then the soil is not acceptable.

PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.

Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS

The following guidelines (general and PFAS-specific) can be used to assist with the development of a QAPP for projects within DER involving sampling and analysis of PFAS.

General Guidelines in Accordance with DER-10

- Document/work plan section title – Quality Assurance Project Plan
- Summarize project scope, goals, and objectives
- Provide project organization including names and resumes of the project manager, Quality Assurance Officer (QAO), field staff, and Data Validator
    - The QAO should not have another position on the project, such as project or task manager, that involves project productivity or profitability as a job performance criterion
- List the ELAP certified lab(s) to be used for analysis of samples
- Include a site map showing sample locations
- Provide detailed sampling procedures for each matrix
- Include Data Quality Usability Objectives
- List equipment decontamination procedures
- Include an "Analytical Methods/Quality Assurance Summary Table" specifying:
    - Matrix type
    - Number or frequency of samples to be collected per matrix
    - Number of field and trip blanks per matrix
    - Analytical parameters to be measured per matrix
    - Analytical methods to be used per matrix with minimum reporting limits
    - Number and type of matrix spike and matrix spike duplicate samples to be collected
    - Number and type of duplicate samples to be collected
    - Sample preservation to be used per analytical method and sample matrix
    - Sample container volume and type to be used per analytical method and sample matrix
    - Sample holding time to be used per analytical method and sample matrix
- Specify Category B laboratory data deliverables and preparation of a DUSR

Specific Guidelines for PFAS

- Include in the text that sampling for PFAS will take place
- Include in the text that PFAS will be analyzed by EPA Method 1633
- Include the list of PFAS compounds to be analyzed (*PFAS Analyte List*)
- Include the laboratory SOP for PFAS analysis
- List the minimum method-achievable Reporting Limits for PFAS
    - Reporting Limits should be less than or equal to:
        - Aqueous – 2 ng/L (ppt)
        - Solids – 0.5 µg/kg (ppb)
- Include the laboratory Method Detection Limits for the PFAS compounds to be analyzed
-
- Include detailed sampling procedures
    - Precautions to be taken
    - Pump and equipment types
    - Decontamination procedures
    - Approved materials only to be used
- Specify that regular ice only will be used for sample shipment
- Specify that equipment blanks should be collected at a minimum frequency of 1 per day per site for each matrix

Appendix B - Sampling Protocols for PFAS in Soils, Sediments and Solids

General

The objective of this protocol is to give general guidelines for the collection of soil, sediment and other solid samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Containers

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in to contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel spoon
- stainless steel bowl
- steel hand auger or shovel without any coatings

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Sampling is often conducted in areas where a vegetative turf has been established. In these cases, a pre-cleaned trowel or shovel should be used to carefully remove the turf so that it may be replaced at the conclusion of sampling. Surface soil samples (e.g. 0 to 6 inches below surface) should then be collected using a pre-cleaned, stainless steel spoon. Shallow subsurface soil samples (e.g. 6 to ~36 inches below surface) may be collected by digging a hole using a pre-cleaned hand auger or shovel. When the desired subsurface depth is reached, a pre-cleaned hand auger or spoon shall be used to obtain the sample.

When the sample is obtained, it should be deposited into a stainless steel bowl for mixing prior to filling the sample containers. The soil should be placed directly into the bowl and mixed thoroughly by rolling the material into the middle until the material is homogenized. At this point the material within the bowl can be placed into the laboratory provided container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A soil log or sample log shall document the location of the sample/borehole, depth of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix C - Sampling Protocols for PFAS in Monitoring Wells

General

The objective of this protocol is to give general guidelines for the collection of groundwater samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including plumbers tape and sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel inertia pump with HDPE tubing
- peristaltic pump equipped with HDPE tubing and silicone tubing
- stainless steel bailer with stainless steel ball
- bladder pump (identified as PFAS-free) with HDPE tubing

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Monitoring wells should be purged in accordance with the sampling procedure (standard/volume purge or low flow purge) identified in the site work plan, which will determine the appropriate time to collect the sample. If sampling using standard purge techniques, additional purging may be needed to reduce turbidity levels, so samples contain a limited amount of sediment within the sample containers. Sample containers that contain sediment may cause issues at the laboratory, which may result in elevated reporting limits and other issues during the sample preparation that can compromise data usability. Sampling personnel should don new nitrile gloves prior to sample collection due to the potential to contact PFAS containing items (not related to the sampling equipment) during the purging activities.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Additional equipment blank samples may be collected to assess other equipment that is utilized at the monitoring well
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A purge log shall document the location of the sample, sampling equipment, groundwater parameters, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix D - Sampling Protocols for PFAS in Surface Water

General

The objective of this protocol is to give general guidelines for the collection of surface water samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel cup

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Where conditions permit, (e.g. creek or pond) sampling devices (e.g. stainless steel cup) should be rinsed with site medium to be sampled prior to collection of the sample. At this point the sample can be collected and poured into the sample container.

If site conditions permit, samples can be collected directly into the laboratory container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A sample log shall document the location of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix E - Sampling Protocols for PFAS in Private Water Supply Wells

General

The objective of this protocol is to give general guidelines for the collection of water samples from private water supply wells (with a functioning pump) for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101. The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials (e.g. plumbers tape), including sample bottle cap liners with a PTFE layer.

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Locate and assess the pressure tank and determine if any filter units are present within the building. Establish the sample location as close to the well pump as possible, which is typically the spigot at the pressure tank. Ensure sampling equipment is kept clean during sampling as access to the pressure tank spigot, which is likely located close to the ground, may be obstructed and may hinder sample collection.

Prior to sampling, a faucet downstream of the pressure tank (e.g., washroom sink) should be run until the well pump comes on and a decrease in water temperature is noted which indicates that the water is coming from the well. If the homeowner is amenable, staff should run the water longer to purge the well (15+ minutes) to provide a sample representative of the water in the formation rather than standing water in the well and piping system including the pressure tank. At this point a new pair of nitrile gloves should be donned and the sample can be collected from the sample point at the pressure tank.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- If equipment was used, collect one equipment blank per day per site and a minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers.
- A field reagent blank (FRB) should be collected at a rate of one per 20 samples. The lab will provide a FRB bottle containing PFAS free water and one empty FRB bottle. In the field, pour the water from the one bottle into the empty FRB bottle and label appropriately.
- Request appropriate data deliverable (Category B) and an electronic data deliverable
- For sampling events where multiple private wells (homes or sites) are to be sampled per day, it is acceptable to collect QC samples at a rate of one per 20 across multiple sites or days.

Documentation

A sample log shall document the location of the private well, sample point location, owner contact information, sampling equipment, purge duration, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate and available (e.g. well construction, pump type and location, yield, installation date). Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appendix F - Sampling Protocols for PFAS in Fish

This appendix contains a copy of the current SOP developed by the Division of Fish and Wildlife (DFW) entitled "General Fish Handling Procedures for Contaminant Analysis" (Ver. 8). This SOP should be followed when collecting fish for contaminant analysis. Note, however, that the Bureau of Ecosystem Health will not be supplying bags or tags. All supplies are the responsibility of the collector

Procedure Name: General Fish Handling Procedures for Contaminant Analysis

Number: FW-005

Purpose: This procedure describes data collection, fish processing and delivery of fish collected for contaminant monitoring. It contains the chain of custody and collection record forms that should be used for the collections.

Organization: Environmental Monitoring Section
Bureau of Ecosystem Health
Division of Fish and Wildlife (DFW)
New York State Department of Environmental Conservation (NYSDEC)
625 Broadway
Albany, New York 12233-4756

Version: 8

Previous Version Date: 21 March 2018

Summary of Changes to this Version: Updated bureau name to Bureau of Ecosystem Health. Added direction to list the names of all field crew on the collection record. Minor formatting changes on chain of custody and collection records.

Originator or Revised by: Wayne Richter, Jesse Becker

Date: 26 April 2019

Quality Assurance Officer and Approval Date: Jesse Becker, 26 April 2019

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

GENERAL FISH HANDLING PROCEDURES FOR CONTAMINANT ANALYSES

A. Original copies of all continuity of evidence (i.e., Chain of Custody) and collection record forms must accompany delivery of fish to the lab. A copy shall be directed to the Project Leader or as appropriate, Wayne Richter. All necessary forms will be supplied by the Bureau of Ecosystem Health. Because some samples may be used in legal cases, it is critical that each section is filled out completely. Each Chain of Custody form has three main sections:

   1. The top box is to be filled out **and signed** by the person responsible for the fish collection (e.g., crew leader, field biologist, researcher). This person is responsible for delivery of the samples to DEC facilities or personnel (e.g., regional office or biologist).

   2. The second section is to be filled out **and signed** by the person responsible for the collections while being stored at DEC, before delivery to the analytical lab. This may be the same person as in (1), but it is still required that they complete the section. Also important is the **range of identification numbers** (i.e., tag numbers) included in the sample batch.

   3. Finally, the bottom box is to record any transfers between DEC personnel and facilities. Each subsequent transfer should be **identified, signed, and dated**, until laboratory personnel take possession of the fish.

B. The following data are required on each **Fish Collection Record** form:

   1. Project and Site Name.

   2. DEC Region.

   3. All personnel (and affiliation) involved in the collection.

   4. Method of collection (gill net, hook and line, etc.)

   5. Preservation Method.

C. The following data are to be taken on each fish collected and recorded on the **Fish Collection Record** form:

   1. Tag number - Each specimen is to be individually jaw tagged at time of collection with a unique number. Make sure the tag is turned out so that the number can be read without opening the bag. Use tags in sequential order. For small fish or composite samples place the tag inside the bag with the samples. The Bureau of Ecosystem Health can supply the tags.

   2. Species identification (please be explicit enough to enable assigning genus and species). Group fish by species when processing.

   3. Date collected.

   4. Sample location (waterway and nearest prominent identifiable landmark).

   5. Total length (nearest mm or smallest sub-unit on measuring instrument) and weight (nearest g or

smallest sub-unit of weight on weighing instrument). Take all measures as soon as possible with calibrated, protected instruments (e.g. from wind and upsets) and prior to freezing.

6. Sex - fish may be cut enough to allow sexing or other internal investigation, but do not eviscerate. Make any incision on the right side of the belly flap or exactly down the midline so that a left-side fillet can be removed.

D. General data collection recommendations:

1. It is helpful to use an ID or tag number that will be unique. It is best to use metal striped bass or other uniquely numbered metal tags. If uniquely numbered tags are unavailable, values based on the region, water body and year are likely to be unique: for example, R7CAY11001 for Region 7, Cayuga Lake, 2011, fish 1. If the fish are just numbered 1 through 20, we have to give them new numbers for our database, making it more difficult to trace your fish to their analytical results and creating an additional possibility for errors.

2. Process and record fish of the same species sequentially. Recording mistakes are less likely when all fish from a species are processed together. Starting with the bigger fish species helps avoid missing an individual.

3. If using Bureau of Ecosystem Health supplied tags or other numbered tags, use tags in sequence so that fish are recorded with sequential Tag Numbers. This makes data entry and login at the lab and use of the data in the future easier and reduces keypunch errors.

4. Record length and weight as soon as possible after collection and before freezing. Other data are recorded in the field upon collection. An age determination of each fish is optional, but if done, it is recorded in the appropriate “Age” column.

5. For composite samples of small fish, record the number of fish in the composite in the Remarks column. Record the length and weight of each individual in a composite. All fish in a composite sample should be of the same species and members of a composite should be visually matched for size.

6. Please submit photocopies of topographic maps or good quality navigation charts indicating sampling locations. GPS coordinates can be entered in the Location column of the collection record form in addition to or instead for providing a map. These records are of immense help to us (and hopefully you) in providing documented location records which are not dependent on memory and/or the same collection crew. In addition, they may be helpful for contaminant source trackdown and remediation/control efforts of the Department.

7. When recording data on fish measurements, it will help to ensure correct data recording for the data recorder to call back the numbers to the person making the measurements.

E. Each fish is to be placed in its own individual plastic bag. For small fish to be analyzed as a composite, put all of the fish for one composite in the same bag but use a separate bag for each composite. It is important to individually bag the fish to avoid difficulties or cross contamination when processing the fish for chemical analysis. Be sure to include the fish’s tag number inside the bag, preferably attached to the fish with the tag number turned out so it can be read. Tie or otherwise secure the bag closed. **The Bureau of Ecosystem Health will supply the bags.** If necessary, food grade bags may be procured from a suitable vendor (e.g., grocery store). It is preferable to redundantly label each bag with a manila tag tied between the knot and the body of the bag. This tag should be labeled with the project name, collection location, tag number, collection date, and fish species. If scales are collected, the scale envelope should be labeled with

the same information.

F. Groups of fish, by species, are to be placed in one large plastic bag per sampling location. **The Bureau of Ecosystem Health will supply the larger bags.** Tie or otherwise secure the bag closed. Label the site bag with a manila tag tied between the knot and the body of the bag. The tag should contain: project, collection location, collection date, species and **tag number ranges**. Having this information on the manila tag enables lab staff to know what is in the bag without opening it.

G. Do not eviscerate, fillet or otherwise dissect the fish unless specifically asked to. If evisceration or dissection is specified, the fish must be cut along the exact midline or on the right side so that the left side fillet can be removed intact at the laboratory. If filleting is specified, the procedure for taking a standard fillet (SOP PREPLAB 4) must be followed, including removing scales.

H. Special procedures for PFAS: Unlike legacy contaminants such as PCBs, which are rarely found in day to day life, PFAS are widely used and frequently encountered. Practices that avoid sample contamination are therefore necessary. While no standard practices have been established for fish, procedures for water quality sampling can provide guidance. The following practices should be used for collections when fish are to be analyzed for PFAS:

No materials containing Teflon.
No Post-it notes.
No ice packs; only water ice or dry ice.
Any gloves worn must be powder free nitrile.
No Gore-Tex or similar materials (Gore-Tex is a PFC with PFOA used in its manufacture).
No stain repellent or waterproof treated clothing; these are likely to contain PFCs.
Avoid plastic materials, other than HDPE, including clipboards and waterproof notebooks.
Wash hands after handling any food containers or packages as these may contain PFCs.
Keep pre-wrapped food containers and wrappers isolated from fish handling.
Wear clothing washed at least six times since purchase.
Wear clothing washed without fabric softener.
Staff should avoid cosmetics, moisturizers, hand creams and similar products on the day of sampling as many of these products contain PFCs (Fujii et al. 2013). Sunscreen or insect repellent should not contain ingredients with “fluor” in their name. Apply any sunscreen or insect repellent well downwind from all materials. Hands must be washed after touching any of these products.

I. All fish must be kept at a temperature <45° F (<8° C) immediately following data processing. As soon as possible, freeze at -20° C ± 5° C. Due to occasional freezer failures, daily freezer temperature logs are required. The freezer should be locked or otherwise secured to maintain chain of custody.

J. In most cases, samples should be delivered to the Analytical Services Unit at the Hale Creek field station. Coordinate delivery with field station staff and send copies of the collection records, continuity of evidence forms and freezer temperature logs to the field station. For samples to be analyzed elsewhere, non-routine collections or other questions, contact Wayne Richter, Bureau of Ecosystem Health, NYSDEC, 625 Broadway, Albany, New York 12233-4756, 518-402-8974, or the project leader about sample transfer. Samples will then be directed to the analytical facility and personnel noted on specific project descriptions.

K. A recommended equipment list is at the end of this document.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH AND WILDLIFE
FISH COLLECTION RECORD

Project and Site Name _____ DEC Region _____

Collections made by (include all crew) _____

Sampling Method: □Electrofishing □Gill netting □Trap netting □Trawling □Seining □Angling □Other _____

Preservation Method: □Freezing □Other _____ Notes (SWFDB survey number): _____

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17, 4/26/19

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CHAIN OF CUSTODY

I, _____, of _____ collected the
(Print Name) (Print Business Address)

following on _____, 20____ from _____
(Date) (Water Body)

in the vicinity of _____
(Landmark, Village, Road, etc.)

Town of _____, in _____ County.

Item(s) _____

_____

Said sample(s) were in my possession and handled according to standard procedures provided to me prior to collection. The sample(s) were placed in the custody of a representative of the New York State Department of Environmental Conservation on _____, 20_____.

_____ _____
Signature Date

I, _____, received the above mentioned sample(s) on the date specified and assigned identification number(s) _____ to the sample(s). I have recorded pertinent data for the sample(s) on the attached collection records. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and on dates as attested to below.

_____ _____
Signature Date

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	REMARKS
SIGNATURE	UNIT	
LOGGED IN BY (Print Name)	TIME & DATE	ACCESSION NUMBERS
SIGNATURE	UNIT	

richter: revised 21 April 2014; becker: 23 March 2017, 26 April, 2019

NOTICE OF WARRANTY

By signature to the chain of custody (reverse), the signatory warrants that the information provided is truthful and accurate to the best of his/her ability. The signatory affirms that he/she is willing to testify to those facts provided and the circumstances surrounding the same. Nothing in this warranty or chain of custody negates responsibility nor liability of the signatories for the truthfulness and accuracy of the statements provided.

HANDLING INSTRUCTIONS

On day of collection, collector(s) name(s), address(es), date, geographic location of capture (attach a copy of topographic map or navigation chart), species, number kept of each species, and description of capture vicinity (proper noun, if possible) along with name of Town and County must be indicated on reverse.

Retain organisms in manila tagged plastic bags to avoid mixing capture locations. Note appropriate information on each bag tag.

Keep samples as cool as possible. Put on ice if fish cannot be frozen within 12 hours. If fish are held more than 24 hours without freezing, they will not be retained or analyzed.

Initial recipient (either DEC or designated agent) of samples from collector(s) is responsible for obtaining and recording information on the collection record forms which will accompany the chain of custody. This person will seal the container using packing tape and writing his signature, the time and the date across the tape onto the container with indelible marker. Any time a seal is broken, for whatever purpose, the incident must be recorded on the Chain of Custody (reason, time, and date) in the purpose of transfer block. Container then is resealed using new tape and rewriting signature, with time and date.

EQUIPMENT LIST

Scale or balance of appropriate capacity for the fish to be collected.

Fish measuring board.

Plastic bags of an appropriate size for the fish to be collected and for site bags.

Individually numbered metal tags for fish.

Manila tags to label bags.

Small envelops, approximately 2” x 3.5”, if fish scales are to be collected.

Knife for removing scales.

Chain of custody and fish collection forms.

Clipboard.

Pens or markers.

Paper towels.

Dish soap and brush.

Bucket.

Cooler.

Ice.

Duct tape.

Appendix G – PFAS Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonic acids	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluoropentanesulfonic acid	PFPeS	2706-91-4
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanesulfonic acid	PFOS	1763-23-1
	Perfluorononanesulfonic acid	PFNS	68259-12-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
	Perfluorododecanesulfonic acid	PFDoS	79780-39-5
Perfluoroalkyl carboxylic acids	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUnA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTeDA	376-06-7
Per- and Polyfluoroether carboxylic acids	Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6
	4,8-Dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
	Perfluoro-3-methoxypropanoic acid	PFMPA	377-73-1
	Perfluoro-4-methoxybutanoic acid	PFMBA	863090-89-5
	Nonafluoro-3,6-dioxaheptanoic acid	NFDHA	151772-58-6
Fluorotelomer sulfonic acids	4:2 Fluorotelomer sulfonic acid	4:2-FTS	757124-72-4
	6:2 Fluorotelomer sulfonic acid	6:2-FTS	27619-97-2
	8:2 Fluorotelomer sulfonic acid	8:2-FTS	39108-34-4
Fluorotelomer carboxylic acids	3:3 Fluorotelomer carboxylic acid	3:3 FTCA	356-02-5
	5:3 Fluorotelomer carboxylic acid	5:3 FTCA	914637-49-3
	7:3 Fluorotelomer carboxylic acid	7:3 FTCA	812-70-4
Perfluorooctane sulfonamides	Perfluorooctane sulfonamide	PFOSA	754-91-6
	N-methylperfluorooctane sulfonamide	NMeFOSA	31506-32-8
	N-ethylperfluorooctane sulfonamide	NEtFOSA	4151-50-2
Perfluorooctane sulfonamidoacetic acids	N-methylperfluorooctane sulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethylperfluorooctane sulfonamidoacetic acid	N-EtFOSAA	2991-50-6
Perfluorooctane sulfonamide ethanols	N-methylperfluorooctane sulfonamidoethanol	MeFOSE	24448-09-7
	N-ethylperfluorooctane sulfonamidoethanol	EtFOSE	1691-99-2

Group	Chemical Name	Abbreviation	CAS Number
Ether sulfonic acids	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B Major)	9Cl-PF3ONS	756426-58-1
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	11Cl-PF3OUdS	763051-92-9
	Perfluoro(2-ethoxyethane) sulfonic acid	PFEESA	113507-82-7

Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

These guidelines are intended to be used for the validation of PFAS using EPA Method 1633 for projects within the Division of Environmental Remediation (DER). Data reviewers should understand the methodology and techniques utilized in the analysis. Consultation with the end user of the data may be necessary to assist in determining data usability based on the data quality objectives in the Quality Assurance Project Plan. A familiarity with the laboratory's Standard Operating Procedure may also be needed to fully evaluate the data. If you have any questions, please contact DER's Quality Assurance Officer, Dana Barbarossa, at dana.barbarossa@dec.ny.gov.

Preservation and Holding Time

Samples should be preserved with ice to a temperature of less than 6°C upon arrival at the lab. The holding time is 28 days to extraction for aqueous and solid samples. The time from extraction to analysis for aqueous samples is 28 days and 40 days for solids.

Temperature greatly exceeds 6ºC upon arrival at the lab*	Use professional judgement to qualify detects and non-detects as estimated or rejected
Holding time exceeding 28 days to extraction	Use professional judgement to qualify detects and non-detects as estimated or rejected if holding time is grossly exceeded

*Samples that are delivered to the lab immediately after sampling may not meet the thermal preservation guidelines. Samples are considered acceptable if they arrive on ice or an attempt to chill the samples is observed.

Initial Calibration

The initial calibration should contain a minimum of six standards for linear fit and six standards for a quadratic fit. The relative standard deviation (RSD) for a quadratic fit calibration should be less than 20%.

The low-level calibration standard should be within 50% - 150% of the true value, and the mid-level calibration standard within 70% - 130% of the true value.

%RSD >20%	J flag detects and UJ non detects

Continuing Calibration Verification

Continuing calibration verification (CCV) checks should be analyzed at a frequency of one per ten field samples. If CCV recovery is very low, where detection of the analyte could be in question, ensure a low level CCV was analyzed and use to determine data quality.

CCV recovery <70 or >130%	J flag results

Blanks

There should be no detections in the method blanks above the reporting limits. Equipment blanks, field blanks, rinse blanks etc. should be evaluated in the same manner as method blanks. Use the most contaminated blank to evaluate the sample results.

Blank Result	Sample Result	Qualification
Any detection	<Reporting limit	Qualify as ND at reporting limit
Any detection	>Reporting Limit and >10x the blank result	No qualification
>Reporting limit	>Reporting limit and <10x blank result	J+ biased high

Field Duplicates

A blind field duplicate should be collected at rate of one per twenty samples. The relative percent difference (RPD) should be less than 30% for analyte concentrations greater than two times the reporting limit. Use the higher result for final reporting.

RPD >30%	Apply J qualifier to parent sample

Lab Control Spike

Lab control spikes should be analyzed with each extraction batch or one for every twenty samples. In the absence of lab derived criteria, use 70% - 130% recovery criteria to evaluate the data.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects

Matrix Spike/Matrix Spike Duplicate

One matrix spike and matrix spike duplicate should be collected at a rate of one per twenty samples. Use professional judgement to reject results based on out of control MS/MSD recoveries.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only
RPD >30%	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only

Extracted Internal Standards (Isotope Dilution Analytes)

Problematic analytes (e.g. PFBA, PFPeA, fluorotelomer sulfonates) can have wider recoveries without qualification. Qualify corresponding native compounds with a J flag if outside of the range.

Recovery <50% or >150%	Apply J qualifier
Recovery <25% or >150% for poor responding analytes	Apply J qualifier
Isotope Dilution Analyte (IDA) Recovery <10%	Reject results

Signal to Noise Ratio

The signal to noise ratio for the quantifier ion should be at least 3:1. If the ratio is less than 3:1, the peak is discernable from the baseline noise and symmetrical, the result can be reported. If the peak appears to be baseline noise and/or the shape is irregular, qualify the result as tentatively identified.

Reporting Limits

If project-specific reporting limits were not met, please indicate that in the report along with the reason (e.g. over dilution, dilution for non-target analytes, high sediment in aqueous samples).

Peak Integrations

Target analyte peaks should be integrated properly and consistently when compared to standards. Ensure branched isomer peaks are included for PFAS where standards are available. Inconsistencies should be brought to the attention of the laboratory or identified in the data review summary report.

ATTACHMENT 3

Roux's Standard Operating Procedures

Date: May 5, 2000

1.0 PURPOSE

The purpose for this standard operating procedure (SOP) is to establish the guidelines for decontamination of all field equipment potentially exposed to contamination during drilling, and soil and water sampling. The objective of decontamination is to ensure that all drilling, and soil-sampling and water-sampling equipment is decontaminated (free of potential contaminants): 1) prior to being brought onsite to avoid the introduction of potential contaminants to the site; 2) between drilling and sampling events/activities onsite to eliminate the potential for cross-contamination between boreholes and/or wells; and 3) prior to the removal of equipment from the site to prevent the transportation of potentially contaminated equipment offsite.

In considering decontamination procedures, state and federal regulatory agency requirements must be considered because of potential variability between state and federal requirements and because of variability in the requirements of individual states. Decontamination procedures must be in compliance with state and/or federal protocols in order that regulatory agency(ies) scrutiny of the procedures and data collected do not result in non-acceptance (invalidation) of the work undertaken and data collected.

2.0 PROCEDURE FOR DRILLING EQUIPMENT

The following is a minimum decontamination procedure for drilling equipment. Drilling equipment decontamination procedures, especially any variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

2.1 The rig and all associated equipment should be properly decontaminated by the contractor before arriving at the test site.

2.2 The augers, drilling casings, rods, samplers, tools, rig, and any piece of equipment that can come in contact (directly or indirectly) with the soil, will be steam cleaned onsite prior to set up for drilling to ensure proper decontamination.

2.3 The same steam cleaning procedures will be followed between boreholes (at a fixed on-site location[s], if appropriate) and before leaving the site at the end of the study.

2.4 All on-site steam cleaning (decontamination) activities will be monitored and documented by a member(s) of the staff of Roux Associates, Inc.

2.5 If drilling activities are conducted in the presence of thick, sticky oils (e.g., PCBs) which coat drilling equipment, then special decontamination procedures may have to be utilized before steam cleaning (e.g., hexane scrub and wash).

2.6 Containment of decontamination fluids may be necessary (e.g., rinseate from steam cleaning) or will be required (e.g., hexane), and disposal must be in accordance with state and/or federal procedures.

3.0 PROCEDURE FOR SOIL-SAMPLING EQUIPMENT

The following is a minimum decontamination procedure for soil-sampling equipment (e.g., split spoons, stainless-steel spatulas). Soil-sampling equipment decontamination procedures, especially any variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

3.1 Wear disposable gloves while cleaning equipment to avoid cross-contamination and change gloves as needed.

3.2 Steam clean the sampler or rinse with potable water. If soil-sampling activities are conducted in the presence of thick, sticky oils (e.g., PCBs) which coat sampling equipment, then special decontamination procedures may have to be utilized before steam cleaning and washing in detergent solution (e.g., hexane scrub and wash).

3.3 Prepare a non-phosphate, laboratory-grade detergent solution and distilled or potable water in a clean bucket.

3.4 Disassemble the sampler, as necessary and immerse all parts and other sampling equipment in the solution.

3.5 Scrub all equipment in the bucket with a brush to remove any adhering particles.

3.6 Rinse all equipment with copious amounts of potable water followed by distilled or deionized water.

3.7 Place clean equipment on a clean plastic sheet (e.g., polyethylene)

3.8 Reassemble the cleaned sampler, as necessary.

3.9 Transfer the sampler to the driller (or helper) making sure that this individual is also wearing clean gloves or wrap the equipment with a suitable material (e.g., plastic bag, aluminum foil.

As part of the decontamination procedure for soil-sampling equipment, state and/or federal protocols must be considered. These may require procedures above those specified as minimum for Roux Associates, Inc., such as the use of nitric acid, acetone, etc. Furthermore, the containment and proper disposal of decontamination fluids must be considered with respect to regulatory agency(ies) requirements.

4.0 PROCEDURE FOR WATER-SAMPLING EQUIPMENT

The following is a decontamination procedure for water-sampling equipment (e.g., bailers, pumps). Water-sampling equipment decontamination procedures, especially any variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

4.1 Decontamination procedures for bailers follow:

a. Wear disposable gloves while cleaning bailer to avoid cross-contamination and change gloves as needed.

b. Prepare a non-phosphate, laboratory-grade detergent solution and potable water in a bucket.

c. Disassemble bailer (if applicable) and discard cord in an appropriate manner and scrub each part of the bailer with a brush and solution.

d. Rinse with potable water and reassemble bailer.

e. Rinse with copious amounts of distilled or deionized water.

f. Air dry.

g. Wrap equipment with a suitable material (e.g., clean plastic bag, aluminum foil).

h. Rinse bailer at least three times with distilled or deionized water before use.

4.2 Decontamination procedures for pumps follow:

a. Wear disposable gloves while cleaning pump to avoid cross-contamination and change gloves as needed.

b. Prepare a non-phosphate, laboratory-grade detergent solution and potable water in a clean bucket, clean garbage can, or clean 55-gallon drum.

c. Flush the pump and discharge hose (if not disposable) with the detergent solution and discard disposable tubing and/or cord in an appropriate manner.

d. Flush the pump and discharge hose (if not disposable) with potable water.

e. Place the pump on clear plastic sheeting.

f. Wipe any pump-related equipment (e.g., electrical lines, cables, discharge hose) that entered the well with a clean cloth and detergent solution, and rinse or wipe with a clean cloth and potable water.

g. Air dry.

h. Wrap equipment with a suitable material (e.g., clean plastic bag).

As part of the decontamination procedure for water-sampling equipment, state and/or federal protocols must be considered. These may require procedures above those specified as minimum for Roux Associates, Inc., such as the use of nitric acid, acetone, etc. Furthermore, the containment and proper disposal of decontamination fluids must be considered with respect to regulatory agency(ies) requirements.

Date: May 5, 2000

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to establish guidelines for the collection of soil samples for laboratory analysis. This SOP is applicable to soil samples collected from split-spoon samplers during drilling, hand auger samples, grab samples from stockpiled soils, surface samples, test pit samples, etc.

2.0 CONSIDERATIONS

Soil samples may be collected in either a random or biased manner. Random samples can be based on a grid system or statistical methodology. Biased samples can be collected in areas of visible impact or suspected source areas. Soil samples can be collected at the surface, shallow subsurface, or at depth. When samples are collected at depth the water content should be noted, since generally "soil sampling" is restricted to the unsaturated zone. Equipment selection will be determined by the depth of the sample to be collected. A thorough description of the sampling locations and proposed methods of sample collection should be included in the work plan.

Commonly, surface sampling refers to the collection of samples at a 0 to 6-inch depth interval. Certain regulatory agencies may define the depth interval of a surface sample differently, and this must be defined in the work plan. Collection of surface soil samples is most efficiently accomplished with the use of a stainless-steel trowel or scoop. For samples at greater depths a decontaminated bucket auger or power auger may be needed to advance the hole to the point of sample collection. Another clean bucket auger should then be used to collect the sample. To collect samples at depths of greater than approximately six feet the use of a drill rig and split spoon samples will usually be necessary. In some situations, sample locations are accessed with the use of a backhoe.

3.0 MATERIALS/EQUIPMENT

a. A work plan which outlines soil sampling requirements.

b. Field notebook, field form(s), maps, chain-of-custody forms, and custody seals.

c. Decontamination supplies (including: non-phosphate, laboratory grade detergent, buckets, brushes, potable water, distilled water, regulatory-required reagents, aluminum foil, plastic sheeting, etc.).

d. Sampling device (split-spoon sampler, stainless steel hand auger, stainless steel trowel, etc.).

e. Stainless steel spoons or spatulas.

f. Disposable sampling gloves.

g. Laboratory-supplied sample containers with labels.

h. Cooler with blue or wet ice.

i. Plastic sheeting.

j. Black pen and indelible marker.

k. Zip-lock bags and packing material.

l. Tape measure.

m. Paper towels or clean rags.

n. Masking and packing tape.

o. Overnight (express) mail forms.

4.0 DECONTAMINATION

All reusable sampling equipment will be thoroughly cleaned according to the decontamination SOP. Where possible, thoroughly pre-cleaned and wrapped sampling equipment should be used and dedicated to individual sampling locations. Disposable items such as sampling gloves, aluminum foil, and plastic sheeting will be changed after each use and discarded in an appropriate manner.

5.0 PROCEDURE

5.1 Prior to collecting soil samples, ensure that all sampling equipment has been thoroughly cleaned according to the decontamination SOP. If samples are to be collected at depth, then the boring must be advanced with thoroughly cleaned equipment to the desired sampling horizon and a different thoroughly cleaned sampler must be used to collect the sample.

5.2 Using disposable gloves and a pre-cleaned, stainless steel spatula or spoon, extract the soil sample from the sampler, measure the recovery, and separate the wash from the true sample. Where allowed by regulatory agency(ies), disposable plastic spoons may be used.

5.3 Place the sample in a laboratory-supplied, pre-cleaned sample container. This should be done as quickly as possible and this is especially important when sampling for volatile organic compounds (VOCs). Samples to be analyzed for VOCs must be collected prior to other constituents.

5.4 The sample container will be labeled with appropriate information such as, client name, site location, sample identification (location, depth, etc.), date and time of collection, and sampler's initials.

5.5 Using the remaining portion of soil from the sampler, log the sample in detail and record sediment characteristics (color, odor, moisture, texture, density, consistency, organic content, layering, grain size, etc.).

5.6 If soil samples are to be composited in the field, then equal portions from selected locations will be placed on a clean plastic sheet and homogenized. Alternately, several samples may be submitted to the laboratory for compositing by weight. The method used is dependent upon regulatory requirements. Specific compositing procedures shall be approved by the appropriate regulatory agency and described in the work plan. Samples to be analyzed for VOCs will not be composited unless required by a regulatory agency.

5.7 After the sample has been collected, labeled, and logged in detail, it is placed in a zip-lock bag and stored in a cooler at 4°C.

5.8 A chain-of-custody form is completed for all samples collected. One copy is retained and two are sent with the samples in a zip-lock bag to the laboratory. A custody seal is placed on the cooler prior to shipment.

5.9 Samples collected from Monday to Friday are to be delivered to the laboratory within 24 hours of collection. If Saturday delivery is unavailable, samples collected on Friday must be delivered by Monday morning. Check the work plan to determine if any analytes require a shorter delivery time.

5.10 The field notebook and appropriate forms should include, but not be limited to the following: client name, site location, sample location, sample depth, sample identification, date and time collected, sampler's name, method of sample collection, number and type of containers, geologic description of material, description of decontamination procedures, etc. A site map should be prepared with exact measurements to each sample location in case follow-up sampling is necessary.

5.11 All reusable sampling equipment must be thoroughly cleaned in accordance with the decontamination SOP. Following the final decontamination (after all samples are collected) the sampling equipment is wrapped in aluminum foil. Discard any gloves, foil, plastic, etc. in an appropriate manner that is consistent with site conditions.

END OF PROCEDURE

Date: May 5, 2000

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish guidelines for sample handling which will allow consistent and accurate results. Valid chemistry data are integral to investigations that characterize media-quality conditions. Thus, this SOP is designed to ensure that once samples are collected, they are preserved, packed and delivered in a manner which will maintain sample integrity to as great an extent as possible. The procedures outlined are applicable to most sampling events and any required modifications must be clearly described in the work plan.

2.0 CONSIDERATIONS

Sample containers, sampling equipment decontamination, quality assurance/quality control (QA/QC), sample preservation, and sample handling are all components of this SOP.

2.1 Sample Containers

Prior to collection of a sample, considerations must be given to the type of container that will be used to store and transport the sample. The type and number of containers selected is usually based on factors such as sample matrix, potential contaminants to be encountered, analytical methods requested, and the laboratory's internal quality assurance requirements. In most cases, the overriding considerations will be the analytical methodology, or the state or federal regulatory requirements because these regulations generally encompass the other factors. The sample container selected is usually based on some combination of the following criteria:

a. Reactivity of Container Material with Sample

Choosing the proper composition of sample containers will help to ensure that the chemical and physical integrity of the sample is maintained. For sampling potentially hazardous material, glass is the recommended container type because it is chemically inert to most substances. Plastic containers are not recommended for most hazardous wastes because the potential exists for contaminants to adsorb to the surface of the plastic or for the plasticizer to leach into the sample.

In some instances, however, the sample characteristics or analytes of interest may dictate that plastic containers be used instead of glass. Because some metals species will adhere to the sides of the glass containers in an aqueous matrix, plastic bottles (e.g., nalgene) must be used for samples collected for metals analysis. A separate, plastic

container should accompany glass containers if metals analysis is to be performed along with other analyses. Likewise, other sample characteristics may dictate that glass cannot be used. For example, in the case of a strong alkali waste or hydrofluoric solution, plastic containers may be more suitable because glass containers may be etched by these compounds and create adsorptive sites on the container's surface.

b. Volume of the Container

The volume of sample to be collected will be dictated by the analysis being performed and the sample matrix. The laboratory must supply bottles of sufficient volume to perform the required analysis. In most cases, the methodology dictates the volume of sample material required to complete the analysis. However, individual laboratories may provide larger volume containers for various analytes to ensure sufficient quantities for duplicates or other QC checks.

To facilitate transfer of the sample from the sampler into the container and to minimize spillage and sample disturbance, wide-mouth containers are recommended. Aqueous volatile organic samples must be placed into 40-milliliter (ml) glass vials with polytetrafluoroethylene (PTFE) (e.g., TeflonTM) septums. Non-aqueous volatile organic samples should be collected in the same type of vials or in 4-ounce (oz) wide-mouth jars provided by the laboratory. These jars should have PTFE-lined screw caps.

c. Color of Container

Whenever possible, amber glass containers should be used to prevent photodegradation of the sample, except when samples are being collected for metals analysis. If amber containers are not available, then containers holding samples should be protected from light (i.e., place in cooler with ice immediately after filling).

d. Container Closures

Container closures must screw on and off the containers and form a leak-proof seal. Container caps must not be removed until the container is ready to be filled with the sample, and the container cap must be replaced (securely) immediately after filling it. Closures should be constructed of a material which is inert with respect to the sampled material, such as PTFE (e.g., TeflonTM). Alternately, the closure may be separated from the sample by a closure liner that is inert to the sample material such as PTFE sheeting. If soil or sediment samples are being collected, the threads of the container must be wiped clean with a dedicated paper towel or cloth, so the cap can be threaded properly.

e. Decontamination of Sample Containers

Sample containers must be laboratory cleaned by the laboratory performing the analysis. The cleaning procedure is dictated by the specific analysis to be performed on the sample. Sample containers must be carefully examined to ensure that all containers appear clean. Do not mistake the preservative as unwanted residue. The bottles should not be field cleaned. If there is any question regarding the integrity of the bottle, then the laboratory must be contacted immediately and the bottle(s) replaced.

f. Sample Bottle Storage and Transport

No matter where the sample bottles are, whether at the laboratory waiting to be packed for shipment or in the field waiting to be filled with sample, care must be taken to avoid contamination. Sample shuttles or coolers, and sample bottles must be stored and transported in clean environments. Sample bottles and clean sampling equipment must never be stored near solvents, gasoline, or other equipment that is a potential source of cross-contamination. When under chain of custody, sample bottles must be secured in locked vehicles, and custody sealed in shuttles or in the presence of authorized personnel. Information which documents that proper storage and transport procedures have been followed must be included in the field notebook and on appropriate field forms.

2.2 Decontamination of Sampling Equipment

Proper decontamination of all re-usable sampling equipment is critical for all sampling episodes. The SOP for Decontamination of Field Equipment and SOPs for method-specific or instrument-specific tasks must also be referred to for guidance for decontamination of various types of equipment.

2.3 Quality Assurance/Quality Control Samples

QA/QC samples are intended to provide control over the proper collection and tracking of environmental measurements, and subsequent review, interpretation and validation of generated analytical data. The SOPs for Collection of Quality Control Samples, for Evaluation and Validation of Data, and for Field Record Keeping and Quality Assurance/Quality Control must be referred to for detailed guidance regarding these respective procedures. SOPs for method-specific or instrument-specific tasks must also be referred to for guidance for QA/QC procedures.

2.4 Sample Preservation Requirements

Certain analytical methodologies for specific analytes require chemical additives in order to stabilize and maintain sample integrity. Generally, this is accomplished under the following two scenarios:

a. Sample bottles are preserved at the laboratory prior to shipment into the field.

b. Preservatives are added in the field immediately after the samples are collected.

Many laboratories provide pre-preserved bottles as a matter of convenience and to help ensure that samples will be preserved immediately upon collection. A problem associated with this method arises if not enough sample could be collected, resulting in too much preservative in the sample. More commonly encountered problems with this method include the possibility of insufficient preservative provided to achieve the desired pH level or the need for additional preservation due to chemical reactions caused by the addition of sample liquids to pre-preserved bottles. The use of pre-preserved bottles is acceptable; however, field sampling teams must always be prepared to add additional preservatives to samples if the aforementioned situations occur. Furthermore, care must be exercised not to overfill sample bottles containing preservatives to prevent the sample and preservative from spilling and therefore diluting the preservative (i.e., not having enough preservative for the volume of sample).

When samples are preserved after collection, special care must be taken. The transportation and handling of concentrated acids in the field requires additional preparation and adherence to appropriate preservation procedures. All preservation acids used in the field should be trace-metal or higher-grade.

2.5 Sample Handling

After the proper sample bottles have been received under chain-of-custody, properly decontaminated equipment has been used to collect the sample, and appropriate preservatives have been added to maintain sample integrity, the final step for the field personnel is checking the sample bottles prior to proper packing and delivery of the samples to the laboratory.

All samples should be organized and the labels checked for accuracy. The caps should be checked for tightness and any 40-ml volatile organic compound (VOC) bottles must be checked for bubbles. Each sample bottle must be placed in an individual Ziploc® bag to protect the label, and placed on ice. The bottles must be carefully packed to prevent breakage during transport. When several bottles have been collected for an individual sample, they should not be placed adjacent to each other in the cooler to prevent possible breakage of all bottles for a given sample. If there are any samples which are known or suspected to be highly

contaminated, these should be placed in an individual cooler under separate chain-of-custody to prevent possible cross contamination. Sufficient ice (wet or blue packs) should be placed in the cooler to maintain the temperature at 4 degrees Celsius (°C) until delivery at the laboratory. Consult the work plan to determine if a particular ice is specified as the preservation for transportation (e.g., the United States Environmental Protection Agency does not like the use of blue packs because they claim that the samples will not hold at 4°C). If additional coolers are required, then they should be purchased. The chain-of-custody form should be properly completed, placed in a "zip-lock" bag, and placed in the cooler. One copy must be maintained for the project files. The cooler should be sealed with packing tape and a custody seal. The custody seal number should be noted in the field book. Samples collected from Monday through Friday will be delivered to the laboratory within 24 hours of collection. If Saturday delivery is not available, samples collected on Friday must be delivered by Monday morning. Check the work plan to determine if certain analytes require a shorter delivery time. If overnight mail is utilized, then the shipping bill must be maintained for the files and the laboratory must be called the following day to confirm receipt.

3.0 EQUIPMENT AND MATERIALS

3.1 General equipment and materials may include, but not necessarily be limited to, the following:

a. Sample bottles of proper size and type with labels.

b. Cooler with ice (wet or blue pack).

c. Field notebook, appropriate field form(s), chain-of-custody form(s), custody seals.

d. Black pen and indelible marker.

e. Packing tape, "bubble wrap," and "zip-lock" bags.

f. Overnight (express) mail forms and laboratory address.

g. Health and safety plan (HASP).

h. Work plan/scope of work.

i. Pertinent SOPs for specified tasks and their respective equipment and materials.

3.2 Preservatives for specific samples/analytes as specified by the laboratory. Preservatives must be stored in secure, spillproof glass containers with their content, concentration, and date of preparation and expiration clearly labeled.

3.3 Miscellaneous equipment and materials including, but not necessarily limited to, the following:

a. Graduated pipettes.

b. Pipette bulbs.

c. Litmus paper.

d. Glass stirring rods.

e. Protective goggles.

f. Disposable gloves.

g. Lab apron.

h. First aid kit.

i. Portable eye wash station.

j. Water supply for immediate flushing of spillage, if appropriate.

k. Shovel and container for immediate containerization of spillage-impacted soils, if appropriate.

4.0 PROCEDURE

4.1 Examine all bottles and verify that they are clean and of the proper type, number, and volume for the sampling to be conducted.

4.2 Label bottles carefully and clearly with project name and number, site location, sample identification, date, time, and the sampler's initials using an indelible marker.

4.3 Collect samples in the proper manner (refer to specific sampling SOPs).

4.4 Conduct preservation activities as required after each sample has been collected. Field preservation must be done immediately and must not be done later than 30 minutes after sample collection.

4.5 Conduct QC sampling, as required.

4.6 Seal each container carefully and place in an individual "zip lock" bag.

4.7 Organize and carefully pack all samples in the cooler immediately after collection (e.g., bubble wrap). Insulate samples so that breakage will not occur.

4.8 Complete and place the chain-of-custody form in the cooler after all samples have been collected. Maintain one copy for the project file. If the cooler is to be transferred several times prior to shipment or delivery to the laboratory, it may be easier to tape the chain-of-custody to the exterior of the sealed cooler. When exceptionally hazardous samples are known or suspected to be present, this should be identified on the chain-of-custody as a courtesy to the laboratory personnel.

4.9 Add additional ice as necessary to ensure that it will last until receipt by the laboratory.

4.10 Seal the cooler with packing tape and a custody seal. Record the number of the custody seal in the field notebook and on the field form. If there are any exceptionally hazardous samples, then shipping regulations should be examined to ensure the sample containers and coolers are in compliance and properly labeled.

4.11 Samples collected from Monday through Friday will be delivered to the laboratory within 24 hours of collection. If Saturday delivery is not available, samples collected on Friday must be delivered by Monday morning. Check the work plan to determine if certain analytes require a shorter delivery time.

4.12 Maintain the shipping bill for the project files if overnight mail is utilized and call the laboratory the following day to confirm receipt.

END OF PROCEDURE

Date: May 5, 2000

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish guidelines for screening soil samples for volatile organic vapors using a portable photoionization detector (PID). This SOP is applicable to soil samples collected from split-spoon samplers during drilling, hand auger samples, and grab samples from stockpiled soils.

2.0 CONSIDERATIONS

The primary objective of photoionization screening of soil samples is to obtain a qualitative understanding of the distribution of volatile organic compounds (VOCs) in soil. The proper design of an organic vapor screening program requires an understanding of site hydrogeology, potential source areas, and potential constituents of concern. Sample locations and frequency must be fully defined in the work plan. The work plan should outline the type of lamp to be utilized in the PID based on the ionization potentials and response factors of the constituents of concern. The work plan must also clearly describe the heating or equilibration procedures to be employed if they differ from those described in this SOP. Regardless of the specific equilibration procedure employed, it is imperative that each sample be treated identically to allow the photoionization results from different locations to be compared. Observations such as water, clay, and organic content should be noted to facilitate interpretation of the data. Every effort should be made to collect a representative portion of soil from the sampling device.

3.0 MATERIALS/EQUIPMENT

a. A work plan which outlines photoionization screening requirements.

b. Decontamination supplies (including: non-phosphate, laboratory grade detergent, buckets, brushes, potable water, distilled water, regulatory-required reagents [e.g., acetone, nitric acid, hexane, etc.], aluminum foil, plastic sheeting, etc.).

c. Field notebook, field form(s), maps, chain-of-custody forms.

d. Sampling device (split-spoon sampler, stainless steel hand auger, stainless steel trowel, etc.).

e. Stainless steel spoons or spatulas.

f. Disposable plastic spoons.

g. Plastic sheeting.

h. Aluminum foil.

i. Mason jars or driller's jars.

j. Water bath (hot plate, extension cord, water tray, thermometer).

k. Photoionization detector with charging unit.

l. Calibration gases with regulator.

m. Indelible marker.

n. Masking tape.

o. Disposable sampling gloves.

4.0 DECONTAMINATION

Where possible, thoroughly pre-cleaned and wrapped sampling equipment must be used and dedicated to individual sampling locations. Disposable items such as sampling gloves, aluminum foil, and sample jars will be changed after each use and discarded in an appropriate manner. If only photoionization results are to be obtained, then split-spoon samples and hand augers may be cleaned with a soap and water wash and potable water rinse or steam cleaning, and a final distilled water rinse. However, if samples are to be collected concurrently for laboratory analytical results, then all reusable sampling equipment must be thoroughly decontaminated according to the SOP for decontamination of field equipment.

5.0 CALIBRATION

The PID must be calibrated according to the manufacturer's specifications at a minimum frequency of once per day prior to collecting photoionization readings. In addition, periodic checks (e.g., every 2 hours or every ten samples) with the standard gas will be conducted to confirm that the calibration has not drifted. The time, date, and calibration procedure must be clearly documented in the field notebook and the calibration log. If at any time the photoionization results appear erratic or inconsistent with field observations, then the unit must be recalibrated. If calibration is difficult to achieve, then the unit's lamp should be checked for dirt or moisture and cleaned, as necessary. During humid or wet conditions, the unit should be calibrated on a more frequent basis as determined by field personnel.

6.0 PROCEDURE

6.1 Extract the soil sample from the sampler, quickly measure the recovery, and separate the wash from the true sample by using a dedicated, stainless steel spatula. Where allowed by regulatory agency(ies), disposable plastic spoons may be used.

6.2 Place the sample in a pre-cleaned glass jar (as quickly as possible to avoid loss of VOCs) filling the jar half full. Place an aluminum foil seal between the glass and metal cap and screw tight.

6.3 Label jars with the boring number, depth of sample, date of collection and blow counts. In addition, the field personnel will ensure the following: samples are taken at appropriate depths; unrepresentative portions of the sample are discarded properly; that the sampler is decontaminated properly between use; and the driller uses proper methods during sample collection and does not use oil or grease on tools entering the borehole.

6.4 Log the sample in detail and record sediment characteristics (color, odor, moisture, texture, density, consistency, organic content, and layering).

6.5 After the sample has been collected, heat the sample under controlled conditions in a water bath for a 2 minute period.

6.6 Ensure that the PID has been calibrated and that the calibration information is documented in the field book. Pierce the aluminum foil seal with the probe from the PID and measure the relative concentration of VOCs in the headspace of the soil sample. The initial (peak) reading must be recorded.

6.7 Record the PID reading in the field notebook, on an appropriate field form, and on the base map, if appropriate.

6.8 Place any material not representative of the interval sampled in a pile with the other cuttings from the borehole.

6.9 If only photoionization results are to be obtained, then reusable sampling devices may be cleaned with a soap and water wash and a potable water rinse. The sampler will then be rinsed with distilled water, assembled and placed on plastic sheeting for reuse. A more rigorous decontamination procedure is required when samples are also being collected for laboratory analysis. Refer to the SOP for collection of soil samples for laboratory analysis for additional information.

END OF PROCEDURE

ATTACHMENT 4

Laboratory Standard Operating Procedures

Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

References: **Method 8260D**, SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update VI (Phase II), June 2018.

Method 5035A, SW-846, Closed System Purge & Trap and Extraction for Volatile Organics in Soil and Waste Samples. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Draft Revision I, July 2002.

Method 5030B, Purge & Trap for Aqueous Samples. SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update III, December 1996.

Method 5030C, Purge & Trap for Aqueous Samples. SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update IV, May 2003.

1. Scope and Application

Matrices: Method 8260 is used to determine volatile organic compounds in a variety of solid waste matrices. This method is applicable to nearly all types of samples, regardless of water content, including various air sampling trapping media, ground and surface water, aqueous sludges, caustic liquors, acid liquors, waste solvents, oily wastes, mousses, tars, fibrous wastes, polymeric emulsions, filter cakes, spent carbons, spent catalysts, soils, and sediments.

Definitions: Refer to Alpha Analytical Quality Manual.

The compounds listed in Table 5 may be determined by this method.

There are various techniques by which these components may be introduced into the GC/MS system. Purge-and-trap, by Methods 5030C (aqueous samples) and 5035A (solid and waste oil samples), is the most commonly used technique for volatile organic analytes. However, other techniques are also appropriate and necessary for some analytes. One technique is direct injection of an aqueous sample (concentration permitting).

The data report packages present the documentation of any method modification related to the samples tested. Depending upon the nature of the modification and the extent of intended use, the laboratory may be required to demonstrate that the modifications will produce equivalent results for the matrix. Approval of all method modifications is by one or more of the following laboratory personnel before performing the modification: Department Manager, Department Supervisor, Laboratory Director, or Quality Assurance Officer.

This method is restricted to use by or under the supervision of analysts experienced in the operation of the gas chromatograph/mass spectrometers and in the interpretation of mass spectra and their use as a quantitative tool. Each analyst must demonstrate the ability to generate acceptable results with this method by performing an initial demonstration of capability.

2. Summary of Method

The volatile compounds are introduced into the gas chromatograph by the purge-and-trap method or by direct injection. The analytes are introduced to a narrow-bore capillary column for analysis. The Gas Chromatograph (GC) is temperature-programmed to separate the analytes, which are then detected with a mass spectrometer (MS) interfaced to the GC.

Analytes eluted from the capillary column are introduced into the mass spectrometer via a direct connection. Identification of target analytes is accomplished by comparing their mass spectra with the electron impact (or electron impact-like) spectra of authentic standards. Quantitation is accomplished by comparing the response of a major (quantitation) ion relative to an internal standard, comparing sample response to the calibration standards.

2.1 Method Modifications from Reference

None.

3. Reporting Limits

Table 1 lists our typical reporting limits.

4. Interferences

4.1 Impurities in the purge gas, organic compounds out-gassing from the plumbing ahead of the trap, and solvent vapors in the laboratory account for the majority of contamination problems. The analytical system must be free from contamination under the conditions of the analysis. Running laboratory reagent blanks as described in Section 9.1 and 10.3 demonstrates the system is free of contamination. The use of non-Teflon plastic tubing, non-Teflon thread sealants, or flow controllers with rubber components in the purge and trap system must be avoided.

4.2 Sample contamination occurs by diffusion of volatile organics (particularly fluorocarbons and methylene chloride) through the septum seal into the sample during shipment and storage. A trip blank or a field reagent blank prepared from reagent water and carried through the sampling and handling protocol serves as a check on such contamination.

4.2.1 Storage blanks shall be analyzed if contamination is suspect. If contamination is confirmed by positive detections in the sample storage blanks, all data from samples contained in the relative refrigerator or freezer shall be evaluated for possible contamination. If the samples contain suspected contamination, the Client Services department shall be notified in order to contact the necessary clients regarding the contamination. Samples shall be reanalyzed if so desired by the client. If suspected contamination is not confirmed by storage blanks, no further action shall be pursued concerning said blanks. It is recommended that further action be taken to determine the possible cause of suspected contamination.

4.3 Contamination by carry-over can occur whenever high level and low level samples are sequentially analyzed. Whenever a highly concentrated sample is being encountered, it should be followed by an analysis of reagent water (instrument blank) to check for potential contamination. If carry-over is suspected, then numerous instrument blanks may be required; additionally, all affected samples are rerun for confirmation. In case of severe contamination, preventive maintenance of the entire system may be required.

5. Health and Safety

The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of safety data sheets (SDS) is available to all personnel involved in the chemical analysis. Additional references to laboratory safety are available in the Chemical Hygiene Plan.

All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

The following method analytes have been tentatively classified as known or suspected human or mammalian carcinogens: benzene, carbon tetrachloride, 1,4-dichlorobenzene, 1,2-dichloroethane, hexachlorobutadiene, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, chloroform, 1,2-dibromoethane, tetrachloroethene, trichloroethene, and vinyl chloride. Pure standard materials and stock standard solutions of these compounds should be handled in a hood. A NIOSH/MESA approved toxic gas respirator should be worn when the analyst handles high concentrations of these toxic compounds.

5.1 Lab coats, safety glasses, and gloves must be worn when handling samples, standards, or solvents.

5.2 All stock solution standard preparation must be performed in the volatiles hood. Initial calibration, continuing calibration, laboratory control sample and client sample dilutions do not need to be performed in the hood.

5.3 All expired standards must be placed into the waste bucket in the lab for future disposal. The container must be labeled properly with hazard warning labels indicating the container contents.

5.4 Bottles containing Methanol must be stored in the flammables cabinet.

6. Sample Collection, Preservation, Storage, Shipping and Handling

6.1 Sample Collection and Preservation

6.1.1 Aqueous Samples

Grab samples are collected in standard 40mL glass screw-cap vials with Teflon lined silicon septa (VOA vial). Two or more VOA vials should be filled per sample location. EPA Method 8260 requires that samples be acidified to eliminate the possibility of biological degradation. Unless otherwise directed for project-specific reasons, all VOA vials are delivered to the client with approximately 2 – 4 drops of 1:1 HCl added to the vial, which is sufficient to adjust the pH of the sample to < 2. Prepared trip blanks are provided to the client to accompany field samples for QC purposes.

Fill the sample vial to the point of overflowing so that no headspace is contained within. Samples must be introduced into the vials gently to reduce agitation, which might drive off volatile compounds or cause loss of the HCl preservative.

Seal the bottle so that no air bubbles are in the VOA vial. If preservative has been added, shake vigorously for one minute. Invert the bottle and tap to check for air bubbles. Recollect the samples if any air bubbles are present.

Maintain the hermetic seal on the VOA vial until time of analysis.

6.1.2 Soil Samples

The recommended sampling method for soil samples is EPA 5035A. Method 5035A provides for two distinct sampling procedures, depending on the required reporting limits and suspected or known concentration levels of target analytes. These methods are referred to as the High Level and Low Level methods. Both are listed below but depending on the samples only one of the methods may be required. If concentration levels are unknown, it is recommended that samples be collected using both procedures.

The Lab will analyze the high level sample first, followed by the low level sample if the results from the high level analysis show that the sample is clean or contains analytes at low levels. The typical reporting levels of the two methods are listed in Table 1.

6.1.2.1 High Level Soil Samples

Collect sample in a standard 40mL glass screw-cap vial with Teflon lined silicon septa (VOA vial). The vial is provided containing 15mL of Purge and Trap Grade methanol and is labeled and weighed prior to addition of sample. Record the weight of the vial with methanol on the vial label. Prepared trip blanks are provided to the client to accompany field samples for QC purposes.

Approximately 15g of soil is added to the vial in the field, making sure that the sample is completely covered by the methanol.

Maintain the hermetic seal on the VOA vial until the time of analysis.

An additional sample of the soil must also be obtained (without methanol) to be used for the determination of soil moisture content to allow for the calculation of the dry weight results, and to calculate the methanol dilution effect. (See Sections 11.2.2.2 and 11.2.2.2.1)

6.1.2.2 Low Level Soil Samples

Collect sample in a standard 40mL glass screw-cap vials with Teflon lined silicon septa (VOA vial). Two samples should be taken per sample location. Vials are provided containing a magnetic stirring bar and 5 mL of either 200g/L sodium bisulfate solution or water, prepared by a certified vendor. These vials are labeled and weighed prior to addition of sample. Record the weight of the vial with the stirring bar and preservative on the vial label.

Approximately 5g of soil is added to the vial in the field, making sure that the sample is completely covered by the sodium bisulfate solution or water.

Maintain the hermetic seal on the VOA until the time of analysis.

6.2 Sample Handling and Storage

Document client specific sample handling, preservation and collection criteria in the project file. The laboratory Log-in staff documents sample temperature at the time of receipt.

Record deviations from this SOP or client specific criteria on the chain of custody form.

Record holding time exceedance, improper preservation and observed sample headspace on the nonconformance report form.

6.2.1 Aqueous Samples

Ice or refrigerate all samples from the time of collection until analysis, maintaining the sample temperature between 1 and 4 °C. Sample receiving personnel must note on the sample delivery group form when samples received at the laboratory are not within the temperature criteria. If more than one vial is received for a sample, the vials are stored in separate refrigerators. Storing the vials apart provides a useful check if laboratory contamination of a sample is suspected. Samples must be analyzed within 14 days of collection. Unpreserved samples must be analyzed within 7 days of collection.

6.2.2 High Level Soil Samples

Ice or refrigerate all samples from the time of collection until analysis, maintaining the sample temperature between 2 and 6 °C. Sample receiving personnel note on the

nonconformance report form when samples received at the laboratory are not within the temperature criteria. Samples must be analyzed within 14 days of collection.

6.2.3 Low Level Soil Samples

Ice or refrigerate samples preserved with water or sodium bisulfate from the time of collection until analysis, maintaining the sample temperature between 2 and 6 °C. Samples preserved with water are to be immediately frozen after sampling. Sample receiving personnel note on the nonconformance report form when samples received at the laboratory are not within the temperature criteria. Samples must be analyzed within 14 days of collection.

6.3 Sample Shipping

Samples requiring shipment to the laboratory are shipped in ice-packed coolers via an overnight delivery service in accordance with applicable Department of Transportation regulations.

7. Equipment and Supplies

7.1 Purge and Trap System (For Aqueous samples): The purge-and-trap system consists of two separate pieces of equipment: a purging device (autosampler) (TekmarAtomxXYZ, EST Centurion or equivalents) coupled to the desorber (concentrator) (EST Encon or Encon EV, or equivalents).

7.1.1 Purge gas = Helium analytical grade (99.999%) or Nitrogen analytical grade (99.999%).

7.1.2 The purging device is configured with 25 mL sample purge tubes, and the purge gas is introduced at the bottom of the water column as finely divided bubbles.

7.1.3 The trap used in the desorber is typically a Supelco “K” trap. Different traps may be used if equivalent performance is demonstrated.

7.1.4 The desorber is capable of rapidly heating the trap to 260^{o}C. The trap is not heated above manufacturer’s specifications.

7.2. Purge and Trap System (For Low Level and High Level Soil Samples): The purge and trap system consists of two separate pieces of equipment: a purging device (autosampler) (Tekmar AtomxXYZ, EST Centurion or equivalents) coupled to the desorber (concentrator) (Tekmar Velocity or Atomx, or EST Encon or Encon EV, or equivalents).

7.2.1 Purge gas = Helium analytical grade (99.999%) Nitrogen analytical grade (99.999%).

7.2.2 The autosampler purging device is a closed system, designed to accept the 40mL VOA vials. The VOA vial, containing the soil sample, water (or sodium bisulfate), and stirring bar is placed into the autosampler tray. The instrument automatically adds reagent water, internal standards, and surrogates to the unopened VOA vial. The vial is heated to 40 °C, and the purge gas is introduced into the aqueous portion to purge the volatile components onto the trap.

7.2.3 The trap used in the desorber is typically a Supelco “K” trap. Different traps may be used if equivalent performance is demonstrated.The desorber is capable of rapidly heating the trap to 260 °C. The trap is not heated above manufacturer specifications.

7.3 Gas Chromatography/Mass Spectrometer/Data System:

7.3.1 Gas Chromatograph, Agilent 6890/7890 or equivalent: An analytical system complete with a temperature-programmable gas chromatograph with appropriate

interface for sample introduction device. The system includes all required accessories, including syringes, analytical columns, and gases. The capillary column is directly coupled to the source of the GC/MS system.

7.3.2 Typical Gas Chromatographic Columns:

7.3.2.1 Column 1: Restek 502.2, 40 meter, 0.18mm ID, 1.0um, or equivalent.

7.3.2.2 Column 2: Restek RTX-VMS, 30 meter, 0.25mm ID, 1.4um, or equivalent.

7.3.2.3 Column 3: Restek RTX-VMS, 20 meter, 0.18mm ID, 1.5um, or equivalent.

7.3.3 Mass Spectrometer, Agilent 5973/5975/5978 or equivalent: Capable of acquiring mass spectra from mass/charge (m/z) 35 to 270 at a rate fast enough to acquire at least five (but preferably 10 or more) mass spectra across each chromatographic peak of interest, using 70 volts (nominal) electron energy in the electron impact ionization mode. The mass spectrometer must be capable of producing a mass spectrum for 4-Bromofluorobenzene (BFB) which meets all of the criteria in Table 3, when 50ng of the GC/MS tuning standard (BFB) are injected through the GC. For all SIM analysis, the mass spectrometer must also be able to acquire data in a dual acquisition mode (SIM and full scan).

7.3.4 Data System: Hewlett-Packard EnviroQuant software is used for data acquisition and allows the continuous acquisition and storage on machine-readable media of all mass spectra obtained throughout the duration of the chromatographic program.

EnviroQuant E.02.02 (or equivalent) is used for data processing and allows searching of any GC/MS data file for ions of a specified m/z, and plotting such ion abundances versus time or scan-number.

The most recent version of the EPA/NIST Mass Spectral Library is loaded onto the Target / EnviroQuant data system.

7.4 Wiretrol or Micro syringes: 10µL - 1,000µL.

7.5 Syringes: 5mL, 10mL, or 25mL, glass with Luerlock tip.

7.6 Balances: Top-loading, capable of weighing 0.01g.

7.7 Vials: 2mL, 4mL.

7.8 Disposable Pipets.

7.9 Volumetric Flasks: Class A, appropriate sizes, with ground-glass stoppers.

7.10 Eppendorf pipets.

7.11 Ottawa Sand: SiO_2

8. Reagents and Standards

Reagent grade organic chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all organic reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

Great care must be taken to maintain the integrity of all standard solutions. Standards in methanol are stored at –10ºC or less, in amber vials with PTFE-lined screw-caps.

8.1 Organic-free Reagent Water:

All references to water in this method refer to organic-free reagent water, which is tap water passed through activated carbon and air bubbled through.

8.2 Methanol:

Purge and Trap Grade or equivalent. Store in flammables cabinet.

8.3 Stock Solutions:

All stock standards are purchased from commercial vendors as certified ampule solutions. When an ampule of stock solution is opened, it is transferred to a labeled amber screw-cap vial with minimal headspace. The expiration date of the stock solution is either the vendor specified expiration date or 6 months from the date the ampule was opened, whichever is sooner. Typical stock standard concentrations are listed in Table 4.

8.4 Intermediate Standards: Intermediate standards are prepared volumetrically by diluting the appropriate stock standard(s) with methanol. Initial Calibration solutions expire 2 months from the date of preparation, or sooner if daily continuing calibration checks do not achieve the method acceptance criteria. If the Intermediate Standards are used as a second source to verify a valid Initial Calibration solution, there is no expiration date.

8.4.1 Internal Standard Solutions:

The internal standards are Fluorobenzene, Chlorobenzene-d_5, and 1,4-Dichlorobenzene-d_4. The intermediate IS solution is prepared by diluting the stock solution(s) with methanol to a concentration of 100 µg/mL. The appropriate amount of IS solution is added to the water or soil sample or QC sample to achieve a final concentration of 100 ng/sample or standard. Internal standard is added at the same concentration to all standards, samples, and QC samples.

8.4.2 Surrogate Standard Solutions:

The surrogate standards are Dibromofluoromethane, 1,2-Dichloroethane-d_4, Toluene-d_8, and 4-Bromofluorobenzene. The intermediate surrogate solution is prepared by diluting the stock solution(s) with methanol to a concentration of 100 µg/mL. The appropriate amount of surrogate solution is added to the water or soil sample or QC sample to achieve a final concentration of 100 ng/sample.

8.4.3 Target Compound Solutions:

The target analytes routinely reported by this method are listed in Table 1 and 4. The intermediate target compound solutions are prepared by diluting the stock solution(s) with methanol. This set of solutions, at concentrations of 200 µg/mL, is used for preparation of the calibration standards.

8.4.4 4-Bromofluorobenzene (BFB) Tune solution:

8.4.4.1 A solution containing BFB at a concentration of 50 µg/mL is prepared by volumetrically diluting the BFB stock solution. 1 µL of this solution is direct-injected or purged into the GC/MS system to verify system performance prior to any standard or sample analysis.

8.4.4.2 BFB may be analyzed in full scan mode while standards, samples, and QC are analyzed in SIM

8.5 Calibration Standards:

There are two types of calibration standards used for this method – initial calibration standards and calibration verification standards.

8.5.1 Initial Calibration Standards:

Initial calibration standards can be prepared at the levels listed in Table 4 (other/different levels are allowed). The Initial Calibration needs to have a minimum of 5 standards, 6 if a quadratic curve fit is used. Prepare these solutions in organic-free reagent water. The standards correspond to the range of concentrations found in typical samples and do not exceed the working range of the GC/MS system. Initial calibration should be mixed from fresh stock standards and dilution standards when generating an initial calibration curve.

8.5.2 Initial Calibration Verification Standard (ICV):

The initial calibration verification standard is at the same concentration as the level 3 for liquids and level 4 for soils initial calibration standard. This standard is prepared from source materials from a second manufacturer or from a manufacturer's batch prepared independently from the batch used for calibration. A second lot# from the same manufacturer may be adequate to meet this requirement. The standard must contain all calibrated target analytes that will be reported for the project, if readily available.

8.5.3 Continuing Calibration Verification Standard:

The continuing calibration verification standard, or calibration check standard, should be analyzed near the action level of the project. Since most projects are focused on achieving low reporting limits, the continuing calibration verification standard is at the same concentrations as the level 3 for liquids and level 4 for soils initial calibration standard. This standard is run at the beginning of each analytical sequence, following the BFB tune standard, to verify system performance.

9. Quality Control

The laboratory must maintain records to document the quality of data that is generated. Ongoing data quality checks are compared with established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

9.1 Blank(s)

9.1.1 Before processing any samples, the analyst must demonstrate through the analysis of a method blank (MB) or instrument blank that equipment and reagents are free from contaminants and interferences. The blank must contain the internal standards and surrogates and must be from the same source of water used for preparing the standards, QC samples and sample dilutions.

9.1.2 Analyze a matrix-specific blank, i.e. methanol samples need to have methanol in the blank; sodium bisulfate samples need to have a sodium bisulfate blank analyzed;

TCLP samples need a TCLP blank, after each ICAL and CCV, and prior to any sample analysis to demonstrate that interferences from the analytical system are under control.

9.1.3 Low level soil blanks must include 5g of Ottawa sand and be vortexed.

9.1.4 Blanks are considered to be acceptable if target analyte concentrations are less than one half the LOQ or are less than project-specific requirements. Blanks may contain analyte concentrations greater than acceptance limits if the associated samples in the batch are unaffected (i.e., target analytes are not present in samples or sample concentrations/responses are >10X the blank).

9.1.5 If an analyte of interest is found in a sample in the batch near a concentration detected in the blank, the presence and/or concentration of that analyte should be considered suspect and may require qualification. Reanalysis is not necessary if the analyte concentration falls well below the action or regulatory limit or if the analyte is deemed not important for the project.

9.1.6 The laboratory must not subtract the results of the MB (or any blank) from those of any associated samples.

9.2 Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)

An LCS/LCSD pair is analyzed at the beginning of each analytical sequence. Since the LCS contains the same compounds at the same concentrations as the continuing calibration check standard, the same analysis is used to satisfy both QC elements. The LCS/LCSD acceptance criteria are based on in-house control limits, unless specified by project/regulation. Less than 10% of total compounds may be outside of control limits if recoveries are >10%. (Note: this does not apply to difficult analytes listed in Table 7 which may be accepted at recoveries <10.) If >10% of analytes are recovered above control limits, this is deemed acceptable as long as the analytes in question are not detected in associated samples. If these criteria are not met, the entire batch is re-extracted. If re-extraction is not possible, due to insufficient sample or holding time exceedance, the analyst must write up the failure on a narrative sheet for inclusion in the client report.

9.3 Initial Calibration Verification (ICV)

Refer to 12

9.4 Continuing Calibration Verification (CCV)

Refer to Section 11.2.

9.5 Matrix Spike/ Matrix Spike Duplicate

Upon Client Request or state mandate, a matrix spike/matrix spike duplicate pair may be analyzed with each batch of 20 or less samples. The MS/MSD are sample aliquots spiked with the target compounds at the same concentration as the continuing calibration standard for water analysis and level 6 for soils. The MS/MSD acceptance criteria are based on in-house control limits. If the MS/MSD does not meet the criteria, but the LCSD does, the failure may be attributed to sample matrix. Report the MS/MSD, including a narrative sheet for inclusion with the client report.

9.6 Laboratory Duplicate

Not applicable.

9.7 Method-specific Quality Control Samples

9.7.1 Internal Standards

Area counts of the internal standard peaks in all samples and QC samples must be between 50-200% of the areas of the internal standards in the QC check standard.

If any individual percent recovery falls outside the range, that parameter has failed the acceptance criteria. For calibration standards, CCVs, LCS/LCSD or blanks the internal standard must be within the range for data to be reported to the clients. For samples, matrix spikes and duplicates: if the data is not within the range, the sample is rerun to confirm that the failure is due to sample matrix. A nonconformance report form is completed to ensure client notification and reporting if matrix effect is confirmed.

9.7.2 Surrogates

Surrogates are added to each field sample and QC sample. The laboratory must evaluate surrogate recovery data from individual samples versus the surrogate control limits developed by the laboratory. The surrogate acceptance criteria are listed in Table 2. Since the SIM analysis is acquired in dual mode, the surrogates from the full scan are used to evaluate the entire sample (SIM and full scan).

9.8 Method Sequence

In a 12-hour period, the typical analytical sequence is as follows:

- BFB
- QC Check Standard/Laboratory Control Sample/LCSD
- Method Blank
- Samples
- MS/MSD (upon Client request, may be run any time after the Method Blank)

10. Procedure

10.1 Equipment Set-up

Typical instrument operating conditions are listed below. Alternate conditions are allowed if method performance criteria can be met.

10.1.1 GC Conditions:

Temperature 1:	35°C	Carrier gas:	Helium 99.999% or Nitrogen 99.999%
Hold Time 1:	4 minutes	Carrier mode:	Constant flow
Ramp 1:	6°C/minute	Carrier flow:	1 mL/minute
Temperature 2:	150°C		
Hold Time 2:	0 minutes		
Ramp 2:	8°C/minute		
Temperature 3:	220°C		
Final Time:	1 minute		

10.1.2 MS Conditions:

Mass range:	m/z of 35 – 270 amu
Scan time:	0.5 minutes/scan
Source temperature:	230°C or according to manufacturer's specifications.

10.1.3 Velocity Concentrator Purge and Trap Conditions:

Purge time:	11 minutes
Dry purge:	2 minutes
Desorb preheat:	250°C
Desorb temp:	255°C
Desorb time:	2 minutes
Bake temp:	290°C
Bake time:	10 minutes

10.1.4 Encon Concentrator Purge and Trap Conditions:

Purge time:	11 minutes
Dry purge:	1 minute
Desorb preheat:	245°C
Desorb temp:	255°C
Desorb time:	1 minute
Bake temp:	270°C
Bake time:	10 minutes

10.2 Initial Calibration

10.2.1 The initial calibration is performed at a minimum of five (5) concentration levels listed in Table 4, the low level either at or below the reporting limit. The calibration is performed using instrument conditions listed in 10.1.

BFB must be analyzed prior to analysis of the initial calibration standards and must pass the criteria listed in Table 3. The mass spectrum of BFB should be acquired in the following manner:

(1) Three scans (the peak apex scan, the scan immediately preceding the apex and the scan immediately following the apex) are acquired and averaged.
(2) Background subtraction is performed using a single scan of no more than 20 scans prior to the elution of BFB.

This is done automatically with the EnviroQuant software.

10.2.1.1 Low Level/High Level Soil Curve on Centurion: To prepare a calibration standard, add the appropriate volume of standard solution(s) to a 50mL volumetric flask using a micro syringe. Remove the needle quickly and mix by inverting the flask 3 times. Pour several mLs of the aqueous standard into the waste vessel, then gently fill a 5mL syringe with standard and transfer to a 40mL VOA vial containing a magnetic stir bar. Load the vial onto autosampler.

10.2.1.2 Aqueous/High Level Soil Curve on Solatek or Centurion: To prepare a calibration standard, add the appropriate volume of standard solution(s) to a 100mL volumetric flask using a micro syringe. Remove the needle quickly and mix by inverting the flask 3 times. Pour several mLs of the aqueous standard into the waste vessel, and then gently fill a 40mL VOA vial to the top. Load the vial onto the autosampler.

10.2.2 Establish the GC operating conditions by loading the appropriate GC method. Typical instrument conditions are listed in Section 10.1. The same operating conditions are used for calibration and sample analyses. Create the analytical sequence using the HP EnviroQuant data acquisition software.

Relative Response Factors: The internal standard calibration technique is used. In each calibration standard, calculate the relative response factor for each analyte and the relative standard deviation (RSD) of the response factors using the EnviroQuant data processing software. The response factors are calculated using the areas of the characteristic (quantitation) ion for each target analyte and internal standard. The calculations are performed automatically using the EnviroQuant software, using the formulae listed in Alpha's Quality Manual.

10.2.3 Initial Calibration Criteria: The following sections outline the method acceptance criteria for an initial calibration curve. All criteria must be met for the calibration to be deemed acceptable, and for sample analysis to proceed. For MCP and CT projects see the related project specific addenda for modifications.

10.2.3.1 Relative Standard Deviation Criteria: If the RSD for each target analyte is less than or equal to 20%, then the response for this compound is considered linear over the calibration range and the mean calibration factor can be used to quantitate sample results. If the 20% RSD criterion is not met for an analyte linear regression may be used if $\mathbf{r^2} \geq 0.990$, weighted linear with a weighting factor of 1/SD2 and r > 0.995, or quadratic fit if $\mathbf{r^2} \geq 0.990$. A minimum of five points are required for linear fit and six points is required for quadratic fit. The calibration must be repeated for any compounds that fail. If more than 10% of the compounds exceed the 20% RSD limit and do not achieve the minimum correlation coefficient for alternative curve fits, sample analysis cannot proceed.

10.2.3.1.1 Percent Relative Error (%RE): For linear and quadratic fit compounds the %RE relative error must be calculated for the standard at or near the midpoint of the initial calibration and at the lowest level. The %RE between the calculated and expected amounts of an analyte should be ≤ 30% for all standards, otherwise recalibration is necessary.

10.2.4 Evaluation of Retention Times: The relative retention times used for identification of target analytes are +/- 0.06 RRT (Relative Retention Time) units, based on the most recent standard run. It has been determined that these limits work well, being wide enough to eliminate false-negative results while being tight enough to eliminate false positive results. Due to the selectivity of the mass spectrometer, compound identification is more definitive than when using a less selective detector.

10.2.5 Initial Calibration Verification: After each calibration and before the analysis of samples, an ICV must be analyzed at or near the midpoint of the curve. The ICV must be prepared using a different source than the Initial Calibration and must contain all target analytes. The percent recoveries must be between 70% and 130% for target analytes

except for “difficult” analytes (Table 7), which must exhibit percent recoveries between 40% and 160%. Corrective action is required if greater than 10% of all analytes are outside the prescribed criteria.

10.2.5.1 The ICV used for the initial calibration can be used as the continuing calibration verification. See Section 10.4 for criteria.

10.2.6 Additional considerations for SIM analysis

10.2.6.1 SIM may be useful for applications requiring quantitation limits below the normal range of electron impact quadrupole mass spectrometry, and both are allowable options for this method. Using the primary m/z for quantitation and at least one secondary m/z (or product ion) for confirmation, set up the descriptor windows based on their retention times. The selected m/z values should include any mass defect noted in the target analyte mass spectra acquired on the instrument, usually less than 0.2 amu. The dwell time for each ion may be automatically calculated by the instrument software or may be calculated based on the peak widths of the analytes of interest, the number of spectra needed to be acquired across each peak, and the number of concurrent ions that need to be acquired in each segment. When fewer m/z values are monitored in each segment, the acquisition time for each m/z can be increased, thereby increasing the sensitivity of the system. The total cycle time for the MS should be short enough that at least five, but preferably ten or more, spectra are acquired per chromatographic peak.

10.2.6.2 When compounds are analyzed in SIM mode, the following best practices are recommended:

10.2.6.2.1 Monitor at least two ions for each target analyte and use the mid-point of the calibration curve to establish proper ion ratios for each compound. The ratios of primary and secondary ions are the only qualitative tools available in SIM runs (other than RT), which increases their importance in proper identification. When interferences are expected or observed in a given matrix, acquiring multiple secondary ions may aid in qualitative identification.

10.2.6.2.2 Verify that all monitored ions are correctly integrated in order to achieve proper ion ratios. Update the primary/secondary ion ratios and reference mass spectra after each ICAL using a mid-range ICAL standard.

10.3 Equipment Operation and Sample Processing

The same GC, MS, and Purge and Trap conditions used for the initial calibration must be employed for sample analysis. After verification of system performance by analysis of BFB, the continuing calibration standard and method blank, samples are analyzed and processed as described below.

10.3.1 All samples are initially screened using Tekmar 7000 Headspace Autosamplers.

10.3.2 Retrieve sample VOA vials from the sample refrigerator just prior to loading onto the purge and trap system.

10.3.3 Aqueous samples:
Load the VOA vial directly on the sampling rack. Dilutions may be prepared volumetrically and poured into VOA vials ensuring there is no headspace left in the vial. The autosampler will then sample 10mL from the VOA vial.

10.3.4 Low level soil samples:

Low level soil sample should be shaken briefly to ensure that the stir bar is loose, and will spin on the autosampler unit. Take the low level VOA vial and place directly into the rack of the autosampler unit. Surrogate and internal standards are added automatically by the autosampler prior to sample purging.

10.3.5 High level soil samples:

Shake or vortex the sample for 15 seconds, ensuring the methanol has completely penetrated the soil in the vial. Let sample settle prior to taking methanol aliquot.

10.3.5.1 Through liquid path

Load a maximum of 860µL or appropriate dilution of the methanol into a half-full VOA vial. Fill the VOA vial up to the top with water and cap with no headspace. Allow the auto-sampler to sample 10mL out of the VOA vial which would be equivalent to injecting 100µL of the methanol extract. Prepare dilutions accordingly.

10.3.5.2 Through soil path

Into a VOA vial with a stir bar added, load 4.9mL of water plus a maximum of 100 µL of methanol or appropriate dilution of methanol extract from a 5mL luerlock syringe. Cap the vial and load onto the auto-sampler.

10.3.6 Qualitative Analysis:

10.3.6.1 The qualitative identification of each compound is based on retention time and on comparison of the sample mass spectrum with the reference mass spectrum. The reference mass spectrum must be generated by the laboratory on the same GC/MS system. The characteristic ions from the reference mass spectrum are defined to be the three ions of greatest relative intensity, or any ions over 30% relative intensity if less than three such ions occur in the reference spectrum. Compounds are identified as present when the following criteria are met:

10.3.6.1.1 The intensities of the characteristic ions of a compound maximize in the same scan or within one scan of each other. The EnviroQuant data system is configured to make this check.

10.3.6.1.2 The relative retention time (RRT) of the sample component is within ±0.06 RRT units of the RRT of the standard component.

10.3.6.1.3 The relative intensities of the characteristic ions agree within 30% of the relative intensities of these ions in the reference spectrum. (Example: For an ion with an abundance of 50% in the reference spectrum, the corresponding abundance in a sample spectrum can range between 20% and 80%.)

10.3.6.1.4 Structural isomers that produce very similar mass spectra should be identified as individual isomers if they have sufficiently different GC retention times. Sufficient GC resolution is achieved if the height of the valley between two isomer peaks is ≤ 50% of the average of the two peak heights. Otherwise, structural isomers are identified as isomeric pairs (i.e., m and p-xylene).

10.3.6.1.5 Identification is hampered when sample components are not resolved chromatographically and produce mass spectra containing ions contributed by more than one analyte. When gas chromatographic peaks obviously represent more than one sample component (i.e., a broadened peak with shoulder(s) or a valley between two or more maxima), appropriate selection of analyte spectra and background spectra is important.

10.3.6.1.6 Examination of extracted ion current profiles of appropriate ions can aid in the selection of spectra, and in qualitative identification of compounds. When analytes coelute (i.e., only one chromatographic peak is apparent), the identification criteria may be met, but each analyte spectrum will contain extraneous ions contributed by the coeluting compound.

10.3.6.2 For samples containing non-target analytes, a library search will be performed at client request. Compound identification will be classified as “tentative”, and the concentration will be reported as an estimate as no quantitative standards are run for these compounds.

10.3.6.2.1 Relative intensities of major ions in the reference spectrum (ions greater than 10% of the most abundant ion) are present in the sample spectrum.

10.3.6.2.2 The relative intensities of the major ions should agree within ±20%. (Example: For an ion with an abundance of 50% in the standard spectrum, the corresponding sample ion abundance must be between 30 and 70%.)

10.3.6.2.3 Molecular ions present in the reference spectrum are present in the sample spectrum. If the molecular ion is not present, carefully review library matches in order to avoid misidentification.

10.3.6.2.4 Ions present in the sample spectrum but not in the reference spectrum should be reviewed for possible background contamination or presence of coeluting compounds.

10.3.6.2.5 Ions present in the reference spectrum but not in the sample spectrum are reviewed for possible subtraction from the sample spectrum because of background contamination or coeluting peaks.

10.3.6.2.6 Mass spectral library search algorithms typically assign a match factor to the peak identity based on comparison of an unknown mass spectrum to library spectra. For spectra meeting the above conditions, match factors greater than 0.85 (85%) may be considered confirming evidence. Where a known limitation in data collection is identified (e.g., the presence of an incompletely resolved spectral interference), a lower match factor may be considered confirmatory. For multiple library spectra with similar match factors (e.g., for hydrocarbons with low abundance molecular ions, or structural isomers), the tentative identification assigned to the unknown may be better represented as a more generic structure (e.g., unknown hydrocarbon, C4 benzene structural isomer).

10.3.7 Quantitative Analysis:

10.3.7.1 Quantitation of a target compound detected in a sample is performed automatically by the EnviroQuant data processing software, using the formulae found in Alpha’s Quality Manual. Either the average response factor or calibration curve will be used for sample quantitation, depending on how the particular analyte was processed in the initial calibration curve. If non-target

compounds are to be reported, the quantitation is performed automatically by the EnviroQuant software using the total area of the compound and the nearest internal standard, and assuming a relative response factor of 1.0.

10.4 Continuing Calibration

Calibration verification consists of three steps that are performed at the beginning of each 12-hour analytical shift. For MCP and CT projects see the related project specific addenda for modifications.

10.4.1 Prior to the analysis of samples or calibration standards, inject or purge 1 µL (50 ng) of the 4-Bromofluorobenzene standard (Section 8.4.4) into the GC/MS system. The resultant mass spectra for the BFB must meet the criteria given in Table 3 before sample analysis begins.

10.4.2 The initial calibration curve for each compound of interest must be verified once every 12 hours prior to sample analysis. This is accomplished by analyzing the continuing calibration check standard (Section 8.5.3).

10.4.3 A method blank must be analyzed prior to any samples, typically immediately following the continuing calibration check standard, to ensure that the analytical system is free of contaminants. The method blank must not contain any target analytes at or above the required compound reporting limits.

10.4.4 The percent difference or drift for each target analyte must be less than or equal to 20% (30% for all SIM compounds). If greater than 20% of target analytes exceed the %D criteria corrective action must be taken prior to the analysis of samples. If less than or equal to 20% of compounds exceed the criteria, corrective action is not required.

10.4.5 Internal Standard Retention Time:

The absolute retention times of the internal standards in the calibration verification standard are evaluated after data acquisition. If the absolute retention time for any internal standard changes by more than 30 seconds from that in the mid-point standard level of the most recent initial calibration sequence, then the chromatographic system must be inspected for malfunctions and corrections must be made, as required. When corrections are made, reanalysis of samples analyzed while the system was malfunctioning is required.

10.4.6 Internal Standard Response:

If the area for any of the internal standards in the calibration verification standard changes by a factor of two (50% to 200%) from that in the mid-point standard level of the most recent initial calibration sequence, the mass spectrometer must be inspected for malfunctions and corrections must be made, as appropriate. When corrections are made, re-analysis of samples analyzed while the system was malfunctioning is required.

10.5 Preventive Maintenance

Routine preventive maintenance should be performed on the analytical system. This includes replacement of GC septa and periodic rinsing or replacement of purge and trap tubes and sparge needles. The trap should be replaced every six months or sooner if performance criteria

cannot be met. Periodic cleaning (typically twice per year) of the mass spectrometer ion source is required. More frequent source cleaning may be needed, especially if dirty samples are analyzed.

If system performance deteriorates, additional maintenance may be required. This includes replacement of injector ports and seals, clipping several inches off of the front end of the GC column, or in extreme cases the replacement of the GC column. Flushing or replacement of purge and trap lines may be necessary if they become contaminated or develop active sites.

Perform routine preventative maintenance as described throughout this SOP. Record all maintenance in the instrument logbook.

11. Data Evaluation, Calculations and Reporting

11.1 LIMS Data Corrections

Please note that the Laboratory Information Management System (LIMS) automatically adjusts soil sample results to account for the % Total Solids of the sample (as determined per Alpha SOP/07-38) and the methanol preservation dilution effect.

11.2 Data Calculations

11.2.1 Results of Aqueous Sample Analysis:

$$Concentration\ (ug/L) = \frac{(Conc.)\ (Vp)\ (DF)}{(Vs)}$$

where:

Conc. = On-column concentration obtained from the quantitation report.
Vp = Volume purged, 10 mL is standard
Vs = Volume of sample purged
DF = Dilution factor, for manually prepared dilutions, not instrumental "dilutions".

11.2.2 Results of Sediment/Soil, Sludge, and Waste Analysis:

All solids including soils, sediments, and sludges must be reported on a dry-weight basis.

11.2.2.1 Low-Level Samples:

$$Concentration\ (ug/Kg) = \frac{(Conc.)\ (Vp)\ (DF)}{(W)\ (\%S)}$$

11.2.2.2 High-Level Samples:

$$\text{Concentration (ug/Kg)} = \frac{\text{(Conc.) (Vp) (5000) (DF)}}{\text{(W) (Ve) (\%S)}}$$

where:

Conc. = On-column concentration obtained from the quantitation report.
DF = Dilution factor, for manually prepared dilutions, not instrumental "dilutions".
Ve = Extract volume, mL
Vp = Volume purged, 5 mL is standard
W = Aliquot of sample (wet), g
%S = Sample % solid
5000 = Constant representing the final volume of the methanol extraction.

11.2.2.2.1 High-Level Samples Corrected for Total Water/Solvent Mixture (V_t):

Samples that are extracted prior to analysis in a water miscible solvent such as methanol are diluted by the total volume of the water/solvent mixture. The total mixture volume can only be calculated based on the sample moisture present as determined by the % moisture calculation.

$$\text{\% moisture} = \frac{\text{g of sample – g of dry sample}}{\text{g of sample}} \times 100$$

$$V_t = \frac{\text{[mL of solvent + (\%moisture x g of sample)]}}{100} \times 1000\text{mL/mL}$$

The calculated V_t value is now added to the volume of methanol in the sample (typically 5000µL), and the corrected concentration is calculated using the equation below:

$$\text{Corrected concentration (mg/Kg)} = \frac{\text{(Conc.) } (V_t \text{ + methanol vol.) (Vp) (DF)}}{\text{(W) (Ve) (\%S)}}$$

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

All batch and sample specific QC criteria outlined in section 10 are evaluated by the analyst prior to approval of the data. When any QC criteria fail, the cause for the failure must be identified and corrected. This may include instrument recalibration followed by sample reanalysis, sample cleanup, or sample re-extraction. If it is determined that the failure is due to sample matrix effects, a project narrative report is written by the analyst for inclusion in the data report. If there is insufficient sample volume to perform the re-analysis for confirmation, this is also noted in the narrative and included in the client report.

13. Method Performance

13.1 Detection Limit Study (DL) / Limit of Detection Study (LOD) / Limit of Quantitation (LOQ)

The laboratory follows the procedure to determine the DL, LOD, and/or LOQ as outlined in Alpha SOP/1732. These studies performed by the laboratory are maintained on file for review.

13.2 Demonstration of Capability Studies

Refer to Alpha SOP/1739 for further information regarding IDC/DOC Generation.

13.2.1 Initial (IDC)

The analyst must make an initial, one-time, demonstration of the ability to generate acceptable accuracy and precision with this method, prior to the processing of any samples.

13.2.2 Continuing (DOC)

The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

Refer to Alpha's Chemical Hygiene Plan and Waste Management and Disposal SOP for further pollution prevention and waste management information.

15. Referenced Documents

Chemical Hygiene Plan

SOP/1732 DL/LOD/LOQ Generation

SOP/1739 IDC/DOC Generation

SOP/1728 Waste Management and Disposal SOP

16. Attachments

Table 1: 8260 REPORTING LIMITS

Table 2: 8260 QC ACCEPTANCE CRITERIA

Table 3: BFB TUNING CRITERIA

Table 4: STANDARD SOLUTIONS and ICAL Levels

Table 5: 8260D Volatile Internal Standards with Corresponding Target Compounds and Surrogates Assigned for Quantitation

Table 6: 8260D Quantitation Ions

Table 7: Difficult Analytes

Table 8: ICAL Low Point re-quantitation ranges

Table 1

Standard Reported Detection Limits

US EPA METHOD 8260D and 5035A/8260D

Analyte	Recommended Minimum Response Factor	RDL (µg/L)	RDL(µg/KG)(1)	RDL (µg/KG) (2)
Acetone (3,4,5)	0.01	5.0	25	1250
Acrolein (5)		5.0	25	1250
Acrylonitrile (3,4)		5.0	4	200
Allyl Chloride (7)		N/A	5	250
Benzene (3,4,5)	0.2	0.5	0.5	25
Bromobenzene (3,4)		2.5	2	100
Bromochloromethane (3,4,5)	0.1	2.5	2	100
Bromodichloromethane (3,4,5)	0.300	0.5	0.5	25
Bromoform (3,4,5)	0.100	2.0	4	200
Bromomethane (3,4,5)	0.01	1.0	2	100
2-Butanone (3,4,5)	0.01	5.0	10	500
Butyl acetate (7)		N/A	5	50
n-Butylbenzene (3,4)		0.5	1	50
sec-Butylbenzene (3,4)		0.5	1	50
tert-Butylbenzene (3,4)		2.5	2	100
Carbon disulfide (3,4,5)	0.100	5.0	10	500
Carbon tetrachloride (3,4,5)	0.100	0.5	1	50
Chlorobenzene (3,4,5)	0.400	0.5	0.5	25
Chlorodifluoromethane (7)		N/A	5	250
Chloroethane (3,4,5)	0.01	1.0	2	100
2-Chloroethylvinyl ether (3)		10.0	20	1000
Chloroform (3,4,5)	0.300	0.75	1.5	75
Chloromethane (3,4,5)	0.01	2.5	4	200
o-Chlorotoluene (3,4)		2.5	2	100
Cyclohexane (5)	0.01	10	10	500
Cyclohexanone		10	20	1000
p-Chlorotoluene (3,4)		2.5	2	100
cis-Decahydronaphthalene (7)		N/A	5	250
trans-Decahydronaphthalene (7)		N/A	5	250
n-Decane (7)		N/A	5	250
Dibromochloromethane (3,4,5)	0.200	0.5	1	50
1,2-Dibromo-3-chloropropane (3,4,5)	0.01	2.5	3	150
1,2-Dibromoethane (3,4,5)	0.200	2.0	1	50
Dibromomethane (3,4)		5.0	2	100
1,2-Dichlorobenzene (3,4,5)	0.600	2.5	2	100
1,3-Dichlorobenzene (3,4,5)	0.500	2.5	2	100
1,4-Dichlorobenzene (3,4,5)	0.600	2.5	2	100
1,4-Dichlorobutane (3,4)		5.0	10	500

Analyte	Recommended Minimum Response Factor	RDL (µg/L)	RDL(µg/KG)(1)	RDL (µg/KG) (2)
trans-1,4-Dichloro-2-butene (3,4)		2.5	5	250
Dichlorodifluoromethane (3,4,5)	0.01	5.0	10	500
1,1-Dichloroethane (3,4,5)	0.300	0.75	1	50
1,2-Dichloroethane (3,4,5)	0.07	0.5	1	50
1,1-Dichloroethene (3,4,5)	0.06	0.5	1	50
cis-1,2-Dichloroethene (3,4,5)	0.200	0.5	1	50
trans-1,2-Dichloroethene (3,4,5)	0.100	0.75	1.5	75
1,2-Dichloropropane (3,4,5)	0.200	1.75	1	50
1,3-Dichloropropane (3,4)		2.5	2	100
2,2-Dichloropropane (3,4)		2.5	2	100
1,1-Dichloropropene (3,4)		2.5	0.5	25
cis-1,3-Dichloropropene (3,4,5)	0.300	0.5	0.5	25
p-Diethylbenzene (4)		2.0	2	100
Diisopropyl Ether (6)		2.0	2	100
1,4-Dioxane (5) (non-SIM)		250.0	80	4000
trans-1,3-Dichloropropene (3,4,5)	0.300	0.5	1	50
Ethanol (7)		250.0	1000	50000
Ethyl acetate		10.0	10	500
Ethylbenzene (3,4,5)	0.400	0.5	1	50
Ethyl ether (3,4)		2.5	2	100
4-Ethyltoluene (4)		2.0	2	100
Ethyl methacrylate (3,4)		5.0	10	500
Ethyl-Tert-Butyl-Ether (6)		2.0	2	100
Freon-113 (5)	0.05	10.0	4	200
n-Heptane (7)		N/A	5	250
Hexachlorobutadiene (3,4)		0.5	4	200
Hexachloroethane (7)		N/A	5	250
Hexane		1.0	5	250
2-Hexanone (3,4,5)	0.01	5.0	10	500
Iodomethane		5.0	10	500
Isopropyl Alcohol (IPA)		100.0	100	5000
Isopropylbenzene (3,4,5)	0.400	0.5	1	50
p-Isopropyltoluene (3,4)			1	50
Limonene (7)		N/A	5	250
Methyl Acetate (5)	0.01	10.0	4	200
Methylene chloride (3,4,5)	0.01	3.0	5	250
Methyl Cyclohexane (5)	0.05	10.0	4	200
Methyl isothiocyanate (7)		N/A	5	250
Methyl Methacrylate		2.5	5	250
4-Methyl-2-pentanone (3,4,5)	0.03	5.0	10	500
Methyl-tert-butyl-ether (3,4,5)	0.100	1.0	2	100

Analyte	Recommended Minimum Response Factor	RDL (µg/L)	RDL(µg/KG)(1)	RDL (µg/KG) (2)
Naphthalene (3,4)		2.5	4	200
Nitrobenzene (7)		N/A	5	250
2-Nitropropane (7)		N/A	5	250
n-Nonane (7)		N/A	5	250
n-Octane (7)		N/A	5	250
n-Butanol (5)		100.0	300	15000
n-Propylbenzene (3,4)		0.5	1	50
n-Propyl bromide		5.0	N/A	N/A
Pentachloroethane		2.0	N/A	N/A
Styrene (3,4,5)	0.200	1.0	1	50
Tert-Butyl Alcohol (5)		10.0	20	1000
Tertiary-Amyl Methyl Ether (6)		2.0	2	100
1,1,1,2-Tetrachloroethane (3,4)		0.5	0.5	25
1,2,4,5-Tetramethylbenzene (4)		2.0	2	100
1,1,2,2-Tetrachloroethane (3,4,5)	0.200	0.5	0.5	25
Tetrachloroethene (3,4,5)	0.100	0.5	0.5	25
Tetrahydrofuran (3)		5.0	4	200
Toluene (3,4,5)			1	50
1,2,3-Trichlorobenzene (3,4,5)	0.400	2.5	2	100
1,2,4-Trichlorobenzene (3,4,5)	0.400	2.5	2	100
1,3,5-Trichlorobenzene (6)		2.0	2	100
1,1,1-Trichloroethane (3,4,5)	0.05	0.5	0.5	25
1,1,2-Trichloroethane (3,4,5)	0.200	0.75	1	50
Trichloroethene (3,4,5)	0.200	0.5	0.5	25
Trichlorofluoromethane (3,4,5)	0.01	2.5	4	200
1,2,3-Trichloropropane (3,4)		5.0	10	500
1,2,4-Trimethylbenzene (3,4)		2.5	2	100
1,3,5-Trimethylbenzene (3,4)		2.5	2	100
n-Undecane (7)		N/A	5	250
Vinyl acetate (3,4)		5.0	10	500
Vinyl chloride (3,4,5) (non-SIM)	0.01	1.0	1	50
m/p-Xylenes (3,4,5)	0.200	1.0	2	100
o-Xylene (3,4,5)	0.200	1.0	1	50
Isobutyl Alcohol		10.0	N/A	N/A
2-Butanol		25.0	N/A	N/A
4-penten-2-ol		100.0	N/A	N/A
2-methyl-2-butanol		25.0	N/A	N/A
4-methyl-2-pentanol		25.0	N/A	N/A

Analyte	Recommended Minimum Response Factor	RDL (µg/L)	RDL(µg/KG)(1)	RDL (µg/KG) (2)
Chloropicrin		20.0	100	5000
Halothane		2.5	10	500
1,4-Dioxane (5) SIM		3.0	N/A	N/A
1,1,2,2-Tetrachloroethane SIM		0.1	N/A	N/A
Vinyl Chloride (9) SIM		0.035	N/A	N/A

(1) Detection Limits are for Low-level Aqueous preserved samples.
(2) Detection Limits are for High-level Methanol preserved samples.
(3) Analyte reported by standard 8260 reporting list.
(4) Analyte reported by New York TCL reporting list.
(5) Analyte reported by New Jersey TCL reporting list.
(6) Analyte reported for New Hampshire in addition to standard 8260 reporting list.
(7) Analyte only reported for New York TCL report upon client request.
(8) Note: Reporting Limits are based on standard 8260 reporting list, RL's may vary for NY and NJ reporting lists.
(9) Analyte only reported for New Jersey TCL report upon client request.

Table 2

QUALITY CONTROL ACCEPTANCE CRITERIA

Surrogate Spike Percent Recovery	Aqueous Limits		Soil Limits	
	Lower Control Limit	Upper Control Limit	Lower Control Limit	Upper Control Limit
1,2-Dichloroethane-d_4	70%	130%	70%	130%
4-Bromofluorobenzene	70%	130%	70%	130%
Toluene-d_8	70%	130%	70%	130%
Dibromofluoromethane	70%	130%	70%	130%

Table 3

BFB (4-BROMOFLUOROBENZENE) MASS INTENSITY CRITERIA

m/z	Required Intensity (relative abundance)
50	15 to 40% of m/z 95 (not required)
75	30 to 60% of m/z 95 (not required)
95	50 to 200% of m/z 174
96	5 to 9% of m/z 95
173	Less than 2% of m/z 174
174	50 to 200% of m/z 95
175	5 to 9% of m/z 174
176	95% to 105% of m/z 174
177	5 to 10% of m/z 176

Table 4

Stock Standard Concentrations and Suggested Calibration Concentration Levels - Soil

Soil	Stock (µg/mL)	Level 0 (ug/kg)	Level 1 (ug/kg)	Level 1.5 (ug/kg)	Level 2 (ug/kg)	Level 3 (ug/kg)	Level 4 (ug/kg)	Level 5 (ug/kg)	Level 6 (ug/kg)	Level 7 (ug/kg)	Level 8 (ug/kg)
Fluorobenzene	2500	20	20	20	20	20	20	20	20	20	20
Dichlorodifluoromethane	2000	0.5	1	2	4	20	40	60	100	200	300
Chlorodifluoromethane	2000	0.5	1	2	4	20	40	60	100	200	300
Chloromethane	2000	0.5	1	2	4	20	40	60	100	200	300
Vinyl chloride	2000	0.5	1	2	4	20	40	60	100	200	300
Bromomethane	2000	0.5	1	2	4	20	40	60	100	200	300
Chloroethane	2000	0.5	1	2	4	20	40	60	100	200	300
Trichlorofluoromethane	2000	0.5	1	2	4	20	40	60	100	200	300
Ethyl ether	2000	0.5	1	2	4	20	40	60	100	200	300
Ethanol	2000	N/A	20	N/A	80	200	400	600	1000	3000	4000
1,1-Dichloroethene	2000	0.5	1	2	4	20	40	60	100	200	300
Carbon disulfide	2000	0.5	1	2	4	20	40	60	100	200	300
Freon-113	2000	0.5	1	2	4	20	40	60	100	200	300
Iodomethane	2000	0.5	1	2	4	20	40	60	100	200	300
Acrolein	2000	0.5	1	2	4	20	40	60	100	200	300
Allyl chloride	2000	0.5	1	2	4	20	40	60	100	200	300
Methylene chloride	2000	0.5	1	2	4	20	40	60	100	200	300
Isopropyl alcohol	2000	N/A	20	N/A	80	200	400	600	1000	3000	4000
Acetone	2000	0.5	1	2	4	20	40	60	100	200	300
trans-1,2-Dichloroethene	2000	0.5	1	2	4	20	40	60	100	200	300
Methyl acetate	2000	0.5	1	2	4	20	40	60	100	200	300
Hexane	2000	0.5	1	2	4	20	40	60	100	200	300
Methyl tert-butyl ether	2000	0.5	1	2	4	20	40	60	100	200	300
tert-Butyl alcohol	2000	2.5	5	10	20	100	200	300	500	1000	1500
Diisopropyl ether	2000	0.5	1	2	4	20	40	60	100	200	300
1,1-Dichloroethane	2000	0.5	1	2	4	20	40	60	100	200	300
Halothane	2000	0.5	1	2	4	20	40	60	100	200	300
Acrylonitrile	2000	0.5	1	2	4	20	40	60	100	200	300
Ethyl tert-butyl ether	2000	0.5	1	2	4	20	40	60	100	200	300
Vinyl acetate	2000	0.5	1	2	4	20	40	60	100	200	300
cis-1,2-Dichloroethene	2000	0.5	1	2	4	20	40	60	100	200	300
2,2-Dichloropropane	2000	0.5	1	2	4	20	40	60	100	200	300
Bromochloromethane	2000	0.5	1	2	4	20	40	60	100	200	300
Cyclohexane	2000	0.5	1	2	4	20	40	60	100	200	300

Soil	Stock (µg/mL)	Level 0 (ug/kg)	Level 1 (ug/kg)	Level 1.5 (ug/kg)	Level 2 (ug/kg)	Level 3 (ug/kg)	Level 4 (ug/kg)	Level 5 (ug/kg)	Level 6 (ug/kg)	Level 7 (ug/kg)	Level 8 (ug/kg)
Chloroform	2000	0.5	1	2	4	20	40	60	100	200	300
Ethyl acetate	2000	0.5	1	2	4	20	40	60	100	200	300
Carbon tetrachloride	2000	0.5	1	2	4	20	40	60	100	200	300
Tetrahydrofuran	2000	0.5	1	2	4	20	40	60	100	200	300
Dibromofluoromethane	2500	20	20	20	20	20	20	20	20	20	20
1,1,1-Trichloroethane	2000	0.5	1	2	4	20	40	60	100	200	300
2-Butanol	2000	N/A	20	N/A	80	200	400	600	1000	3000	4000
2-Butanone	2000	0.5	1	2	4	20	40	60	100	200	300
1,1-Dichloropropene	2000	0.5	1	2	4	20	40	60	100	200	300
Heptane	2000	0.5	1	2	4	20	40	60	100	200	300
Benzene	2000	0.5	1	2	4	20	40	60	100	200	300
tert-Amyl methyl ether	2000	0.5	1	2	4	20	40	60	100	200	300
1,2-Dichloroethane-d4	2500	20	20	20	20	20	20	20	20	20	20
1,2-Dichloroethane	2000	0.5	1	2	4	20	40	60	100	200	300
Isobutyl alcohol	2000	N/A	20	N/A	80	200	400	600	1000	3000	4000
2-Methyl-2-butanol	2000	2.5	5	10	20	100	200	300	500	1000	1500
Methyl cyclohexane	2000	0.5	1	2	4	20	40	60	100	200	300
Trichloroethene	2000	0.5	1	2	4	20	40	60	100	200	300
n-Butanol	2000	N/A	20	N/A	80	200	400	600	1000	3000	4000
Dibromomethane	2000	0.5	1	2	4	20	40	60	100	200	300
1,2-Dichloropropane	2000	0.5	1	2	4	20	40	60	100	200	300
4-penten-2-ol	2000	2.5	5	10	20	100	200	300	500	1000	1500
2-Chloroethyl vinyl ether	2000	0.5	1	2	4	20	40	60	100	200	300
Bromodichloromethane	2000	0.5	1	2	4	20	40	60	100	200	300
Ethyl acrylate	2000	0.5	1	2	4	20	40	60	100	200	300
Methyl methacrylate	2000	0.5	1	2	4	20	40	60	100	200	300
1,4-Dioxane	2000	N/A	40	80	200	1000	2000	3000	5000	10000	15000
cis-1,3-Dichloropropene	2000	0.5	1	2	4	20	40	60	100	200	300
Chlorobenzene-d5	2500	20	20	20	20	20	20	20	20	20	20
Octane	2000	0.5	1	2	4	20	40	60	100	200	300
Toluene-d8	2500	20	20	20	20	20	20	20	20	20	20
Toluene	2000	0.5	1	2	4	20	40	60	100	200	300
4-Methyl-2-pentanone	2000	0.5	1	2	4	20	40	60	100	200	300
Tetrachloroethene	2000	0.5	1	2	4	20	40	60	100	200	300
2-Nitropropane	2000	0.5	1	2	4	20	40	60	100	200	300

Soil	Stock (µg/mL)	Level 0 (ug/kg)	Level 1 (ug/kg)	Level 1.5 (ug/kg)	Level 2 (ug/kg)	Level 3 (ug/kg)	Level 4 (ug/kg)	Level 5 (ug/kg)	Level 6 (ug/kg)	Level 7 (ug/kg)	Level 8 (ug/kg)
Chloropicrin	2000	N/A	50	N/A	100	200	300	400	500	600	700
trans-1,3-Dichloropropene	2000	0.5	1	2	4	20	40	60	100	200	300
Methyl isothiocyanate	2000	0.5	1	2	4	20	40	60	100	200	300
4-Methyl-2-pentanol	2000	N/A	20	N/A	80	200	400	600	1000	3000	4000
Ethyl methacrylate	2000	0.5	1	2	4	20	40	60	100	200	300
1,1,2-Trichloroethane	2000	0.5	1	2	4	20	40	60	100	200	300
Chlorodibromomethane	2000	0.5	1	2	4	20	40	60	100	200	300
1,3-Dichloropropane	2000	0.5	1	2	4	20	40	60	100	200	300
1,2-Dibromoethane	2000	0.5	1	2	4	20	40	60	100	200	300
n-Butyl Acetate	2000	0.5	1	2	4	20	40	60	100	200	300
2-Hexanone	2000	0.5	1	2	4	20	40	60	100	200	300
Nonane	2000	0.5	1	2	4	20	40	60	100	200	300
Chlorobenzene	2000	0.5	1	2	4	20	40	60	100	200	300
Ethylbenzene	2000	0.5	1	2	4	20	40	60	100	200	300
1,1,1,2-Tetrachloroethane	2000	0.5	1	2	4	20	40	60	100	200	300
p/m Xylene	2000	1	2	4	8	40	80	120	200	400	600
o Xylene	2000	1	2	4	8	40	80	120	200	400	600
Styrene	2000	1	2	4	8	40	80	120	200	400	600
1,4-Dichlorobenzene-d4	2500	20	20	20	20	20	20	20	20	20	20
Bromoform	2000	0.5	1	2	4	20	40	60	100	200	300
Butyl acrylate	2000	0.5	1	2	4	20	40	60	100	200	300
Isopropylbenzene	2000	0.5	1	2	4	20	40	60	100	200	300
4-Bromofluorobenzene	2500	20	20	20	20	20	20	20	20	20	20
Bromobenzene	2000	0.5	1	2	4	20	40	60	100	200	300
Decane	2000	0.5	1	2	4	20	40	60	100	200	300
n-Propylbenzene	2000	0.5	1	2	4	20	40	60	100	200	300
1,4-Dichlorobutane	2000	0.5	1	2	4	20	40	60	100	200	300
1,1,2,2-Tetrachloroethane	2000	0.5	1	2	4	20	40	60	100	200	300
4-Ethyltoluene	2000	0.5	1	2	4	20	40	60	100	200	300
2-Chlorotoluene	2000	0.5	1	2	4	20	40	60	100	200	300
1,3,5-Trimethylbenzene	2000	0.5	1	2	4	20	40	60	100	200	300
1,2,3-Trichloropropane	2000	0.5	1	2	4	20	40	60	100	200	300
trans-1,4-Dichloro-2-butene	2000	0.5	1	2	4	20	40	60	100	200	300
4-Chlorotoluene	2000	0.5	1	2	4	20	40	60	100	200	300

Soil	Stock (µg/mL)	Level 0 (ug/kg)	Level 1 (ug/kg)	Level 1.5 (ug/kg)	Level 2 (ug/kg)	Level 3 (ug/kg)	Level 4 (ug/kg)	Level 5 (ug/kg)	Level 6 (ug/kg)	Level 7 (ug/kg)	Level 8 (ug/kg)
tert-Butylbenzene	2000	0.5	1	2	4	20	40	60	100	200	300
Pentachloroethane	2000	0.5	1	2	4	20	40	60	100	200	300
n-Butyl methacrylate	2000	0.5	1	2	4	20	40	60	100	200	300
1,2,4-Trimethylbenzene	2000	0.5	1	2	4	20	40	60	100	200	300
Limonene	2000	0.5	1	2	4	20	40	60	100	200	300
sec-Butylbenzene	2000	0.5	1	2	4	20	40	60	100	200	300
p-Isopropyltoluene	2000	0.5	1	2	4	20	40	60	100	200	300
1,3-Dichlorobenzene	2000	0.5	1	2	4	20	40	60	100	200	300
1,4-Dichlorobenzene	2000	0.5	1	2	4	20	40	60	100	200	300
trans-Decahydronaphthalene	2000	0.5	1	2	4	20	40	60	100	200	300
Undecane	2000	0.5	1	2	4	20	40	60	100	200	300
p-Diethylbenzene	2000	0.5	1	2	4	20	40	60	100	200	300
n-Butylbenzene	2000	0.5	1	2	4	20	40	60	100	200	300
Hexachloroethane	2000	0.5	1	2	4	20	40	60	100	200	300
1,2-Dichlorobenzene	2000	0.5	1	2	4	20	40	60	100	200	300
cis-Decahydronaphthalene	2000	0.5	1	2	4	20	40	60	100	200	300
1,2,4,5-Tetramethylbenzene	2000	0.5	1	2	4	20	40	60	100	200	300
1,2-Dibromo-3-chloropropane	2000	0.5	1	2	4	20	40	60	100	200	300
1,3,5-Trichlorobenzene	2000	0.5	1	2	4	20	40	60	100	200	300
Nitrobenzene	2000	0.5	1	2	4	20	40	60	100	200	300
Hexachlorobutadiene	2000	0.5	1	2	4	20	40	60	100	200	300
1,2,4-Trichlorobenzene	2000	0.5	1	2	4	20	40	60	100	200	300
Naphthalene	2000	0.5	1	2	4	20	40	60	100	200	300
1,2,3-Trichlorobenzene	2000	0.5	1	2	4	20	40	60	100	200	300
1,3-Dioxolane	2000	N/A	25	N/A	50	100	250	500	1000	1500	2000

- For Low Level Soil analysis, the calibration levels are the same in µg/Kg units.
- For High Level Soil analysis, the calibration levels are at 50x the levels listed due to sample preparation requirements.

Stock Standard Concentrations and Suggested Calibration Concentration Levels – Water

Water	Stock (µg/mL)	Level 11 (ug/L)	Level 1 (ug/L)	Level 2 (ug/L)	Level 3 (ug/L)	Level 4 (ug/L)	Level 5 (ug/L) Optional	Level 6 (ug/L)	Level 7 (ug/L) Optional	Level 8 (ug/L)	Level 9 (ug/L) Optional	Level 10 (ug/L)
Fluorobenzene	2500	10	10	10	10	10	10	10	10	10	10	10
Dichlorodifluoromethane	2000		0.5	2	10	30	50	80	100	120	160	200
Chloromethane	2000		0.5	2	10	30	50	80	100	120	160	200
Vinyl chloride	2000	0.19	0.5	2	10	30	50	80	100	120	160	200
Bromomethane	2000		0.5	2	10	30	50	80	100	120	160	200
Chloroethane	2000		0.5	2	10	30	50	80	100	120	160	200
Trichlorofluoromethane	2000		0.5	2	10	30	50	80	100	120	160	200
Ethyl ether	2000		0.5	2	10	30	50	80	100	120	160	200
Ethanol	2000		0.5	2	10	30	50	80	100	120	160	200
1,1-Dichloroethene	2000		0.5	2	10	30	50	80	100	120	160	200
Carbon disulfide	2000		0.5	2	10	30	50	80	100	120	160	200
Freon-113	2000		0.5	2	10	30	50	80	100	120	160	200
Iodomethane	2000		0.5	2	10	30	50	80	100	120	160	200
Acrolein	2000		0.5	2	10	30	50	80	100	120	160	200
Methylene chloride	2000		0.5	2	10	30	50	80	100	120	160	200
Isopropyl alcohol	2000		2.5	10	50	150	250	400	500	600	800	1000
Acetone	2000		0.5	2	10	30	50	80	100	120	160	200
trans-1,2-Dichloroethene	2000		0.5	2	10	30	50	80	100	120	160	200
Methyl acetate	2000		0.5	2	10	30	50	80	100	120	160	200
Methyl tert-butyl ether	2000		0.5	2	10	30	50	80	100	120	160	200
tert-Butyl alcohol	2000		2.5	10	50	150	250	400	500	600	800	1000
Diisopropyl ether	2000		0.5	2	10	30	50	80	100	120	160	200
1,1-Dichloroethane	2000		0.5	2	10	30	50	80	100	120	160	200
Halothane	2000		0.5	2	10	30	50	80	100	120	160	200
Acrylonitrile	2000		0.5	2	10	30	50	80	100	120	160	200
Ethyl tert-butyl ether	2000		0.5	2	10	30	50	80	100	120	160	200
Vinyl acetate	2000		0.5	2	10	30	50	80	100	120	160	200
cis-1,2-Dichloroethene	2000		0.5	2	10	30	50	80	100	120	160	200
2,2-Dichloropropane	2000		0.5	2	10	30	50	80	100	120	160	200
Bromochloromethane	2000		0.5	2	10	30	50	80	100	120	160	200
Cyclohexane	2000		0.5	2	10	30	50	80	100	120	160	200
Chloroform	2000		0.5	2	10	30	50	80	100	120	160	200
Ethyl acetate	2000		0.5	2	10	30	50	80	100	120	160	200
Carbon tetrachloride	2000	0.19	0.5	2	10	30	50	80	100	120	160	200

Water	Stock (µg/mL)	Level 11 (ug/L)	Level 1 (ug/L)	Level 2 (ug/L)	Level 3 (ug/L)	Level 4 (ug/L)	Level 5 (ug/L) Optional	Level 6 (ug/L)	Level 7 (ug/L) Optional	Level 8 (ug/L)	Level 9 (ug/L) Optional	Level 10 (ug/L)
Tetrahydrofuran	2000		0.5	2	10	30	50	80	100	120	160	200
Dibromofluoromethane	2500	10	10	10	10	10	10	10	10	10	10	10
1,1,1-Trichloroethane	2000		0.5	2	10	30	50	80	100	120	160	200
2-Butanol	2000		2.5	10	50	150	250	400	500	600	800	1000
2-Butanone	2000		0.5	2	10	30	50	80	100	120	160	200
1,1-Dichloropropene	2000		0.5	2	10	30	50	80	100	120	160	200
Benzene	2000	0.19	0.5	2	10	30	50	80	100	120	160	200
tert-Amyl methyl ether	2000		0.5	2	10	30	50	80	100	120	160	200
1,2-Dichloroethane-d4	2500	10	10	10	10	10	10	10	10	10	10	10
1,2-Dichloroethane	2000		0.5	2	10	30	50	80	100	120	160	200
Isobutyl alcohol	2000		2.5	10	50	150	250	400	500	600	800	1000
2-Methyl-2-butanol	2000		2.5	10	50	150	250	400	500	600	800	1000
Methyl cyclohexane	2000		0.5	2	10	30	50	80	100	120	160	200
Trichloroethene	2000	0.19	0.5	2	10	30	50	80	100	120	160	200
n-Butanol	2000		2.5	10	50	150	250	400	500	600	800	1000
Dibromomethane	2000		0.5	2	10	30	50	80	100	120	160	200
1,2-Dichloropropane	2000		0.5	2	10	30	50	80	100	120	160	200
4-penten-2-ol	2000		2.5	10	50	150	250	400	500	600	800	1000
2-Chloroethyl vinyl ether	2000		0.5	2	10	30	50	80	100	120	160	200
Bromodichloromethane	2000		0.5	2	10	30	50	80	100	120	160	200
Ethyl acrylate	2000		0.25	1	5	15	25	40	50	60	80	100
Methyl methacrylate	2000		0.25	1	5	15	25	40	50	60	80	100
1,4-Dioxane	2000		100	400	500	600	1000	800	1000	1200	1600	2000
cis-1,3-Dichloropropene	2000		0.5	2	10	30	50	80	100	120	160	200
Chlorobenzene-d5	2500	10	10	10	10	10	10	10	10	10	10	10
Toluene-d8	2500	10	10	10	10	10	10	10	10	10	10	10
Toluene	2000		0.5	2	10	30	50	80	100	120	160	200
4-Methyl-2-pentanone	2000		0.5	2	10	30	50	80	100	120	160	200
Tetrachloroethene	2000		0.5	2	10	30	50	80	100	120	160	200
Chloropicrin	2000		30	50	80	120	200	160	400	200	320	400
trans-1,3-Dichloropropene	2000		0.5	2	10	30	50	80	100	120	160	200
4-Methyl-2-pentanol	2000		2.5	10	50	150	250	400	500	600	800	1000
Ethyl methacrylate	2000		0.5	2	10	30	50	80	100	120	160	200
1,1,2-Trichloroethane	2000		0.5	2	10	30	50	80	100	120	160	200

Water	Stock (µg/mL)	Level 11 (ug/L)	Level 1 (ug/L)	Level 2 (ug/L)	Level 3 (ug/L)	Level 4 (ug/L)	Level 5 (ug/L) Optional	Level 6 (ug/L)	Level 7 (ug/L) Optional	Level 8 (ug/L)	Level 9 (ug/L) Optional	Level 10 (ug/L)
Chlorodibromomethane	2000		0.5	2	10	30	50	80	100	120	160	200
1,3-Dichloropropane	2000		0.5	2	10	30	50	80	100	120	160	200
1,2-Dibromoethane	2000		0.5	2	10	30	50	80	100	120	160	200
2-Hexanone	2000		0.5	2	10	30	50	80	100	120	160	200
Chlorobenzene	2000		0.5	2	10	30	50	80	100	120	160	200
Ethylbenzene	2000		0.5	2	10	30	50	80	100	120	160	200
1,1,1,2-Tetrachloroethane	2000		0.5	2	10	30	50	80	100	120	160	200
p/m Xylene	2000		1	4	20	60	100	160	200	240	320	400
o Xylene	2000		1	4	20	60	100	160	200	240	320	400
Styrene	2000		1	4	20	60	100	160	200	240	320	400
1,4-Dichlorobenzene-d4	2500	10	10	10	10	10	10	10	10	10	10	10
Bromoform	2000		0.5	2	10	30	50	80	100	120	160	200
Butyl acrylate	2000		0.25	1	5	15	25	40	50	60	80	100
Isopropylbenzene	2000		0.5	2	10	30	50	80	100	120	160	200
4-Bromofluorobenzene	2500	10	10	10	10	10	10	10	10	10	10	10
Bromobenzene	2000		0.5	2	10	30	50	80	100	120	160	200
n-Propylbenzene	2000		0.5	2	10	30	50	80	100	120	160	200
1,4-Dichlorobutane	2000		0.5	2	10	30	50	80	100	120	160	200
1,1,2,2-Tetrachloroethane	2000		0.5	2	10	30	50	80	100	120	160	200
4-Ethyltoluene	2000		0.5	2	10	30	50	80	100	120	160	200
2-Chlorotoluene	2000		0.5	2	10	30	50	80	100	120	160	200
1,3,5-Trimethylbenzene	2000		0.5	2	10	30	50	80	100	120	160	200
1,2,3-Trichloropropane	2000		0.5	2	10	30	50	80	100	120	160	200
trans-1,4-Dichloro-2-butene	2000		0.5	2	10	30	50	80	100	120	160	200
4-Chlorotoluene	2000		0.5	2	10	30	50	80	100	120	160	200
tert-Butylbenzene	2000		0.5	2	10	30	50	80	100	120	160	200
Pentachloroethane	2000		0.5	2	10	30	50	80	100	120	160	200
n-Butyl methacrylate	2000		0.25	1	5	15	25	40	50	60	80	100
1,2,4-Trimethylbenzene	2000		0.5	2	10	30	50	80	100	120	160	200
sec-Butylbenzene	2000		0.5	2	10	30	50	80	100	120	160	200
p-Isopropyltoluene	2000		0.5	2	10	30	50	80	100	120	160	200
1,3-Dichlorobenzene	2000		0.5	2	10	30	50	80	100	120	160	200
1,4-Dichlorobenzene	2000		0.5	2	10	30	50	80	100	120	160	200

Water	Stock (µg/mL)	Level 11 (ug/L)	Level 1 (ug/L)	Level 2 (ug/L)	Level 3 (ug/L)	Level 4 (ug/L)	Level 5 (ug/L) Optional	Level 6 (ug/L)	Level 7 (ug/L) Optional	Level 8 (ug/L)	Level 9 (ug/L) Optional	Level 10 (ug/L)
p-Diethylbenzene	2000		0.5	2	10	30	50	80	100	120	160	200
n-Butylbenzene	2000		0.5	2	10	30	50	80	100	120	160	200
1,2-Dichlorobenzene	2000		0.5	2	10	30	50	80	100	120	160	200
1,2,4,5-Tetramethylbenzene	2000		0.5	2	10	30	50	80	100	120	160	200
1,2-Dibromo-3-chloropropane	2000		0.5	2	10	30	50	80	100	120	160	200
1,3,5-Trichlorobenzene	2000		0.5	2	10	30	50	80	100	120	160	200
Hexachlorobutadiene	2000		0.5	2	10	30	50	80	100	120	160	200
1,2,4-Trichlorobenzene	2000		0.5	2	10	30	50	80	100	120	160	200
Naphthalene	2000		0.5	2	10	30	50	80	100	120	160	200
1,2,3-Trichlorobenzene	2000		0.5	2	10	30	50	80	100	120	160	200
1,3-Dioxolane	2000		10	40	100	250	N/A	500	N/A	750	N/A	1000
Pentachloroethane	2000		0.5	2	10	30	50	80	100	120	160	200
1,4-Dioxane (SIM)	100		0.5	2	10	20	30	50	100	200	N/A	N/A
1,1,2,2-Tetrachloroethane (SIM)	100		0.05	0.1	0.2	0.5	1	2	5	10	N/A	N/A
Vinyl Chloride (SIM)	200		0.02	0.05	0.1	0.2	0.5	1.0	2.0			

- For Low Level Soil analysis, the calibration levels are the same in µg/Kg units.
- For High Level Soil analysis, the calibration levels are at 50x the levels listed due to sample preparation requirements.

Table 5

8260D Volatile Internal Standards with Corresponding Target Compounds and Surrogates Assigned for Quantitation

Fluorobenzene	Chlorobenzene-d5	1,4-Dichlorobenzene-d4
Dichlorodifluoromethane	Toluene-d8 (surr)	Isopropylbenzene
Chloromethane	Toluene	Bromoform
Vinyl Chloride	Ethyl Methacrylate	1,4-dichloro-2-butane
Bromomethane	Trans-1,3-dichloropropene	1,1,2,2,-tetrachloroethane
Chloroethane	1,1,2-trichloroethane	4-bromofluorobenzene (surr)
Trichlorofluoromethane	2-hexanone	1,2,3-trichloropropane
Ethyl Ether	1,3-dichloropropane	trans-1,4-dichloro-2-butene
Freon 113	Tetrachloroethene	n-propylbenzene
Acrolein	Chlorodibromomethane	Bromobenzene
Acetone	1,2-dibromoethane	4-ethyltoluene
Ethanol	Chlorobenzene	1,3,5-trimethybenzene
1,1,-dichloroethene	1,1,1,2-tetrachloroethane	2-chlorotoluene
Tert-Butyl Alcohol	Ethylbenzene	4-chorotoluene
Methyl Acetate	p/m xylene	tert-butylbenzene
Carbon Disulfide	o xylene	1,2,4-trimethylbenzene
Methylene Chloride	Styrene	sec-butylbenzene
Acrylonitrile	Octane	p-isopropyltoluene
Methyl Tert Butyl Ether	2-Nitropropane	1,3-dichlorobenzene
Halothane	Methyl isothiocyanate	1,4-dichlorobenzene
Trans-1,2-dichloroethene	n-Butyl acetate	n-butylbenzene
Diisopropyl Ether	Nonane	p-diethylbenzene
Vinyl Acetate		1,2-dichlorobenzene
1,1-dichloroethane		1,2,4,5-tetramethylbenzene
Ethyl-Tert-Butyl-Ether		1,2-dibromo-3-chloropropane
2-butanone		1,3,5-trichlorobenzene
2,2-dichloropropane		1,2,4-trichlorobenzene
Cis-1,2-dichloroethene		Hexachlorobutadiene
Chloroform		Naphthalene
Bromochloromethane		1,2,3-trichlorobenzene
Tetrahydrofuran		Cyclohexanone
Dibromofluoromethane (surr)		Nitrobenzene

Fluorobenzene	Chlorobenzene-d5	1,4-Dichlorobenzene-d4
1,1,1-trichloroethane		Pentachloroethane
Cyclohexane		Decane
1,1-dichloropropene		Limonene
carbon Tetrachloride		trans-Decahydronaphthalene
Tertiary-Amyl Methyl Ether		Undecane
1,2-dichloroethane-d4 (surr)		Hexachloroethane
1,2-dichloroethane		cis-Decahydronaphthalene
Benzene		
Trichloroethene		
Methyl cyclohexane		
1,2-Dichloropropane		
Bromodichloromethane		
1,4-Dioxane		
Dibromomethane		
2-Chloroethylvinyl Ether		
4-methyl-2-pentanone		
cis-1,3-Dichloropropene		
Iodomethane		
Methyl methacrylate		
n-Butanol		
Ethyl acetate		
Isopropyl alcohol (IPA)		
Hexane		
n-Propyl bromide		
Chlorodifluoromethane		
Allyl chloride		
Heptane		

Table 6

8260D Quantitation Ions

Analyte	Quantitation Ion	Analyte	Quantitation Ion
Dichlorodifluoromethane	85	Ethyl Methacrylate	69
Chloromethane	50	Trans-1,3-dichloropropene	75
Vinyl Chloride	62	1,1,2-trichloroethane	83
Bromomethane	94	2-hexanone	43
Chloroethane	64	1,3-dichloropropane	76
Trichlorofluoromethane	101	Tetrachloroethene	166
Ethyl Ether	74	Chlorodibromomethane	129
Freon 113	101	1,2-dibromoethane	107
Acrolein	56	Chlorobenzene	112
Acetone	43	1,1,1,2-tetrachloroethane	131
1,1,-dichloroethene	96	Ethylbenzene	91
Tert-Butyl Alcohol	59	p/m xylene	106
Methyl Acetate	43	o xylene	106
Carbon Disulfide	84	Styrene	104
Methylene Chloride	76	Isopropylbenzene	105
Acrylonitrile	53	Bromoform	173
Methyl Tert Butyl Ether	73	1,4-dichloro-2-butane	55
Halothane	117	1,1,2,2,-tetrachloroethane	83
Trans-1,2-dichloroethene	96	1,2,3-trichloropropane	75
Diisopropyl Ether	45	Trans-1,4-dichloro-2-butene	53
Vinyl Acetate	43	n-propylbenzene	91
1,1-dichloroethane	63	Bromobenzene	156
Ethyl-Tert-Butyl-Ether	59	4-ethyltoluene	105
2-butanone	43	1,3,5-trimethybenzene	105
2,2-dichloropropane	77	2-chlorotoluene	91
Cis-1,2-dichloroethene	96	4-chlorotoluene	91
Chloroform	83	tert-butylbenzene	119
Bromochloromethane	128	1,2,4-trimethylbenzene	105
Tetrahydrofuran	42	sec-butylbenzene	105
1,1,1-trichloroethane	97	p-isopropyltoluene	119
Cyclohexane	56	1,3-dichlorobenzene	146
1,1-dichloropropene	75	1,4-dichlorobenzene	146
Carbon Tetrachloride	117	n-butylbenzene	91
Tertiary-Amyl Methyl Ether	73	p-diethylbenzene	119
1,2-dichloroethane	62	1,2-dichlorobenzene	146
Benzene	78	1,2,4,5-Tetramethylbenzene	119
Trichloroethene	95	1,2-Dibromo-3-chloropropane	75
Methyl Cyclohexane	83	1,3,5-Trichlorobenzene	180
1,2-Dichloropropane	63	1,2,4-Trichlorobenzene	180
Bromodichloromethane	83	Hexachlorobutadiene	225
1,4-dioxane	88	Naphthalene	128
Dibromomethane	93	1,2,3-trichlorobenzene	180
2-Chloroethylvinyl Ether	63	Ethanol	45
4-methyl-2-pentanone	58	Cyclohexanone	55
Cis-1,3-dichloropropene	75	Ethyl acetate	43
Toluene	92	Iodomethane	142
Methyl methacrylate	69	n-Butanol	56
Pentachloroethane	167	Isopropyl Alcohol (IPA)	45

Analyte	Quantitation Ion	Analyte	Quantitation Ion
Hexane	57	n-Propyl bromide	43
Chlorodifluoromethane	51	Iodomethane	142
Allyl chloride	76	Heptane	71
Octane	85	2-Nitropropane	41
Methyl isothiocyanate	73	n-Butyl Acetate	43
Nonane	57	Decane	57
Limonene	68	Undecane	57
trans-Decahydronaphthalene	138	cis-Decahydronaphthalene	138
Hexachloroethane	117	Nitrobenzene	77

Table 7

List of 8260 Difficult Analytes:

1,1,2,2-Tetrachloroethane
1,2-Dibromo-3-chloropropane (DBCP)
1,4-Dioxane
2-Butanone
2-chloroethylvinyl ether
2-Hexanone
2,2-dichloropropane
4-Methyl-2-pentanone
Acetone
Bromoform
Bromomethane
Carbon disulfide
Chloroethane
Chloromethane
cis-1,3-Dichloropropene
Dichlorodifluoromethane (Freon 12)
Ethanol
Iodomethane
Isobutyl Alcohol
Naphthalene
Nitrobenzene
n-butanol
Styrene
Tert-Butyl Alcohol
Trichlorofluoromethane (Freon 11)
Isopropyl Alcohol (IPA)

Table 8

ICAL Low Point re-quantitation ranges - Water

Water	Level 11 (ug/L)	L11 (70% - 130%)	Level 1 (ug/L)	L1 (70% - 130%)	Level 2 (ug/L)	L2 (70% - 130%)	Level 3 (ug/L)	L3 (70% - 130%)
Dichlorodifluoromethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Chloromethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Vinyl chloride	0.19	0.133 - 0.247	0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Bromomethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Chloroethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Trichlorofluoromethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Ethyl ether			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Ethanol			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,1-Dichloroethene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Carbon disulfide			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Freon-113			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Iodomethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Acrolein			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0

Water	Level 11 (ug/L)	L11 (70% - 130%)	Level 1 (ug/L)	L1 (70% - 130%)	Level 2 (ug/L)	L2 (70% - 130%)	Level 3 (ug/L)	L3 (70% - 130%)
Methylene chloride			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Isopropyl alcohol			2.5	1.75 - 3.25	10	7 - 13.0	50	35 - 65
Acetone			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
trans-1,2-Dichloroethene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Methyl acetate			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Methyl tert-butyl ether			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
tert-Butyl alcohol			2.5	1.75 - 3.25	10	7 - 13.0	50	35 - 65
Diisopropyl ether			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,1-Dichloroethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Halothane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Acrylonitrile			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Ethyl tert-butyl ether			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Vinyl acetate			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
cis-1,2-Dichloroethene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
2,2-Dichloropropane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Bromochloromethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Cyclohexane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Chloroform			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Ethyl acetate			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Carbon tetrachloride	0.19	0.133 - 0.247	0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Tetrahydrofuran			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,1,1-Trichloroethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
2-Butanol			2.5	1.75 - 3.25	10	7 - 13.0	50	35 - 65
2-Butanone			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,1-Dichloropropene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Benzene	0.19	0.133 - 0.247	0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
tert-Amyl methyl ether			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,2-Dichloroethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Isobutyl alcohol			2.5	1.75 - 3.25	10	7 - 13.0	50	35 - 65
2-Methyl-2-butanol			2.5	1.75 - 3.25	10	7 - 13.0	50	35 - 65
Methyl cyclohexane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Trichloroethene	0.19	0.133 - 0.247	0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
n-Butanol			2.5	1.75 - 3.25	10	7 - 13.0	50	35 - 65
Dibromomethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,2-Dichloropropane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
4-penten-2-ol			2.5	1.75 - 3.25	10	7 - 13.0	50	35 - 65
2-Chloroethyl vinyl ether			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Bromodichloromethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Ethyl acrylate			0.25	0.175 - 0.325	1	0.7 - 1.3	5	3.5 - 6.5
Methyl methacrylate			0.25	0.175 - 0.325	1	0.7 - 1.3	5	3.5 - 6.5
1,4-Dioxane			100	70 - 130	400	280 - 520	500	350 - 650
cis-1,3-Dichloropropene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Toluene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0

Water	Level 11 (ug/L)	L11 (70% - 130%)	Level 1 (ug/L)	L1 (70% - 130%)	Level 2 (ug/L)	L2 (70% - 130%)	Level 3 (ug/L)	L3 (70% - 130%)
4-Methyl-2-pentanone			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Tetrachloroethene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Chloropicrin			30	21 - 39	50	35 - 65	80	56 - 104
trans-1,3-Dichloropropene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
4-Methyl-2-pentanol			2.5	1.75 - 3.25	10	7 - 13.0	50	35 - 65
Ethyl methacrylate			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,1,2-Trichloroethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Chlorodibromomethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,3-Dichloropropane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,2-Dibromoethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
2-Hexanone			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Chlorobenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Ethylbenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,1,1,2-Tetrachloroethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
p/m Xylene			1	0.7 - 1.3	4	2.8 - 5.2	20	14 - 26
o Xylene			1	0.7 - 1.3	4	2.8 - 5.2	20	14 - 26
Styrene			1	0.7 - 1.3	4	2.8 - 5.2	20	14 - 26
Bromoform			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Butyl acrylate			0.25	0.175 - 0.325	1	0.7 - 1.3	5	3.5 - 6.5
Isopropylbenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Bromobenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
n-Propylbenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,4-Dichlorobutane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,1,2,2-Tetrachloroethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
4-Ethyltoluene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
2-Chlorotoluene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,3,5-Trimethylbenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,2,3-Trichloropropane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
trans-1,4-Dichloro-2-butene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
4-Chlorotoluene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
tert-Butylbenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Pentachloroethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
n-Butyl methacrylate			0.25	0.175 - 0.325	1	0.7 - 1.3	5	3.5 - 6.5
1,2,4-Trimethylbenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
sec-Butylbenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
p-Isopropyltoluene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,3-Dichlorobenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,4-Dichlorobenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
p-Diethylbenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
n-Butylbenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,2-Dichlorobenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,2,4,5-Tetramethylbenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,2-Dibromo-3-chloropropane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,3,5-Trichlorobenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0

Water	Level 11 (ug/L)	L11 (70% - 130%)	Level 1 (ug/L)	L1 (70% - 130%)	Level 2 (ug/L)	L2 (70% - 130%)	Level 3 (ug/L)	L3 (70% - 130%)
Hexachlorobutadiene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,2,4-Trichlorobenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
Naphthalene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,2,3-Trichlorobenzene			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,3-Dioxolane			10	7 - 13.0	40	28 - 52	100	70 - 130
Pentachloroethane			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,4-Dioxane (SIM)			0.5	0.35 - 0.65	2	1.4 - 2.6	10	7 - 13.0
1,1,2,2-Tetrachloroethane (SIM)			0.05	0.035 - 0.065	0.1	0.07 - 0.13	0.2	0.14 - 0.26

ICAL Low Point re-quantitation ranges – Soil

Soil	Level 0 (ug/kg)	L0 (70% - 130%)	Level 1 (ug/kg)	L1 (70% - 130%)	Level 1.5 (ug/kg)	L1.5 (70% - 130%)	Level 2 (ug/kg)	L2 (70% - 130%)	Level 3 (ug/kg)	L3 (70% - 130%)
Dichlorodifluoromethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Chlorodifluoromethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Chloromethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Vinyl chloride	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Bromomethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Chloroethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Trichlorofluoromethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Ethyl ether	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Ethanol	N/A	N/A	20	14 - 26	N/A	N/A	80	56 -104	200	140 - 260
1,1-Dichloroethene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Carbon disulfide	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Freon-113	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Iodomethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Acrolein	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Allyl chloride	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Methylene chloride	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Isopropyl alcohol	N/A	N/A	20	14 - 26	N/A	N/A	80	56 -104	200	140 - 260
Acetone	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
trans-1,2-Dichloroethene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Methyl acetate	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Hexane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Methyl tert-butyl ether	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
tert-Butyl alcohol	2.5	1.75 - 3.25	5	3.5 - 6.5	10	7.0 - 13.	20	14 - 26	100	70 - 130
Diisopropyl ether	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,1-Dichloroethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Halothane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Acrylonitrile	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Ethyl tert-butyl ether	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26

Soil	Level 0 (ug/kg)	L0 (70% - 130%)	Level 1 (ug/kg)	L1 (70% - 130%)	Level 1.5 (ug/kg)	L1.5 (70% - 130%)	Level 2 (ug/kg)	L2 (70% - 130%)	Level 3 (ug/kg)	L3 (70% - 130%)
Vinyl acetate	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
cis-1,2-Dichloroethene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
2,2-Dichloropropane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Bromochloromethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Cyclohexane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Chloroform	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Ethyl acetate	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Carbon tetrachloride	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Tetrahydrofuran	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,1,1-Trichloroethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
2-Butanol	N/A	N/A	20	14 - 26	N/A	N/A	80	56 - 104	200	140 - 260
2-Butanone	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,1-Dichloropropene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Heptane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Benzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
tert-Amyl methyl ether	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,2-Dichloroethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Isobutyl alcohol	N/A	N/A	20	14 - 26	N/A	N/A	80	56 - 104	200	140 - 260
2-Methyl-2-butanol	2.5	1.75 - 3.25	5	3.5 - 6.5	10	7	20	14 - 26	100	70 - 130
Methyl cyclohexane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Trichloroethene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
n-Butanol	N/A	N/A	20	14 - 26	N/A	N/A	80	56 - 104	200	140 - 260
Dibromomethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,2-Dichloropropane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
4-penten-2-ol	2.5	1.75 - 3.25	5	3.5 - 6.5	10	7	20	14 - 26	100	70 - 130
2-Chloroethyl vinyl ether	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Bromodichloromethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Ethyl acrylate	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Methyl methacrylate	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,4-Dioxane	N/A	N/A	40	28 - 52	80	56 – 104	200	140 - 260	1000	700 - 1300
cis-1,3-Dichloropropene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Octane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Toluene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
4-Methyl-2-pentanone	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Tetrachloroethene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
2-Nitropropane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Chloropicrin	N/A	N/A	50	35 - 65	N/A	N/A	100	70 - 130	200	140 - 260
trans-1,3-Dichloropropene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Methyl isothiocyanate	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
4-Methyl-2-pentanol	N/A	N/A	20	14 - 26	N/A	N/A	80	56 - 104	200	140 - 260
Ethyl methacrylate	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26

Soil	Level 0 (ug/kg)	L0 (70% - 130%)	Level 1 (ug/kg)	L1 (70% - 130%)	Level 1.5 (ug/kg)	L1.5 (70% - 130%)	Level 2 (ug/kg)	L2 (70% - 130%)	Level 3 (ug/kg)	L3 (70% - 130%)
1,1,2-Trichloroethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Chlorodibromomethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,3-Dichloropropane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,2-Dibromoethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
n-Butyl Acetate	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
2-Hexanone	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Nonane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Chlorobenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Ethylbenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,1,1,2-Tetrachloroethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
p/m Xylene	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	8	5.6 - 10.4	40	28 - 52
o Xylene	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	8	5.6 - 10.4	40	28 - 52
Styrene	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	8	5.6 - 10.4	40	28 - 52
Bromoform	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Butyl acrylate	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Isopropylbenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Bromobenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Decane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
n-Propylbenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,4-Dichlorobutane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,1,2,2-Tetrachloroethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
4-Ethyltoluene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
2-Chlorotoluene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,3,5-Trimethylbenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,2,3-Trichloropropane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
trans-1,4-Dichloro-2-butene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
4-Chlorotoluene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
tert-Butylbenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Pentachloroethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
n-Butyl methacrylate	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,2,4-Trimethylbenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Limonene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
sec-Butylbenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
p-Isopropyltoluene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,3-Dichlorobenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,4-Dichlorobenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
trans-Decahydronaphthalene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Undecane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
p-Diethylbenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26

Soil	Level 0 (ug/kg)	L0 (70% - 130%)	Level 1 (ug/kg)	L1 (70% - 130%)	Level 1.5 (ug/kg)	L1.5 (70% - 130%)	Level 2 (ug/kg)	L2 (70% - 130%)	Level 3 (ug/kg)	L3 (70% - 130%)
n-Butylbenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Hexachloroethane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,2-Dichlorobenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
cis-Decahydronaphthalene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,2,4,5-Tetramethylbenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,2-Dibromo-3-chloropropane	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,3,5-Trichlorobenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Nitrobenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Hexachlorobutadiene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,2,4-Trichlorobenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
Naphthalene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,2,3-Trichlorobenzene	0.5	0.35 - 0.65	1	0.7 - 1.3	2	1.4 - 2.6	4	2.8 - 5.2	20	14 - 26
1,3-Dioxolane	N/A	N/A	25	17.5 - 32.5	N/A	N/A	50	35 - 65	100	70 - 130

Semivolatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS)

Reference Method No.: **EPA 8270 E**

Reference: SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update VI (Phase II), June, 2018.

1. Scope and Application

Matrices: This method is used to determine the concentration of semivolatile organic compounds in extracts prepared from many types of solid waste matrices, soils, and wastewater samples.

This method is used to quantitate most neutral, acidic, and basic organic compounds that are soluble in methylene chloride and capable of being eluted, without derivatization, as sharp peaks from a gas chromatographic fused-silica capillary column coated with a slightly polar silicone.

Table 9 lists “difficult” compounds that may require special treatment when being determined by this method.

Approval of any method modifications is by one of the following laboratory personnel before performing the modification: Area Supervisor, Laboratory Director, or Quality Assurance Officer.

This method is restricted to use by or under the supervision of analysts experienced in the operation of a gas chromatograph/mass spectrometer and in the interpretation of mass spectra. Each analyst must demonstrate the ability to generate acceptable results with this method by performing an initial demonstration of capability (Section 13.2).

2. Summary of Method

The samples are introduced into the GC/MS by injecting 1µL or 3µL for LVI and RVT of the sample extract into a gas chromatograph (GC) with a narrow-bore fused-silica capillary column. The GC column is temperature-programmed to separate the analytes, which are then detected with a mass spectrometer (MS) connected to the gas chromatograph.

Analytes eluted from the capillary column are introduced into the mass spectrometer via direct connection. Identification of target analytes is accomplished by comparing their mass spectra with the electron impact spectra of standards run on the same GC/MS system. Quantitation is accomplished by comparing the response of quantitation ion relative to an internal standard using a calibration curve.

2.1 Method Modifications from Reference

None.

3. Reporting Limits

Table 6 lists our routine reporting limits.

4. Interferences

4.1 Only high purity helium is used in the GC system to eliminate this source of possible contamination. The helium (carrier gas) is certified by the gas supplier.

4.2 Preventive instrument maintenance is performed routinely. Section 10.5 details the maintenance steps.

4.3 Glassware must be scrupulously cleaned. This procedure is detailed in the Organic Extraction Glassware Cleaning & Handling SOP/1953.

4.4 Contaminated solvents or reagents are also possible sources of contamination. All solvents used are pesticide grade or equivalent, and reagents are purchased as certified contaminant free.

4.5 Contamination by carry-over can occur whenever high-concentration and low-concentration samples are sequentially analyzed. Whenever an unusually concentrated sample is encountered (concentrations greater than 2x the highest concentration) and the next sample has reportable hits this sample should to be re-analyzed for confirmation based on analyst discretion.

5. Health and Safety

The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound must be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of material data handling sheets is available to all personnel involved in the chemical analysis. Additional references to laboratory safety are available in the Chemical Hygiene Plan.

All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

5.1 Lab coats, safety glasses, and gloves must be worn when handling samples, extracts, standards or solvents.

5.2 All solvent and extract transfers must be handled in the vented bench area in the GC/MS laboratory.

5.3 All stock standards, working standards, and vialed sample extracts must be placed into the waste bucket in the lab for future disposal by the Health and Safety Officer. The container must be labeled properly with hazard warning labels indicating the container contents.

5.4 Flammable solvent bottles must be stored in the flammables cabinet.

6. Sample Collection, Preservation, Shipping and Handling

6.1 Sample Collection

Aqueous samples are collected in two 1L amber glass jars with teflon-lined lids.
LVI, aqueous samples are collected in two 275mL amber glass jars with teflon-lined lids.
RVT, aqueous samples are collected in two 100mL amber glass jars with teflon-lined lids.
Solid samples are collected in 250mL wide-mouth glass jars with teflon-lined lids.
All containers are purchased pre-cleaned and certified from commercial vendors.

6.2 Sample Preservation

Both aqueous and solid samples are then preserved by packing in coolers with ice or ice packs, to maintain a temperature of 4 ± 2ºC. Upon receipt at the laboratory, the samples are transferred into sample storage refrigerators to maintain at a temperature of 4 ± 2ºC.

6.3 Sample Handling

Aqueous samples must be extracted within 7 days of sample collection, solid samples within 14 days of collection. Once extracted, the samples must be analyzed within 40 days of the extraction date.

7. Equipment and Supplies

7.1 Gas Chromatograph/Mass Spectrometer System:

7.1.1 Gas Chromatograph, Hewlett Packard 6890 (or equivalent): An analytical system complete with a temperature-programmable gas chromatograph configured for split/splitless-injection and all required accessories, including syringes, analytical columns, and gases. The capillary column is directly coupled to the source.

7.1.2 Column: Rxi-5Sil MS30m x 0.32mm ID, 0.25µm film thickness or column of similar configuration.

7.1.3 Mass Spectrometer, Hewlett Packard 5973 (or equivalent): Scanning from 35 to 500 amu every 1 second or less, using 70 volts (nominal) electron energy in the electron impact ionization mode. The mass spectrometer is capable of producing a mass spectrum for decafluorotriphenylphosphine (DFTPP) which meets the criteria in Table 1 when 1 µL of the GC/MS tuning standard is injected through the GC (50ng of DFTPP).

7.1.4 Data System: A computer system is interfaced to the Mass Spectrometer. The system allows the continuous acquisition and storage on machine-readable media of all mass spectra obtained throughout the duration of the chromatographic program. The computer software allows the analyst to search for any GC/MS data file for ions of specific mass and plot such ion abundances versus time or scan number. *HP ChemServer* software is used for data acquisition and *MSD Chemstation/Enviroquant version E.02.02* is used for data reduction.

7.2 Syringe: 10 µL.

7.3 Volumetric Flasks, Class A: Appropriate sizes with ground-glass stoppers.

7.4 Vials: Glass autosampler vials with polytetrafluoroethylene (PTFE)-lined crimp top caps.

8. Reagents and Standards

8.1 Stock Standard Solutions

Certified stock standard solutions, traceable to NIST, when available, are purchased from commercial vendors. They can be replaced with different standards as long as they contain all target analytes.

All stock standards, lot number, catalog number, expiration date, preparation date and initials are recorded in a logbook. Standards are stored in the refrigerator or freezer. Store away from any light source at 6 °C when not in use (−10 °C is recommended).

Stock standard expire 6 months from the date of preparation or on the earliest expiration date of any of the stock solution used to prepare it.

Please note that the following preparation instructions and stock standards are included for illustration purposes and may be modified as needed (ex. to accommodate standard availability or client requests), however final concentrations for the initial calibration levels shall always follow the example in 8.1.4.

Vendor	Standard	Catalog#	Concentration
Restek			
	8270 Mega Mix	31850	500-1000ug/mL
	Benzoic Acid Mix	31879	2000ug/mL
	Acid Surrogate Mix	31087	10000ug/mL
	B/N Surrogate Mix	31086	5000ug/mL
	Benzaldehyde Standard	33017	2000ug/mL
	Custom AP9 ICAL Standard	571813-FL	2000ug/mL
	Custom ADP Standard	572745-FL	2000ug/mL
	Benzidine Mix	31834	2000ug/mL
	SV Internal Standard Mix	31206	2000ug/mL
	1,4-Dioxane	30287	2000ug/mL
	Custom CLP 04.1 BNA Surrogate Mix	571320-FL	1000ug/mL
Absolute	Aromatic Amines Mix	99410	2000ug/ml
Ultra	Semi-Volatiles GC/MS Tuning Standard	GCM-150-1	1000ug/mL

8.1.1 ABN Stock Standard, 200ug/mL

Use 5mL of each of the following:
Benzoic Acid Mix
Benzidine Mix

and use 10mL of each of the following:
8270 Mega Mix
Custom CLP 04.1 BNA Surrogate Mix

Bring up to 50mL volume with DCM.

8.1.2 AP9 Additional Compounds Stock Standard, 200ug/mL

Use 5mL of each of the following:
Custom AP9 ICAL Standard
Benzaldehyde Standard

Bring up to 50mL volume with DCM.

8.1.3 ADP Stock Standard, 200ug/ml

Use 5ml of:
Custom ADP Standard

Bring up to 50mL volume with DCM.

8.1.4 Calibration Standard

A minimum of 5 calibration standards must be included for each analyte:

Calibration Curve Levels	
Level	Concentration ug/mL
1	1.0
2	2.0
3	3.0
4	5.0
5	10
6	20
7	50
8	100
9	150
10	200

LVI/RVT Calibration Curve Levels	
Level	Concentration ug/mL
1	0.1
2	0.2
3	0.5
4	1.00
5	2.5
6	5.0
7	10
8	25
9	50

*LVI- Low Volume Initiative
*RVT-Reduce Volume Test

8.2 Internal Standard Solution

The internal standards are:

1,4-dichlorobenzene-d_4
naphthalene-d_8
acenaphthene-d_{10}
phenanthrene-d_{10}
chrysene-d_{12}
perylene-d_{12}

Each 500µL of standards, blank and sample extracts are spiked with 10µL of SV Internal Standard Mix, resulting in a concentration of 40ng/ µL.

For the LVI and RVT method, a 1:10 dilution is made of the Internal Standard Stock Solution. 500µL of standards, blank and sample extracts are spiked with 10µL of this preparation, resulting in a concentration of 4ng/ µL.

8.3 GC/MS Tuning Standard

The tuning standard is a methylene chloride solution containing 50ng/µL of decafluorotriphenylphosphine (DFTPP). The standard also contains 50ng/µL each of 4,4'DDT, pentachlorophenol, and benzidine to verify injection port inertness and GC column performance.

Prepare the GC/MS Tuning Standard with 25µL GCM-150 and 475µL Dichloromethane.

8.4 Surrogate Spiking Solution

8.4.1 Extraction Surrogate Preparation

In a 1000mL volumetric flask, add 5ml of 31086 and 31087. Bring up to volume with Acetone. The final concentration is 50µg/mL for the acid surrogates and 25µg/mL for the B/N surrogates.

8.4.2 LVI Extraction Surrogate Preparation

The LVI surrogate is a 10 fold dilution of the surrogate solution prepared in 8.4.1. For example, to make 200mL of LVI surrogate, add 20mL of 8.4.1 to a 200mL volumetric flask and fill to volume with Acetone. The resulting surrogate concentration is 5µg/mL for the acid surrogates and 2.5µg/mL for the B/N surrogates.

8.4.3 RVT Extraction Surrogate Preparation

The RVT surrogate is a 2.5 fold dilution of the surrogate solution prepared in 8.4.1. For example, to make 50mL of LVI surrogate, add 20mL of 8.4.1 to a 50mL volumetric flask and fill to volume with Acetone. The resulting surrogate concentration is 20µg/mL for the acid surrogates and 10µg/mL for the B/N surrogates.

8.5 Spike Solution (LCS, MS, MSD)

Spike Solution Preparation

ABN SPK1:
In a 500ml volumetric flask, add 20ml of 8270 Mega Mix #31850, 10ml of Benzoic Acid Mix #31879, 10ml Custom AP9 ICAL Standard #571813-FL and 10ml Benzaldehyde Standard #33017. Bring up to volume with Acetone. The final concentration is 40µg/ml.

LVI ABN SPK1 is prepared by making an 8 fold dilution of the 40µg/ml ABN SPK (in acetone), resulting in a 5µg/ml LVI ABN SPK1.

RVT ABN SPK1 is prepared by making a twofold dilution of the 40µg/ml ABN SPK (in acetone), resulting in a 20µg/ml RVT ABN SPK1.

ABN SPK2:
In a 500ml volumetric flask, add 10ml Benzidine Mix #31834 and 10mL Custom ADP Standard #572945-FL. Bring up to volume with Acetone. The final concentration is 40µg/ml.

LVI ABN SPK2 is prepared by making an 8 fold dilution of the 40µg/ml ABN SPK (in acetone), resulting in a 5µg/ml LVI ABN SPK2.

RVT ABN SPK2 is prepared by making a twofold dilution of the 40µg/ml ABN SPK (in acetone), resulting in a 20µg/ml RVT ABN SPK2.

8.6 Dichloromethane (DCM): Pesticide quality.

8.7 Acetone: Pesticide quality.

9. Quality Control

9.1 Blank(s)

Extraction blanks are performed with each extraction batch of 20 or less samples. The extraction blank must not contain any of the reportable analytes above the reporting limit. Corrective actions:

- No corrective action required if concentration of contaminant in sample is >10x concentration in blank or if contaminant not detected in sample

- If the blank have reportable hits and re-extraction could not be performed due to lack of additional sample volume, the sample results are reported and qualified with “B” flag for any associated samples that concentration is less than 10x the blank concentration

For NJ regulatory work the method blank must have all the target analytes less than RL except for Phthalates which must be less than 5x of the RL. Sample results are qualified with "B" flag for analytes observed in the blank greater than RL and the Phthalates observed in the blank greater than 5x RL

The surrogate recoveries must also be within the acceptance criteria listed in Table 2. If surrogate acceptance criteria are exceeded, the extraction batch must be evaluated to determine if re-extraction or re-analysis is necessary.

9.2 Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS / LCSD)

A Laboratory Control Sample/Laboratory Control Sample Duplicate pair (LCS/LCSD) are extracted and analyzed with each analytical batch of 20 or fewer samples.

The LCS/LCSD acceptance criteria are based the performance standard control limits. These performance standards are based on commonly used state programs RCP,MCP etc. See table 3. Less than 10% of total compounds may be outside of control limits provided that recoveries are >10%. Note: this does not apply to difficult analytes listed in Table 9 which may be accepted at recoveries <10. If >10% of analytes are recovered above control limits, this is deemed acceptable as long as the analytes in question are not detected in associated samples.

If these criteria are not met, the entire batch is re-extracted. If re-extraction is not possible, due to insufficient sample or holding time exceedance, the analyst must write up the failure on a narrative sheet for inclusion in the client report.

9.3 Initial Calibration Verification (ICV)

Refer to Section 10.2.7.

9.4 Continuing Calibration Verification (CCV)

Refer to Section 10.4.

9.5 Matrix Spike and Matrix Spike Duplicate (MS / MSD)

A matrix spike/matrix spike duplicate pair is extracted and analyzed for each batch of 20 or fewer samples per client request. The MS/MSD acceptance criteria are based on performance standards. See table 3 for individual control limits. If the recovery criteria are not met, but are met in the LCS/LCSD, this is noted on a narrative sheet for inclusion in the client report.

9.6 Laboratory Duplicate

Not applicable.

9.7 Method-specific Quality Control Samples

9.7.1 Surrogates

All extracted samples and associated QC are spiked with surrogates. The acceptable surrogate recovery limits are listed in Table 2.

Corrective action: Up to one surrogate can be out in each fraction (Acid and Base/Neutral) but not less than 10% recovery, before any corrective action is necessary. Otherwise, analysis must be repeated once to see if an analytical error has occurred. If the % recovery still exceeds the control limits the sample must be re-extracted and re-analyzed to confirm sample matrix. If matrix effect is confirmed, this must be noted on a narrative sheet for inclusion in the client report.

Re-extraction is not required if surrogate recoveries are high and target analytes are not detected in the sample.

9.7.2 Internal Standards

If the area for any of the internal standards in the samples changes by a factor of two (-50% to +100%) from that in the CCV, the mass spectrometer must be inspected for malfunctions and corrections must be made, as appropriate. When corrections are made, reanalysis of samples analyzed while the system was malfunctioning is required.

9.8 Method Sequence

In a 12-hour period, the typical analytical sequence is:

- Degradation Check
- DFTPP
- Continuing or Daily Standards (1 – 3)*
  - (1) ABN 50 ppm
  - (2) AP9 50 ppm
  - (3) ADP 50 ppm
- Method/Instrument Blank
- Samples
- QC (as required)

***Additional Continuing standards may be run at the analyst's discretion or by client request.**

10. Procedure

10.1 Equipment Set-up

10.1.1 GC/MS Operating Conditions:

Typical GC/MS operating conditions are listed below, but may be altered as long as method performance criteria are met.

Mass range:	35 – 500 amu
Scan time:	3.15 second / scan
Initial temperature:	50°C, hold for 1.5 minutes
Temperature program:	28°C/minute to 250°C then 9°C/minute to 320°C
Final temperature:	320°C for 1.50 min
Injector temperature:	300°C
Transfer line temperature:	280°C
Source temperature:	230ºC
Injector:	split ratio 5:1; 11.7mL/min
Injection volume:	1µL
Carrier gas:	helium at 523 cm/second (2.0 mL/min) constant flow

GC/MS Operating Conditions for LVI/RVT method:

Mass range:	35 – 550 amu
Scan time:	3.15 second / scan
Initial temperature:	45°C, hold for 4 minutes
Temperature program:	25°C/minute to 250°C then 20°C/minute to 320°C

Final temperature:	320°C for 4.3 min
Injector temperature:	270°C
Transfer line temperature:	280°C
Source temperature:	320ºC
Injector:	split ratio 5:1; 8.57mL/min
Injection volume:	3µL
Carrier gas:	helium at 1.7148mL/min) constant flow

10.1.2 GC/MS Tune:

At the beginning of every 12 hour sequence, analyze DFTPP tuning solution (Section 8.3).

The resultant mass spectrum for DFTPP must meet the criteria given in Table 1 before sample analysis begins. The mass spectrum of DFTPP should be acquired in the following manner:

(1) Three scans (the peak apex scan, the scan immediately preceding the apex and the scan immediately following the apex) are acquired and averaged.
(2) Background subtraction is performed using a single scan of no more than 20 scans prior to the elution of DFTPP.

The GC/MS tuning standard is also used to assess GC column performance and injection port inertness. Degradation of DDT to DDE and DDD must not exceed 20%. Benzidine and pentachlorophenol must be present at their normal responses and no peak tailing must be visible.

The tailing factor for benzidine and pentachlorophenol must be calculated in every DFTPP run. (See Table 4)

If degradation is excessive and/or poor chromatography is noted, the system needs maintenance (see Section 10.5).

10.2 Initial Calibration

10.2.1 Prepare calibration standards for all target analytes at a minimum of five concentration levels as specified in Section 8.1.4.

10.2.2 Add 10µL of Internal Standard to each calibration standard directly into the autosampler vial containing 500µL of standard. Analyze each calibration standard under the conditions specified in Section 10.1.1.

10.2.3 Record the calibration standard, unique lab identifier code (lot), concentration, and analyst's initials in the analytical sequence list.

10.2.4 In each standard, calculate the response factor (RF) for each analyte, the average RF, and the relative standard deviation (RSD) of the RFs, using the Enviroquant data processing software. The calculations are performed automatically, using the formulae listed in Alpha's Quality Manual.

It is recommended that a minimum response factor for the most common target analytes, as noted in Table 8, be demonstrated for each individual calibration level as a

means to ensure that these compounds are behaving as expected. In addition, meeting the minimum response factor criteria for the lowest calibration standard is critical in establishing and demonstrating the desired sensitivity.

10.2.5 Initial Calibration %RSD Criteria:

For all analytes, the RSD must be ≤ 20% for the mean response factor to be used for sample quantitation.

If the RSD for any target analyte exceeds 20%, the fit must be ≥0.99 quadratic or ≥ 0.995 linear fit for all target analytes. A minimum of 5 levels are required for a linear calibration model and a minimum of 6 levels are required for a quadratic calibration model. When calculating calibration using the linear regression model, a quantitation check must be performed on the lowest calibration point, or the point that corresponds to that compound's established reporting limit.

Percent Relative Error (%RE): For linear and quadratic fit compounds, the %RE must be calculated for the standard at or near the midpoint and at the lowest level of the initial calibration. The %RE between the calculated and expected concentration of an analyte must be ≤ 30% for the midpoint and ≤ 50% for the lowest point otherwise recalibration is necessary.

10.2.6 Evaluation of Retention Times:

The relative retention time (RRT) of each target analyte in each calibration standard should agree within 0.06 RRT units.

10.2.7 Initial Calibration Verification (Second Source Verification)

10.2.7.1 The initial calibration (Section 10.2) for each compound of interest must be verified prior to sample analysis. This is accomplished by analyzing second source calibration standards at a concentration near the midpoint concentration for the calibrating range of the GC/MS.

10.2.7.2 Analyze the standards and calculate the % Difference for each analyte according to the formula in Alpha's Quality Manual.

If the % Difference for each analyte is ± 30%, then the calibration is assumed to be valid. If this criterion is not met, then corrective action must be taken prior to the analysis. For RCP Difficult compounds may recover between 40-160%

10.2.7.3 In cases where compounds fail (greater than 30% difference), they may still be reported as non-detects.

10.2.7.4 Once the calibration curve is accepted and prior to processing any samples, the analyst must demonstrate through the analysis of a Method Blank or Instrument Blank that equipment and reagents are free from contaminants and interferences. If a peak is found in the blank that would prevent the identification or bias the measurement of an analyte, the analyst should determine the source of the contaminant peak and eliminate it, if possible. Blank are generally considered to be acceptable if target analyte concentration are less than one half the LLOQ or are less than project specific

requirements. Blanks may contain analyte concentrations are greater than acceptance limits if the associated samples in the batch are unaffected.

10.3 Equipment Operation and Sample Processing

10.3.1 GC/MS Analysis of Samples

10.3.1.1 Allow the sample extracts to warm to room temperature.

10.3.1.2 Transfer all of the sample extract to a 1.5mL vial. Remove 500µL of sample extract to another vial, and add 10µL of the internal standard solution (Section 8.2).

10.3.1.3 The autosampler is programmed to inject 1µL aliquot of the sample extract into the GC/MS system, using the same instrument conditions that were used for calibration. The injection volume of the sample must be the same as the volume used for the calibration standard.

10.3.1.4 If the response of any quantitation ion exceeds the initial calibration range of the GC/MS system, the sample extract must be diluted and reanalyzed.

10.3.2 Qualitative Identification

Perform first level data review. Obtain the primary m/z (Table 5) masses for each parameter of interest. The following criteria must be met to make qualitative identification:

- Compare the background subtracted mass spectra for the sample to the reference spectra. The characteristic masses of each parameter of interest must maximize in the same or within one scan of each other.
- The retention time must fall within ± 0.1 minutes of the retention time of the compound in the analytical standard. However, analyst experience must be used in making the qualitative identification.
- The relative peak height of the one characteristic mass must fall within 30% of the relative intensity of the mass in a reference mass spectrum. The reference spectrum is obtained from a standard analyzed on the GC/MS system.

Structural isomers that have very similar mass spectra are identified only if the resolution between authentic isomers in a standard mix is less than 25% of the sum of the two peak heights. Otherwise, structural isomers are identified as isomeric pairs.

10.4 Continuing Calibration

10.4.1 The initial calibration (Section 10.2) for each compound of interest must be verified once every 12 hours prior to sample analysis. This is accomplished by analyzing calibration standards at a concentration near the midpoint concentration for the calibrating range of the GC/MS.

10.4.2 Analyze the standards and calculate the % Difference for each analyte according to the formula in Alpha's Quality Manual.

If the % Difference for each CCV analyte is ≤ 20%, then the calibration is assumed to be valid. If the criterion is not met for more than 20% of the compounds then corrective action must be taken.

Due to the large number of analytes present, allowances may be made for a RF that drifts out high, as long as there are no positive hits for that particular analyte in any of the associated samples.

10.4.3 If this criterion is exceeded, inspect the gas chromatographic system to determine the cause and perform whatever maintenance is necessary before verifying calibration and proceeding with sample analysis.

10.4.4 If routine maintenance does not return the instrument performance to meet the QC requirements based on the last initial calibration, then a new initial calibration must be performed.

10.4.5 Internal Standard Retention Time

The retention times of the internal standards in the calibration verification standard is evaluated after data acquisition. If the retention time for any internal standard changes by more than 30 seconds from that in the mid-point standard of the most recent initial calibration, then the chromatographic system must be inspected for malfunctions and corrections must be made, as required. When corrections are made, reanalysis of samples analyzed while the system was malfunctioning is required.

10.4.6 Internal Standard Response

Refer to section 9.7.2

10.5 Preventive Maintenance

When poor sensitivity is observed, replacement of the injector liner and seal may solve the problem. If not, clip approximately 3 – 6 inches from the injector end of the GC column. If the sensitivity does not improve it may be necessary to replace the split line or the injector weldment assembly. If the problem persists, it may be necessary to replace the GC column.

Periodic cleaning (typically twice per year) of the mass spectrometer ion source is required. More frequent source cleaning may be needed, especially if dirty samples are analyzed.

11. Data Evaluation, Calculations and Reporting

When a parameter is identified, the quantitation of that parameter must be based on the integrated abundance of the quantitation characteristic m/z given in Table 5

Calculate the concentration in the sample using the average response factor (RF) from the initial calibration curve according to the formula in Alpha's Quality Manual.

After performing technical data review, validating that all QC criteria have been met and confirming all positive hits, the data report is sent electronically to the LIMS computer for generation of the client report. There are two levels of review of the data in the LIMS system prior to release of data. These reviews must be done by two separate individuals.

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

Holding time exceedence and improper preservation are noted on the nonconformance report form.

Perform instrument maintenance as described throughout this SOP as needed when instrument calibration criteria are not met. Record all maintenance in the instrument logbook.

All batch and sample specific QC criteria outlined in Section 9 are evaluated by the analyst prior to approval of the data. When any QC criteria fail, the cause for the failure must be identified and corrected. This may include instrument recalibration followed by sample reanalysis, sample cleanup, or sample re-extraction. If it is determined that the failure is due to sample matrix effects, a project narrative report is written by the analyst for inclusion in the data report. If there is insufficient sample volume to perform the re-analysis for confirmation, this is also noted in the narrative and included in the client report.

13. Method Performance

13.1 Detection Limit Study (DL) / Limit of Detection Study (LOD) / Limit of Quantitation (LOQ)

The laboratory follows the procedure to determine the DL, LOD, and/or LOQ as outlined in Alpha SOP/1732. These studies performed by the laboratory are maintained on file for review.

13.2 Demonstration of Capability Studies

Refer to Alpha SOP/1739 for further information regarding IDC/DOC Generation.

13.2.1 Initial (IDC)

The analyst must make an initial, one-time, demonstration of the ability to generate acceptable accuracy and precision with this method, prior to the processing of any samples.

13.2.2 Continuing (DOC)

The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

Refer to Alpha's Chemical Hygiene Plan and Waste Management and Disposal SOP for further pollution prevention and waste management information.

15. Referenced Documents

Chemical Hygiene Plan

Alpha SOP/1732 DL/LOD/LOQ Generation

Alpha SOP/1739 IDC/DOC Generation

Alpha SOP/1729 Waste Management and Disposal SOP

16. Attachments

Table 1: DFTPP Key Ions and Ion Abundance Criteria

Table 2: Acceptable Surrogate Spike Recovery Limits

Table 3A: Acceptable Aqueous QC Limits

Table 3B: Acceptable Soil QC Limits

Table 4: Tailing Factor Calculation

Table 5: Characteristic Ions for Semivolatile Compounds

Table 6: Reported Detection Limits

Table 7: Semivolatile Internal Standards with Corresponding Target Compounds and Surrogates Assigned for Quantitation

Table 8: Recommended Minimum Response Factor Criteria

Table 9: Difficult analytes

TABLE 1

DFTPP KEY IONS AND ION ABUNDANCE CRITERIA

Mass	Ion Abundance Criteria
68	< 2% of mass 69
69	Present
70	< 2% of mass 69
197	< 2% of mass 198
198	Base peak or present
199	5-9% of mass 198
365	> 1% of Base Peak
441	Present but less than 24% mass 442
442	Base peak, or present
443	15-24% of mass 442

TABLE 2

ACCEPTABLE SURROGATE SPIKE RECOVERY LIMITS

Analytical Fraction	Surrogate Compound	Water	Soil/Sediment
BN-8270D	Nitrobenzene-d_5	23-120%	23-120%
BN-8270D	2-Fluorobiphenyl	15-120%	30-120%
BN-8270D	p-Terphenyl-d_{14}	41-149%	18-120%
Acid-8270D	Phenol-d_6	10-120%	10-120%
Acid-8270D	2-Fluorophenol	21-120%	25-120%
Acid-8270D	2,4,6-Tribromophenol	10-120%	10-136%

It is allowable for one surrogate from each fraction be outside acceptance criteria, provided a minimum recovery of 10% has been achieved.

TABLE 3A

ACCEPTABLE AQUEOUS QC LIMITS

	STANDARD TARGET COMPOUND LIST (Aqueous)		NEW JERSEY TARGET COMPOUND LIST (Aqueous)		CT TARGET COMPOUND LIST (Aqueous)	
Analyte	**Acceptance Criteria**	**Duplicate RPD**	**Acceptance Criteria**	**Duplicate RPD**	**Acceptance Criteria**	**Duplicate RPD**
1,2,4,5-Tetrachlorobenzene			70-130	20	40-140	20
1,2,4-Trichlorobenzene	39-98	30	70-130	20	40-140	20
1,2-Dichlorobenzene	40-140	30	70-130	20		
1,3-Dichlorobenzene	40-140	30	70-130	20		
1,3-Dinitrobenzene	15-130	30				
1,4-Dichlorobenzene	36-97	30	70-130	20		
1,4-Dioxane					40-140	30
1-Methylnaphthalene	41-103	30				
2,3,4,6-Tetrachlorophenol			70-130	20		
2,4,5-Trichlorophenol	30-130	30	70-130	20	30-130	20
2,4,6-Trichlorophenol	30-130	30	70-130	20	30-130	20
2,4-Dichlorophenol	30-130	30	70-130	20	30-130	20
2,4-Dimethylphenol	30-130	30	70-130	20	30-130	20
2,4- Dimethylaniline	40-140	30	70-130	20		
3,4- Dimethylaniline	40-140	30	70-130	20		
2,3- Dimethylaniline	40-140	30	70-130	20		
2,4,5-Dimethylaniline	40-140	30	70-130	20		
4-Chlorotoluidine	40-140	30	70-130	20		
2-Ethylaniline	40-140	30	70-130	20		
O-toluidine	40-140	30	70-130	20		
2-Napthylamine	40-140	30	70-130	20		
2,4-Dinitrophenol	20-130	30	20-130	20	30-130	20
2,4-Dinitrotoluene	24-96	30	70-130	20	40-140	20
2,6-Dinitrotoluene	40-140	30	70-130	20	40-140	20
2-Chloronaphthalene	40-140	30	70-130	20	40-140	20
2-Chlorophenol	27-123	30	70-130	20	30-130	20
2-Methylnaphthalene	40-140	30	70-130	20	40-140	20
2-Methylphenol	30-130	30	70-130	20	30-130	20
2-Nitroaniline	52-143	30	70-130	20	40-140	20
2-Nitrophenol	30-130	30	70-130	20	30-130	20
3,3'-Dichlorobenzidine	40-140	30	70-130	20	40-140	20
3,3'-Dimethylbenzidine			20-160	20		
3-Methylphenol/4-Methylphenol	30-130	30	20-160	20	30-130	20
3-Nitroaniline	25-145	30	70-130	20	40-140	20
4,6-Dinitro-o-cresol	20-164	30	70-130	20	30-130	20
4-Bromophenyl phenyl ether	40-140	30	70-130	20	40-140	20
4-Chloroaniline	40-140	30	20-160	20	40-140	20
4-Chlorophenyl phenyl ether	40-140	30	70-130	20	40-140	20
4-Nitroaniline	51-143	30	70-130	20	40-140	20
4-Nitrophenol	10-80	30	20-160	20	30-130	20
Acenaphthene	37-111	30	70-130	20	40-140	20

	STANDARD TARGET COMPOUND LIST (Aqueous)		NEW JERSEY TARGET COMPOUND LIST (Aqueous)		CT TARGET COMPOUND LIST (Aqueous)	
Analyte	**Acceptance Criteria**	**Duplicate RPD**	**Acceptance Criteria**	**Duplicate RPD**	**Acceptance Criteria**	**Duplicate RPD**
Acenaphthylene	45-123	30	70-130	20	40-140	20
Acetophenone	39-129	30	70-130	20		
Aniline	40-140	30	20-160	20	40-140	20
Anthracene	40-140	30	70-130	20	40-140	20
Atrazine			70-130	20		
Azobenzene	40-140	30	70-130	20		
Benzaldehyde			20-160	20		
Benzidine	10-75	30	20-160	20		
Benzo(a)anthracene	40-140	30	70-130	20	40-140	20
Benzo(a)pyrene	40-140	30	70-130	20	40-140	20
Benzo(b)fluoranthene	40-140	30	70-130	20	40-140	20
Benzo(ghi)perylene	40-140	30	70-130	20	40-140	20
Benzo(k)fluoranthene	40-140	30	70-130	20	40-140	20
Benzoic Acid	10-164	30	20-160	20		
Benzyl Alcohol	26-116	30	20-160	20		
Biphenyl	40-140	30	70-130	20		
Bis(2-chloroethoxy)methane	40-140	30	70-130	20	40-140	20
Bis(2-chloroethyl)ether	40-140	30	70-130	20	40-140	20
Bis(2-chloroisopropyl)ether	40-140	30	70-130	20	40-140	20
Bis(2-Ethylhexyl)phthalate	40-140	30	70-130	20	40-140	20
Butyl benzyl phthalate	40-140	30	70-130	20	40-140	20
Caprolactam			20-160	20		
Carbazole	55-144	30	70-130	20	40-140	20
Chrysene	40-140	30	70-130	20	40-140	20
Dibenzo(a,h)anthracene	40-140	30	70-130	20	40-140	20
Dibenzofuran	40-140	30	70-130	20	40-140	20
Diethyl phthalate	40-140	30	70-130	20	40-140	20
Dimethyl phthalate	40-140	30	70-130	20	40-140	20
Di-n-butylphthalate	40-140	30	70-130	20	40-140	20
Di-n-octylphthalate	40-140	30	70-130	20	40-140	20
Fluoranthene	40-140	30	70-130	20	40-140	20
Fluorene	40-140	30	70-130	20	40-140	20
Hexachlorobenzene	40-140	30	70-130	20	40-140	20
Hexachlorobutadiene	40-140	30	70-130	20	40-140	20
Hexachlorocyclopentadiene	40-140	30	20-160	20	40-140	20
Hexachloroethane	40-140	30	20-160	20	40-140	20
Indeno(1,2,3-cd)Pyrene	40-140	30	70-130	20	40-140	20
Isophorone	40-140	30	70-130	20	40-140	20
Naphthalene	40-140	30	70-130	20	40-140	20
Nitrobenzene	40-140	30	70-130	20	40-140	20
NitrosoDiPhenylAmine(NDPA)/ Diphenylamine (DPA)	40-140	30	70-130	20	40-140	20
n-Nitrosodimethylamine	22-74	30	20-160	20		
n-Nitrosodi-n-propylamine	29-132	30	70-130	20	40-140	20
P-Chloro-M-Cresol	23-97	30	70-130	20	30-130	20
Pentachlorophenol	9-103	30	20-160	20	30-130	20

	STANDARD TARGET COMPOUND LIST (Aqueous)			NEW JERSEY TARGET COMPOUND LIST (Aqueous)		CT TARGET COMPOUND LIST (Aqueous)	
Analyte	**Acceptance Criteria**	**Duplicate RPD**		**Acceptance Criteria**	**Duplicate RPD**	**Acceptance Criteria**	**Duplicate RPD**
Pentachloronitrobenzene						40-140	20
Phenanthrene	40-140	30		70-130	20	40-140	20
Phenol	12-110	30		20-160	20	30-130	20
Pyrene	26-127	30		70-130	20	40-140	20
Pyridine	10-66	30				40-140	20
2-Fluorophenol	*21-120*			*15-110*		*15-110*	
Phenol-d6	*10-120*			*15-110*		*15-110*	
Nitrobenzene-d5	*23-120*			*30-130*		*30-130*	
2-Fluorobiphenyl	*15-120*			*30-130*		*30-130*	
2,4,6-Tribromophenol	*10-120*			*15-110*		*15-110*	
4-Terphenyl-d14	*41-149*			*30-130*		*30-130*	

TABLE 3B

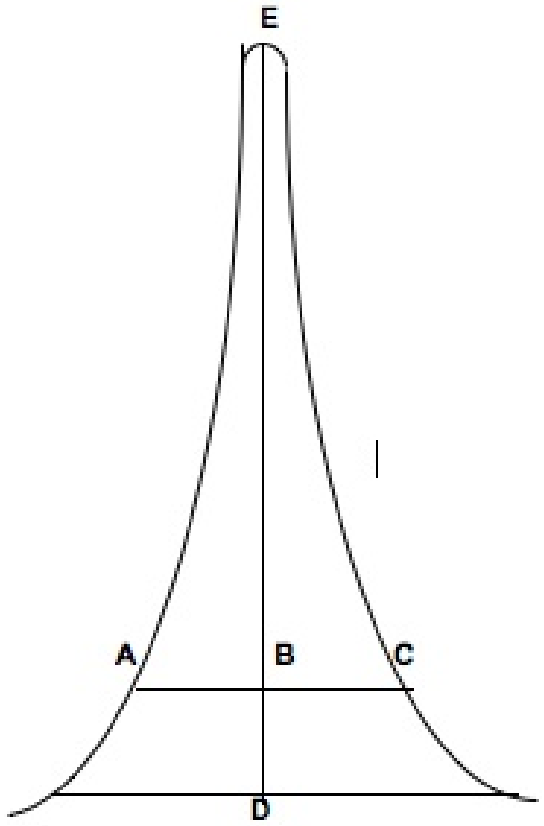
ACCEPTABLE SOIL QC LIMITS

	STANDARD TARGET COMPOUND LIST (Soil)		NEW JERSEY TARGET COMPOUND LIST (Soil)		CT TARGET COMPOUN LIST (Soil)	
Analyte	**Acceptance Criteria**	**Duplicate RPD**	**Acceptance Criteria**	**Duplicate RPD**	**Acceptance Criteria**	**Duplica RPD**
1,2,4,5-Tetrachlorobenzene	40-117	50	70-130	30	40-140	30
1,2,4-Trichlorobenzene	38-107	50	70-130	30	40-140	30
1,2-Dichlorobenzene	40-140	50	70-130	30		
1,3-Dichlorobenzene	40-140	50	70-130	30		
1,3-Dinitrobenzene	40-140	50				
1,4-Dichlorobenzene	28-104	50	70-130	30		
1,4-Dioxane					40-140	30
1-Methylnaphthalene	26-130	50				
2,3,4,6-Tetrachlorophenol	40-140	50	70-130	30		
2,4,5-Trichlorophenol	30-130	50	70-130	30	30-130	30
2,4,6-Trichlorophenol	30-130	50	70-130	30	30-130	30
2,4-Dichlorophenol	30-130	50	70-130	30	30-130	30
2,4-Dimethylphenol	30-130	50	70-130	30	30-130	30
2,4-Dinitrophenol	4-130	50	20-160	30	30-130	30
2,4-Dinitrotoluene	28-89	50	70-130	30	40-140	30
2,6-Dinitrotoluene	40-140	50	70-130	30	40-140	30
2-Chloroaniline	30-130	50				
2-Chloronaphthalene	40-140	50	70-130	30	40-140	30
2-Chlorophenol	25-102	50	70-130	30	30-130	30
2-Methylnaphthalene	40-140	50	70-130	30	40-140	30
2-Methylphenol	30-130.	50	70-130	30	30-130	30
2-Nitroaniline	47-134	50	70-130	30	40-140	30
2-Nitrophenol	30-130	50	70-130	30	30-130	30
3,3'-Dichlorobenzidine	40-140	50	70-130	30	40-140	30
3,3'-Dimethylbenzidine	15-115	50				
3-Methylphenol/4-Methylphenol	30-130	50	20-160	30	30-130	30
3-Nitroaniline	26-129	50	70-130	30	40-140	30
4,6-Dinitro-o-cresol	10-130	50	70-130	30	30-130	30
4-Bromophenyl phenyl ether	40-140	50	70-130	30	40-140	30
4-Chloroaniline	40-140	50	20-160	30	40-140	30
4-Chlorophenyl phenyl ether	40-140	50	70-130	30	40-140	30
4-Nitroaniline	41-125	50	70-130	30	40-140	30
4-Nitrophenol	11-114	50	20-160	30	30-130	30
Acenaphthene	31-137	50	70-130	30	40-140	30

	STANDARD TARGET COMPOUND LIST (Soil)		NEW JERSEY TARGET COMPOUND LIST (Soil)		CT TARGET COMPOUN LIST (Soil)	
Analyte	**Acceptance Criteria**	**Duplicate RPD**	**Acceptance Criteria**	**Duplicate RPD**	**Acceptance Criteria**	**Duplica RPD**
Acenaphthylene	40-140	50	70-130	30	40-140	30
Acetophenone	14-144	50	70-130	30	40-140	30
Aniline	40-140	50	20-160	30	40-140	30
Anthracene	40-140	50	70-130	30	40-140	30
Atrazine	40-140	50	70-130	30		
Azobenzene	40-140	50	70-130	30		
Benzaldehyde	40-140	50	20-160	30		
Benzidine	10-66	50	20-160	30		
Benzo(a)anthracene	40-140	50	70-130	30	40-140	30
Benzo(a)pyrene	40-140	50	70-130	30	40-140	30
Benzo(b)fluoranthene	40-140	50	70-130	30	40-140	30
Benzo(e)pyrene	40-140	50				
Benzo(ghi)perylene	40-140	50	70-130	30	40-140	30
Benzo(k)fluoranthene	40-140	50	70-130	30	40-140	30
Benzoic Acid	10-110	50	20-160	30		
Benzyl Alcohol	40-140	50	20-160	30		
Biphenyl	37-127	50	70-130	30		
Bis(2-chloroethoxy)methane	40-117	50	70-130	30	40-140	30
Bis(2-chloroethyl)ether	40-140	50	70-130	30	40-140	30
Bis(2-chloroisopropyl)ether	40-140	50	70-130	30	40-140	30
Bis(2-Ethylhexyl)phthalate	40-140	50	70-130	30	40-140	30
Butyl benzyl phthalate	40-140	50	70-130	30	40-140	30
Caprolactam	15-130	50	20-160	30		
Carbazole	54-128	50	70-130	30	40-140	30
Chrysene	40-140	50	70-130	30	40-140	30
Dibenzo(a,h)anthracene	40-140	50	70-130	30	40-140	30
Dibenzofuran	40-140	50	70-130	30	40-140	30
Diethyl phthalate	40-140	50	70-130	30	40-140	30
Dimethyl phthalate	40-140	50	70-130	30	40-140	30
Di-n-butylphthalate	40-140	50	70-130	30	40-140	30
Di-n-octylphthalate	40-140	50	70-130	30	40-140	30
Diphenamid	40-140	50				
Fluoranthene	40-140	50	70-130	30	40-140	30
Fluorene	40-140	50	70-130	30	40-140	30
Hexachlorobenzene	40-140	50	70-130	30	40-140	30
Hexachlorobutadiene	40-140	50	70-130	30	40-140	30
Hexachlorocyclopentadiene	40-140	50	20-160	30	40-140	30
Hexachloroethane	40-140	50	20-160	30	40-140	30
Indeno(1,2,3-cd)Pyrene	40-140	50	70-130	30	40-140	30
Isophorone	40-140	50	70-130	30	40-140	30
Naphthalene	40-140	50	70-130	30	40-140	30
Nitrobenzene	40-140	50	70-130	30	40-140	30

	STANDARD TARGET COMPOUND LIST (Soil)		NEW JERSEY TARGET COMPOUND LIST (Soil)		CT TARGET COMPOUN LIST (Soil)	
Analyte	**Acceptance Criteria**	**Duplicate RPD**	**Acceptance Criteria**	**Duplicate RPD**	**Acceptance Criteria**	**Duplica RPD**
NitrosoDiPhenylAmine(NDPA)/ Diphenylamine (DPA)	36-157	50	70-130	30	40-140	30
n-Nitrosodimethylamine	22-100	50	20-160	30		
n-Nitrosodi-n-propylamine	32-121	50	70-130	30	40-140	30
Parathion, ethyl	40-140	50	20-160	30		
P-Chloro-M-Cresol	26-103	50	70-130	30	30-130	30
Pentachloronitrobenzene	42-153	50			40-140	30
Pentachlorophenol	17-109	50	20-160	30	30-130	30
Phenanthrene	40-140	50	70-130	30	40-140	30
Phenol	26-90	50	20-160	30	30-130	30
Pyrene	35-142	50	70-130	30	40-140	30
Pyridine	10-93	50	20-160	30	40-140	30
Thionazin	40-140	50				
2-Fluorophenol	*25-120*		*30-130*		*30-130*	
Phenol-d6	*10-120*		*30-130*		*30-130*	
Nitrobenzene-d5	*23-120*		*30-130*		*30-130*	
2-Fluorobiphenyl	*30-120*		*30-130*		*30-130*	
2,4,6-Tribromophenol	*10-136*		*30-130*		*30-130*	
4-Terphenyl-d14	*18-120*		*30-130*		*30-130*	

TABLE 4 – Tailing Factor Calculation



Tailing Factor = $\frac{BC}{AB}$

Example calculation:

Peak Height = DE = 100mm
10% Peak Height = BD = 10mm
Peak Width at 10% Peak Height = AC = 23mm

AB = 11mm
BC = 12mm

Therefore: Tailing Factor = $\frac{12}{11}$ = 1.1

Tailing factor for benzidine < 2.0

Tailing factor for pentachlorophenol <2.0

TABLE 5

CHARACTERISTIC IONS FOR SEMIVOLATILE COMPOUNDS

Compound	Primary Ion	Secondary Ion(s)
Acenaphthene	**154**	**153, 152**
Acenaphthylene	**152**	**151, 153**
Acetophenone	**105**	**71, 51, 120**
Aniline	**93**	**66, 65**
Anthracene	**178**	**176, 179**
Atrazine	**200**	**202, 215**
Azobenzene	**77**	**182, 105**
Benzaldehyde	**105**	**77**
Benzidine	**184**	**92, 185**
Benzo(a)anthracene	**228**	**229, 226**
Benzo(a)pyrene	**252**	**253, 125**
Benzo(b)fluoranthene	**252**	**253, 125**
Benzo(g,h,i)perylene	**276**	**138, 277**
Benzo(k)fluoranthene	**252**	**253, 125**
Benzoic acid	**105**	**122, 77**
Benzyl alcohol	**79**	**77,108**
Biphenyl	**154**	**153,152**
Bis (2-chloroethoxy) methane	**93**	**95, 123**
Bis (2-chloroethyl) ether	**93**	**63, 95**
Bis (2-chloroisopropyl) ether	**45**	**77, 121**
Bis (2-ethylhexyl) phthalate	**149**	**167, 279**
4-Bromophenyl phenyl ether	**248**	**250, 141**
Butyl Benzyl phthalate	**149**	**91, 206**
Caprolactam	**55**	**85, 113**
Carbazole	**167**	**168, 166**
4-Chloro-3-methylphenol	**107**	**144, 142**
2-Chloroaniline	**127**	**129, 65**
3-Chloroaniline	**65**	**127, 129**
4-Chloroaniline	**65**	**127,129**
2-Chloronaphthalene	**162**	**127, 164**
4-Chlorophenyl phenyl ether	**204**	**206, 141**
2-Chlorophenol	**128**	**64,130**
Chrysene	**228**	**226, 229**
Dibenzo(a,h)anthracene	**278**	**139, 279**
Dibenzofuran	**168**	**139**
1,2-Dichlorobenzene	**146**	**148, 111**
1,3-Dichlorobenzene	**146**	**148, 111**
1,4-Dichlorobenzene	**146**	**148, 111**
3,3'-Dichlorobenzidine	**252**	**254, 126**
2,4-Dichlorophenol	**162**	**164, 98**
Diethyl phthalate	**149**	**177, 150**

TABLE 5 (continued)

CHARACTERISTIC IONS FOR SEMIVOLATILE COMPOUNDS

Compound	Primary Ion	Secondary Ion(s)
3,3-Dimethylbenzidine	212	211, 213
Dimethyl phthalate	163	194, 164
2,4-Dimethylphenol	107	121,122
Di-n-butyl phthalate	149	150, 104
Di-n-octyl phthalate	149	167, 43
4,6-Dinitro-2-methylphenol	198	51, 105
O-Toluidine	106	107, 77
2-Ethylaniline	106	121, 77
2,4-Dimethylaniline	121	120, 106
2,3-Dimethylaniline	106	121, 120
3,4- Dimethylaniline	121	120,106
2,4,5-Trimethylaniline	120	135, 134
4-Chlorotoluidine	106	141, 140
2-Napthylamine	143	115, 116
2,4-Dinitrophenol	184	107,91
2,4-Dinitrotoluene	165	63, 89
2,6-Dinitrotoluene	165	63, 89
Diphenamide	167	72, 165
1,4-Dioxane	88	58,43
Ethyl parathion	109	97, 291
Fluoranthene	202	101, 203
Fluorene	166	165, 167
Hexachlorobenzene	284	142, 249
Hexachlorobutadiene	225	223, 227
Hexachlorocyclopentadiene	237	235, 272
Hexachloroethane	117	201, 199
Indeno(1,2,3-cd)pyrene	276	138, 227
Isophorone	82	95, 138
1-Methylnaphthalene	115	141, 142
2-Methylnaphthalene	142	141
2-Methylphenol	108	107,90
3/4-Methylphenol	108	107,90
Naphthalene	128	129, 127
2-Nitroaniline	65	92, 138
3-Nitroaniline	138	92,65
4-Nitroaniline	138	65, 108, 92, 80, 39
Nitrobenzene	77	123, 65

TABLE 5 (continued)

CHARACTERISTIC IONS FOR SEMIVOLATILE COMPOUNDS

Compound	Primary Ion	Secondary Ion(s)
2-Nitrophenol	139	109, 65
4-Nitrophenol	65	109, 139
n-Nitrosodimethylamine	74	42,44
n-Nitrosodi-n-butylamine	84	57, 41, 116, 158
n-Nitrosodi-n-propylamine	70	42, 101, 130
n-Nitrosodiphenylamine/Diphenylamine	169	168, 167
Pentachlorobenzene	250	252, 108, 248, 215, 254
Pentachloronitrobenzene	237	142, 214, 249, 295, 265
Pentachlorophenol	266	264, 268
Phenanthrene	178	179, 176
Phenol	94	65, 66
Pyrene	202	200, 203
Pyridine	79	52
1,2,4,5-Tetrachlorobenzene	216	214, 179, 108, 143, 218
2,3,4,6-Tetrachlorophenol	232	131, 230, 166, 234, 168
m-Toluidine	106	107, 79
1,2,4-Trichlorobenzene	180	182, 145
2,4,5-Trichlorophenol	196	200,198
2,4,6-Trichlorophenol	196	198, 200
Acenaphthene-d_{10} (IS)	164	162, 160
Chrysene-d_{12} (IS)	240	120, 236
1,4-Dichlorobenzene-d_4 (IS)	152	150, 115
Naphthalene-d_8 (IS)	136	68
Perylene-d_{12} (IS)	264	260, 265
Phenanthrene-d_{10} (IS)	188	94, 80
2-Fluorobiphenyl (Surrogate)	172	171
2-Fluoroophenol (Surrogate)	112	64
Nitrobenzene-d_5 (Surrogate)	82	128, 54
Phenol-d_6 (Surrogate)	99	42, 71
Terphenyl-d_{14} (Surrogate)	244	122, 212
2,4,6-Tribromophenol (Surrogate)	330	62,141

TABLE 6

REPORTED DETECTION LIMITS FOR SEMIVOLATILE ORGANIC COMPOUNDS*

Analyte	RDL (µg/L)	RDL (µg/Kg)
Acenaphthene	2	133.34
Acenaphthylene	2	133.34
Acetophenone	5	333.34
Aniline	2	133.34
Anthracene	2	133.34
Atrazine	10	666.67
Azobenzene	2	500
Benzaldehyde	5	333.34
Benzidine	20	1333.34
Benzo(a)anthracene	2	133.34
Benzo(b)fluoranthene	2	133.34
Benzo(k)fluoranthene	2	133.34
Benzo(ghi)perylene	2	133.34
Benzo(a)pyrene	2	133.34
Benzoic acid	50.0	3333.34
Benzyl alcohol	2	133.34
Biphenyl	2	366.67
Bis(2-chloroethyl)ether	2	133.34
Bis(2-chloroisopropyl)ether	2	133.34
Bis(2-chloroethoxy)methane	5.0	333.34
Bis(2-ethylhexyl)phthalate	3	200
4-Bromophenyl phenyl ether	2	133.34
Butyl benzyl phthalate	5.0	333.34
Caprolactam	10	666.67
Carbazole	2	166.67
2-Chloroaniline	2	na
3-Chloroaniline	10	na
4-Chloroaniline	5	333.34
p-Chloro-m-cresol (4-chloro-3-cresol)	2	133.34
2-Chloronaphthalene	2	133.34
2-Chlorophenol	2	133.34
4-Chlorophenyl phenyl ether	2	133.34
Chrysene	2	133.34
m/p-Methylphenol (3/4-methylphenol)	5.0	333.34
o-Methylphenol (2-methylphenol)	5.0	333.34
Dibenzo(a,h)anthracene	2	133.34
Dibenzofuran	2	133.34
Di-n-butylphthalate	5.0	333.34
1,2-Dichlorobenzene	2	133.34

TABLE 6 (continued)

REPORTED DETECTION LIMITS FOR SEMIVOLATILE ORGANIC COMPOUNDS*

Analyte	RDL (µg/L)	RDL (µg/Kg)
1,3-Dichlorobenzene	2	133.34
1,3-Dinitrobenzene	2	N/A
1,4-Dichlorobenzene	2	133.34
3,3-Dichlorobenzidine	5	333.34
2,4-Dichlorophenol	5	333.34
O-Toluidine	2	N/A
2-Ethylaniline	2	N/A
2,4-Dimethylaniline	2	N/A
2,3-Dimethylaniline	2	N/A
3,4-Dimetylaniline	2	N/A
2,4,5-Trimethylaniline	2	N/A
4-Chlorotoluidine	2	N/A
2-Napthylamine	2	N/A
2,6-Dichlorophenol	10.0	666.67
Diethyl phthalate	5.0	333.34
3,3-Dimethylbenzidine	4	500
2,4-Dimethylphenol	5	333.34
Dimethyl phthalate	5.0	333.34
4,6-Dinitro-o-cresol	10	666.67
2,4-Dinitrophenol	20	1333.4
2,4-Dinitrotoluene	5.0	333.34
2,6-Dinitrotoluene	5.0	333.34
Di-n-octylphthalate	5.0	333.34
Diphenamide	5	N/A
1,4-Dioxane	5	166.67
Ethyl Parathion	N/A	166.67
Fluoranthene	2	133.34
Fluorene	2	133.34
Hexachlorobenzene	2	133.34
Hexachlorobutadiene	2	133.34
Hexachlorocyclopentadiene	20	1333.34
Hexachloroethane	2	133.34
Indeno(1,2,3-cd)pyrene	2	133.34
Isophorone	5.0	333.34
1-Methylnaphthalene	2	166.67
2-Methylnaphthalene	2	133.34
Naphthalene	2	133.34
2-Nitroaniline	5.0	333.34

TABLE 6 (continued)

REPORTED DETECTION LIMITS FOR SEMIVOLATILE ORGANIC COMPOUNDS*

Analyte	RDL (µg/L)	RDL (µg/Kg)
3-Nitroaniline	5.0	333.34
4-Nitroaniline	5.0	333.34
Nitrobenzene	2	133.34
2-Nitrophenol	10.0	666.67
4-Nitrophenol	10.0	666.67
Nitrosodi-n-butylamine	10.0	666.67
n-Nitrosodimethylamine	2	133.34
n-Nitrosodiphenylamine/Diphenylamine	2	133.34
Nitrosodipiperidine	20.0	2000
n-Nitrosodi-n-propylamine	5.0	333.34
Pentachlorobenzene	20.0	1333.34
Pentachloronitrobenzene	10.0	150
Pentachlorophenol	10.0	666.67
Phenanthrene	2	133.34
Phenol	5.0	333.34
Pyrene	2	133.34
Piridine	5	666.67
1,2,4,5-Tetrachlorobenzene	10	666.67
1,2,4-Trichlorobenzene	5.0	333.34
2,4,5-Trichlorophenol	5.0	333.34
2,4,6-Trichlorophenol	5.0	333.34
2,3,4,6-Tetrachlorophenol	5.0	166.66
m-Toluidine	5	300

*** Note**: Reporting Limits are based on standard 8270 reporting list. RLs may vary for other reporting lists.

Table 7
Semivolatile Internal Standards with Corresponding
Target Compounds and Surrogates Assigned for Quantitation

1,4-dichlorobenzene-d4	Naphthalene-d8	Acenaphthene-d10	Phenanthrene-d10	Chrysene-d12	Perylene-d12
O-Toluidine	2-Ethylaniline	2-Naphthylamine	3,3-Dimethylbenzidine	3,3'-Dichlorobenzidine	Benzo(g,h,i)perylene
1,2,4-Trichlorobenzene	2,4-Dimethylaniline	2,3,4,6-Tetrachlorophenol	Anthracene	Benzo(a)Anthracene	Dibenzo(a,h)anthracene
1,2-Dichlorobenzene	3,4-Dimethylaniline	2,3,5,6-Tetrachlorophenol	Benzidine	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene
1,3-Dichlorobenzene	2,3-Dimethylaniline	2,4,6-Tribromophenol, surr	Benzyl butyl phthalate	Benzo(b)fluoranthene	
1,4-Dichlorobenezne	2,4,5-Trimethylaniline	2,4-Dinitrophenol	Carbazole	Benzo(k)fluoranthene	
2,4-Dichlorophenol	4-Chlorotoludine	2,4-Dinitrotoluene	Di-n-Butylphthalate	Bis(2-ethylhexyl) phthalate	
2,4-Dimethylphenol	1,2,4,5-Tetrachlorobenzene	3-Nitroaniline	Diphenamid	Chrysene	
2-Chloroaniline	1,2-Dichlorobenzene	4,6-Dinitro-2-methylphenol	Fluoranthene	Di-n-octylphthalate	
2-Chlorophenol	1,3-Dichlorobenzene	4-Bromophenyl-phenyl ether	n-Octadecane		
2-Fluorophenol, surr	1,4-Diclorobenzene	4-Chlorophenyl-phenyl ether	Parathion		
2-Methylphenol	1-chloror-2-nitrobenzene	4-Nitroaniline	Phenanthrene		
2-Nitrophenol	1-Methylnapthalene	4-Nitrophenol	Pyrene		
3-Methylphenol / 4-Methylphenol	2,4,5-Trichlorphenol	Acenaphthene	Terphenyl-d14, surr		
Acetophenone	2,4,6-Trichlorophenol	Atrazine			
Aniline	2,6-Dichlorophenol	Azobenzene			
Benzaldehyde	2,6-Dinitrotoluene	Dibenzofuran			
Benzyl Alcohol	2-Chloronaphthalene	Dichloran			
Bis(2-chloroethoxy)methane	2-Fluorobiphenyl, surr	Diethyl phthalate			
Bis(2-chloroethyl)ether	2-Methylnaphthalene	Fluorene			

Table 7 (cont.)
Semivolatile Internal Standards with Corresponding
Target Compounds and Surrogates Assigned for Quantitation

1,4-dichlorobenzene-d4	Naphthalene-d8	Acenaphthene-d10	Phenanthrene-d10	Chrysene-d12	Perylene-d12
bis(2-Chloroisopropyl)ether	2-Nitroaniline	Hexachlorobenzene			
Hexachloroethane	3-Choloroaniline	NDPA/DPA			
Isophorone	4-Chloro-3-Methylphenol	Pentachloronitrobenzene			
m-Toluidine	4-Chloroaniline	Pentachlorophenol			
n-Decane	Acenaphthylene				
Nitrobenzene	a-Terpineol				
Nitrobenzene-d5, surr	Benzoic Acid				
N-Nitrosodimethylamine	Biphenyl				
N-Nitrosodi-n-propylamine	Caprolactam				
Phenol	Dimethyl Phthalate				
Phenol-d6, surr	Hexachlorobutadiene				
Pyridine 1,4-Dioxane	Hexachlorocyclopentadiene				
Phenol-d6, surr	Naphthalene				

Table 8

Recommended Minimum Response Factor Criteria from Initial and Continuing Calibration Verification Using the Suggested Ions in Table 5

Analyte	MRF
Benzaldehyde	0.010
Phenol	0.800
Bis(2-chloroethyl)ether	0.700
2-Chlorophenol	0.800
2-Methylphenol	0.700
2,2'-Oxybis-(1-chloropropane)	0.010
Acetophenone	0.010
4-Methylphenol	0.600
N-Nitroso-di-n-propylamine	0.500
Hexachloroethane	0.300
Nitrobenzene	0.200
Isophorone	0.400
2-Nitrophenol	0.100
2,4-Dimethylphenol	0.200
Bis(2-chloroethoxy)methane	0.300
2,4-Dichlorophenol	0.200
Naphthalene	0.700
4-Chloroaniline	0.010
Hexachlorobutadiene	0.010
Caprolactam	0.010
4-Chloro-3-methylphenol	0.200
2-Methylnaphthalene	0.400
Hexachlorocyclopentadiene	0.050
2,4,6-Trichlorophenol	0.200
2,4,5-Trichlorophenol	0.200
1,1'-Biphenyl	0.010
2-Chloronaphthalene	0.800
2-Nitroaniline	0.010
Dimethyl phthalate	0.010
2,6-Dinitrotoluene	0.200
Acenaphthylene	0.900
3-Nitroaniline	0.010
Acenaphthene	0.900
2,4-Dinitrophenol	0.010
4-Nitrophenol	0.010
Dibenzofuran	0.800
2,4-Dinitrotoluene	0.200
Diethyl phthalate	0.010
1,2,4,5-Tetrachlorobenzene	0.010

Table 8 (cont.)

Recommended Minimum Response Factor Criteria from Initial and Continuing Calibration Verification Using the Suggested Ions in Table 5

Analyte	MRF
4-Chlorophenyl-phenyl ether	0.400
Fluorene	0.900
4-Nitroaniline	0.010
4,6-Dinitro-2-methylphenol	0.010
4-Bromophenyl-phenyl ether	0.100
N-Nitrosodiphenylamine	0.010
Hexachlorobenzene	0.100
Atrazine	0.010
Pentachlorophenol	0.050
Phenanthrene	0.700
Anthracene	0.700
Carbazole	0.010
Di-n-butyl phthalate	0.010
Fluoranthene	0.600
Pyrene	0.600
Butyl benzyl phthalate	0.010
3,3'-Dichlorobenzidine	0.010
Benzo(a)anthracene	0.800
Chrysene	0.700
Bis-(2-ethylhexyl)phthalate	0.010
Di-n-octyl phthalate	0.010
Benzo(b)fluoranthene	0.700
Benzo(k)fluoranthene	0.700
Benzo(a)pyrene	0.700
Indeno(1,2,3-cd)pyrene	0.500
Dibenz(a,h)anthracene	0.400
Benzo(g,h,i)perylene	0.500
2,3,4,6-Tetrachlorophenol	0.010

Table 9
Difficult analytes

Aniline

Benzaldehyde
Benzidine
Benzoic acid
Benzyl alcohol

Caprolactam
4-Chloroaniline
4-chloro-3-methylphenol (p-chloro-m-cresol)

3,3-Dimethylbenzidine
1,4-Dioxane
Dimethylphthalate
2,4 Dinitrophenol
4,6-dinitro-2-methylphenol (4,6-dinitro-o-cresol)

Hexachlorocyclopentadiene
Hexachloroethane

2-Methylphenol
3-Methylphenol/4-Methylphenol

2-nitroaniline
3-nitroaniline
4-nitroaniline
4-Nitrophenol
Nitrosodiphenylamine and diphenylamine (NDPA/DPA)
n-Nitrosodimethylamine

Parathion
Pentachloronitrobenzene
Pentachlorophenol
Phenol
Pyridine

Pace ANALYTICAL SERVICES	**ENV-SOP-MANS-0048 V07 Metals by ICP EPA 6010D**
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Management Approval:
Cindy McQueen Approved on 11/11/2025 9:50:43 AM
Nathan Sorelle Approved on 11/17/2025 9:52:53 AM
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1.0 SCOPE & APPLICATION

This Standard Operating Procedure (SOP) describes the laboratory procedure used by PAS-Mansfield for the determination of trace elements, including metals, in solution by inductively coupled plasma-atomic emission spectrometry, following Method 6010D, SW-846 2014. This SOP is applicable to groundwater, aqueous, TCLP, industrial and organic wastes, soils, sludges, and sediments.

1.1 Target Analyte List, Limits of Detection & Quantitation (LOD & LOQ)

The target analyte(s) that can be determined by this SOP and the associated LOD, LOQ, and RL are provided in Appendix A**.**

LOQ are established in accordance with PAS policies and procedures for method validation, determination of detection limits (LOD), and quantitation limits (LOQ). Refer to laboratory SOP ENV-WES2-0112, or however named, for additional information.

The reporting limit (RL) is the value to which analytes are reported as detected or non-detect in the final report. When the RL is less than the lower limit of quantitation (LLOQ), all detects and non-detects at the RL are qualitative. The LLOQ is the lowest point of the calibration curve used for each target analyte.

1.2 Reference Methods & Documents

This SOP is based on reference method 6010D, SW-846, 2014. If the laboratory procedure is modified from the reference method, a list of modifications and rationale for the modification is provided in Section 14.0. Modifications are permitted when allowed by the regulatory program for which test results will be used and when the modification has been validated comparable and equivalent to the reference method.

1.3 Quantitation Range

The upper limit of quantitation for each target analyte in this procedure is defined in Appendix D. The quantitation range for each target analyte in this procedure is defined in Section 9.2.2 Calibration Levels.

1.4 State/Program Specific Requirements

Massachusetts Contingency Plan (MCP) specific requirements, if they vary from the procedure in the SOP, are specified in Appendix C. These requirements supersede Method 6010D, SW-846 when samples are analyzed from that state or under the specified project program.

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2.0 SUMMARY OF METHOD

Prior to analysis, samples must be solubilized or digested using appropriate Sample Preparation Methods. When analyzing groundwater samples for dissolved constituents, acid digestion is not necessary if the samples are filtered, and acid preserved prior to analysis.

This method describes multi-elemental determinations by ICP-AES using sequential or simultaneous optical systems and axial or radial viewing of the plasma. The instrument measures characteristic emission spectra by optical spectrometry. Samples are nebulized and the resulting aerosol is transported to the plasma torch. Element-specific emission spectra are produced by a radiofrequency inductively coupled plasma. The spectra are dispersed by a grating spectrometer, and the intensities of the emission lines are monitored by photosensitive devices. Background correction is required for trace element determination. Background must be measured adjacent to analyte lines on samples during analysis. The position selected for the background-intensity measurement, on either or both sides of the analytical line, will be determined by the complexity of the spectrum adjacent to the analyte line. In one mode of analysis the position used must be as free as possible from spectral interference and must reflect the same change in background intensity as occurs at the analyte wavelength measured. Background correction is not required in cases of line broadening where a background correction measurement would degrade the analytical result. The possibility of additional interferences named in Section 4.0 must also be recognized and appropriate corrections made; tests for their presence are described in Section 9.7. Alternatively, users may choose multivariate calibration methods. In this case, point selections for background correction are superfluous since whole spectral regions are processed.

This SOP includes the manual calculations for Total Hardness and Calcium Hardness, according to SM 2340B.

3.0 INTERFERENCES

3.1 Spectral

Spectral interferences are caused by background emission from continuous or recombination phenomena, stray light from the line emission of high concentration elements, overlap of a spectral line from another element, or unresolved overlap of molecular band spectra.

- Background emission and stray light can usually be compensated for by subtracting the background emission determined by measurements adjacent to the analyte wavelength peak. Spectral scans of samples or single element solutions in the analyte regions may indicate when alternate wavelengths are desirable because of severe spectral interference. These scans will also show whether the most appropriate estimate of the background emission is provided by an interpolation from measurements on both sides of the wavelength peak or by measured emission on only one side. The locations selected for the measurement of background intensity will be determined by the complexity of the spectrum adjacent to the wavelength peak. The locations used for routine measurement must be free of off-line spectral interference (interelement or molecular) or adequately corrected to reflect the same change in background intensity as occurs at the wavelength peak. For multivariate methods using whole spectral regions, background scans must be included in the correction algorithm. Off-line spectral interferences are handled by including spectra on interfering species in the algorithm.

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- To determine the appropriate location for off-line background correction, the user must scan the area on either side adjacent to the wavelength and record the apparent emission intensity from all other method analytes. This spectral information must be documented and kept on file. The location selected for background correction must be either free of off-line interelement spectral interference or a computer routine must be used for automatic correction on all determinations. If a wavelength other than the recommended wavelength is used, the analyst must determine and document both the overlapping and nearby spectral interference effects from all method analytes and common elements and provide for their automatic correction on all analyses. Tests to determine spectral interference must be done using analyte concentrations that will adequately describe the interference. Normally, 100 mg/L single element solutions are sufficient; however, for analytes such as iron that may be found at high concentration, a more appropriate test would be to use a concentration near the upper analytical range limit

- Spectral overlaps may be avoided by using an alternate wavelength or can be compensated by equations that are correct for interelement contributions. Instruments that use equations for interelement correction require the interfering elements to be analyzed at the same time as the element of interest. When operative and uncorrected, interferences will produce false positive determinations and be reported as analyte concentrations. More extensive information on interferant effects on various wavelengths and resolutions is available in reference wavelength tables and books. Users may apply interelement correction equations determined on their instruments with tested concentration ranges to compensate (off-line or on-line) for the effects of interfering elements. For multivariate methods using whole spectral regions, spectral interferences are handled by including spectra of the interfering elements in the algorithm. The interferences listed are only those that occur between method analytes. Only interferences of a direct overlap nature are listed. These overlaps were observed with a single instrument having a working resolution of 0.035 nm.

- When using inter-element correction equations, the interference may be expressed as analyte concentration equivalents (i.e. false analyte concentrations) arising from 100 mg/L of the interference element. For example, assume that As is to be determined (at 193.696 nm) in a sample containing approximately 10 mg/L of Al. 100 mg/L of Al would yield a false signal for As equivalent to approximately 1.3 mg/L. Therefore, the presence of 10 mg/L of Al would result in a false signal for As equivalent to approximately 0.13 mg/L. The user is cautioned that each instrument may exhibit somewhat different levels of interference. The interference effects must be evaluated for each individual instrument since the intensities will vary.

- Major known interferences are Fe, Al, Ca, Mg, V, Ni, Cu, and Cr. To minimize any of these interferences, every analyte is analyzed on each instrument at or near its linear range and corrected for these interferences. This is done on an annual basis, and data is kept on file.

- Inter-element corrections will vary for the same emission line among instruments because of differences in resolution, as determined by the grating, the entrance and exit slit widths, and by the order of dispersion. Inter-element corrections will also vary depending upon the choice of background correction points. Selecting a background correction point where an interfering emission line may appear must be avoided when practical. Inter-element corrections that

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constitute a major portion of an emission signal may not yield accurate data. Users must not forget that some samples may contain uncommon elements that could contribute spectral interferences.

- The interference effects must be evaluated for each individual instrument whether configured as a sequential or simultaneous instrument. For each instrument, intensities will vary not only with optical resolution but also with operating conditions (such as power, viewing height and argon flow rate). When using the recommended wavelengths, the analyst is required to determine and document for each wavelength the effect from referenced interferences as well as any other suspected interferences that may be specific to the instrument or matrix. The analyst is encouraged to utilize a computer routine for automatic correction on all analyses.

- The primary wavelength for each analyte is based upon the instrument manufacturer's recommendations. An alternate wavelength is chosen if there is an indication of elevated background or overlap of another spectral wavelength. The wavelength for each analyte must be as free from interferences as possible.

- If the correction routine is operating properly, the determined apparent analyte(s) concentration from analysis of each interference solution must fall within a specific concentration range around the calibration blank. The concentration range is calculated by multiplying the concentration of the interfering element by the value of the correction factor being tested and divided by 10. If after the subtraction of the calibration blank the apparent analyte concentration falls outside of this range in either a positive or negative direction, a change in the correction factor of more than 10% should be suspected. The cause of the change must be determined and corrected and the correction factor updated. The interference check solutions must be analyzed more than once to confirm a change has occurred. Adequate rinse time between solutions and before analysis of the calibration blank will assist in the confirmation.

- When inter-element corrections are applied, their accuracy must be verified, daily, by analyzing the spectral interference check solution. The correction factor or multivariate correction matrices tested daily. All inter-element spectral correction factors or multivariate correction matrices are verified and updated when an instrumentation changes, such as in the torch, nebulizer, injector, or plasma conditions occur. The standard solution must be inspected to ensure that there is no contamination that may be perceived as a spectral interference.

- When inter-element corrections are not used, verification of absence of interferences is required.

    - One method is to use a computer software routine for comparing the determinative data to limits, files for notifying the analyst when an interfering element is detected in the sample at a concentration that will produce either an apparent false positive concentration, (i.e., greater than) the analyte instrument detection limit, or false negative analyte concentration, (i.e., less than the lower control limit of the calibration blank defined for a 99% confidence interval).
    - Another method is to analyze an Interference Check Solution(s) which contains similar concentrations of the major components of the samples (>10 mg/L) on a continuing basis to verify the absence of effects at the wavelengths selected. This data must be kept on file with the sample analysis data. If the check solution confirms an operative interference that is >20% of the analyte concentration, the analyte must be determined

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using (1) analytical and background correction wavelengths (or spectral regions) free of the interference, (2) by an alternative wavelength, or (3) by another documented test procedure.

3.2 Physical

- Physical interferences are effects associated with the sample nebulization and transport processes. Changes in viscosity and surface tension can cause significant inaccuracies, especially in samples containing high dissolved solids or high acid concentrations. If physical interferences are present, they must be reduced by diluting the sample, using a peristaltic pump, use of an internal standard or by using a high solids nebulizer. Another problem that can occur with high dissolved solids is salt buildup at the tip of the nebulizer, affecting aerosol flow rate and causing instrumental drift. The problem can be controlled by wetting the argon prior to nebulization, using a tip washer, using a high solids nebulizer or diluting the sample. Also, it has been reported that better control of the argon flow rate, especially to the nebulizer, improves instrument performance: this may be accomplished with the use of mass flow controllers. The test described in Section 10.3.4.1 will help determine if physical interference is present.

3.3 Chemical

- Chemical interferences include molecular compound formation, ionization effects, and solute vaporization effects. Normally, these effects are not significant with the ICP technique, but if observed, can be minimized by careful selection of operating conditions (incident power, observation position, and so forth), by buffering of the sample, by matrix matching, and by standard addition procedures. Additionally, if filtered samples are found to have an organic or sulfur like odor they are processed by heating after the addition of the acids to matrix match. Chemical interferences are highly dependent on matrix type and the specific analyte element.

3.4 Memory

- Memory interferences result when analytes in a previous sample contribute to the signals measured in a new sample. Memory effects can result from sample deposition on the uptake tubing to the nebulizer and from the build-up of sample material in the plasma torch and spray chamber. The site where these effects occur is dependent on the element and can be minimized by flushing the system with a rinse blank between samples. The possibility of memory interferences must be recognized within an analytical run and suitable rinse times must be used to reduce them. The rinse times necessary for a particular element must be estimated prior to analysis. This may be achieved by aspirating a standard containing elements at a concentration ten times the usual amount or at the top of the linear dynamic range. The aspiration time for this sample must be the same as a normal sample analysis period, followed by analysis of the rinse blank at designated intervals. The length of time required to reduce analyte signals to within a factor of two of the method detection limits must be noted. Until the required rinse time is established, this method suggests a rinse period of at least 60 seconds between samples and standards. If memory interference is suspected, the sample must be reanalyzed after a rinse period of sufficient length. Alternate rinse times may be established by the analyst based upon their DQOs.

3.5 Other Interferences

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- Users are advised that high salt concentrations can cause analyte signal suppressions and confuse interference tests. If the instrument does not display negative values, fortify the interference check solution with the elements of interest at 0.5 to 1 mg/L and measure the added standard concentration accordingly. Concentrations must be within 20% of the true spiked concentration or dilution of the samples will be necessary. In the absence of measurable analyte, overcorrection could go undetected if a negative value is reported as zero.

4.0 DEFINITIONS

Refer to the Laboratory Quality Manual for a glossary of common lab terms and definitions.

- **PAS:** Acronym for Pace® Analytical Services, LLC

5.0 HEALTH & SAFETY

Contact your supervisor or local safety coordinator with questions or concerns regarding safety protocol or safe handling procedures for this procedure.

The following sections provide general health and safety information about chemicals and materials that may be present in the laboratory.

- The toxicity or carcinogenicity of each chemical material used in the laboratory has not been fully established. Each chemical should be regarded as a potential health hazard and exposure to these compounds should be as low as reasonably achievable.
- The laboratory maintains documentation of hazard assessments and OSHA regulations regarding the safe handling of the chemicals specified in each method. Safety data sheets for all hazardous chemicals are available to all personnel. Employees must abide by the health, safety and environmental (EHS) policies and procedures specified in this SOP and in the Pace® Chemical Hygiene / Safety Manual (COR-MAN-0001).
- Personal protective equipment (PPE) such as safety glasses, gloves, and a laboratory coat must be worn in designated areas and while handling samples and chemical materials to protect against physical contact with samples that contain potentially hazardous chemicals and exposure to chemical materials used in the procedure.
- Concentrated corrosives present additional hazards and are damaging to skin and mucus membranes. For procedures that require use of acids, use acids in a fume hood whenever possible with PPE designed for handing these materials. If eye or skin contact occurs, flush with large volumes of water. When working with acids, always add acid to water to prevent violent reactions. For procedures that emit large volumes of solvents (evaporation/concentration processes), these activities must be performed in a fume hood or apparatus that reduces exposure.

6.0 SAMPLE COLLECTION, PRESERVATION, HOLDING TIME & STORAGE

PAS offers sample collection services for this test method. Unless otherwise specified by client or program specific sampling protocols, refer to SOP ENV-SOP-WES2-0003, Sample Login & Receipt,, or however named, for the procedure used when sample collection is performed by the location

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referenced in the scope and application of this SOP. If sample collection is performed by a different PAS facility, contact a PAS Project Manager (PM) to obtain the SOP used by that location.

PAS provides containers for the collection of samples upon client request. The routine container type and size is provided in the following table along with requirements for sample size, preservation and holding time. Refer to laboratory SOP ENV-SOP-WES2-0122, Bottle Orders, or however named, for procedures related to preparation of bottle kits.

Container Type, Minimum Sample Amount, Preservation, and Holding Time

Matrix	Container Size & Type[1]	Minimum Sample Amount[2]	Preservation	Holding Time
Liquid	250 mL Plastic A-25	250 mL	Chemical: Nitric Acid	Collection to Analysis: 6 months
Solid	4 oz. Glass A-120	4 oz	Refrigerated	Collection to Analysis: 6 months

[1] *Default container type provided in sample kit.*

[2] *Amount of sample required for each discrete test.*

After analysis, samples are retained as stated in the Pace® standard terms and conditions, unless otherwise specified in the analytical services contract. Samples are then disposed of in accordance with Federal, State, and Local regulations.

7.0 EQUIPMENT & SUPPLIES

Use of equivalent instrumentation, support equipment, and supplies from alternative vendors is acceptable so long as they meet the specifications as stated in the reference method(s).

7.1 Instrumentation

- Inductively Coupled argon plasma optical emission spectrometer
  - Thermo Scientific ICAP Duo 6500, ICAP Duo 7000 or ICAP PRO XP Duo Computer-controlled emission spectrometer with background correction
  - Radio-frequency generator compliant with FCC regulations
  - Optional mass flow controller for argon nebulizer gas supply
  - Optional peristaltic pump
  - Optional autosampler
  - Each instrument has an associated auto-sampler and recirculating chiller

7.2 Support Equipment

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- Analytical Balance – Capable of weighing to 0.01g; Ohaus AX523, or equivalent.

7.3 Supplies

- Argon Gas supply – High purity
- Auto-Sampler Tubes – 13 x 10 mm metals free auto-sampler tubes; Moldpro, or equivalent
- Filters – Filtermate filters, 2 um PTFE; Environmental Express, Catalog # SC0408.
- Whatman #41 ashless 90mm filter paper

8.0 REAGENTS & STANDARDS

Refer to laboratory SOP ENV-SOP-MANS-0076, Reagent and Solvent Control, or however named, for information regarding standard and reagent tracking and traceability. All reagents and stock standards are commercially prepared when available. Expiration and storage requirements are defined per manufacturer.

8.1 Reagents

Use of equivalent reagents from alternative vendors is acceptable so long as the substitution meets the performance specifications required by the reference method(s).

- **Hydrochloric acid (conc), HCl**. Stored at room temperature in acid resistant cabinet. Expiration date is defined by vendor.
- **Hydrochloric acid (1**:1), HCl. Add 500 mL concentrated HCl to 400 mL DI water and dilute to 1 Liter in an appropriately sized beaker. Stored at room temperature in polypropylene bottle, expiration date is defined by vendor.
- **Nitric acid (conc), $HN0_3$** – Stored at room temperature in acid resistant cabinet. Expiration date is defined by vendor
- **Nitric Acid (1:1), HNO_3** – Add 500 mL concentrated HNO_3 to 400 mL DI water and dilute to 1 liter in a appropriately sized beaker. Stored at room temperature in polypropylene bottle, expiration date is defined by vendor
- **Reagent Water**: All references to water in the method refer to reagent water unless otherwise specified. Reagent water will be interference free. Refer to Chapter One for a definition of reagent water.

8.2 Standards

Use of equivalent standards from alternative vendors is acceptable so long as they are traceable to a national standard, when commercially available.

- **Standard stock solutions** may be purchased or prepared from ultra-high purity grade chemicals or metals (99.99% pure or greater). All stock standards are ordered through ISO and American Association for Lab Accreditation vendor. All standards are in aqueous solutions and are generally at concentrations of 1,000ppm and 10,000ppm.

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8.2.1 Calibration Standards

- Calibration Stock Standards – Custom Blend of Elements. Inorganic Ventures, Absolute Standard or equivalent. See Appendix E for the standard information.
- Internal Calibration Verification (ICV) stock Standard Solutions – Custom Blend. Must separate stock from the calibration standards. Agilent Technologies or Equivalent. See Appendix E for the standard information.
- Wavelength Optimization Standards – Prepared as needed in house from 1,000 or 10,000ppm stock standards.

8.2.2 Internal Standard -

- Yttrium 1000ppm Absolute Standards or equivalent
- Scandium 1000ppm Absolute Standards or equivalent

8.3 Formulations

8.3.1 Working Solutions

Working solutions are stored In glass containers under ambient conditions.

2% (v/v) Nitric Acid/3% (v/v) Hydrochloric Acid Solution

Add 200 mL HNO3 (see section 8.1) and 300 mL HCl (see section 8.1) to 10 L with ASTM Type I water (18 megaohm).

Used for all blanks and rinsing and preparation of standards.

9.0 PROCEDURE

9.1 Equipment Preparation

9.1.1 Instrument Setup

9.1.1.1 Routine Instrument Operating Conditions

Set up the instrument with proper operating parameters established as detailed below. The instrument must be allowed to become thermally stable before beginning (usually requiring at least 30 minutes of operation prior to calibration).

Startup Procedures

- Turn on power on the chiller
- Click on the ThermoSpec Icon; enter analyst initials in login screen
- Click on Plasma icon to start instrument

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- Allow to warm up for 30 minutes
- Enter analytical workgroup number (obtained from LIMS) globally under the Instrument menu by selecting Tools, then Options, then Analyst
- Click on the Sequence tab and enter the sequence by selecting New Autosampler Table, Add Sequence, Add # of spaces
- Enter the sample locations and IDs
- Press Run Auto-session Button (►) in menu bar

Specific wavelengths are listed in Table 1. Other wavelengths may be substituted if they can provide the needed sensitivity and are corrected for spectral interference. The instrument and operating conditions utilized for determination must be capable of providing data of acceptable quality to the program and data user.

Operating conditions for axial plasma will vary from 1100-1500 watts forward power, 15-19 Liters/min argon coolant flow, 0.5-0.7 L/min argon nebulizer flow, 140-200 rpm pump rate and a default 1 minute pre-flush time and 10 second measurement time is recommended for all simultaneous instruments.

The plasma operating conditions need to be optimized prior to use of the instrument. This routine is not required daily, but only when first setting up a new instrument or following a change in operating conditions. The following procedure is recommended or follows manufacturer's recommendations. The purpose of plasma optimization is to provide a maximum signal to background ratio for some of the least sensitive elements in the analytical array. The use of a mass flow controller to regulate the nebulizer gas flow or source optimization software greatly facilitates the procedure.

The Thermo ICP’s typically use a Meinhard Nebulizer. The nebulizer flow for each instrument is 1.0 +/- 0.2 mL/min.

The 6500 Duo instruments automatically perform a wavelength check at start up without user interaction.

The instrument operating condition finally selected as being optimum must provide the lowest reliable instrument detection limits and method detection limits.

If either the instrument operating conditions, such as incident power or nebulizer gas flow rate are changed, or a new torch injector tube with a different orifice internal diameter is installed, the plasma and argon pressures must be reoptimized.

After completing the initial optimization of operating conditions, but before analyzing samples, the laboratory must establish and initially verify an

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interelement spectral interference correction routine to be used during sample analysis. A general description concerning spectral interference and the analytical requirements for background correction are discussed in the section on interferences. Criteria for determining an interelement spectral interference is an apparent positive or negative concentration for the analyte that falls within ± ½ LLOQ. The upper control limit is the analyte instrument detection limit. Once established, the entire routine is periodically verified every six months. In between that time, IEC's are done on a need be basis per analyte. Only a portion of the correction routine must be verified more frequently or daily. Initial and periodic verification of the routine must be kept on file. Special cases where continual verification is required are described elsewhere.

Sensitivity, instrumental detection limit, precision, linear dynamic range, and interference effects must be established for each individual analyte line on each particular instrument. All measurements must be within the instrument linear range where the correction equations are valid.

Method detection limits must be established for all wavelengths utilized for each type of matrix commonly analyzed. The matrix used for the MDL calculation must contain analytes of known concentrations within 3-5 times the anticipated detection limit.

Determination of limits using reagent water MDLs represent a best-case situation and do not represent possible matrix effects of real-world samples.

If additional confirmation is desired, reanalyze the seven replicate aliquots on two more non-consecutive days and again calculate the method detection limit values for each day. An average of the three values for each analyte may provide for a more appropriate estimate.

The upper limit of the linear dynamic range must be established for each wavelength utilized by determining the signal responses with 10% of the true value of each element from a concentration standard at the upper limit of the range run on the same calibration as required by the sample responses above the calibration range. The range which may be used for the analysis of samples must be no more than 90% of the resulting data. Determined analyte concentrations that are above the upper range limit must be diluted and reanalyzed. The analyst must also be aware that if an inter-element correction from an analyte above the linear range exists, a second analyte where the inter-element correction has been applied may be inaccurately reported.

> **NOTE:** Many of the alkali and alkaline earth metals have non-linear response curves due to ionization and self-absorption effects. These curves may be used if the instrument allows; however the effective range must be checked, and the second order curve fit must have a correlation coefficient of 0.995 or better. Third order fits are not acceptable. These curves are much more sensitive to changes in operating conditions than the linear lines and must be checked whenever there have been moderate equipment changes.

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The analyst must (1) verify that the instrument configuration and operating conditions satisfy the analytical requirements and (2) maintain quality control data confirming instrument performance and analytical results.

9.1.2 Support Equipment

Refer to laboratory SOP ENV-SOP-WES2-0036, Balance Calibration, or however named, for additional information on calibration requirements for support equipment that may be used in this procedure.

9.2 Calibration

Refer to corporate POL ENV-POL-CORQ-0005, *Acceptable Calibration Practices for Instrument Testing*, for general laboratory calibration policies and procedures.

9.2.1 Calibration Frequency

Daily.

9.2.2 Calibration Levels

Calibration standards are stored in various sized plastic containers under ambient conditions. A calibration curve consists of a single point standard and a calibration blank.

See Appendix E for calibration standard concentrations.

9.2.3 Calibration Sequence

- Cal Blank
- ICAL
- ICV
- ICB
- LLOQ
- ICSA
- SIC Multi
- LDR Check
- CCV
- CCB

9.2.4 Calibration Evaluation

9.2.4.1 Curve Fit

Curve is a single point linear curve forced through the blank.

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9.2.4.2 Relative Error (% RE)

Test Method - Single Point Calibration:

To verify adequate sensitivity a standard shall be analyzed at or below the lowest concentration for which quantitative data are to be reported without qualification. The low standard must be recovered within 80%-120% of the true value.

If the criteria are not met, the calibration is not acceptable for use. Investigate and troubleshoot to correct the problem and perform a new calibration. Do not proceed to analyze samples; sample analysis may not proceed if this quality control measure is not within criteria.

Test Method - Multi-Point Calibration (Linear Regression Models):

Calculate relative error for the low calibration standard and the mid-point calibration standard using the equation in Section 10.2.1. Before performing this calculation, quantify the measured concentration of both of these standards against the new calibration curve and use these values as the measured concentration of standard (x'i).

The %RE for the low and mid-calibration standards must be within ±20% and ±10%, respectively.

If the criterion is not met, the calibration is not acceptable for use. Investigate and troubleshoot to correct the problem and perform a new calibration. Do not proceed to analyze samples; sample analysis may not proceed if this quality control measure is not within criteria.

9.2.4.3 Initial Calibration Verification (ICV)

9.2.4.4 Calibrate the instrument according to the instrument manufacturer's recommended procedures, using the typical mixed calibration standard solutions described in Section 8.7. Flush the system with the calibration blank (Section 8.8.1) between each standard or as the manufacturer recommends. (Use the average intensity of multiple exposures for both standardization and sample analysis to reduce random error.) The calibration curve consists of a calibration blank, RL standard and a high-level standard. Calibration curve verification is accomplished through the analysis of the ICV, ICB and SIC standards.

9.2.4.5 Continuing Calibration Verification (CCV)

Check calibration with an CV following the initial calibration (Section 8.9). Verify calibration with the Continuing Calibration Verification (CCV) Standard (Section 8.9) at the end of the initial calibration sequence (ICV, ICB), after every ten samples, and at the end of an analytical run. Use a calibration blank (Section 8.8.1) immediately following daily calibration, after every 10 samples and at the end of the analytical run.

- The results of the ICV are to agree within 10% of the expected value, and CCVs are to agree within 10% of the expected value;

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if not, terminate the analysis, correct the problem, and recalibrate the instrument. Each may be rerun once to confirm or cure the initial failure.

- The results of the calibration blank should be below ½ of LLOQ or RL (whichever is lower). If not, repeat the analysis and if the failure is repeated terminate the analysis, correct the problem, recalibrate, and reanalyze the previous 10 samples. If the blank is less than 1/10 the concentration of the action level of interest, and no sample is within ten percent of the action limit, analyses need not be rerun, and recalibration need not be performed before continuation of the run.
- Verify the inter-element and background correction factors at the beginning of each analytical run. Do this by analyzing the SIC (Section 8.10). Results must be less than +/- LLOQ for all non-spiked elements.
- When low-level sensitivity is required, a check standard at the requested limit of quantitation is analyzed to confirm the reported detection limit (RDL). This is performed on a project-by-project basis.

9.2.4.6 Low-Level of Quantification (LLOQ)

The LLOQ is initially verified by the analysis of at least 7 replicate samples, spiked at the LLOQ and processed through all preparation and analysis steps of the method at or below the lowest calibration point. The mean recovery and relative standard deviation of these samples provide an initial statement of precision and accuracy at the LLOQ. In most cases the mean recovery should be +/- 35% of the true value and RSD should be < 20%. In-house limits may be calculated when sufficient data points exist. Monitoring recovery of LLOQ over time is useful for assessing precision and bias.

Ongoing LLOQ verification, at a minimum, is on a quarterly basis to validate quantitation capability at low analyte concentration levels. This verification may be accomplished either with clean control material (e.g., reagent water, method blanks. Optimally, the LLOQ should be less than the desired regulatory action levels based on the stated project-specific requirements.

9.2.4.7 Ongoing Low Level of Quantification, (LLOQ)

Ongoing LLOQ verification, at a minimum, is on a quarterly basis to validate quantitation capability at low analyte concentration levels. This verification may be accomplished either with clean control material (e.g., reagent water, method blanks. Optimally, the LLOQ should be less than the desired regulatory action levels based on the stated project-specific requirements.

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9.2.4.8 Internal Standard

The Internal standard consists of a multi-element solution; each internal standard covers a range of the spectrum (low, middle, or high wavelengths) and the elements within that range.

5.0ug/mL Scandium

3.0ug/mL Yttrium

Note: The standard is used to monitor instrument fluctuations including but not limited to nebulization efficiency, plasma variations, environmental temperature changes, peristaltic pump pulsations, etc. Therefore, the solution used to start an analysis calibration cannot be added to or changed out during analysis without requiring subsequent full recalibration.

9.2.5 Calibration Blanks

9.2.5.1 Initial Calibration Blank (ICB)

The calibration blank is prepared by acidifying reagent water to the same concentrations of the acids found in the standards. Prepare enough to flush the system between standards and samples. The calibration blank will also be used for all initial (ICB) and continuing calibration blank (CCB) determinations (see Sections 10.2 and 10.4). Refer to Section 10.4.1.2 for acceptance criteria and/or corrective actions.

The Method blank

The Method Blank must contain all of the reagents in the same volumes as used in the processing of the samples. The method blank must be carried through the complete procedure and contain the same acid concentration in the final solution as the sample solution used for analysis. Refer to Section 9.1 for acceptance criteria and/or corrective actions.

The Rinse Blank

The Rinse Blank consists of HNO3 (1% or 2%) (v/v) in reagent water. Prepare enough to flush the system between standards and samples.

9.3 Sample Preparation

9.3.1 Homogenization & Subsampling

Refer to laboratory SOP ENV-SOP-WES2-0003, Sample Login & Receipt, or however named, for information regarding the handling, homogenization, and splitting of samples to ensure that a representative aliquot is used for preparation.

9.4 Sample Analysis

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9.4.1 Sequence Preparation

1) For all analytes and determinations, the laboratory must analyze an ICV (Section 8.9), and a calibration blank (ICB, Section 8.8.1), immediately following daily calibration.

   A calibration blank (CCB, Section 8.8.1) and a calibration verification standard (CCV, Section 8.9) must be analyzed after every tenth sample and at the end of the sample run. Analysis of the calibration verification (CCV) must verify that the instrument is within 10% of the calibration with the relative standard deviation < 5% from replicate (minimum of three) integrations. If the calibration cannot be verified within the specified limits, the sample analysis must be discontinued, the cause determined and the instrument recalibrated. All samples following the last acceptable ICV/ICB, or CCV/CCB must be reanalyzed. The analysis data for the calibration blank, check standard, and ICV or CCV must be kept on file with the sample analysis data.

2) Rinse the system with the rinse blank solution (Section 8.8.3) before the analysis of each sample. The suggested default rinse time is one minute. Each ICP instrument may establish a reduction in this rinse time through a suitable demonstration.

3) Dilute and reanalyze samples that exceed the linear range or use a calibrated alternate, less sensitive line for which quality control data is already established.

4) If less than acceptable accuracy and precision data are generated a series of tests are performed prior to reporting concentration data for analyte elements. At a minimum, these tests should be performed with each batch of samples prepared/analyzed with corresponding unacceptable data quality results. These tests, as outlined in Sections 10.3.5 and 10.3.6, will ensure that neither positive nor negative interferences are operating on any of the analyte elements to distort the accuracy of the reported values.

5) **Post Digestion Spike Addition**: If the sample concentrations are insufficient to perform a dilution test, a post digestion spike added to a portion of a prepared sample, or its dilution for the elements failing the matrix spike recoveries must be run, recovery limits equal to 75% to 125% of the known spike value. If the spike is not recovered within the specified limits If the post-digestion recovery fails to meet the acceptance criteria, the sample results must be reported as estimated values

6) **Dilution Test**: If the analyte concentration is sufficiently high (minimally, a factor of 25 above the lower limit of quantitation after dilution), an analysis of a 1:5 dilution must agree within ± 20% of the original determination. Elements that fail the dilution test are reported as estimated values.

7) **CAUTION**: If spectral overlap is suspected, use of computerized compensation, an alternate wavelength, or comparison with an alternate method is recommended.

9.4.2 Routine Analytical Sequence

- Calibration of Instrument
- Initial calibration Verification Standard
- Initial Calibration Blank

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- Low Limit of Quantitation Check
- Interference Check Standard A
- Mixed SIC Solution
- Linear Dynamic Range Check
- Continuing Calibration Verification Standard
- Continuing Calibration Blank
- 10 Samples
- Continuing Calibration Verification Standard
- Continuing Calibration Blank
- 10 Samples
- Continuing Calibration Verification Standard
- Continuing Calibration Blank

10.0 DATA ANALYSIS & CALCULATIONS

and required procedures.

10.1 Calculations

Refer to laboratory SOP ENV-SOP-WES2-0124, Common Lab calculations, or however named, for equations used to perform common calculations.

10.1.1 Relative Error (%RE)

$$\%\ Relative\ Error = \left(\frac{x'i - xi}{xi}\right) x\ 100$$

Where:

xi = True value of the calibration standard

x'i = Measured concentration of the calibration standard

10.1.2 Metals Concentration in Soil samples

Soil samples are calculated as follows:

$$A = \frac{Sanoke\ weight\ (grams)}{Final\ Volume\ (mL)}$$

$$B = \left(Concentration\ in\ \frac{mg}{kg}\right) = \frac{Concentration\ of\ analyte\ (\frac{mg}{L})}{A}$$

Dry Weight correction

The LIMS calculates the dry weight correction; however it is calculated as follows:

$$Final\ concentration\ in\ \frac{mg}{kg}\ dry\ weight = \frac{B}{\%\ Solids}$$

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10.1.3 Metals Concentration in Liquid samples

Liquid samples are calculated as follows:

$$Dilution\ Factor = \frac{Final\ Volume\ (mL)}{Sampe\ Volume\ (mL)}$$

$$Final\ concentration\ in\ \frac{mg}{L} = Concentration\ of\ analyte\ \left(\frac{mg}{L}\right) X\ Dilution\ factor$$

10.1.4 Calculations for Hardness

The method for determining hardness is to compute it from the results of separate determinations of Calcium and Magnesium on aqueous samples

Total Hardness

$$Total\ Hardness, mg\ equivalent\ \frac{CaCO_3}{L} = \left[2.497\ \left(Ca, \frac{mg}{L}\right)\right] + [4.118\left(Mg, \frac{Mg}{L}\right)]$$

Calcium Hardness

$$Calcium\ Hardness, mg\ equivalent\ \frac{CaCO_3}{L} = [2.497\ \left(Ca, \frac{mg}{L}\right)]$$

10.2 Reporting

For Reporting information refer to Appendix A: Routine Analyte List, LOD, LOQ, and RL.

11.0 Quality Control & Method Performance

11.1 Quality Control

Prepare the following QC samples with each batch of samples. Refer to Appendix B for acceptance criteria and required corrective action(s).

QC Check	Acronym	Frequency
Method Blank	MB	1 per batch of 20 or fewer samples.
Laboratory Control Sample	LCS	1 per batch of 20 or fewer samples.
Matrix Spike	MS	1 per batch
MS Duplicate	MSD	As requested
Sample Duplicate	DUP	1 per batch

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11.1.1 Spectra Interference Check Standard

A mixed check solution is analyzed once daily (section 8.11). One solution (SIC) has only elevated concentrations of Fe, Al, Ca, Mg to ensure no interferences occur. The concentrations of the analytes of interest must have an absolute value for the LLOQ. This solution is analyzed at the beginning of the first analytical run of the day.

11.2 Instrument QC

Perform the following checks to verify instrument performance. Refer to Appendix B for acceptance criteria and required corrective action.

Instrument Check	Acronym	Frequency
Initial Calibration Verification	ICV	Per calibration
Initial Calibration Blank	ICB	Per Calibration
Continuing Calibration Verification	CCV	After every 10 exposures
Continuing Calibration Blank	CCB	After every 10 exposures
Linnear Dynamic Range	LDR	Daily check or don't report above calibration
Instrument Detection Limit	LLOQ	Per calibration

11.2.1 Linear Dynamic Range (LDR)

LDR Check Solution: A multiple element or single element solution analyzed at a point above the highest calibration standard under the same calibration used to quantify the associated sample data. The LDR check must be within +/-10% of the true value of each element of interest to be considered valid.

11.3 Method Performance

11.3.1 Method Validation

Refer to corporate SOP ENV-SOP-CORQ-0011, *Method Validation and Instrument Verification*, for general requirements and procedures for method validation.

Establish limits of quantitation (LOQ) at initial method set up and verify the LOQ on an on-going basis thereafter. Refer to corporate policy and/or SOP for and LOQ requirements and procedures.

11.3.2 Demonstration of Capability (DOC)

Refer to laboratory SOP ENV-SOP-WES2-0122, Demonstration of Capability, or however named, for information regarding the laboratory's procedures for initial and ongoing Demonstration of Capability.

12.0 Data Review & Corrective Action

12.1 Data Review

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The data review process of Pace® Analytical Services includes a series of checks performed at different stages of the process by different people to ensure that SOPs were followed, the analytical record is complete, and properly documented, QC criteria were met, proper corrective actions were taken for QC failure and other nonconformance(s), and test results are reported with proper qualification, when necessary.

The review and checks that are performed by the employee performing the task is called primary review.

All data and test results are also peer reviewed.

This process, known as secondary review is performed to verify SOPs were followed, that calibration, instrument performance, and QC criteria were met and/or proper corrective actions were taken, qualitative ID and quantitative measurement is accurate, all manual integrations are justified and documented, and approved in accordance with the Pace® Analytical Services SOP for manual integration, calculations are correct, the analytical record is complete and traceable, and that results are properly qualified.

Lastly, a third-level review, called a completeness check, is performed by reporting or project management staff to verify the test report is complete.

Refer to laboratory SOP ENV-SOP-WES2-0126, Data Review, for specific instructions and requirements for each step of the data review process.

12.2 Corrective Action

Corrective action is required when QC or sample results are not within acceptance criteria.

Refer to Appendix B for a complete summary of QC, acceptance criteria, and recommended corrective actions for QC associated with this test method.

If corrective action is not taken or was not successful, the decision/outcome must be documented in the analytical record. The primary analyst has primary responsibility for taking corrective action when QA/QC criteria are not met. Secondary data reviewers must verify that appropriate action was taken and/or that results reported with QC failure are properly qualified.

Corrective action is also required when carryover is suspected and when results are over range.

Samples analyzed after a high concentration sample must be checked for carryover and reanalyzed if carryover is suspected. Carryover is usually indicated by low concentration detects of the analyte in successive samples analyzed after the high concentration sample.

Sample results at concentrations above the upper limit of quantitation must be diluted and reanalyzed. The result in the diluted samples should be within the upper half of the calibration range. Results less than the mid-range of the calibration indicate the sample was over diluted and analysis should be repeated with a lower level of dilution. If dilution is not performed, any result reported above the upper range is considered a qualitative measurement and must be qualified as an estimated value.

13.0 Pollution Prevention & Waste Management

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Refer to laboratory SOP (234835, Hazardous Waste Management and Sample Disposal), or however named, for waste handling and management practices pertaining to the waste streams created at this facility.

Pace® proactively seeks ways to minimize waste generated during work processes. Some examples of pollution prevention include but are not limited to reduced solvent extraction, solvent capture, use of reusable cycletainers for solvent management, and real-time purchasing.

The EPA requires that laboratory waste management practices comply with all applicable federal and state laws and regulations. Excess reagents, samples, and method process wastes are characterized and disposed of in an acceptable manner in accordance with the Pace® Chemical Hygiene Plan / Safety Manual. Refer to this manual for these procedures.

14.0 MODIFICATIONS

The procedures in this SOP have not been modified from the reference test method(s) cited.

15.0 RESPONSIBILITIES

- PAS employees that perform any part of this procedure in their work activities must have a signed Read and Acknowledgement Statement (R&A) in their training file for the version(s) of the SOP that were in effect during the time the employee performed the activity.
- PAS supervisors and managers, however named, are responsible for training employees on the procedures in this SOP, implementing the SOP in the work area, and monitoring on-going adherence to the SOP in the work area(s) they oversee.
- PAS employees are responsible for following the procedures in this SOP. Unauthorized deviations or departures from this SOP are not allowed except with documented approval from the local QM and only when those deviations do not violate the Pace® Code of Ethics or Professional Conduct (COR-POL-0004) or associated policy and procedure(s). Hand-edits or manual changes to the SOP are not permitted. If a change is desired or necessary, Pace® employees must follow the procedures for document revision specified in corporate SOPs ENV-SOP-CORQ-0015, *Document Management* and ENV-SOP-CORQ-0016, *SOP for Creation of SOP and SWI.*

16.0 ATTACHMENTS

- Appendix A: Routine Analyte List, LOD, LOQ, and RL
- Appendix B: QC Summary & Corrective Action Table
- Appendix C: State/Program Specific Requirements
- Appendix D: Charts and Tables
    - Table 1: Element Wavelengths
    - Table 2: Precision and Accuracy Acceptance Criteria
    - LCS and Matrix Spike
    - MCP Reporting Limits

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17.0 REFERENCES

- ENV-POL-CORQ-0005, *Acceptable Calibration Practices*, current version.
- ENV-SOP-CORQ-0006, *Manual Integration*, current version.
- ENV-SOP-CORQ-0011, *Method Validation and Instrument Verification*, current version.
- ENV-SOP-CORQ-0015, *Document Management*, current version.
- ENV-SOP-CORQ-0016, *Standard Operating Procedures and Standard Work Instructions,* current version.
- COR-POL-0004, *Code of Ethics and Professional Conduct*, current version.
- COR-MAN-001, *Pace® Safety Manua*l, current version.
- ENV-MAN-WES2-0001 V03 *Quality Manual*, current version.
- TNI Standard, "Volume 1 Management and Technical Requirements for Laboratories Performing Environmental Analysis", current version.
- MA DEP 310 CMR 42.00
- Reference Method no: Method 6010D SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA A@-846, Update V, July 2014
- SM 2340B, Hardness by Calculation, Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 21st Edition, 1997

18.0REVISION HISTORY

Revisions Made from Prior Version

Section	Description of Change
General Document	Document was changed from previous template to Pace Analytical Services Template

Document Succession: This version replaces the following document(s):

Document Number	Version	Document Title	Effective Date:
26796	6	Inductively Coupled Plasma – Atomic Emission Spectrometry	6/13/2023

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Appendix A: Target Analyte Lists, LOD, LOQ, and RL

Standard Analyte List- (Aqueous)

Analyte	CAS #	DL (mg/L)	LOQ[1] (mg/L)	RL[1] (mg/L)
Aluminum	7429-90-5	0.03	0.1	0.1
Antimony	7440-36-0	0.0037	0.05	0.05
Arsenic	7440-38-2	0.0042	0.005	0.005
Barium	7440-39-3	0.0012	0.01	0.01
Beryllium	7440-41-7	0.0007	0.005	0.005
Boron	7440-42-8	0.0092	0.03	0.03
Cadmium	7440-43-9	0.0008	0.005	0.005
Calcium	7440-70-2	0.0189	0.10	0.10
Chromium	7440-47-3	0.0050	0.01	0.01
Cobalt	7440-48-4	0.0017	0.02	0.02
Copper	7440-50-8	0.004	0.01	0.01
Iron	7439-89-6	0.0104	0.05	0.05
Lead	7439-92-1	0.0036	0.01	0.01
Lithium	7439-93-2	0.0021	0.009	0.009
Magnesium	7439-95-4	0.0223	0.10	0.10
Manganese	7439-96-5	0.0040	0.1	0.1
Molybdenum	7439-98-7	0.0009	0.05	0.05
Nickel	7440-02-0	0.0048	0.025	0.025
Potassium	7440-09-7	0.122	2.5	2.5
Sulfur	7704-34-9	0.0635	0.25	0.25
Selenium	7782-49-2	0.0039	0.01	0.01
Silica	7631-86-9	0.109	0.007	0.007
Sodium	7440-23-5	0.266	2.0	2.0
Strontium	7440-24-6	0.0009	0.01	0.01
Thallium	7440-28-0	0.0058	0.02	0.02
Tin	7440-31-5	0.0027	0.05	0.05
Titanium	7440-32-6	0.0022	0.01	0.01
Vanadium	7440-62-2	0.0010	0.01	0.01

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Zinc	7440-66-6	0.0036	0.05	0.05

[1] *LOD, LOQ, and RL are always adjusted to account for actual amounts used and for dilution. Values as of effective date of this SOP. LOD, LOQ, and RL are subject to change. Contact quality personnel for current information.*

Standard Analyte List- (Soils)

Analyte	CAS #	DL (mg/kg)	LOQ[1] (mg/Kg)	RL[1] (mg/Kg)
Aluminum	7429-90-5	0.806	4.0	4.0
Antimony	7440-36-0	0.148	2.0	2.0
Arsenic	7440-38-2	0.0974	0.40	0.40
Barium	7440-39-3	0.0695	0.40	0.40
Beryllium	7440-41-7	0.0306	0.20	0.20
Boron	7440-42-8	0.1400	1.2	1.2
Cadmium	7440-43-9	0.0393	0.40	0.40
Calcium	7440-70-2	1.40	4.0	4.0
Chromium	7440-47-3	0.0712	0.40	0.40
Cobalt	7440-48-4	0.069	0.80	0.80
Copper	7440-50-8	0.179	0.40	0.40
Iron	7439-89-6	0.417	2.0	2.0
Lead	7439-92-1	0.107	2.0	2.0
Lithium	7439-93-2	0.048	0.36	0.36
Magnesium	7439-95-4	0.89	0.40	0.40
Manganese	7439-96-5	0.14	0.40	0.40
Molybdenum	7439-98-7	0.0542	2.0	2.0
Nickel	7440-02-0	0.19	1.0	1.0
Potassium	7440-09-7	19.8	100	100
Sulfur	7704-34-9	1.25	10	10
Selenium	7782-49-2	0.262	0.80	0.80
Silica	7631-86-9	4.34	20	20
Sodium	7440-23-5	8.03	80	80
Strontium	7440-24-6	0.0364	2.0	2.0
Thallium	7440-28-0	0.19	0.80	0.80
Tin	7440-31-5	0.276	4.0	4.0

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Titanium	7440-32-6	0.0737	0.40	0.40
Vanadium	7440-62-2	0.0811	0.40	0.40
Zinc	7440-66-6	0.37		2.0

[1] *LOD, LOQ, and RL are always adjusted to account for actual amounts used and for dilution. Values as of effective date of this SOP. LOD, LOQ, and RL are subject to change. Contact quality personnel for current information.*

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Appendix B: QC Summary & Corrective Action Table

QC Item	Frequency	Acceptance Criteria	Corrective Action	Qualification
Demonstration of Capability (DOC)	Annual	±20% RSD, 80-120% Recovery	IDOC must be re-analyzed	None
Initial Calibration (ICAL)	Daily (Every 24 hours)	LLOQ recovery 80%-120%	Recalibrate and rerun	None
Initial Calibration Verification (ICV)	Immediately following daily calibration	Must be within 10% of the expected value	re-analyze once, if still failing terminate the analysis, correct the problem, and recalibrate the instrument or exclude failing analyte from analysis	None
Initial Calibration Blank (ICB)	Immediately following daily calibration	<1/2 RL	re-analyze once, if still failing terminate the analysis, correct the problem, and recalibrate the instrument or exclude failing analyte from analysis	None
Low limit of Quantitation (LLOQ)	Following calibration	80%-120%	To verify adequate sensitivity a standard shall be analyzed at or below the lowest concentration for which quantitative data are to be reported without qualification. The low standard must be recovered within 80%-120% of the true value. If the criteria are not met, the calibration is not acceptable for use. Investigate and troubleshoot to correct the problem and perform a new calibration. Do not proceed to analyze samples; sample analysis may not proceed if this quality control measure is not within criteria.	None
Continuing Calibration Verification (CCV)	After every 10th sample and at the end of the sample run	Must verify instrument is within 10% of the calibration with the relative standard deviation <5% from replicate (minimum of two) integrations	Immediate corrective action for a failing CCV/CCB includes reanalyzing the failing standard. If the standard passes the second time then the analysis may be continued. The batch sheet is noted. If the standard fails again, instrument maintenance must be performed and the CCV/CCB standard is reanalyzed. If the standard passes, then all samples run after the last passing CCV/CCB	Analysis may proceed if it can be demonstrated that the CCV exceedance has no impact on analytical measurements. For example, the CCV %R is high, and the analyte is not detected in sample(s).

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Continuing Calibration Blank (CCB)	After every 10th sample and at the end of the sample run	< RL	pair must be re-analyzed. If the standard fails after instrument maintenance, the instrument is recalibrated. A new ICV/ICB is performed, and all previous data after the last passing CCV/CCB is reanalyzed.	Analysis may proceed if it can be demonstrated that the CCB detection has no impact on analytical measurements. For example, the samples are non-detect or 10x higher than the CCB.
Mixed element interference check	The mixed element SIC solution is analyzed at least once per day,	The concentration measured for any target analytes must be less than ±LLOQ	If the SIC fails take corrective action which may include re-evaluation of the inter-element correction values (IECs) after running single element SIC. The instrument calibration routine must then be performed and confirmed by the ICV/ICB pair and the SIC re-analyzed before proceeding with analysis	None
Linear Dynamic Range	Daily	90%-110% of true value	Dilute samples within the calibration range or re-establish / verify the LDR	Flagging is not appropriate
Method Blank (MB)	Per Batch	< RL	If the results of the method blank exceed the RDL for any analyte, perform re-analysis of a new aliquot of the method blank. If all of the samples for the analyte are non-detected or 10x the concentration detected in the method blank, and the method blank is at or above the RDL, no action is required. If one or more associated samples for that analyte have positive results at or above the RDL but less than 10x the concentration, those samples must be considered to be out of control, and are re-digested and reanalyzed.	Analysis may proceed if it can be demonstrated that the MB detection has no impact on analytical measurements. For example, the samples are non-detect or 10x higher than the MB.
Laboratory Control Sample (LCS)	Per Batch	±20% RSD, See table 2 for criteria	LCS can be rerun once due to failure. If upon reanalysis the LCS is still out of control, the failed analytes are re-prepped and re-analyzed.	Analysis may proceed if it can be demonstrated that the LCS detection has no impact on analytical measurements. For example, the samples are non-detect and

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				the LCS %R is above 120%.
Matrix Spike/Spike Duplicate (MS/MSD)	MS Per Batch/MSD per request	See table 2 for criteria	f the Matrix Spike falls outside of the limits as stated in Table 2, or outside any historical documentation for analytes of interest a post analytical spike is performed for the failed analytes. The same sample from which the MS/MSD aliquots were prepared should be spiked with a post digestion spike at a minimum level of 10 times and a maximum of 100 times the lower limit of quantitation. The acceptable % Recovery of the post analytical spike is 75-125%. A nonconformance is noted in the LIMS and approved in secondary peer review and/or by the Metals Manager.	Qualified in LIMS and narrated
Sample Duplicate (DUP)	Per Batch	See Table 2 for criteria	If the Duplicate falls outside of the limits as stated in Table 2, or outside any historical documentation and the concentrations of the failing analytes are less than 5x the RL or a matrix interference is found a nonconformance is noted in the LIMS and approved in secondary peer review and/or by the Metals Manager	Qualified in LIMS and narrated

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Appendix C: State/Program Specific Requirements

This appendix provides state specific requirements that supersede or supplement the main body of the SOP. When analyzing samples from these states, these requirements are applicable. For MCP Reporting Limits, please see Table 4 in Appendix D

State	SOP Section	Requirement
NJ	Section 11, Method Blank	Target analytes must be < RL/LLOQ. If concentration of contamination in MB is >RL/LLOQ, reanalyze the MB. If reanalysis is acceptable, no further action is required. If reanalysis is not acceptable, all associated samples must be redigested and reanalyzed unless sample results are either not detected or >10x concentration in MB. If 10x concentration of the MB the samples will be qualified with a B.
MA MCP	Section 11, Method Blank	Target analytes must be < RL/LLOQ. If concentration of contamination in MB is >RL/LLOQ, reanalyze the MB. If reanalysis is acceptable, no further action is required. If reanalysis is not acceptable, all associated samples must be redigested and reanalyzed unless sample results are either not detected or >10x concentration in MB
MA MCP	Section 11, LCS/LCSD	Analyze one LCS/LCSD pair per sample batch. The LCS/LCSD samples are a spiked volume of reagent water for aqueous digestions or an aliquot of a standard reference material (SRM) for soil/solid digestions, that is brought through the entire preparation and analytical process. The LCS samples must have a % Recovery of 80-120% of the true value for aqueous samples and a % Recovery within the vendor acceptance limits (the 95% confidence level) for soils of the actual value. The LCS/LCSD must have a calculated RPD (relative percent difference) of ≤ 20% (aqueous) and ≤ 30% (soil).

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		If the LCS or LCSD is not recovered within acceptance criteria for an analyte, reanalyze the failed LCS. If the recovery is acceptable, no further action is required. If one LCS is acceptable and the other is not, no corrective action is required. The LCS exceedance must be narrated. If both the LCS/LCSD are outside of criteria, redigest and reanalyze the LCS/LCSD and all associated samples. If the LCS/LCSD RPD is outside of the acceptance criteria, narrate.
MA MCP	Section 11, CCV	If the CCV fails, reanalyze the CCV. If the re-analysis is acceptable, no further action is required. If reanalysis is still outside of criteria, recalibrate and reanalyze all associated samples since the last compliant CCV. If the recovery is high (>110%) and all associated sample results are not detected, no corrective action is required.
MA MCP	Section 11, MS	A Matrix Spike is performed on one field sample per matrix designated by data user on chain-of-custody or at project setup. The MS must recover within 75 – 125%. If the MS recovery is ≥ 30% and ≤ 125%, and the LCS recovery is valid, no further action is required. If the MS recovery is < 30% and associated with non-detected results, redigest (homogenize sample well) and reanalyze sample/MS pair. Report results and narrate. Perform Dilution test and/or post-digestion spike. Narrate exceedances in report narrative.
MA MCP	Section 11, Post-Digestion Spike	A PDS is performed on the same sample the MS was performed on. Only required for analytes that did not meet the acceptance criteria in the MS and only if spike concentration added

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		in MS was > concentration in unspiked sample. Percent Recovery must be 75-125%. Narrate exceedances in report narrative.
MA MCP	Section 11, MSD	One per digestion batch of ≤ 20 field samples designated by data user on the chain-of-custody or at project set-up. Digest and analyze an additional aliquot of the same field sample used for the MS. The RPD for each target analyte must be ≤ 20% for aqueous and ≤ 35% for solids. Narrate exceedances in report narrative
MA MCP	Section 11, Initial Calibration Blank, Continuing Calibration Blank	The results of the ICB/CCB must be < RL/LLOQ. If the results are greater than the RL/LLOQ, re-analyze the ICB/CCB; if acceptable, no further action is required. If reanalysis is still outside of criteria and all associated sample concentrations are either not detected or > 10x blank level, no further action is required. Otherwise, recalibrate and reanalyze ICV and ICB. If ICBs consistently have target metals > RL/LLOQ, re-evaluate the RL/LLOQ.
MA MCP	Section 11, Low-Level Calibration Verification	Daily prior to sample analysis, an LLCV standard is analyzed at the RL/LLOQ for each target analyte. The percent recovery must be within 70 – 130%. If the criteria is not met, re-analyze the LLCV. If reanalysis is acceptable, no further action is required. If reanalysis is still outside of criteria and associated analytes are ≤10x RL/LLOQ in associated field samples, recalibrate and reanalyze the LLCV and associated field samples. If associated field samples are >10x RL/LLOQ, narrate.
MA MCP	Section 11, Dilution Test (Serial Dilution)	Performed once per batch of ≤ 20 field samples. A 1:5 dilution is performed on the same sample that was used for the MS. The percent difference (%D) of the sample and dilution results for target analytes at levels > 25x the

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		RL/LLOQ must be less than or equal to 20% for all matrices. Narrate exceedances in report narrative.

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MCP Analytical Sequence:

- Instrument Calibration
- Initial Calibration Verification (ICV)
- Initial Calibration Blank (ICB)
- Low-Level Calibration Verification (LLCV)
- Blank (to check for carry-over)
- Spectra Interference Check Standard
- Linear Dynamic Range Check
- Continuing Calibration Verification Standard
- Continuing Calibration Blank
- 10 Samples
- Continuing Calibration Verification Standard
- Continuing Calibration Blank

Appendix D: Charts and Tables

Table 1: Element Wavelengths

Element	6500 Duo wavelength (nm)
Pb	220.3
Se	196
Sb	206.8
As	189
Ba	455.4
Be	313
Cd	214.4
Co	228.6
Cu	324.7
Cr	267.7
Fe	259.9
Mn	257.6
Mo	202.0
Ni	231.6
Ag	328.0
Ti	190.8
V	292.4
Zn	206.2

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Al	396.1
Ca	315.8
Mg	279.0
B	208.9
Si	212.9
Sn	189.9
Sr	421.5
Ti	334.9
Bi	223.0
Na	589.5
K	766.4
S	180.7
Li	

Table 2: precision and accuracy acceptance criteria

	% Recovery LCS		Aqueous % Recovery MS		Soil % Recovery SRM *		Duplicate	
Element	**Lower Control Limit**	**Upper Control Limit**	**Lower Control Limit**	**Upper Control Limit**	**Lower Control Limit**	**Upper Control Limit**	**Aqueous % RPD**	**Soil % RPD**
Aluminum	80	120	75	125	29	171	20	20
Antimony	80	120	75	125	4	196	20	20
Arsenic	80	120	75	125	81	119	20	20
Barium	80	120	75	125	83	118	20	20
Beryllium	80	120	75	125	83	117	20	20
Boron	80	120	75	125	70	129	20	20
Cadmium	80	120	75	125	82	117	20	20
Calcium	80	120	75	125	83	117	20	20
Chromium	80	120	75	125	80	119	20	20
Cobalt	80	120	75	125	83	117	20	20
Copper	80	120	75	125	83	117	20	20
Iron	80	120	75	125	51	150	20	20
Lead	80	120	75	125	80	120	20	20
Lithium	80	120	75	125	80	120	20	20
Magnesium	80	120	75	125	74	126	20	20
Manganese	80	120	75	125	83	117	20	20
Molybdenum	80	120	75	125	81	119	20	20

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Nickel	80	120	75	125	82	117	20	20
Potassium	80	120	75	125	74	126	20	20
Sulfur	80	120	75	125	NA	NA	20	20
Selenium	80	120	75	125	80	120	20	20
Silica (SiO2)	80	120	75	125	NA	NA	20	20
Silver	80	120	75	125	66	134	20	20
Sodium	80	120	75	125	74	127	20	20
Strontium	80	120	75	125	80	120	20	20
Thallium	80	120	75	125	79	120	20	20
Tin	80	120	75	125	69	131	20	20
Titanium	80	120	75	125	82	118	20	20
Vanadium	80	120	75	125	79	121	20	20
Zinc	80	120	75	125	82	119	20	20

Table 3: LCS and Matrix Spike

Analyte	Liquid Concentration (mg/L)	Soil Concentration * (MS Spike only) {mg/Kg}
Antimony	0.50	160
Arsenic	0.12	160
Barium	2.00	160
Beryllium	0.05	80
Cadmium	0.051	80
Chromium	0.20	160
Copper	0.25	160
Lead	0.51	160
Nickel	0.50	160
Selenium	0.12	160
Silver	0.05	40
Thallium	0.12	160
Zinc	0.50	160
Iron	1.00	800
Manganese	0.5	160
Calcium	10.0	800
Magnesium	10.0	800
Potassium	10.0	800

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Sodium	10.0	800
Silica	1.00	800
Aluminum	2.00	800
Cobalt	0.50	160
Vanadium	0.50	160
Boron	1.00	NA
Molybdenum	1.00	NA
Lithium	1.00	800
Titanium	1.00	NA

Table 4: MCP Reporting Limits

Element	Aqueous (mg/L)	Soil (mg/Kg)
Aluminum	0.10	4.0
Antimony	0.05	2.0
Arsenic	0.005	0.40
Barium	0.01	0.40
Beryllium	0.005	0.20
Boron	0.03	1.2
Cadmium	0.004	0.40
Calcium	0.10	4.0
Chromium	0.01	0.40
Cobalt	0.02	0.80
Copper	0.01	0.40
Iron	0.05	2.0
Lead	0.01	2.0
Magnesium	0.10	4.0
Manganese	0.01	0.40
Molybdenum	0.05	2.0
Nickel	0.025	1.0
Potassium	2.5	100
Selenium	0.005	0.80
Silicon	0.50	20
Silver	0.007	0.40
Sodium	2.0	80
Strontium	0.01	2.0
Thallium	0.02	0.40
Tin	0.05	4.0
Titanium	0.01	0.40
Vanadium	0.01	0.40
Zinc	0.05	2.0

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Appendix D: Linear Range Reference Table

Wavelength	LDR (PPM)	Standard	Type
Ag 328	1	Cal 1	**LDR**
Al 396	500	ICSA	**SIC/LDR**
As 189	5	LDR Check	**LDR**
B 209	5	LDR Check	**LDR**
Ba 455	10	LDR Check	**LDR**
Be 313	1	Cal 1	**LDR**
Ca 315	500	ICSA	**SIC/LDR**
Cd 214	1	Cal 1	**LDR**
Co 228	1	Cal 1	**LDR**
Cr 267	20	SIC Multi	**SIC/LDR**
Cu 324	20	LDR Check	**LDR**
Fe 259	200	ICSA	**SIC/LDR**
K 766	300	LDR Check	**LDR**
Li 670	5	LDR Check	**LDR**
Mg 279	500	ICSA	**SIC/LDR**
Mn 257	20	SIC Multi	**SIC/LDR**
Mo 202	5	LDR Check	**LDR**
Na 589	500	LDR Check	**LDR**
Ni 231	10	LDR Check	**LDR**
Pb 220	50	LDR Check	**LDR**
S 180	100	LDR S	**LDR**
Sb 206	1	Cal 1	**LDR**
Se 196	1	Cal 1	**LDR**
Si 212	20	LDR Check	**LDR**
Sn 189	1	Cal 1	**LDR**
Sr 421	1	Cal 1	**LDR**
Ti 334	20	SIC Multi	**SIC/LDR**
Tl 190	1	Cal 1	**LDR**
V 292	10	SIC Multi	**SIC/LDR**
Zn 206	20	LDR Check	**LDR**

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Appendix E: Standards Reference Table

Cal	Element	ICP Working Calibration Standard				ICP Calibration Verification Standard			
		Stock Concentration (mg/L)	Aliquot (mL)	Final Volume (mL)	Cal STD Final Concentration (mg/L)	Stock Concentration (mg/L)	Aliquot (mL)	Final Volume (mL)	Final Concentration(mg/L)
ICAL	Ag	100	10	1000	1.0	100	10	2000	0.500
	Al	100|1000	10|24		25.0	100	10		0.500
	As	100	10		1.0	100	10		0.500
	B	100	10		1.0	100	10		0.500
	Ba	100	10		1.0	100	10		0.500
	Be	100	10		1.0	100	10		0.500
	Ca	100|1000	10|9		10.0	100	10		0.500
	Cd	100	10		1.0	100	10		0.500
	Co	100	10		1.0	100	10		0.500
	Cr	100	10		1.0	100	10		0.500
	Cu	100	10		1.0	100	10		0.500
	Fe	100|1000	10|24		25.0	100	10		0.500
	K	1000|1000	10|24		35.0	100	10		5.000
	Li	1000	1		1.0	1000	1		0.500
	Mg	100|1000	10|9		10.0	100	10		0.500
	Mn	100	10		1.0	100	10		0.500
	Mo	100	10		1.0	100	10		0.500
	Na	100|1000	10|24		25.0	100|10,000	10|1.9		10.00
	Ni	100	10		1.0	100	10		0.500
	Pb	100	10		1.0	100	10		0.500
	Sb	100	10		1.0	100	10		0.500
	Se	100	10		1.0	100	10		0.500
	Si	50|10,000	10|0.9		10.0	50|10,000	10|1		5.250
	Sn	1000	1		1.0	1000	1		0.500
	Sr	1000	1		1.0	1000	1		0.500
	Ti	100	10		1.0	100	10		0.500
	Tl	100	10		1.0	100	10		0.500
	V	100	10		1.0	100	10		0.500
	Zn	100	10		1.0	100	10		0.500
SCal	S	1000	1	500	2.0	1000	.250	500	0.500

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Appendix F: Daily Standards Reference Tables

Table 1: ICSA

Element	Stock Concentration (mg/L)	Aliquot (mL)	Final Volume (mL)	Final Concentration (mg/L)
Al	10,000	50	1000	**500**
Ca	10,000	50		**500**
Fe	10,000	20		**200**
Mg	10,000	50		**500**

Table 2: LLOQ Intermediate Stocks (used at 100X)

Element	Stock Concentration (mg/L)	Aliquot (mL)	Final Volume (mL)	Final Concentration (mg/L)
Ag	1000	0.25	500	**0.5**
As	1000	0.25		**0.5**
B	1000	1.5		**3.0**
Ba	1000	0.5		**1.0**
Be	1000	0.25		**0.5**
Cd	1000	0.2		**0.4**
Co	1000	1.0		**2.0**
Cr	1000	0.5		**1.0**
Cu	1000	0.5		**1.0**
Li	1000	0.5		**1.0**
Mn	1000	0.5		**1.0**
Mo	1000	2.5		**5.0**
Ni	1000	1.0		**2.0**
Li	1000	0.5		**1.0**
Pb	1000	0.5		**1.0**
Sb	1000	2.5		**5.0**
Se	1000	0.5		**1.0**
Si	10,000	25		**50.0**
Sn	1000	2.5		**5.0**

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Sr	1000	0.5		**1.0**
Ti	1000	2.5		**5.0**
Tl	1000	1.0		**2.0**
V	1000	0.5		**1.0**
Zn	1000	0.25		**0.50**
LLOQ Intermediate Mineral Stock (used at 100X)				
Al	1000	5	500	**10.0**
Ca	1000	5		**10.0**
Fe	1000	2.5		**5.0**
K	1000	12.5		**25.0**
Mg	10,000	5.0		**10.0**
Na	10,000	10.0		**20.0**

Table 3: SIC Multi

Element	Stock Concentration (mg/L)	Aliquot (mL)	Final Volume (mL)	Final Concentration (mg/L)
Cr	1000	20.0	00	**20.0**
Mn	1000	20.0		**20.0**
Ti	1000	20.0		**20.0**
V	1000	10.0		**10.0**

Table 4: LDR Check

Element	Stock Concentration (mg/L)	Aliquot (mL)	Final Volume (mL)	Final Concentration (mg/L)
As	1000	5.0	**1000**	5.0
B	1000	5.0		5.0
Ba	1000	10.0		10.0
Cu	1000	20.0		20.0
K	10,000	30.0		300.0
Li	1000	5.0		5.0
Mo	1000	5.0		5.0
Na	10,000	50.0		500.0
Ni	1000	10.0		10.0

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Pb	1000	50.0		**50.0**
Si	1000	20.0		**20.0**
Zn	1000	20.0		**20.0**

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Mercury in Solid or Semisolid Waste
(Manual Cold-Vapor Technique)

Reference Method No.: **EPA 7471B**

Reference: SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update III, February 2007.

1. Scope and Application

Matrices: Method 7471 is approved for measuring total mercury (organic and inorganic) in soils, sediments, bottom deposits, and sludge-type materials. All samples must be subjected to an appropriate dissolution step prior to analysis. If this dissolution procedure is not sufficient to dissolve a specific matrix type or sample, then this method is not applicable for that matrix.

Definitions: Refer to Alpha Analytical Quality Manual.

The data report packages present the documentation of any method modification related to the samples tested. Depending upon the nature of the modification and the extent of intended use, the laboratory may be required to demonstrate that the modifications will produce equivalent results for the matrix. Approval of all method modifications is by one or more of the following laboratory personnel before performing the modification: Area Supervisor, Department Supervisor, Laboratory Director, or Quality Assurance Officer.

This method is restricted to use by or under the supervision of analysts experienced in the operation of the Mercury Analyzer and in the interpretation of Mercury data. Each analyst must demonstrate the ability to generate acceptable results with this method by performing an initial demonstration of capability..

2. Summary of Method

Prior to analysis, the solid or semi-solid samples must be prepared according to the procedures discussed in this method.

Method 7471, a cold-vapor atomic absorption method, is based on the absorption of radiation at the 253.7-nm wavelength by mercury vapor. The mercury is reduced to the elemental state and aerated from solution in a closed system. The mercury vapor passes through a cell positioned in the light path of an atomic absorption spectrophotometer. Absorbance (peak height) is measured as a function of mercury concentration.

2.1 Method Modifications from Reference

Alpha analyzes only one 0.3g aliquot of sample. The original method does not address the automated instrument procedure. A reduced volume of sample is digested in disposable digestion tubes on a hot block digestor.

3. Reporting Limits

The reporting limit for this method is 0.08mg/Kg.

4. Interferences

Potassium permanganate is added to eliminate possible interference from sulfide. Concentrations as high as 20 mg/Kg of sulfide, as sodium sulfide, do not interfere with the recovery of added inorganic mercury in reagent water.

Copper has also been reported to interfere; however, copper concentrations as high as 10 mg/Kg had no effect on recovery of mercury from spiked samples.

Samples high in chlorides require additional permanganate (as much as 25 mL) because, during the oxidation step, chlorides are converted to free chlorine, which also absorbs radiation of 253 nm. Care must therefore be taken to ensure that free chlorine is absent before the mercury is reduced and swept into the cell. This may be accomplished by using an excess of hydroxylamine sulfate reagent (25 mL).

Certain volatile organic materials that absorb at this wavelength may also cause interference. A preliminary run without reagents should determine if this type of interference is present.

5. Health and Safety

The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of material safety data sheets is available to all personnel involved in the chemical analysis. Additional references to laboratory safety are available in the Chemical Hygiene Plan.

All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

Because mercury vapor is toxic, precaution must be taken to avoid its inhalation.

6. Sample Collection, Preservation, Shipping and Handling

6.1 Sample Collection

Samples may be collected in plastic or glass containers.

6.2 Sample Preservation

None.

6.3 Sample Shipping

No special shipping requirements.

6.4 Sample Handling

Samples are stored under refrigeration at 4°C and analyzed as soon as possible after collection. The samples have a 28-day holding time from the time of collection.

7. Equipment and Supplies

7.1 Instrumentation:

Perkin Elmer FIMS 100 Atomic absorption spectrophotometer: Use instrument settings recommended by the manufacturer. The PE FIMS is designed specifically

for the measurement of mercury using the cold-vapor technique with BOC (background offset correction) performed by a survey scan prior to each sample introduction. PE S10 autosampler is coupled to the instrument.

Cetac M-6100 Atomic absorption spectrophotometer: Use instrument settings recommended by the manufacturer. This instrument employs a reference cell off-set correction and full automation through the CETAC software. A Cetac ASX-260 autosampler is coupled to the instrument.

Nippon Instrument model# RA-4300A analyzer with integrated 80 position autosampler:

The instrument adds a stannous chloride (II) solution to the sample post digestion, the divalent mercury ion (Hg2+) is reduced to zero-valent metallic mercury and turns into mercury gas by bubbling. $Hg2{+}{+}SnCl2 \rightarrow Hg0 \uparrow$

After removing the acid mist and water vapor generated by bubbling with an electronic cooling unit, the instrument measures the absorbance of mercury at 253.7 nm absorption wavelength. It measures the known mercury amount, creates a calibration curve, and then calculates the mercury amount from the absorbance.

7.2 Hot Block Digestor: Environmental Express, 54 position, capable of maintaining a temperature of 95°C +/-3°C.

7.3 Graduated cylinder. Rinse once with 50% Nitric Acid, then rinse with reagent water prior to use.

7.4 Volumetric Flasks, Class A, various volumes. Rinse once with 50% Nitric Acid, then rinse with reagent water prior to use.

7.5 Polypropylene Digestion Vessels: 50 mL volume, with plastic screw caps

7.6 Pump Tubing: Environmental Express, three stop and two stop tubing in various IDs.

7.7 PTFE membranes: Pall TF1000 disks

7.8 Dilution vials: 20mL capacity, used when making analytical dilutions.

7.9 Laboratory Wipes

7.10 Compressed Air

7.11 Whatman 41 or equivalent filter paper

7.12 Eppendorf pipets: Accurate means to make trace standards

8. Reagents and Standards

8.1 Reagent Water: Reagent water is DI water shown to be interference free. All references to water in this method refer to reagent water unless otherwise specified.

8.2 Aqua regia: Prepare immediately before use by carefully adding three volumes of concentrated HCl to one volume of concentrated HNO_3.

8.3 Concentrated Nitric Acid, (HNO_3): Trace grade. Store at room temperature in the appropriately marked acid cabinet.

8.4 Concentrated Hydrochloric Acid, (HCl): Trace grade. Store at room temperature in the appropriately marked acid cabinet.

8.5 Reductant, Stannous Chloride in 3% HCl: This is the ***reductant*** for the Instrument. In a 1L volumetric flask, add 30mL concentrated trace grade HCl and 11g $SnCl_2 \cdot 2H_20$. Mix to dissolve the solid and bring to volume with reagent water. Store at room temperature, prepare as needed.

8.6 Carrier, Hydrochloric Acid, 3%: This is the ***carrier*** for the instrument. In a 1L volumetric flask, add 30mL concentrated trace grade HCl (Section 8.4). Bring to volume with reagent water. Store at room temperature, prepare as needed.

8.7 Potassium permanganate, mercury-free, 5% solution (w/v): Dissolve 5 g of potassium permanganate in 100 mL of reagent water. Store at room temperature.

8.8 Sodium chloride-hydroxylamine hydrochloride solution: Dissolve 12 g of sodium chloride and 12 g of hydroxylamine hydrochloride in reagent water and dilute to 100 mL. Store at room temperature.

8.9 Mercury stock solution, 1000ppm: This solution is purchased commercially prepared with a certificate of analysis. Three solutions are purchased, each from a different source. Store at room temperature. Expires according to manufacturer's specifications.

8.9.1 10ppm Mercury Stock Standard: To a 100mL volumetric flask, add 5mL of concentrated HNO_3 and 1.0mL of 1000ppm Mercury Stock Solution (Section 8.9). Bring to volume with reagent water. Store at room temperature. Expires one month from date of preparation.

8.9.1.1 0.1ppm Mercury Working Stock / Matrix Spike Solution: To a 500mL volumetric flask, add 5mL of concentrated HNO_3 and 5 mL of 10ppm Mercury Stock Standard (Section 8.9.1). Bring to volume with reagent water. Store at room temperature. Expires one week from date of preparation.

8.9.2 10ppm Mercury ICV Stock Standard: To a 100mL volumetric flask, add 5mL of concentrated HNO_3 and 1.0mL of Mercury Stock Solution (Section 8.9, from an alternate source than that used in Section 8.9.1). Bring to volume with reagent water. Store at room temperature. Expires one month from date of preparation.

8.9.2.1 0.3ppm Mercury ICV Working Stock: To a 100mL volumetric flask, add 5mL of concentrated HNO_3 and 3.0mL of 10ppm Hg ICV Stock Standard (Section 8.9.2). Bring to volume with reagent water. Store at room temperature. Expires one week from date of preparation.

8.9.3 10ppm Mercury LCS Stock Standard: To a 100mL volumetric flask, add 5mL of concentrated HNO_3 and 1.0mL of 1000ppm Mercury Stock Solution (Section 8.9, from an alternate source than that used in Sections 8.9.1 and 8.9.2). Bring to volume with reagent water. Store at room temperature. Expires one month from date of preparation.

8.9.3.1 0.1ppm Mercury LCS Working Stock: To a 100mL volumetric flask, add 5mL of concentrated HNO_3 and 1.0mL of 10ppm Mercury LCS Stock Standard (Section

8.9.3). Bring to volume with reagent water. Store at room temperature. Expires one week from date of preparation.

8.10 SRM: Purchased from ERA in 300-500g lots.

9. Quality Control and Data Assessment

The laboratory must maintain records to document the quality of data that is generated. Ongoing data quality checks are compared with established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

9.1 Blank(s)

The Method Blank consists of the 0ppm standard as prepared in Section 10.1.2.1.1. Analyze one Method Blank per analytical batch of twenty samples or less. The Method Blank must be less than the Reporting Limit (RL). See Section 12.1 for corrective action.

9.1.1 PBS

A preparation blank is analyzed once per batch of twenty samples or less. It is prepared in the same manner as the 0ppm standard (Section 10.1.2.1.1). The PBS must be recovered within ± 0.2 µg/L.

9.1.2 ICB

The ICB is analyzed after the ICV, and is prepared in the same manner as the 0ppm standard (Section 10.1.2.1.1). The ICB must be recovered within ± 0.2 µg/L.

9.1.3 CCB

The CCB is analyzed after the CCV. It is prepared in the same manner as the 0ppm standard (Section 10.1.2.1.1). The CCB must be recovered within ± 0.2 µg/L.

9.2 Laboratory Control Sample (LCS)

The LCS is analyzed once per each analytical batch of twenty samples or less. It is prepared in the same manner as in Section 10.1.2.3. The LCS must be recovered within 80 – 120% of the true value. See Section 12.3 for corrective action.

9.3 Initial Calibration Verification (ICV)

The ICV is analyzed after the calibration curve. It is prepared in the manner specified in Section 10.1.2.2. The ICV must be recovered within ± 10% of the true value. See Section 12.2 for corrective action.

9.4 Continuing Calibration Verification (CCV)

The CCV is analyzed after every ten analytical samples. It is prepared in the same manner as the 5.0ppb calibration standard (Section 10.1.2.1.5). The CCV must be recovered within 20% of the true value. See Section 12.2 for corrective action.

9.5 Matrix Spike

Analyze one matrix spike per twenty or less analytical samples. The recovery of the matrix spike must be between 80 – 120%. Calculate percent recovery using Section 11.2.

If the recovery of the matrix spike is out of range, a post-analytical spike is analyzed. Prepare the post analytical spike by adding 1.25mL of 0.020ppm Calibration Standard

(Section 10.1.2.1.6) and 1.25mL of the sample digestate to a 15mL centrifuge tube for a final concentration of 0.0105mg/L. Analyze the post spike as outlined in Section 10.3.

Calculate the post spike concentration as follows:

Post Analytical Spike Sample Concentration (mg/L) =

[Sample Concentration (mg/L) x (0.5)] + 0.010mg/L

The percent recovery of the post-analytical spike must be between 75 – 125%.

See Section 12.4 for corrective action.

9.6 Laboratory Duplicate

Analyze one sample in duplicate per twenty or less analytical samples. The RPD between the sample and its duplicate must be ≤ 20% (as calculated in Section 11.3). See Section 12.5 for corrective action.

9.7 Method-specific Quality Control Samples

None

9.8 Method Sequence

- Sample preparation
- Sample digestion
- Standards preparation:
  - Calibration standards
  - ICV standard
  - LCS standard
- Standards digestion
- Analysis of calibration standards
- Generation of calibration curve
- Analysis of samples and standards:
  - ICV
  - ICB
  - analytical samples
  - CCV
  - CCB
  - analytical samples
  - CCV
  - CCB
  - etc.

10. Procedure

10.1 Equipment Set-Up

10.1.1 Sample preparation: Weigh a 0.3-g portion of untreated and homogenized sample and place in the bottom of a polypropylene digestion vessel. Record the weight in the laboratory notebook. NOTE: When preparing the batch, include one sample duplicate aliquot to be prepared in the same manner.

Add 2.5 mL of reagent water and 2.5 mL of aqua regia (Section 8.2). Heat 2 min on a hot block at 95°C +/-3°C. Cool; then add 15 mL reagent water, and 7.5 mL potassium permanganate solution (Section 8.7) to the digestion vessel. Wait 15 minutes to be sure the potassium permanganate is not exhausted (purple color disappears), if it does add additional potassium permanganate to all samples and QC until stable. Mix thoroughly and place in the hot block for 30 min at 95°C +/-3°C. Cool and add 3 mL of sodium chloride-hydroxylamine hydrochloride (Section 8.8) to reduce the excess permanganate.

CAUTION: Perform this addition under a hood, as Cl_2 could be evolved.

Bring up to a final volume of 50 mL with reagent water. Continue as described under Section 10.3.1.

10.1.2 Standard preparation: Standard preparation is performed each time samples are digested.

10.1.2.1 Calibration Standards

10.1.2.1.1 0 ppb: Add 10mL of reagent water to a polypropylene digestion vessel. This aliquot may be used for the CCB. Another separate aliquot is prepared for use as the ICB and the diluent for any samples with concentration greater than 90% the highest calibration standard used to determine the linear range.

10.1.2.1.2 0.5ppb: Add 10 mL of reagent water to a polypropylene digestion vessel. Using a volumetric pipet, add 0.25 mL of 0.1ppm Mercury Working Stock (Section 8.9.1.1) to the digestion vesel.

10.1.2.1.3 1.0ppb: Add 10 mL of reagent water to a polypropylene digestion vessel.. Using a volumetric pipet, add 0.5 mL of 0.1ppm Mercury Working Stock (Section 8.9.1.1) to the digestion vessel.

10.1.2.1.4 2.0ppb: Add 10 mL of reagent water to a polypropylene digestion vessel.. Using a volumetric pipet, add 1.0mL of 0.1ppm Mercury Working Stock (Section 8.9.1.1) to the digestion vessel.

10.1.2.1.5 5.0ppb/CCV: Add 10 mL of reagent water to a polypropylene digestion vessel.. Using a volumetric pipet, add 2.5 mL of 0.1ppm Mercury Working Stock (Section 8.9.1.1) to the digestion vessel.

10.1.2.1.6 10ppb: Add 10 mL of reagent water to a polypropylene digestion vessel.Using a volumetric pipet, add 5.0 mL of 0.1ppm Mercury Working Stock (Section 8.9.1.1) to the digestion vessel.

10.1.2.1.7 20ppb: Add 10 mL of reagent water to a polypropylene digestion vessel.Using a volumetric pipet, add 10.0 mL of 0.1ppm Mercury Working Stock (Section 8.9.1.1) to the digestion vessel.

10.1.2.2 ICV Standard, 3.0ppb: This standard is used for calibration verification.

Add 10.0 mL of reagent water to a digestion vessel. Using a volumetric pipet, add 0.5 mL of 0.3ppm Mercury Working Stock (Section 8.9.2.1) to the digestion vessel. Digest the ICV Standard as in Section 10.1.3.

10.1.2.3 LCS Standard, 1.0ppb: This standard is prepared and analyzed with each analytical batch.

Add 5.0mL of reagent water to a digestion vessel. Add 0.15g of SRM (Section 8.10). Digest the LCS Standard as in Section 10.1.3.

10.1.2.4 Matrix Spike, 0.001mg/L: Weigh two aliquots of the sample designated to be the batch matrix spike.

Add 10.0 mL of the reagent water to the digestion vessel containing the weighed sample aliquot. Add a 5 mL aliquot of 0.1ppm Mercury LCS Working Stock (Section 8.9.3.1). Digest the MS as in Section 10.1.3.

10.1.3 Standard Digestion:

To each standard (Sections 10.1.2.1 through 10.1.2.3), add 2.5 mL of reagent water and 2.5 mL of aqua regia (Section 8.2) and heat 2 min on the hot block at 95°C +/- 3°C. Allow the standard to cool; add 15 mL reagent water and 7.5 mL of $KMnO_4$ solution (Section 8.7) to each bottle and return to the hot block for 30 min. Cool and add 3 mL of sodium chloride-hydroxylamine hydrochloride solution (Section 8.8) to reduce the excess permanganate. Bring up to final volume of 50 mL with reagent water, continue as described in Section 10.3.3.

Note: Alternate volumes of standards may be made base on need as long as they are made with the same proportions as describe above.

10.2 Initial Calibration

Construct a calibration curve by plotting the absorbances of prepared standards (Section 10.1.2) versus micrograms of mercury. (See Section 11.1.) Determine the peak height of the unknown from the absorbance maxima on the spectrometer, and read the mercury value from the standard curve.

The curve correlation coefficient (cc) must be greater than or equal to 0.995 in order for the curve to be linear. If the correlation coefficient is less than 0.995, find and correct the problem. When the problem has been corrected, re-analyze either the previous standards or new standards. When the curve has generated an acceptable cc, then the analysis can continue with the ICV/ICB.

Analyze an Initial Calibration Verification Standard (ICV) (Section 9.3), an Initial Calibration Blank sample (ICB) (Section 9.1.2) at the start of the analytical run. The results for the ICV must be within 10% of the true value. If results are outside this range, refer to Section 12.2 for corrective action.

10.3 Equipment Operation and Sample Processing

10.3.1 Instrument Setup

10.3.1.1 Turn the instrument on. The autosampler will initialize itself.

10.3.1.2 Choose the instrument software from the desktop menu. The autosampler will initialize again.

FIMS 100 NOTE: The instrument must be turned on before the application is started. Otherwise, an error message will result.

10.3.1.3 Enter the appropriate fields for sample identification, and data storage.

10.3.1.4 Fill the carrier and reductant bottles.

10.3.1.4.1 The Carrier is 3% HCl (Section 8.6).

10.3.1.4.2 The Reductant is 1.1% $SnCl_2$ in 3% HCl (Section 8.5).

10.3.1.5 Allow the instrument to warm up while clearing samples. Samples that are cloudy or with particulate present after clearing must be filtered through Whatman 41 filter paper (Section 7.11) before analysis.

10.3.1.6 Place carrier uptake line and reductant uptake line.

10.3.1.7 Load carrier and reductant lines into pump magazines

10.3.1.8 Load the two waste lines into the pump magazines below the roller.

10.3.1.9 Lock the magazines into place.

FIMS100 only:

10.3.1.10 Remove the cap from the liquid/vapor separator and wipe dry with a Lab Wipe (Section 7.9). Compressed air (Section 7.10) through the vapor transfer line to dry it out.

10.3.1.11 Place a PTFE membrane (Section 7.7), rough side up, in the liquid/vapor separator; replace the cap and reattach the vapor transfer line to the sample absorption cell.

10.3.1.12 Adjust the gas flow by turning the black knob below the air flow meter to obtain a reading of just over 50.

10.3.2 Calibration and Sample Analysis

10.3.2.1 The instrument will now run the calibration standards; verify a CC of 0.995 or better before proceeding with the ICV and ICB. Ten analytical samples, a CCV and CCB, ten analytical samples, CCV, CCB, etc. The CCBs and CCVs must be recovered within the proper ranges (Sections 9.4 and 9.1.3) for analysis to continue.

10.3.2.2 If the sample result is beyond 90% of the concentration of the highest point on the calibration curve or LDR study used to establish the linear range, dilute the sample extract with a portion of one of the prepared blanks (ICB, CCB or PBS) to produce an analytical result that is within the range.

10.3.3 Instrument Shut Down

10.3.3.1 When analysis is complete place reagent uptake lines in a beaker of DI water.

10.3.3.1.1 Continue to run the pumps for several minutes to flush reagents out of the lines.

10.3.3.1.2 Continue to run the pumps for several more minutes to flush the lines thoroughly with DI water.

10.3.3.2 Pull the reagent uptake lines out of the DI water beaker to allow the pump to draw air completely through the lines.

10.3.3.3 Unlock the top and bottom pump magazines and remove tubing from the magazines.

10.3.3.4 Exit from the software application.

Note: This procedure must be followed every time the instrument is shut down to prevent water or reagents from being draw back into the instrument which can cause severe damage.

10.3.3.4.1 Dump the samples and instrument waste in the Metals/WetChem waste drum located in the transfer room only after all data has been processed through final review and package generation.

10.4 Continuing Calibration

After every 10 samples, analyze a Continuing Calibration Verification Standard (CCV), and a Continuing Calibration Blank sample (CCB). Determine the concentrations from the calibration curve. The results for the CCV must be within 20% of the true value.

10.5 Preventive Maintenance

Preventative maintenance is conducted per the manufacturer's instructions. All preventative maintenance is recorded in the Instrument Maintenance Logbook.

11. Data Evaluation, Calculations and Reporting

11.1 Calculate Mercury Concentration From the Daily Calibration Curve

The curve is generated utilizing a straight-line equation defined as:

$$A = k_1 + k_2C$$

Where:

A = Average peak height of the sample/standard integrations
C = Sample/Standard Concentration, µg/L
k_1 = y-intercept
k2 = slope

The instrument will plot peak height against concentration (µg/L). The result is generated in µg/L. This value is divided by 1000 to convert the units to mg/L. The mg/L units are converted to mg/Kg by multiplying by L/Kg. A dilution factor (DF) is applied if necessary. The Result is then divided by the % Total Solids prior to release to the client.

$$\text{Result, mg/Kg} = (\text{concentration, µg/L}) \times (1\text{mg}/1000\mu\text{g}) \times (\text{DF}) \times (\text{L/Kg})$$

Where:

$$\text{L/Kg} = \frac{\text{Final volume of digestate, in L}}{\text{Weight of original sample, in Kg}}$$

11.2 Calculate Percent Recovery for the Matrix Spike corrected for concentrations measured in the unfortified sample. Percent recovery is calculated using the following equation:

$$\%\ \text{Recovery} = \frac{(Cm - C)}{s} \times 100$$

Where:

Cm = measured Mercury in the fortified sample
C = measured native mercury sample concentration
S = concentration equivalent of spike added to sample

11.3 Calculate the Relative Percent Difference (RPD) for each Duplicate of the initial quantitated concentration (IC) and duplicate quantitated concentration (Dc) using the following formula:

$$RPD = \frac{|(IC - Dc)|}{\{(IC + Dc) / 2\}} \times 100$$

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

12.1 Method Blank Failure

When a prep blank mercury concentration is ≥10% of the mercury concentration determined for any associated sample, or is greater than 2.2x the MDL value (whichever is greater), the entire batch associated with the prep blank must be redigested.

12.2 ICV / CCV Failure

If the ICV %Recovery is outside of acceptance criteria, analysis is terminated until the problem is found and corrected. If the CCV %Recovery is outside of acceptance criteria, all samples analyzed since the last acceptable CCV must be reanalyzed following correction of the problem.

12.3 LCS Failure

If the LCS is not recovered within acceptance criteria, the associated batch and another LCS must be redigested (Section 10.1).

12.4 Matrix Spike/Post Digestion Spike Failure

If the recovery of the matrix spike is outside of the acceptance criteria of 80 – 120%, a post digestion spike is performed (Section 9.5). If the post digestion spike is beyond 75 – 125%, the sample and its spike are redigested (Section 10.1).

12.5 Duplicate Failure

If the RPD between the sample and its duplicate is greater than 20%, visually evaluate the sample matrix. If the sample matrix appears clean, the sample and its duplicate are removed from the batch and redigested (Section 10.1). If the matrix appears problematic, the sample digestate may be diluted and reanalyzed, or a narrative included with the data to explain the matrix problem.

13. Method Performance

13.1 Method Detection Limit Study (MDL) / Limit of Detection Study (LOD) / Limit of Quantitation (LOQ)

The laboratory follows the procedure to determine the MDL, LOD, and/or LOQ as outlined in Alpha SOP 1732. These studies performed by the laboratory are maintained on file for review.

13.2 Demonstration of Capability Studies

Refer to Alpha SOP 1739 for further information regarding IDC/DOC Generation.

13.2.1 Initial (IDC)

The analyst must make an initial, one-time, demonstration of the ability to generate acceptable accuracy and precision with this method, prior to the processing of any samples.

13.2.2 Continuing (DOC)

The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

Refer to Alpha's Chemical Hygiene Plan and Waste Management and Disposal SOP for further pollution prevention and waste management information.

15. Referenced Documents

Chemical Hygiene Plan

SOP/1732 DL/LOD/LOQ Generation

SOP/1739 IDC/DOC Generation

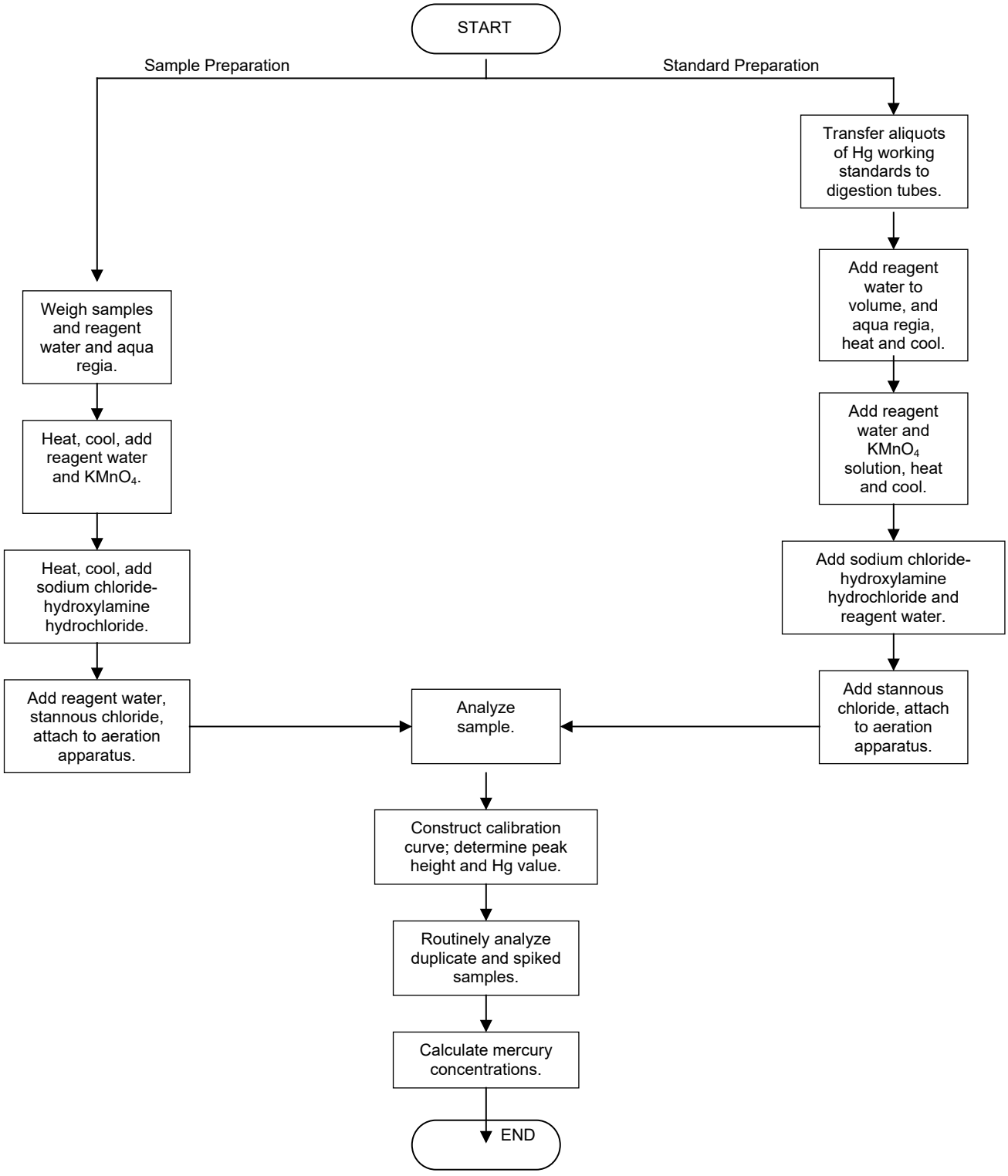
SOP/1797 Waste Management and Disposal SOP

16. Attachments

FIGURE 1: Flow Chart for Method 7471B

Figure 1

Method 7471B Flow Chart



Organochlorine Pesticides
By Capillary Column Gas Chromatography

Reference Method No.: **Method 8081B**

References: SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update IV, 2007.

Mass DEP CAM QC Requirements and Performance Standards for the Analysis of Chlorinated Pesticides by Gas Chromatography (GC), Revision 2, April 12, 2024.

SW-846 Pesticides by 8081, State of Connecticut Department of Environmental Protection Reasonable Confidence Protocol (RCP), Version 3.0, May 2024

1. Scope and Application

Method 8081B is used to determine the concentrations of various organochlorine pesticides in extracts from solid and liquid matrices. This SOP details the analysis for these compounds using fused-silica, open-tubular, capillary columns with electron capture detectors (ECD).

Matrices: Extracts from solid and liquid matrices.

Definitions: See Pace Analytical Quality Manual

Regulatory Parameter List: The compounds listed below are determined by this method:

Parameter	CAS
Aldrin	309-00-2
Alpha-BHC	319-84-6
Beta-BHC	319-85-7
Gamma-BHC (Lindane)	58-89-9
Delta-BHC	319-86-8
Alpha-chlordane	5103-71-9
Gamma-chlordane	5103-74-2
4,4'-DDD	72-54-8
4,4'-DDE	72-55-9
4,4'-DDT	50-29-3
Dieldrin	60-57-1
Endosulfan I	959-98-8
Endosulfan II	33213-65-9
Endosulfan Sulfate	1031-07-8
Endrin	72-20-8
Endrin Aldehyde	7421-93-4
Endrin Ketone	53494-70-5
Heptachlor	76-44-8
Heptachlor Epoxide	1024-57-3
Methoxychlor	72-43-5
Toxaphene	8001-35-2
Chlordane	57-74-9
Alachlor [+]	15972-60-8
Hexachlorobenzene [++]	118-74-1

[+] CT-RCP only compound [++] MCP/CT only compound

The data report packages present the documentation of any method modification related to the samples tested. Depending upon the nature of the modification and the extent of intended use, the laboratory may be required to demonstrate that the modifications will produce equivalent results for the matrix. Approval of all method modifications is by one of the following laboratory personnel before performing the modification: Area Supervisor, Laboratory Services Manager, Laboratory Director, or Quality Assurance Officer

This method is restricted to use by or under the supervision of analysts experienced in the operation of the gas chromatograph (GC) and in the interpretation of gas chromatograms. Each analyst must demonstrate the ability to generate acceptable results with this method by performing an initial demonstration of capability (see section 13), analyzing a proficiency test sample and completing the record of training.

After initial demonstration, ongoing demonstration is based on acceptable laboratory performance of at least a quarterly laboratory control sample or acceptable performance from an annual proficiency test sample. A major modification to this procedure requires demonstration of performance. The identification of major method modification requiring performance demonstration is directed by the QA Officer and/or Laboratory Director on a case-by-case basis.

2. Summary of Method

A measured volume or weight of sample (for liquids: 100mL, for solids: 15g) is extracted using the appropriate matrix-specific sample extraction technique.

Liquid samples are extracted at neutral pH with methylene chloride using Method 3510C (separatory funnel), or other appropriate technique.

Solid samples are extracted with methylene chloride: acetone (1:1) using Method 3540C (Soxhlet), Method 3546 (microwave extraction), or other appropriate technique.

Wipe samples are extracted with methylene chloride: acetone (1:1) using Method 3540C (Soxhlet) or other appropriate technique.

Oil samples are diluted with hexane following the procedure outlined in the extraction SOP.

After cleanup, the extract is analyzed by injecting a 1µL sample into a gas chromatograph equipped with narrow- or wide-bore fused silica capillary columns and electron capture (GC/ECD) detectors.

2.1 Method Modifications from Reference

None.

3. Reporting Limits

Table 1 lists our routine reporting limits.

4. Interferences

4.1 Only high purity gases are used in the GC system to eliminate this source of possible contamination. Both the hydrogen (carrier gas – 99.999%) and argon-methane (detector make-up gas) are certified by the gas supplier.

4.2 Preventive instrument maintenance is performed routinely, and whenever highly contaminated extracts are analyzed that could result in chromatographic interferences or result in degradation of system performance. Section 9.5 details the maintenance steps.

4.3 Glassware must be scrupulously cleaned. This procedure is detailed in the extraction SOPs. Store dry glassware in a clean environment.

4.4 All solvents used are pesticide grade or equivalent, and reagents are purchased as certified contaminant free. All of these materials are routinely determined to be free of interferences by analysis of extraction blanks with every extraction batch performed.

4.5 Certain compounds (i.e. phthalates) can be extracted from the sample matrix and be detected by the ECD that could possibly result in false positive results or complicate the data interpretation. The use of the cleanup procedures detailed in the extraction SOPs minimize these possible interferences. Analyst experience is also crucial in making compound determinations.

4.6 Interferences co-extracted from the samples will vary considerably from waste to waste. While general cleanup techniques are referenced or provided as part of the method, unique samples may require additional cleanup approaches to achieve desired degrees of discrimination and quantitation.

4.7 Interferences by phthalate esters introduced during sample preparation can pose a major problem in pesticide determinations.

4.7.1 Common flexible plastics contain varying amounts of phthalate esters which are easily extracted or leached from such materials during laboratory operations.

4.7.2 Cross-contamination of clean glassware routinely occurs when plastics are handled during extraction steps, especially when solvent-wetted surfaces are handled.

4.7.3 Interferences from phthalate esters are minimized by avoiding contact with any plastic materials and checking all solvents and reagents for phthalate contamination.

4.8 The presence of elemental sulfur will result in broad peaks that interfere with the detection of early-eluting organochlorine pesticides. Sulfur contamination is often seen in sediment and some soil samples.

4.9 Other halogenated pesticides or industrial chemicals may interfere with the analysis of pesticides. Coeluting chlorophenols are eliminated by using Method 3620B (Florisil).

5. Health and Safety

The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of material data handling sheets is available to all personnel involved in the chemical analysis. The following analytes covered by this method have been tentatively classified as known or suspected human or mammalian carcinogens: 4,4'-DDT, 4,4'-

DDD, and BHCs. Additional references to laboratory safety are available in the Chemical Hygiene Plan.

All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

5.1 Lab coats, safety glasses, and gloves must be worn when handling samples, extracts, standards or solvents.

5.2 All solvent and extract transfers must be handled in the vented bench area in the GC laboratory.

5.3 All stock standards, working standards, and vialed sample extracts must be placed into the waste bucket in the lab, for future disposal by the Hazardous Waste Manager. The container must be labeled properly with hazard warning labels indicating the container contents.

5.4 Bottles containing flammable solvents must be stored in the flammables cabinet.

6. Sample Collection, Preservation, Shipping and Handling

6.1 Sample Collection

Aqueous samples are collected in either two 500 ml amber glass jars or two 1L amber glass jars with teflon-lined lids. Solid samples are collected in one 250 mL wide-mouth glass jar with a teflon-lined lid. All containers are purchased pre-cleaned and certified from commercial vendors.

6.2 Sample Preservation

Both aqueous and solid samples are then preserved by packing in coolers with ice or ice packs, to maintain a temperature of 4 ± 2^{o} C. Upon receipt at the laboratory, the samples are transferred into sample storage refrigerators to maintain at a temperature of 4 ± 2^{o} C.

6.3 Sample Shipping

No special shipping requirements.

6.4 Sample Handling

Aqueous samples must be extracted within 7 days of sample collection, solid samples within 14 days of collection. Once extracted, the samples must be analyzed within 40 days of the extraction date.

7. Equipment and Supplies

7.1 Gas Chromatograph, Hewlett Packard 6890 (or equivalent): An analytical system completes with gas chromatograph configured for split-splitless injection and all required accessories including syringes, analytical columns, gases, electron capture detectors (ECD), and data system.

7.1.1 Data System: A computer system is interfaced to the GC for collection of data. Data acquisition is performed using Agilent Technologies GC ChemStation (Rev. A.10.02 [1757]).

7.2 GC Columns: Pace utilizes dual-column analyses. The dual-column approach involves either a single injection that is split between two columns that are mounted in a single gas chromatograph, or dual injections of the split extract on a single GC equipped with two

columns. Typical column pairs used are listed below. Other columns may be used as long as method performance criteria can be met.

7.2.1 Column pair 1

30m x 0.32mm ID fused silica capillary column (RTX-clpesticide), 0.32µm film thickness.

30m x 0.32mm ID fused silica capillary column (RTX-clpesticideII) 0.25µm film thickness.

7.2.2 Column pair 2

30m x 0.32mm ID fused silica capillary column (STX-clpesticide), 0.32µm film thickness.

30m x 0.32mm ID fused silica capillary column (STX-clpesticideII) 0.25µm film thickness.

7.3 Guard Column: Cat. #10027 from Restek or equivalent: 5m, 0.32mm

7.4 Gooseneck splitless injection liner: Cat. #23303 from Restek or equivalent

7.5 Universal "Y" Press-tight tee split: Cat. #20406 from Restek or equivalent **/ Siltek MXT Connector:**

7.6 Class "A" Volumetric Flasks: 10mL, 25mL, 50mL, 100mL, 200mL, and 2000mL, for the preparation of standards.

7.7 Microsyringes/Wiretrol syringes: 10 µL – 1000 µL

7.8 Disposable Borosilicate Pipets

7.9 Vials: 2 mL clear glass, crimp-top and screw-cap.

8. Reagents and Standards

Reagent grade or pesticide grade chemicals are used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficient high purity to permit its use without lessening the accuracy of the determination.

NOTE: Store the standard solutions (stock, composite, calibration, internal, and surrogate) at 4 ± 2°C in Teflon(R)-sealed containers in the dark. When a lot of standards is prepared, aliquots of that lot are stored in individual small vials. All stock standard solutions must be replaced after one year or sooner if routine QC tests indicate a problem. All other standard solutions must be replaced after six months or sooner if routine QC indicates a problem.

8.1 n-Hexane: Pesticide quality or equivalent.

8.2 Acetone: Pesticide quality or equivalent.

8.3 Methylene chloride: Pesticide quality or equivalent.

8.4 Organic-free Reagent Water: All references to water in this method refer to organic-free reagent water from Alpha's RO water treatment system.

8.5 Stock Standard Solutions: All stock standard solutions are purchased from commercial vendors as ampulated certified solutions. When an ampulated stock solution is opened, it is transferred to a labeled amber screw-cap vial. The expiration date of the stock solution is either the vendor specified expiration date, or 6 months from the date the ampule was opened, whichever is sooner. Typical stock standard concentrations are listed in Table 2.

8.6 Calibration Standards: Calibration standards are prepared volumetrically by diluting the appropriate stock standard(s) with hexane. Calibration standards expire 6 months from the date of preparation, or on the earliest expiration date of any of the stock solutions used to prepare the calibration standard. Calibrations are typically performed at 11 concentration levels for individual pesticides, Chlordane and Toxaphene; concentrations for all levels are listed in Table 2. Below are suggested procedures for preparation of individual pesticides (Sec. 8.6.1), Chlordane (Sec. 8.6.2), and Toxaphene (Sec. 8.6.3) initial calibration standards.

8.6.1 Preparation of individual pesticides initial calibration standards;

(syringes needed: *100µL [A], 500µL [B], 1000µL [C]*)
(solvent: *Hexane)*
(glassware: *9x10mL, 2x25mL, 1x50mL, 2x100mL, volumetric flasks*)

ICAL (Initial Calibration) STOCK #1: *2000µg/L; 25mL*
50µL[A] of AccuStandard M-8081-SC (Pesticides mix; 1000µg/mL)
250µL[B] of AccuStandard CLP-032-R (TCMX, Deca; 200µg/mL)
500µL[B] of AccuStandard P-102S (Alachlor; 100µg/mL)
500µL[B] of AccuStandard APP-9-112 (Hexachlorobenzene; 100µg/mL)

ICAL STOCK #2 (=LEVEL 10)**:** *200µg/L; 25mL.*
2500µL[B] of STOCK #1
…..

LEVEL 1, 0.5 µg/L:	25µL[A] of ICAL STOCK #2, 10mL
LEVEL 2, 1.0 µg/L:	50µL[A] of ICAL STOCK #2, 10mL
LEVEL 3, 2.0 µg/L:	100µL[A] of ICAL STOCK #2, 10mL
LEVEL 4, 3.0 µg/L:	150µL[B] of ICAL STOCK #2, 10mL
LEVEL 5, 4.0 µg/L:	200µL[B] of ICAL STOCK #2, 10mL
LEVEL 6, 5.0 µg/L:	250µL[B] of ICAL STOCK #2, 10mL
LEVEL 7, 10 µg/L:	500µL[B] of ICAL STOCK #2, 10mL
LEVEL 8, 50 µg/L:	2500µL[C] of ICAL STOCK #2, 10mL
LEVEL 9, 100 µg/L:	5000µL[C] of ICAL STOCK #2, 10mL
LEVEL 10, 200 µg/L:	2500µL[C] of ICAL STOCK #1, 25mL
LEVEL 11, 400 µg/L:	2000µL[C] of ICAL STOCK #1, 10mL

ICV (Initial Calibration Verification) STOCK #1: *2000µg/L; 100mL*
1000µL[C] of Restek 579104 (Custom Pesticides Mix; 200µg/mL)

ICV STOCK #2: *1000µg/L; 50mL*
250µL[B] of Agilent ISM-320-1 (TCMX, Deca; 200µg/mL)
…..

ICV, 50 µg/L:	2500µL[C] of ICV STOCK #1 with 5000µL[C] of ICV STOCK #2, 100mL

8.6.2 Preparation of Chlordane initial calibration standards:

(syringes needed: *100μL [A], 500μL [B], 1000μL [C]*)
(solvent: *Hexane)*
(glassware: *11x10mL, 1x25mL, 1x50mL, volumetric flasks*)

ICAL STOCK #1: *50μg/mL (Chlordane);10mL*
100μL[A] of Agilent EPA-1086-1 (Chlordane Standard; 5000μg/mL)

ICAL STOCK #2 (=LEVEL 9)**:** *2000μg/L; 25mL.*
1000μL[C] of STOCK #1

LEVEL 1, 2μg/L:	10μL[A] of ICAL STOCK #2, 10mL
LEVEL 2, 5μg/L:	25μL[A] of ICAL STOCK #2, 10mL
LEVEL 3, 10μg/L:	50μL[A] of ICAL STOCK #2, 10mL
LEVEL 4, 20μg/L:	100μL[A] of ICAL STOCK #2, 10mL
LEVEL 5, 100μg/L:	500μL[B] of ICAL STOCK #2, 10mL
LEVEL 6, 250μg/L:	1250μL[B] of ICAL STOCK #2, 10mL
LEVEL 7, 500μg/L:	2500μL[C] of ICAL STOCK #2, 10mL
LEVEL 8, 1000μg/L:	5000μL[C] of ICAL STOCK #2, 10mL
LEVEL 9, 2000μg/L:	1000μL[C] of ICAL STOCK #1, 25mL
LEVEL 10, 5000μg/L:	1000μL[C] of ICAL STOCK #1, 10mL

ICV STOCK: *50μg/mL; 10mL*
500μL[B] of Restek 32021 (Chlordane Standard; 1000μg/mL)
…..
ICV, 1000μg/L: 1000μL[C] of ICV STOCK, 50mL

8.6.3 Preparation of Toxaphene initial calibration standards;

(syringes needed: *100μL [A], 500μL [B], 1000μL [C]*)
(solvent: *Hexane)*
(glassware: *11x10mL, 1x50mL, volumetric flasks*)

ICAL STOCK #1: *100μg/mL (Toxaphene);10mL*
1000μL[C] of Absolute Standards 20021 (Toxaphene; 1000μg/mL)

ICAL STOCK #2 (=LEVEL 8)**:** *2000μg/L; 10mL.*
200μL[A] of STOCK #1

LEVEL 1, 5 μg/L:	25μL[A] of ICAL STOCK #2, 10mL
LEVEL 2, 10 μg/L:	50μL[A] of ICAL STOCK #2, 10mL
LEVEL 3, 20 μg/L:	100μL[A] of ICAL STOCK #2, 10mL
LEVEL 4, 100 μg/L:	500μL[B] of ICAL STOCK #2, 10mL
LEVEL 5, 200 μg/L:	1000μL[C] of ICAL STOCK #2, 10mL
LEVEL 6, 500 μg/L:	50μL[A] of ICAL STOCK #1, 10mL
LEVEL 7, 1000 μg/L:	100μL[A] of ICAL STOCK #1, 10mL
LEVEL 8, 2000 μg/L:	200μL[B] of ICAL STOCK #1, 10mL
LEVEL 9, 5000 μg/L:	500μL[B] of ICAL STOCK #1, 10mL
LEVEL 10, 10000 μg/L:	1000μL[C] of ICAL STOCK #1, 10mL

ICV: *2000µg/L; 50mL*
1000µL[C] of Agilent PP-271-1 (Toxaphene Standard; 100µg/mL)

8.7 Internal Standard Solution: 1-Bromo-2-nitrobenzene is used as the internal standard and is added to all single-component calibration standards and sample extracts to achieve a concentration of 0.25 µg/mL. Standard solution expires 6 months after the date of preparation. Below are suggested procedures for preparation of PCB Internal Standard which is diluted to prepare Pesticides Internal Standard.

8.7.1 Preparation of Internal Standard solution:

(syringe needed: *1000µL [A]*)
(solvent: *Hexane)*
(glassware: *2x200mL, volumetric flasks*)

PCB INTERNAL STANDARD: *25µg/mL; 200mL*
1000µL[A] of Agilent PPS-351-1 (1-Bromo-2-nitrobenzene Standard; 5000µg/mL)

PESTICIDES INTERNAL STANDARD: *2.5µg/mL; 200mL*
20mL[A] of PCB INTERNAL STANDARD

8.8 PEM/DEG Solution: is prepared volumetrically by diluting stock standard in Hexane. Solution expires 6 months from the date of preparation, or on the earliest expiration date of any of the stock solution used to prepare the standard.

- 5mL of Pesticides Deg. Check Solution, Ultra. #ISM-450-1 into 100mL of Hexane

8.9 Surrogate Standards: Tetrachloro-m-xylene and decachlorobiphenyl are used as surrogates. They are added to the calibration standards at the concentrations listed in Table 2, and are spiked into all samples and QC samples prior to extraction. The spiking solution is prepared in acetone at the concentrations listed in Table 2. Standard expires 6 months after the date of preparation. Below are suggested procedures for preparation of surrogate standard.

8.9.1 Preparation of surrogate standard:

(syringe needed: *1000µL [A]*)
(solvent: *Acetone)*
(glassware: *1x2000mL, volumetric flasks*)

- **EXTRACTION SURROGATES:** *2000µg/L; 2000mL*
  20mL[A] of AccuStandard CLP-032-R (Deca. & TCMX; 0.2mg/mL)
- **ICV Surrogate Stock:** is prepared by diluting of 250µL of Pesticides Surrogate Standard (Ultra, Cat. #CS-1947) to 50mL of Hexane to achieve concentration of TCMX and DCB at 1.0µg/mL.

8.10 LCS/MS Spiking Solutions: The LCS/MS spiking solutions are prepared volumetrically by diluting the appropriate stock standards in acetone. The spiking solution concentrations are listed in Table 2. Spiking solution expires 6 months after the date of

preparation. Below are suggested procedures for preparation of individual pesticides, Chlordane, and Toxaphene spiking solutions.

8.10.1 Preparation of spiking solutions:

(syringes needed: *250μL [A], 1000μL [B]*)
(solvent: *Acetone)*
(glassware: *1x25mL, 1x50mL, 1x200mL, volumetric flasks*)

INDIVIDUAL PESTICIDES SPIKE: *2000μg/L; 200mL*
2000μL[B] of Restek 579104 (Custom Pesticides Mix; 200μg/mL)

CHLORDANE SPIKE: *25μg/mL; 50mL*
250μL[A] of Agilent EPA-1086-1 (Chlordane Standard; 5000μg/mL)

TOXAPHENE SPIKE: *25μg/mL; 25mL*
625μL[A] of Absolute Standards 20021 (Toxaphene; 1000μg/mL)

9. Quality Control

The laboratory must maintain records to document the quality of data that is generated. Ongoing data quality checks are compared with established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

9.1 Blank(s)

Extraction blanks are performed with each extraction batch of 20 or less samples, according to the extraction SOPs. The extraction blank must not contain any of the reportable analytes above the reporting limit. If any reportable analytes are detected in the blank, the entire extraction batch is suspect and re-extraction of all associated samples is required. Actions associated with blank failures are listed in Table 5.

9.2 Laboratory Control Sample (LCS)

A Laboratory Control Sample (LCS) is extracted with each analytical batch. The LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume. The LCS is spiked with single component pesticide analytes. The concentration of the spiking solution is listed in Table 2. The recovery acceptance criteria are listed in Table 3. If any recovery criteria are not met, the extract should be reanalyzed. If the criteria are still not met, the entire batch should be re-extracted. If this is not possible, due to insufficient sample or holding time exceedance, the analyst must write up the failure on a narrative sheet for inclusion in the client report. Actions associated with LCS/LCSD failures are listed in Table 5.

9.2.1 LCS Duplicate (LCSD)

A Laboratory Control Sample Duplicate is extracted with each analytical batch. The LCSD consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume. The LCSD is spiked with the single component pesticide analytes. The concentration of the spiking solution is listed in Table 2. The recovery acceptance criteria are listed in Table 3. If Recovery limits are outside acceptance criteria, the non-conformance is narrated.

9.2.2 Connecticut RCP/MCP/NJ LCS Requirements

For CT- Reasonable Confidence Protocol (RCP) 8081B samples, Massachusetts Contingency Plan (MCP) samples, and samples with a state of origin of New Jersey, the LCS recovery criteria is 40 – 140%. MCP allows for up to 10% of reported spike compounds to fail in the LCS/LCSD and still report.

9.3 Initial Calibration Verification (ICV)

Refer to Section 10.2.

9.4 Continuing Calibration Verification (CCV)

Refer to Section 10.4

9.5 Matrix Spike

A matrix spike (MS)/matrix spike duplicate (MSD) is extracted and analyzed upon Client request for each batch of 20 or less samples. MS and MSDs are field samples spiked with a known quantity of the target analyte(s). They are prepared by taking additional sample aliquots of the same weight or volume and adding the appropriate amounts of surrogate and spiking solutions. The spike compounds and levels are listed in Table 2. The recovery acceptance criteria are 30-150%. If the recovery criteria are not met, but are met in the LCS, the failure may be attributed to sample matrix effects. Actions associated with MS/MSD failures are listed in Table 5.

9.6 Laboratory Duplicate (DUP)

A duplicate sample is extracted and analyzed upon Client request for each batch of 20 or less samples. Duplicates are laboratory selected replicate samples, prepared by taking an additional sample aliquot of the same weight or volume of a sample. The % RPD criteria are listed in Table 3. If the %RPD is not met, the failure may be attributed to sample matrix effects. Actions associated with duplicate failures are listed in Table 5.

For samples with a state of origin of New Jersey, a MS and MSD/DUP must be extracted for every twenty samples within a 24hr period.

9.7 Surrogates:

All extracted samples and associated QC are spiked with surrogates at the levels listed in Table 2. The laboratory must evaluate surrogate recovery data from individual samples and QC samples versus the surrogate control limits listed in Table 3. If the surrogate limits are not met, the extract should be reanalyzed to determine if the failure was due to an instrument problem. If the criteria are still not met, the affected samples should be re-extracted to confirm that the failure was due to sample matrix. If matrix effect is confirmed, this must be noted on a narrative sheet for inclusion in the client report.

9.8 Method Sequence

<u>Typical Initial Calibration</u> (each level to identify the standard lot number)

1. Instrument Blank (may be omitted to conserve tray space)
2. Degradation check standard
3. Std Level 1

4. Std Level 2
5. Std Level 3
6. Std Level 4
7. Std Level 5
8. Std Level 6
9. Std Level 7
10. Std Level 8
11. Std Level 9
12. Std Level 10
13. Std Level 11 (Individual Pesticides only)
14. Initial Calibration Verification Standard (ICV)
15. Repeat std Levels 1 –10 for other mixes until curve is complete.

    [**NOTE:** If multiple calibration mixtures are analyzed, it is acceptable to analyze appropriate ICVs after all calibration standards have been injected.]

Typical Daily sequence (each standard must be identified with lot number)

1. Degradation Check Standard
2. Pesticide Continuing Calibration Standard
3. Chlordane Continuing Calibration Standard
4. Toxaphene Continuing Calibration Standard
5. Extraction Blank
6. Laboratory Control Sample
7. Laboratory Control Sample Duplicate
8. Matrix Spike (Upon Client Request)
9. Duplicate/Matrix Spike Duplicate (Upon Client Request)
10. Samples (up to **20 field samples may be analyzed**)
11. Cal check
12. Repeat 1 – 10 (as needed)

10. Procedure

10.1 Equipment Set-up

10.1.1 Sample Extraction

Water samples are extracted at a neutral pH with methylene chloride using a separatory funnel (Method 3510C). See extraction SOP for details.

Solid samples are extracted with methylene chloride: acetone (1:1) using Soxhlet extraction (Method 3540C) or microwave extraction (Method 3546). See extraction SOP for details.

10.1.2 Extract Cleanup

Cleanup procedures may not be necessary for a relatively clean sample matrix, but most extracts from environmental and waste samples will require additional preparation before analysis. The specific cleanup procedure used will depend on the nature of the sample to be analyzed and the data quality objectives for the measurements. See extraction SOPs for details.

10.1.3 GC Conditions:

The dual-column / dual-detector approach involves the use of the columns listed in section 7.2. The columns are connected to an injection tee or dual injection GC, and separate electron capture detectors. Typical GC conditions for the HP 6890 instruments are listed below but may be altered as long as method performance criteria are met.

Temperature 1:	120 °C
Time 1:	0 minute
Ramp 1:	45 °C/minute
Temperature 2	200 °C
Time 2:	0 minutes
Ramp 2:	15 ° C/minute
Temperature 3:	230 °C
Time 3:	0 minutes
Injector temperature:	250 °C
Ramp 3:	30 °C/minute
Final Temperature:	330 °C
Final Time:	2.0 minutes

Injector mode:	Pulsed Split
	4:1 split
Injector Flow:	20 mL/min split flow
Detector temperature:	350 °C
Carrier gas:	Hydrogen
Carrier flow:	28 mL/min
Carrier mode:	Constant flow
Makeup gas:	Nitrogen
Total detector flow:	60 mL/min
Injection volume:	1 µL

10.1.4 DDT and Endrin Breakdown

The breakdown of DDT and Endrin must be measured before samples are analyzed and at the beginning of each 12-hour shift. Injector maintenance must be completed if the breakdown is greater than 15% for either compound (See Section 10.5.1). Both analytical columns must pass DDT/Endrin breakdown criteria prior to sample analysis.

10.2 Initial Calibration

10.2.1 Prepare calibration standards using the procedures in Section 8.6 and the concentrations listed in Table 2. The calibration standards are aliquoted into autosampler vials and capped prior to loading onto the autosampler tray.

10.2.2 Single point calibration might be employed for analysis of the multi-component analytes (Chlordane, Toxaphene). A single calibration standard near the mid-point of the expected

calibration range of each multi-component analyte is included with the initial calibration of the single component analytes for pattern recognition, so that the analyst is familiar with the patterns and retention times on each column. The calibration standard may be at a lower concentration than the mid-point of the expected range, if appropriate for the project.

10.2.3 Establish the GC operating conditions by loading the appropriate GC method. Typical instrument conditions are listed in section 10.1.3. The same operating conditions are used for calibrations and sample analyses. Create the analytical sequence using the Agilent Chemstation data acquisition software.

10.2.3.1 Record the calibration standard, unique lab identifier code (lot), the analytical sequence list.

10.2.4 A 1µL injection volume of each calibration standard is used. Other injection volumes may be employed, provided that the analyst can demonstrate adequate sensitivity for the compounds of interest. The same injection volume must be used for all standards and samples.

10.2.5 Because of the low concentration of pesticide standards injected on a GC/ECD, column adsorption may be a problem when the GC has not been used for a day or more or after system maintenance. The GC column may be primed (or deactivated) by injecting a pesticide standard mixture approximately 20 times more concentrated than the mid-concentration standard. Inject this standard mixture prior to beginning the initial calibration or calibration verification.

Alternately, the system may be primed by baking at the final analytical temperature for approximately 30 minutes.

Several analytes may be observed in the injection just following system priming. Always run an instrument blank after system priming.

10.2.6 Calibration Factors

10.2.6.1 Internal Standard Procedure

Internal standard calibration techniques are employed in this method. In each standard, calculate the response factor (RF) for each analyte, the average RF, and the relative standard deviation (RSD) of the RFs, using the Enviroquant data processing software. The calculations are performed automatically, using the formulae listed in Pace's Quality Manual.

10.2.7 Initial Calibration Criteria

- If the **RSD for an analyte is < 20%,** then the response of the instrument for this compound is considered linear over the range and the mean calibration factor can be used to quantitate sample results.

- If the **RSD for any analyte is > 20%,** then linearity through the origin cannot be assumed. The mean response factor cannot be used for quantitation. An

alternative calculation may be done using **linear regression or quadratic regression** as long as the correlation coefficient is >0.990. If both quantitation methods fail criteria for any compound in the initial calibration, then the system must be reevaluated, and a new calibration curve must be analyzed. If quadratic regression is used for calibration, this must be noted in the laboratory narrative (MCP/RCP-CT only).

- **Percent Relative Error (%RE):** For linear and quadratic fit compounds, the %RE must be calculated for the standard at or near the midpoint and at the lowest level of the initial calibration. The %RE between the calculated and expected concentration of an analyte must be ≤ 30%, otherwise recalibration is necessary.

- **Chlordane/Toxaphene peaks requirements**:

Analyte	Number of Peaks
Chlordane	3-5
Toxaphene	4-6

- **The minimum number of calibration standards based on the type of calibration curve is listed below**:

Type of Calibration Curve	Minimum Number of Calibration Standards
Linear Fit/Avg Response	5
Quadratic Fit	6

- **Removal and replacement of the calibration standards:**

    - The Analyst may remove individual analyte from the lowest (cannot remove RL level) and or the highest calibration levels of the curve. Removal of the individual analyte of interior levels is not permitted.

    - The Analyst may remove an entire single standard calibration level from the interior of the calibration curve when the instrument response demonstrates that the standard was not properly introduced to the instrument, or an incorrect standard was analyzed. The Analyst who chooses to remove a calibration standard from the interior of the calibration shall remove that particular standard calibration level for all analytes.

    - The Analyst may replace a calibration standard provided that:

        - the replacement standard will be analyzed within **twenty-four (24) hours** of the original calibration standard analysis for that particular calibration level;

- all analytes of the replacement calibration standard must be replaced if a standard within the interior of the calibration is replaced;

- the laboratory limits the replacement of calibration standards to one calibration standard concentration.

10.2.8 Retention Time Windows

10.2.8.1 The retention time windows used for the identification of target analytes are calculated using the procedure recommended in Method 8000 and were found to be ± 0.015 minutes.

10.2.8.2 The windows listed above are used as guidance; however, the experience of the analyst weighs heavily in the interpretation of the chromatograms. For example, it has been observed that certain oil matrices can cause the retention times to shift more dramatically. Additionally, if any positive results are questionable and at sufficiently high concentration, GC/MS analysis is used for confirmation.

10.2.9 Initial Calibration Verification

An **Initial Calibration Verification** standard must be run immediately after each initial calibration, near the midpoint of the curve. This standard must be prepared using a second source that is different than the source used for the initial calibration. The **%D** for each analyte to be quantitated must not exceed a **± 20%** difference when compared to the initial calibration curve.

If recovery is outside the 80-120% criteria, the following steps should be taken:

- Analyze the replacement standard. The cause of the failure of the first calibration verification result should be documented.
- If the reanalysis still didn't achieve the criteria, the source of the problem must be investigated, and the instrument must be recalibrated.

10.3 Equipment Operation and Sample Processing

10.3.1 The same GC operating conditions used for the initial calibration must be employed for sample analyses, including sample injection volume (Section 10.1.3).

10.3.2 Tentative identification of an analyte occurs when a peak from a sample extract falls within the retention time window for the compound. Each tentative identification is confirmed using a second GC column of dissimilar stationary phase. Confirmation is positive when the %RPD is $\leq$ 40% from the results of the two columns. In particularly difficult matrices, confirmation by GC/MS may be advisable (see Section 10.3.11).

10.3.3 The concentration reported for an identified target analyte in an extract is calculated using the Enviroquant data processing software. The Enviroquant methods have been configured to utilize the quantitation formulas found in Quality Manual. Proper quantitation requires the appropriate selection of a baseline from which the peak area or height can be determined. See the Manual Integration SOP for integration guidelines.

10.3.3.1 If the responses exceed the calibration range of the system, dilute the extract and reanalyze.

10.3.4 Each sample analysis must begin with an acceptable initial calibration, breakdown standard (PEM) calibration verification standard(s) (each **12-hour analytical shift**), or calibration standards interspersed within the samples.

The **Internal Standard area of the samples must be within 50%-200% of the starting CCV.** When a calibration verification standard fails to meet the QC criteria, all samples that were injected after the last standard that last met the QC criteria must be re-injected.

10.3.5 Sample injections may continue as long as the calibration verification standards and standards interspersed with the samples meet instrument QC requirements. The sequence ends when the set of samples has been injected or when qualitative and/or quantitative QC criteria are exceeded.

10.3.6 Use the calibration standards analyzed during the sequence to evaluate retention time stability. The retention time windows are established using the absolute retention time of each analyte in the mid-concentration standard during the initial calibration as the mid-point of the window. The widths of the windows are defined in Section 10.2.7.

10.3.7 Each subsequent injection of a standard during the 12-hour analytical shift (i.e., those standards injected every 20 field samples, or more frequently) must be checked against the retention time windows. If any of these subsequent standards fall outside their absolute retention time windows, the GC system is out of control. Determine the cause of the problem and correct it. If the problem cannot be corrected, a new initial calibration must be performed.

10.3.8 Identification of mixtures (i.e. Chlordane and Toxaphene) is based on the characteristic 'fingerprint' retention time and shape of the indicator peak(s); and quantitation is based on the area under the characteristic peaks as compared to the area under the corresponding calibration peaks(s) of the same retention time and shape generated using internal calibration procedures.

10.3.9 If compound identification or quantitation is precluded due to interference (e.g., broad, rounded peaks or ill-defined baselines are present) cleanup of the extract may be needed. If instrument problems are suspected, rerun the extract on another instrument to determine if the problem results from analytical hardware or the sample matrix. Refer to the extraction SOPs for the procedures to be followed in sample cleanup.

10.3.10 For secondary column analysis, a second dissimilar column is utilized to confirm positive pesticide results. The laboratory must report the **higher of the two results** unless obvious interference is present on one of the columns. All required QA/QC parameters (e.g. calibrations, LCSs, etc.) must be met on the second column as well.

10.3.10.1 The **Relative Percent Difference (RPD)** should be 40 or lower. If the RPD exceeds 40, this will be denoted with a P flag. If the RPD exceedance is due to interference, the lower of the dual column values can be reported with I and P flags.

10.3.11 GC/MS Confirmation

GC/MS confirmation may be used in conjunction with either single-column or dual-column analysis if the concentration is sufficient for detection by GC/MS.

10.3.11.1 Full-scan GC/MS will normally require a concentration of approximately 10ng/µL in the final extract for each single-component compound.

10.3.11.2 The GC/MS must be calibrated for the specific target pesticides when it is used for quantitative analysis.

10.3.11.3 GC/MS may not be used for confirmation when concentrations are below the sensitivity of the instrument.

10.3.11.4 GC/MS confirmation should be accomplished by analyzing the same extract that is used for GC/ECD analysis.

10.3.11.5 The base/neutral/acid extract and the associated blank may be used for GC/MS confirmation if the surrogates and internal standards do not interfere and if it is demonstrated that the analyte is stable during acid/base partitioning. However, if the compounds are not detected in the base/neutral/acid extract, then GC/MS analysis of the pesticide extract should be performed.

10.3.11.6 A QC reference sample containing the compound should also be analyzed by GC/MS. The concentration of the QC reference sample must demonstrate that those pesticides identified by GC/ECD can be confirmed by GC/MS.

10.4 Continuing Calibration Verification

10.4.1 Verify calibration each 12-hour shift by injecting calibration verification standards (CCV) prior to conducting any sample analyses. A calibration standard must be injected at intervals of not less than once every twenty field samples.

10.4.1.1 The calibration factor (for external standard compounds) and response factor (for internal standard compounds) for each analyte to be quantitated must not exceed a **± 20%** difference when compared to the initial calibration curve. The Enviroquant data processing software automatically calculates the %D for all analytes according to the formulae in Quality Manual. **The Internal Standard area of the CCV must be within 50%-150%** of the Initial Calibration Internal Standard area.

10.4.1.2 If this criterion is exceeded, inspect the gas chromatographic system to determine the cause and perform whatever maintenance is necessary before verifying calibration and proceeding with sample analysis.

10.4.1.3 If routine maintenance does not return the instrument performance to meet the QC requirements (Section 10) based on the last initial calibration, then a new initial calibration must be performed. Due to the large number of analytes present, allowances may be made for a CF or RF that drifts out high, as long as there are no positive hits for that particular analyte in any of the associated samples. Any QC failures must be written up by the analyst on narrative sheets for inclusion with the sample data.

10.4.2 Compare the retention time of each analyte in the calibration standard with the absolute retention time windows described in section 10.2.7. The center of the absolute retention time window for each analyte is its retention time in the mid-concentration standard analyzed during the initial calibration. Each analyte in each standard must fall within its respective retention time window. If not, the gas chromatographic system must either be adjusted so that a second analysis of the standard does result in all analytes falling

within their retention time windows, or a new initial calibration must be performed and new retention time windows established.

10.5 Internal Standard

The use of internal standard calibration does not require that all sample results be bracketed with CCV standard. However, when internal standard calibration is used, the retention times of internal standards and the area response of internal standards should be checked for each analysis.

10.5.1 **IS in CCAL** – The measured area of the internal standard must be no more than ± 50% different from the average area calculated during initial calibration (-50 to 150%).

10.5.2 **IS in samples** - The measured area of the internal standard must be no more than -50% to +100% different from the area calculated from opening CCV (-50 to 200%)

Retention time shifts of more than 30 seconds from the retention time of the most recent calibration standard are cause for concern and must be investigated.

10.6 Preventive Maintenance

Routine preventive maintenance should be performed to maintain GC system performance. This includes periodic replacement of injector septa, replacement of injector liner(s), and replacement of injector seals.

10.6.1 Other Maintenance

Additional maintenance may be required if system performance degrades.

10.6.1.1.1 GC injector ports are of critical concern, especially in the analysis of DDT and Endrin.

10.6.1.1.1.1 Injectors that are contaminated or chemically active can cause the degradation (“breakdown”) of the analytes. Endrin and DDT breakdown to Endrin aldehyde, Endrin ketone, DDD, or DDE.

Check for degradation problems by injecting a standard containing only 4,4’-DDT and Endrin. The presence of 4,4’-DDE, 4,4’-DDD, Endrin ketone or Endrin indicates breakdown. If degradation of either DDT or Endrin exceeds 15%, take corrective action before proceeding with calibration.

When such a breakdown is observed, replacement of the injector liner and seal may solve the problem. If not, clip approximately 3 – 6 inches from the injector end of the GC column. If the degradation does not improve, it may be necessary to replace the column(s).

Calculate percent breakdown as follows:

$$\%\ breakdown\ of\ DDT = \frac{sum\ of\ degradation\ peak\ areas\ (DDE + DDD)}{sum\ of\ all\ peak\ areas\ (DDT + DDE + DDD)} * 100$$

$$\%\ breakdown\ of\ Endrin = \frac{sum\ of\ degradation\ peak\ areas\ (Aldehyde + Ketone)}{sum\ of\ all\ peak\ areas\ (Endrin + Aldehyde + Ketone)} * 100$$

10.6.1.1.2 ECD detectors may also become contaminated, requiring bake out at elevated temperatures, or repair by the manufacturer.

11. Data Evaluation, Calculations and Reporting

11.1 Quantitation of Single Component Pesticides

The single component pesticide compounds are calculated as described in Section 10.3.3 and reported in µg/L or µg/Kg units. After performing technical data review, validating that all QC criteria have been met and confirming all positive hits, the data report is sent electronically to the LIMS computer for generation of the client report. There are two levels of review of the data in the LIMS system prior to release of data. These reviews should be done by two separate individuals.

11.1.1 Quantitation of Multiple-Component Analytes

Quantitation is based on use of 3-5 of the major peaks present for chlordane and 4-6 of the major peaks present for Toxaphene. Each of these peaks is individually calibrated with a 10-point calibration based on average response factors. The %RSD must meet the criteria of ≤20%. The 3 to 5 or 4 – 6 major peaks are calculated as described in Section 10.3.3. After individual calculation meets criteria, the average of the major 3-5 or 4 – 6 peaks is used to determine the final concentration.

11.1.1.1 Toxaphene

Toxaphene is quantitated by the internal standard method, using the 4 – 6 largest peaks found in the standard and averaging the resulting concentrations.

11.1.1.2 Chlordane

Chlordane is a mixture of at least 11 major components and 30 or more minor components. Trans- and cis-Chlordane (alpha and gamma, respectively), are the two major components of Chlordane. However, the exact percentage of each in the chlordane material is not completely defined and is not consistent from batch to batch.

11.1.1.2.1 The GC pattern of a Chlordane residue may differ considerably from that of the chlordane standard. Depending on the sample substrate and its history, residues of Chlordane can consist of almost any combination of constituents from the Chlordane, plant and/or animal metabolites, and products of degradation caused by exposure to environmental factors such as water and sunlight.

11.1.1.2.2 Whenever possible, when Chlordane residue does not resemble Chlordane, the analyst should quantitate the peaks of alpha-Chlordane, gamma-

Chlordane, Heptachlor, and trans-Nonachlor separately against the appropriate reference materials, and report the individual residues.

11.1.1.2.3 When the GC pattern of the residue resembles that of Chlordane, the analyst may quantitate Chlordane residues by comparing the total area of the Chlordane chromatogram using the 3-5 major peaks.

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

Holding time exceedance and/or improper preservation are noted on the nonconformance report form.

All non-conformances, sample preparatory extraction methods and clean-up methods must be addressed in a case narrative and included in the data report.

Perform instrument maintenance as described throughout this SOP as needed when instrument calibration criteria are not met. Record all maintenance in the instrument logbook.

All batch and sample specific QC criteria outlined in Section 10 are evaluated by the analyst prior to approval of the data. When any QC criteria fail, the cause for the failure must be identified and corrected. This may include instrument recalibration followed by sample reanalysis, sample cleanup, or sample re-extraction. If it is determined that the failure is due to sample matrix effects, a project narrative report is written by the analyst for inclusion in the data report. If there is insufficient sample volume to perform the re-analysis for confirmation, this is also noted in the narrative and included in the client report.

13. Method Performance

13.1 Method Detection Limit Study (MDL) / Limit of Detection Study (LOD) / Limit of Quantitation (LOQ)

The laboratory follows the procedure to determine the MDL, LOD, and/or LOQ as outlined in Qualtrax ID 1732. These studies performed by the laboratory are maintained on file for review

13.2 Demonstration of Capability Studies

Refer to Qualtrax ID 1739 for further information regarding IDC/DOC Generation.

13.2.1 Initial (IDC)

The analyst must make an initial, one-time, demonstration of the ability to generate acceptable accuracy and precision with this method, prior to the processing of any samples.

13.2.2 Continuing (DOC)

The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

Refer to Alpha's Chemical Hygiene Plan and Waste Management and Disposal SOP for further pollution prevention and waste management information.

15. Referenced Documents

Chemical Hygiene Plan

Qualtrax ID 1732 MDL/LOQ Generation

Qualtrax ID1739 IDC/DOC Generation

Qualtrax ID 1728 Waste Management and Disposal SOP

16. Attachments

Table 1: REPORTING LIMITS

Table 2: STANDARD SOLUTIONS

Table 3: QC ACCEPTANCE CRITERIA

Table 4: MCP/CT/NJ SPECIFIC ACCEPTANCE CRITERIA

Table 5: QC FAILURE ACTION PLAN

TABLE 1

REPORTING LIMITS*

	RL (Aqueous)	RL (Soil)
Pesticides		
Alpha-BHC	0.02 µg/L	3.33 µg/Kg
Gamma-BHC (Lindane)	0.02 µg/L	2.67 µg/Kg
Heptachlor	0.02 µg/L	4 µg/Kg
Endosulfan I	0.02 µg/L	10 µg/Kg
Dieldrin	0.04 µg/L	5 µg/Kg
Endrin	0.04 µg/L	3.33 µg/Kg
4, 4'-DDD	0.04 µg/L	10 µg/Kg
4, 4'-DDT	0.04 µg/L	15 µg/Kg
Methoxychlor	0.2 µg/L	15 µg/Kg
Aldrin	0.02 µg/L	10 µg/Kg
Beta-BHC	0.02 µg/L	10 µg/Kg
Delta-BHC	0.02 µg/L	10 µg/Kg
Heptachlor Epoxide	0.02 µg/L	15 µg/Kg
trans-Chlordane	0.02 µg/L	10 µg/Kg
cis-Chlordane	0.02 µg/L	10 µg/Kg
4, 4'- DDE	0.04 µg/L	15 µg/Kg
Endosulfan II	0.04 µg/L	15 µg/Kg
Endrin Aldehyde	0.04 µg/L	10 µg/Kg
Endosulfan Sulfate	0.04 µg/L	3.33 µg/Kg
Endrin Ketone	0.04 µg/L	10 µg/Kg
Chlordane	0.2 µg/L	65 µg/Kg
Toxaphene	0.2 µg/L	150 µg/Kg
Alachlor [+]	0.1 µg/L	10 µg/Kg
Hexachlorobenzene [++]	0.02ug/L	8 µg/Kg

*** RL:** Typical laboratory reporting limit. Actual RLs may be higher depending on sample matrix. RLs are not adjusted for % Moisture.

[+] CT-RCP only compound.
[++] MCP/RCP-CT only compound.

TABLE 2

STANDARD SOLUTIONS

	Stock 1 solution (µg/mL)	Stock 2 solution (µg/mL)	Level 11 (µg/L)	Level 10 (µg/L)	Level 9 (µg/L)	Level 8 (µg/L)	Level 7 (µg/L)	Level 6 (µg/L)	Level 5 (µg/L)	Level 4 (µg/L)	Level 3 (µg/L)	Level 2 (µg/L)	Level 1 (µg/L)	Std. Spike Solution (µg/mL)	Std. LCS Solution (µg/mL)
Hexachlorobenzene	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Alpha-BHC	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Lindane	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Heptachlor	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Endosulfan I	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Dieldrin	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Endrin	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
4, 4'-DDD	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
4, 4'-DDT	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Methoxychlor	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Tetrachloro-m-Xylene *	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Decachloro-Biphenyl *	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Aldrin	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Beta-BHC	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Delta-BHC	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Heptachlor Epoxide	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Trans-Chlordane	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Cis-Chlordane	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
4, 4'- DDE	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Endosulfan II	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Endrin Aldehyde	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Endosulfan Sulfate	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Endrin Ketone	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Alachlor	2	0.1	400	200	100	50	10	5	4	3	2	1	0.5	2.0	2.0
Chlordane	50000	1000	10000	5000	2000	1000	500	250	100	20	10	5	2	25	25
Toxaphene	100000	2000	20000	10000	5000	2000	1000	500	200	100	20	10	5	25	25
Internal Standard															
1-Bromo-2-Nitrobenzene	5000	5000	25	25	25	25	25	25	25	25	25	25	25		

* - surrogates

TABLE 3

QC ACCEPTANCE CRITERIA**

	Aqueous		Soil	
Surrogate % Recovery*	**Lower Control Limit**	**Upper Control Limit**	**Lower Control Limit**	**Upper Control Limit**
2,4,5,6-Tetrachloro-m-xylene	30%	150%	30%	150%
Decachlorobiphenyl	30%	150%	30%	150%

*One surrogate on one column is allowed to be outside of the control limits and still be within criteria.

Compound	LCS % Recovery (Aqueous)		LCS % Recovery (Soil)		Duplicate and/or MSD %RPD	
	Lower Control Limit	**Upper Control Limit**	**Target Analyte Limits**	**Marginal Exceedance Limits**	**Aqueous RPD**	**Soil RPD**
Target Analytes LCS/LCSD	30%	150%	30%	150%	≤ 30%	≤ 50%
Target Analytes MS/MSD	30%	150%	30%	150%	≤ 30%	≤ 50%

TABLE 4

MCP/CT/NJ SPECIFIC QC ACCEPTANCE CRITERIA

Compound	LCS % Recovery (Aqueous)		LCS % Recovery (Soil)		Duplicate and/or MSD %RPD	
	Lower Control Limit	**Upper Control Limit**	**Target Analyte Limits**	**Marginal Exceedance Limits**	**Aqueous RPD**	**Soil RPD**
Target Analytes LCS/LCSD	40%	140%	40%	140%	≤ 20%	≤ 30%
Target Analytes MS/MSD	40%	140%	40%	140%	≤ 20%	≤ 30%

TABLE 5

QC FAILURE ACTION PLAN

Blank Failures	Failure Situation	Action(s)
Surrogate Failure	1 of 4 high or low	Report as is
	2 or more high	Report as is
	2 or more low, samples are non-detect with passing surrogates	Report as is
	2 or more low, samples have hits and/or failing surrogates	Revial/rerun Re-extract if still failing
IS Failure	IS not present (less than 10% recovery)	Add IS Rerun
	IS out high or low	Revial/rerun Re-extract if still failing
Contamination	Below RL; sample(s) non-detect, below RL, or concentration 10 times or more above the blank	Report as is
	Below RL, sample(s) concentration above RL	See team leader/manager
	Above RL, sample(s) concentration 10 times or more above the blank	Report as is
	Above RL with non-detect sample(s)	Report as is
	Above RL, sample(s) concentration less than 10 times above the blank and volume available	Revial/rerun Re-extract if contamination still present
	Above RL, sample(s) concentration less than 10 times above the blank and no volume available	Revial/rerun B-flag affected data

LCS/LCSD Failures	Failure Situation	Action(s)
Surrogate Failure	1 or more high or low	Report as is
IS Failure	IS not present (less than 10% recovery)	Add IS Rerun
	IS out high or low	Revial/rerun Re-extract if still failing
Spike Failure	Spike compounds out high and sample(s) are non-detect with passing surrogates	Report as is
	Spike compounds out high and sample(s) have hits	Revial/rerun Re-extract if still high
	Spike compounds out low	Revial/rerun Re-extract if still low
	RPD failure	Report as is

MS/MSD/DUP Failures	Failure Situation	Action(s)
Surrogate Failure	(MS/MSD) 1 or more high or low	Report as is
	(MS/MSD) 2 or more high or low	Report as is
	(DUP) 1 or more high, parent sample non-detect	Report as is
	(DUP) 1 or more low, parent sample matches	Report as is
	(DUP) 1 or more low, parent sample doesn't match	Revial/rerun Re-extract if still failing
IS Failure	IS not present (less than 10% recovery)	Add IS Rerun
	IS out high or low	Revial/rerun Re-extract if still failing
Spike Failure (MS/MSD only)	Compounds out high or low due to sample matrix or hits	Report as is
	Compounds out high or low due to extraction error	Revial/rerun Re-extract if still failing
	RDP failure	Report as is

Analysis of

Chlorinated Herbicides by GC Using Methylation Derivatization

Reference Methods: **EPA 8151A,** SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update III, 1997.

MA BWS-CAM Section VC, Quality Assurance and Quality Control Requirements and Performance Standards for SW-846 Method 8151A, for the Massachusetts Contingency Plan (MCP). Revision 1. July 1, 2010.

SW-846 Chlorinated Herbicides by 8151, State of Connecticut Department of Environmental Protection Reasonable Confidence Protocol **(RCP)**, Version 2.0, July 2006

1. Scope and Application

Matrices: Aqueous, soil and waste.

Definitions: See Alpha Laboratories Quality Manual Appendix A

Specifically, Method 8151A may be used to determine the following compounds:

Parameter		CAS No.[a]
2,4-D	[1, 2, 3]	94-75-7
2,4-DB		94-82-6
2,4,5-TP (silvex)	[1, 2, 3]	93-72-1
2,4,5-T	[1, 2]	93-76-5
Dalapon		75-99-0
Dicamba		1918-00-9
Dichloroprop		120-36-5
Dinoseb		88-85-7
MCPA		94-74-6
MCPP		93-65-2

[a] Chemical Abstract Service Registry Number

[1] RCRA List

[2] APA List

[3] TCLP List

Method 8151A is a capillary gas chromatographic (GC) method for determining certain chlorinated acid herbicides and related compounds in aqueous, soil and waste matrices.

Because these compounds are produced and used in various forms (i.e., acid, salt, ester, etc.), Method 8151A describes a hydrolysis step than can be used to convert herbicide esters into the acid form prior to analysis. Herbicide esters generally have a half-life of less than one week in soil.

When Method 8151A is used to analyze unfamiliar samples, compound identifications should be supported by at least one additional qualitative technique. Section 10.1 provides gas

chromatograph/mass spectrometer (GC/MS) criteria appropriate for the qualitative confirmation of compound identifications.

The data report packages present the documentation of any method modification related to the samples tested. Depending upon the nature of the modification and the extent of intended use, the laboratory may be required to demonstrate that the modifications will produce equivalent results for the matrix. Approval of all method modifications is by one of the following laboratory personnel before performing the modification: Area Supervisor, Laboratory Services Manager, Laboratory Director, or Quality Assurance Officer.

This method is restricted to use by or under the supervision of analysts experienced in the use of gas chromatography and skilled in the interpretation of gas chromatograms. Only experienced analysts should be allowed to work with diazomethane due to the potential hazards associated with its use (explosive, carcinogenic). Each analyst must demonstrate the ability to generate acceptable results with this method by performing an initial demonstration of capability.

2. Summary of Method

This SOP for Method 8151A details gas chromatographic conditions for the analysis of chlorinated acid herbicides in water, soil, and waste samples. The hydrolysis of esters is also described in SOP number 1964.

Water, soil, and waste samples are extracted with diethyl ether and then derivatized with diazomethane. The derivatives are determined by gas chromatography with an electron capture detector (GC/ECD). The results are reported as acid equivalents.

3. Reporting Limits

The sensitivity of Method 8151A depends on the level of interferences, in addition to instrumental limitations. Table 1 lists the estimated GC/ECD detection limits that can be obtained in aqueous and soil matrices in the absence of interferences. Detection limits for a typical waste sample should be greater.

4. Interferences

4.1 Refer to Method 8000 for instrumental interferences.

4.2 Method interferences may be caused by contaminants in solvents, reagents, glassware, and other sample processing hardware that lead to discrete artifacts or elevated baselines in gas chromatograms. All these materials must be routinely demonstrated to be free from interferences under the conditions of the analysis, by analyzing reagent blanks.

4.2.1 Glassware must be scrupulously cleaned. Clean each piece of glassware as soon as possible after use by rinsing it with the last solvent used in it. This should be followed by detergent washing with hot water and rinses with tap water, then with organic-free reagent water. Glassware should be solvent-rinsed with acetone and pesticide-quality hexane. After rinsing and drying, glassware should be sealed and stored in a clean environment to prevent any accumulation of dust or other contaminants. Store glassware inverted or capped with aluminum foil. Immediately prior to use, glassware should be rinsed with the next solvent to be used.

4.2.2 The use of high purity reagents and solvents helps to minimize interference problems.

4.3 Matrix interferences may be caused by contaminants that are coextracted from the sample. The extent of matrix interferences will vary considerably from waste to waste, depending upon the nature and diversity of the waste being sampled.

4.4 Organic acids, especially chlorinated acids, cause the most direct interference with the determination by methylation. Phenols, including chlorophenols, may also interfere with this procedure.

4.5 Alkaline hydrolysis and subsequent extraction of the basic solution removes many chlorinated hydrocarbons and phthalate esters that might otherwise interfere with the electron capture analysis. However, hydrolysis may result in the loss of Dinoseb and the formation of aldol condensation products if any residual Acetone remains from the extraction of solids.

4.6 The herbicides, being strong organic acids, react readily with alkaline substances and may be lost during analysis. Therefore, glassware must be acid-rinsed and then rinsed to constant pH with organic-free reagent water. Sodium Sulfate must be acidified.

4.7 Sample extracts must be dry prior to methylation otherwise poor recoveries will be obtained.

5. Health and Safety

The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of material data handling sheets is available to all personnel involved in the chemical analysis. Additional references to laboratory safety are available in the Chemical Hygiene Plan.

All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

5.1 Lab coats, safety glasses, and gloves must be worn when handling supplies, samples, extracts, standards or solvents, and when washing glassware.

5.2 All extract concentration steps must be performed in extraction hoods. All solvent and extract transfers must also be handled in a hood.

5.3 All expired stock standards, working standards, and spent sample extracts must be placed into the waste bucket in the laboratory for future disposal by the Hazardous Waste Manager. The container must be properly labeled with hazard warning labels indicating the container contents.

5.4 Bottles containing flammable solvents must be stored in the flammables cabinet or in the vented cabinets found under the hoods. All ether bottles are to be checked for peroxide immediately upon opening.

5.5 All waste solvents must be transferred to the satellite waste storage containers located in the extraction laboratory. Separate containers are provided for chlorinated and non-chlorinated solvents and must be used accordingly. Under no circumstances are solvents to be poured down the sink drains.

5.6 Inspect all glassware prior to use. Do not use any glassware that is chipped or cracked if it could present a safety hazard. Damaged glassware is put aside for repair; otherwise the piece is discarded. A number is etched onto each KD concentrator tube to keep track of calibration (Refer to SOP/08-04, KD Tube Calibration).

6. Sample Collection, Preservation, Shipping and Handling

6.1 Sample Collection

Aqueous samples are collected in two one-liter amber glass containers. Soil samples are collected in 8oz. glass jars.

6.2 Sample Preservation

Both aqueous and soil/solid samples are stored in refrigerators to maintain a temperature of 2 – 6 °C.

6.3 Sample Shipping

No special shipping requirements.

6.4 Sample Handling

Both aqueous and soil/solid samples and extracts are stored under refrigeration (2 – 6 ºC) and protected from light. Aqueous samples must be extracted within 7 days from the time of collection; soil samples, within 14 days from collection. Sample extracts must be analyzed within 40 days following extraction.

After the extraction is completed, the sample extract is stored in a stoppered KD tube before being transferred to a crimp-top or screw cap vial for analysis and long-term storage.

7. Equipment and Supplies

7.1 Gas Chromatograph, Agilent 7890 (or equivalent): An analytical system complete with gas chromatograph configured for split-splitless injection and all required accessories including syringes, analytical columns, gases, electron capture detectors (ECD), and data system.

7.2 GC Columns: Alpha utilizes dual-column analyses. The dual-column approach involves either a single injection that is split between two columns that are mounted in a single gas chromatograph, or dual injections of the split extract on a single GC equipped with two columns. Typical column pairs used are listed below. Other columns may be used as long as method performance criteria can be met.

Column Pair:

STX-CLP: Cat.: #11546 from Restek or equivalent, 30m, 0.32mm, 0.32 µm
STX-CLPII: Cat.: #11444 from Restek or equivalent, 30m, 0.32mm, 0.25µm

7.3 Guard Column: Cat. #10027 from Restek or equivalent; 5m, 0.32mm

7.4 Class “A” Volumetric Flasks: 10mL and 25mL (and other volumes), for standards preparation

7.5 Microsyringes: 10 µL – 1000 µL

7.6 Gooseneck splitless injecton liner, Cat #23303 from Restek or equivalent

7.7 Universal “Y” Press-tight tee split: Cat. #20406 from Restek or equivalent **/ Siltek MXT Connector:** Cat. #21388 from Restek or equivalent

8. Reagents and Standards

Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

NOTE: Store the standard solutions (stock, composite, calibration, internal, and surrogate) at 4±2 °C in Teflon(R)-sealed containers in the dark. When a large volume of standard is prepared, aliquots of that lot are stored in individual small vials.

All stock standard solutions must be replaced ***after one year or sooner*** if routine QC tests indicate a problem.

All other standard solutions must be replaced ***after six months or sooner*** if routine QC indicates a problem.

8.1 Reagent water: All references to water in this method refer to reagent water from Alpha's DI water treatment system.

8.2 n-Hexane: Pesticide grade or equivalent

8.3 Acetone: Pesticide grade or equivalent

8.4 Internal Standard Stock Solution: 4,4'-dibromooctafluorobiphenyl (DBOB) (AccuStandard, Cat # M-8151-IS) is used as the internal standard.

- **Working Internal Standard Solution**: To a 10mL volumetric flask, add 1mL of the 4,4'-dibromooctafluorobiphenyl (DBOB) (AccuStandard, Cat # M-8151-IS) and bring to volume with Acetone. Final concentration is 25µg/mL. 10µL of this solution is added to the 1mL sample and QC sample extracts as well as to all Calibration Standards to achieve a concentration of 0.25µg/mL for analysis.

8.5 Calibration Standards: Appropriate vendor derivatized standard(s) are volumetrically diluted with Hexane to obtain Initial Calibration Stock Standard which is used to prepare Initial Calibration Working Standards.

8.5.1 Initial Calibration Stock Standard: to a 10mL volumetric flask, add few mLs of Hexane:

- **1mL 2,4-Dichlorophenyl acetic acid (DCAA) methyl ester solution: (**100µg/mL in MTBE, Accustandard, Cat # M515-SS) and
- **1mL of Chlorinated Herbicides Methyl Derivatives** (100/10000µg/mL in MTBE, Accustandard, Cat # M-8151) Bring to volume using Hexane. Final concentration is 10µg/mL for all analytes except MCPP and MCPA at 1000µg/mL.

8.5.1.1 Initial Calibration Working Standards

8.5.1.1.1 Cal Level 1: To a 10mL volumetric flask, add 50µL of Initial Calibration Stock Standard. Bring to volume with Hexane. Final concentration is 0.05µg/mL for all analytes except MCPP and MCPA at 5.0µg/mL.

8.5.1.1.2 Cal Level 2: To a 10mL volumetric flask, add 100µL of Initial Calibration Stock Standard. Bring to volume with Hexane. Final concentration is 0.10µg/mL for all analytes except MCPP and MCPA at 10.0µg/mL.

8.5.1.1.3 Cal Level 3: To a 10mL volumetric flask, add 200µL of Initial Calibration Stock Standard. Bring to volume with Hexane. Final concentration is 0.20µg/mL for all analytes except MCPP and MCPA at 20.0µg/mL.

8.5.1.1.4 Cal Level 4: To a 10mL volumetric flask, add 500µL of Initial Calibration Stock Standard. Bring to volume with Hexane. Final concentration is 0.50µg/mL for all analytes except MCPP and MCPA at 50.0µg/mL.

8.5.1.1.5 Cal Level 5: To a 10mL volumetric flask, add 1.0mL of Initial Calibration Stock Standard. Bring to volume with Hexane. Final concentration is 1.0µg/mL for all analytes except MCPP and MCPA at 100µg/mL.

8.5.1.1.6 Cal Level 6: To a 10mL volumetric flask, add 2.0mL of Initial Calibration Stock Standard. Bring to volume with Hexane. Final concentration is 2.0µg/mL for all analytes except MCPP and MCPA at 200µg/mL.

8.6 Second Source Standard: (ICV) Appropriate vendor derivatized standard(s) are volumetrically diluted with Hexane to obtain Initial Calibration Verification Stock Standard which is used to prepare ICV Working Standard.

8.6.1 ICV Stock Standard: to a 10mL volumetric flask, add a few mLs of Acetone (to ensure mix of Methanol from the Herbicides Mixture):

- **1mL of Methylated Herbicides Mixture** (100/10000µg/mL in Methanol, Agilent, Cat # HBM-8151M) and
- **1mL of DCAA Methyl Ester Solution: 2,4-Dichlorophenyl acetic acid (DCAA) methyl ester solution –SURROGATE (**100µg/mL in Acetone, Agilent, Cat # PPS-166). Bring to volume using Hexane. Final concentration is 10µg/mL for all analytes except MCPP and MCPA at 1000µg/mL.

8.6.1.1 ICV Working Standard: To a 50mL volumetric flask, add 1mL ICV Stock Solution. Bring to volume with Hexane. Final concentration is 0.2µg/mL for all analytes except MCPP and MCPA at 20µg/mL.

8.6.2 ICV Standard (2,4-DB only): to a 50mL volumetric flask, add few mLs of Hexane and **2,4-DB methyl ester** (1000µg/mL in Hexane, Restek, Cat # 70931). Bring to final volume using Hexane. Final concentration is 0.2µg/mL.

8.7 Extraction Surrogate Standard: 2,4-Diclorophenylacetic Acid (DCAA) (1000µg/mL in Acetone, AccuStandard, M-8150B-SS-10X) The Surrogate standard is spiked into all samples and QC samples prior to extraction.

- To a 1000mL volumetric flask, add 10mL of ampulated surrogate solution. Bring to volume with Acetone. Final concentration is 10µg/mL.

8.8 LCS/MS Spiking Solutions: The LCS/MS spiking solutions are prepared volumetrically by diluting Underivatized Chlorinated Herbicides (100/10000µg/mL in Acetone, AccuStandard, Cat # M8151A.) in Acetone

- To a 200mL volumetric flask, add 20mL of ampulated LCS/MS solution. Bring to volume with Acetone. Final concentration is 10µg/mL for all analytes except MCPP and MCPA at 1000µg/mL.

9. Quality Control

The laboratory must maintain records to document the quality of data that is generated. Ongoing data quality checks are compared with established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

9.1 Blank(s)

A matrix-specific extraction blank is performed with each extraction batch of 20 or fewer samples, according to the extraction SOPs. The extraction blank must not contain any of the reportable analytes at or above the reporting limit. If any reportable analytes are detected in the blank, the entire extraction batch is suspect and re-extraction of all associated samples is required, unless the associated samples are non-detect or concentration of the analyte in the samples is 10 times greater than the concentration of this analyte in the blank. The surrogate recoveries must also be within the acceptance criteria listed in Table 3. If surrogate acceptance criteria are exceeded, the extraction batch must be evaluated to determine if re-extraction or re-analysis is necessary. Actions associated with blank failures are listed in Table 4.

9.2 Laboratory Control Sample (LCS) / LCS Duplicate

A Laboratory Control Sample (LCS) and an LCS Duplicate (LCSD) is extracted with each analytical batch. The LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume. The LCS is spiked with all target analytes. The concentrations of the spiking solutions are listed in Table 2. The recovery and RPD acceptance criteria are listed in Table 3. If any recovery criteria are not met, the extract should be reanalyzed. If the criteria are still not met, the entire batch should be re-extracted, unless the recoveries are high and the associated samples are non-detect. If this is not possible, due to insufficient sample or holding time exceedance, the analyst must write up the failure on a narrative sheet for inclusion in the client report. Actions associated with LCS/LCSD failures are listed in Table 4.

9.3 Initial Calibration Verification (ICV)

Refer to Section 10.2.7

9.4 Continuing Calibration Verification (CCV)

Refer to Section 10.4

9.5 Matrix Spike (MS)/MS Duplicate

A matrix spike/matrix spike duplicate pair is extracted and analyzed for each batch of 20 or less samples only upon client request. MS and MSDs are field samples spiked with a known quantity of the target analyte(s). They are prepared by taking additional sample aliquots of the same weight or volume and adding the appropriate amounts of surrogate and spiking solutions. The spike compounds and levels are listed in Table 2. The recovery and RPD acceptance criteria are listed in Table 3. If the recovery criteria are not met, but are met in the LCS, the

failure may be attributed to sample matrix. Actions associated with MS/MSD failure are listed in Table 4.

9.6 Laboratory Duplicate (DUP)

A duplicate sample is extracted and analyzed upon Client request for each batch of 20 or less samples. Duplicates are laboratory selected replicate samples, prepared by taking an additional sample aliquot of the same weight or volume of a sample. The % RPD criteria are listed in Table 3. If the %RPD is not met, the failure may be attributed to sample matrix effects and must be noted on a narrative sheet for inclusion in the client report. Actions associated with duplicate failures are listed in Table 4.

For samples with a state of origin of New Jersey, a MS and MSD/DUP must be extracted for every twenty samples within a 24hr period.

9.7 Extraction Surrogates

All extracted samples and associated QC are spiked with surrogates at the levels listed in Table 2. The laboratory must evaluate surrogate recovery data from individual samples and QC samples versus the surrogate control limits for both columns listed in Table 3. If the surrogate limits are not met, the extract should be reanalyzed to determine if the failure was due to an instrument problem. If the criteria are still not met, the affected samples should be re-extracted to confirm that the failure was due to sample matrix. If matrix effect is confirmed, this must be noted on a narrative sheet for inclusion in the client report.

9.8 Method Sequence

Typical Initial Calibration (each level has to be identified with the standard lot number)

1. Instrument Prime
2. Blank
3. Std Level 1
4. Std Level 2
5. Std Level 3
6. Std Level 4
7. Std Level 5
8. Std Level 6
9. Initial Calibration Verification Standard (ICV)
10. Initial Calibration Verification Standard (ICV)

Typical Daily Sequence:

1. Instrument Prime
2. Blank
3. Herbicide Continuing Calibration Standard **(identified with the standard lot number**)
4. Extraction Blank
5. Laboratory Control Sample
6. Laboratory Control Sample Duplicate
7. Matrix Spike (Upon Client Request)
8. Duplicate/Matrix Spike Duplicate (Upon Client Request)
9. Samples (10 field samples)
10. Repeat 3 – 9 (as needed)

10. Procedure

10.1 Equipment Set-up

The dual-column / dual-detector approach involves the use of the columns listed in section 7.2. The columns are connected to an Y-split or similar or dual injection GC, and separate electron capture detectors. Alpha typical GC conditions are listed below but may be altered as long as method performance criteria are met.

Temperature 1:	80 °C	**Detector temperature:**	350 °C
Ramp 1:	15°C/minute	**Carrier gas:**	Hydrogen
Temperature 2:	200°C	**Carrier flow:**	2.5 mL/min
Ramp 2:	20°C/minute	**Carrier mode:**	Constant flow
Temperature 3:	280°C	**Makeup gas:**	Nitrogen
Hold Time:	3 minutes	**Total detector flow:**	55 mL/min
Injector Temperature:	250°C		
Injector Mode:	Split		
Injector Flow:	36.5 mL/min		
Septum Purge Flow:	24 mL/min		
Split Flow:	10 mL/min		
Split Ratio:	4:1		
Injection Volume	1 µL		

10.2 Initial Calibration

10.2.1 Prepare calibration standards using the procedures in Section 8.5 and Table 2. The calibration standards are aliquoted into autosampler vials and capped prior to loading onto the autosampler tray. The calibration standards are analyzed and the curve is calculated prior to sample analysis.

10.2.2 Establish the GC operating conditions by loading the appropriate GC method. Typical instrument conditions are listed in section 10.1. The same operating conditions are used for calibrations and sample analyses. Create the analytical sequence using the Agilent Chemstation data acquisition software. Record the calibration standard, unique lot number (PP#) and analyst's initials in the analytical sequence list.

10.2.3 A 1µL injection volume of each calibration standard is typically used. Other injection volumes may be employed, provided that the analyst can demonstrate adequate sensitivity for the compounds of interest. The same injection volume must be used for all standards and samples.

10.2.4 Column adsorption may be a problem when the GC has not been used for a day or more or after system maintenance. The GC column may be primed (or deactivated) by injecting a Herbicides standard mixture approximately 20 times more concentrated than the mid-concentration standard. Inject this standard mixture prior to beginning the initial calibration or calibration verification.

Alternately, the system may be primed by baking at the final analytical temperature for approximately 30 minutes.

Several analytes may be observed in the injection just following system priming. Always run an instrument blank after system priming.

10.2.5 Calibration Factors

Internal standard calibration techniques are employed in this method.

10.2.5.1 Internal Standard Procedure. In each standard, calculate the response factor (RF) for each analyte, the average RF, and the relative standard deviation (RSD) of the RFs, using the Enviroquant data processing software. The calculations are performed automatically, using the formulae listed in Alpha's Quality Manual.

10.2.6 Initial Calibration Criteria

- If the **RSD for an analyte is < 20%,** then the response of the instrument for this compound is considered linear over the range and the mean calibration factor (Avg. RF) can be used to quantitate sample results.

- If the **RSD for any analyte is > 20%**, then linearity through the origin cannot be assumed. The mean response factor cannot be used for quantitation. An alternative calculation may be done by the use of **linear regression** or **quadratic regression** (minimum of six ICAL points are needed and regression must be weighted inversely proportional to concentration) as long as the **correlation coefficient is >0.990**. If both of these quantitation methods fail criteria for any compound in the initial calibration, then the system must be reevaluated and a new calibration curve must be analyzed. If quadratic regression is used for calibration, this must be noted in the laboratory narrative. The regression equation cannot be forced through the origin. The equation for linear regression may be found in Alpha's Quality Manual.

- **MCP requirement:** If linear or non-linear regression is used, RL must to be verified by recalculating concentrations in the lowest calibration standard using the final calibration curve. Recoveries must be **70-130%.**

- Minimum of five standards must be used for the linear regression and minimum of six for non-linear regression.

- Percent Relative Error (%RE): For linear and quadratic fit compounds, the %RE must be calculated for the standard at or near the midpoint and at the lowest level of the initial calibration. The %RE between the calculated and expected concentration of an analyte must be ≤ 30%, otherwise recalibration is necessary.

10.2.7 Initial Calibration Verification

An Initial Calibration Verification standards must be run immediately after each initial calibration, near the midpoint of the curve. The standards must be prepared using a second source that is different than the source used for the initial calibration. (Standards listed in Section 8.6). The **%D** has to be within **20%** (**15% for CT RCP**) when compared to the mean response factor from the initial calibration.

10.2.8 Retention Time Windows

- The retention time windows used for the identification of target analytes is ± 0.03 minutes. These criteria have been adopted from the EPA CLP Statement of Work (OLM04.2). It has been found that these limits work well, being wide enough to eliminate false-negatives while being tight enough to eliminate false-positives. Windows that are calculated using the procedure recommended in Method 8000 tend to be very narrow, creating the risk of false negative results.
- The windows listed above are used as guidance, however the experience of the analyst weighs heavily in the interpretation of the chromatograms. For example, it has been observed that certain oil matrices can cause the retention times to shift more dramatically. Additionally, if any positive results are questionable and at a sufficiently high concentration, GC/MS analysis is used for confirmation.

10.3 Sample Processing

10.3.1 The same GC operating conditions used for the initial calibration must be employed for sample analyses, including sample injection volume.

10.3.2 Tentative identification of an analyte occurs when a peak from a sample extract falls within the retention time window for the compound. Each tentative identification is confirmed using a second GC column of dissimilar stationary phase. In particularly difficult matrices, confirmation by GC/MS may be advisable.

10.3.3 The concentration reported for an identified target analyte in an extract is calculated using the Enviroquant data processing software. The Enviroquant methods have been configured to utilize the quantitation formulas found in Alpha's Quality Manual. Proper quantitation requires the appropriate selection of a baseline from which the peak area or height can be determined. See the Manual Integration SOP for integration guidelines. Also refer to Section 11 for calculations.

10.3.3.1 If the responses exceed the calibration range of the system, dilute the extract and reanalyze.

10.3.4 The laboratory must report **HIGHER** of the two results unless obvious interference is present on one of the columns.

10.3.4.1 The **Relative Percent Difference (RPD)** should be 40 or lower. If the RPD exceeds 40, this will be denoted with a P flag. If the RPD exceedance is due to interference, the lower of the dual column values can be reported with I and P flags.

10.3.5 If compound identification or quantitation is precluded due to interference (e.g. broad, rounded peaks or ill-defined baselines are present) cleanup of the extract may be needed. If instrument problems are suspected, rerun the extract on another instrument to determine if the problem results from analytical hardware or

the sample matrix. Refer to the extraction SOPs for the procedures to be followed in sample cleanup.

10.3.6 GC/MS Confirmation

GC/MS confirmation may be used in conjunction with either single-column or dual-column analysis if the concentration is sufficient for detection by GC/MS.

10.4 Continuing Calibration

10.4.1 Verify calibration each **12-hours** shift by injecting Continuing Calibration standard prior to conducting any sample analyses. A calibration standard must also be injected at intervals of **not less than once every 10 filed samples.**

A bracketing CCV is not required with the use of internal standard calibration method with the exception of samples ran under CT RCP method.

10.4.2 The Response Factor (for internal standard compounds) for each analyte to be quantitated must not exceed a **± 20% difference (± 15% for MCP and CT RCP**) when compared to the initial calibration curve. The Enviroquant data processing software automatically calculates the %D for all analytes according to the formula in Alpha's Quality Manual.

If this criterion is exceeded, inspect the gas chromatographic system to determine the cause and perform whatever maintenance is necessary before verifying calibration and proceeding with sample analysis.

10.4.3 If routine maintenance does not return the instrument performance to meet the QC requirements based on the last initial calibration, then a new initial calibration must be performed. Due to the large number of analytes present, allowances may be made for a CF or RF that drifts out high, as long as there are no positive hits for that particular analyte in any of the associated samples.

10.5 Internal Standard

The use of internal standard calibration does not require that all sample results be bracketed with CCV standard. However, when internal standard calibration is used, the retention times of internal standards and the area response of internal standards should be checked for each analysis.

10.5.1 **IS in CCAL** – The measured area of the internal standard must be no more than + 50% different from the average area calculated during initial calibration (-50 to 150%).

10.5.2 **IS in samples** - The measured area of the internal standard must be no more than -50% to +100% different from the area calculated from opening CCV (-50 to 200%)

Retention time shifts of more than 30 sec from the retention time of the most recent calibration standard are cause for concern and must be investigated.

10.6 Preventive Maintenance

- Routine preventive maintenance should be performed to maintain GC system performance. This includes periodic replacement of injector septa, replacement of injector liner(s), and replacement of injector seals. All maintenance is noted in individual Instrument Maintenance Logbooks.
- Other Maintenance: ECD detectors may become contaminated, requiring bake out at elevated temperatures, (no greater than 375℃) or repair by the manufacturer.

11. Data Evaluation, Calculations and Reporting

Herbicides are calculated as described in Section 11.1, 11.2, and reported in µg/L or µg/Kg units. After performing technical data review, validating that all QC criteria have been met and confirming all positive hits, the data report is sent electronically to the LIMS computer for generation of the client report. Two levels of review of the data in the LIMS system are preferred prior to release of data. These reviews include analyst review and review by the Department Supervisor or other trained analyst.

11.1 Aqueous Calculation

$$\mu g/L = \frac{(A_s)\,(C_{IS})\,(D)\,(V_f)}{(A_{IS})\,(\overline{RF})\,(V_s)\,(1000)}$$

Where:

A_s = Peak area of analyte
A_{IS} = Peak area of Internal Standard
C_{IS} = Concentration of IS (µg/L)
D = Dilution factor (D = 1 for no dilution)
V_f = Final extract volume (mL)
Vs = Initial volume extracted (mL)

$\overline{RF}$ = Mean response factor

11.2 Soil/Solid Calculation

$$\mu g/Kg = \frac{(A_s)\,(C_{IS})\,(D)\,(V_f)}{(A_{IS})\,(\overline{RF})\,(W_s)\,(1000)}$$

Where:

A_s = Peak area of analyte
A_{IS} = Peak area of Internal Standard
C_{IS} = Concentration of IS (µg/L)
D = Dilution factor (D = 1 for no dilution)
V_f = Final extract volume (mL)
Ws = Initial weight extracted (g)

$\overline{RF}$ = Mean response factor

11.2.1 Response Factor Calculation

$$RF = \frac{(A_s)\,(C_{IS})}{(A_{IS})\,(C_s)}$$

Where:

A_s = Peak area of analyte
A_{IS} = Peak area of Internal Standard
C_s = Concentration of analyte (µg/L)
C_{IS} = Concentration of IS (µg/L)

11.3 Molecular Weight Correction

In addition, conversion factors for the molecular weights have been listed for all analytes reported under EPA Method 8151.

The calibration is performed using the methyl ester compounds; therefore the calculation of the concentration includes a correction for the molecular weight of the methyl ester versus the acid herbicide.

Derivatized herbicides are used for the standard curve, and they are supplied as methyl esters as opposed to acid herbicide form which is used for the LCS. The difference between the acid form and the methyl ester is + 14 (i.e. In Derivatization, a -CH_3 group replaces the -H, (15-1 = 14)). The factors used for correction (listed in the Table below) vary for each herbicide and are applied to the standard concentration at each level of the calibration within the target processing software.

Example: 2,4-D

2,4-D MW = 221.04 2,4-D Methyl ester MW = 235.06

If you spike 10 ug of 2,4-D, and derivatized it, you end up with 10.634 ug of 2,4-D Methyl ester that you are measure, as you've stripped the -H and added a -CH3, increasing the molecular weight. The true value for the spike is 10 ug as the acid herbicide, and 10.634 ug as the methyl ester. So a spike of 10 ug of acid, would measure 10.634 ug of the methyl ester to get 100% recovery. The true value for the spike would be 10.634 as methyl ester, which you use to divide your measured value by.

If measuring recoveries, the value of the 10 ug of the methyl ester, would be 10 ug measured (as methyl ester)/10.634 ug spiked (as methyl ester) = 94.04%.

If, on the other hand you want to convert your final result using a correction factor, you would use the MW of the acid/MW of the ester (221.04/235.06 = 0.94).

Conversion Factors applied in EQ software:

Parameter	CAS No.[a]	MOL WT.	WT as methyl ester	Conversion Factor
2,4-D [1, 2, 3]	94-75-7	221.04	235.06	0.94
2,4-DB	94-82-6	326.18	340.18	0.96
2,4,5-TP (silvex) [1, 2, 3]	93-72-1	269.51	283.51	0.95
2,4,5-T [1, 2]	93-76-5	255.48	269.48	0.95
Dalapon	75-99-0	142.96	156.96	0.91
Dicamba	1918-00-9	221.04	235.04	0.94
Dichloroprop	120-36-5	235.06	249.06	0.94
Dinoseb	88-85-7	240.21	254.21	0.95
MCPA	94-74-6	200.62	214.62	0.93
MCPP	93-65-2	214.65	228.65	0.94

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

Refer to Section 10 for specific corrective actions.

13. Method Performance

13.1 Method Detection Limit Study (MDL) / Limit of Detection Study (LOD) / Limit of Quantitation (LOQ)

The laboratory follows the procedure to determine the MDL, LOD, and/or LOQ as outlined in Qualtrax Document ID 1732. These studies performed by the laboratory are maintained on file for review.

13.2 Demonstration of Capability Studies

Refer to Alpha SOP/08-12 for further information regarding IDC/DOC Generation.

13.2.1 Initial (IDC)

The analyst must make an initial, one-time, demonstration of the ability to generate acceptable accuracy and precision with this method, prior to the processing of any samples.

13.2.2 Continuing (DOC)

The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

Refer to Alpha's Chemical Hygiene Plan and Waste Management and Disposal SOP for further pollution prevention and waste management information.

15. Referenced Documents

- Chemical Hygiene Plan
- Qualtrax ID 1732 MDL/LOQ Generation
- Qualtrax ID 1739 IDC/DOC Generation
- Qualtrax ID 1728 Waste Management and Disposal SOP

16. Attachments

Table 1: REPORTING LIMITS

Table 2: STANDARD SOLUTIONS

Table 3: QC ACCEPTANCE CRITERIA

Table 4: QC FAILURE ACTION PLAN

TABLE 1

REPORTING LIMITS

Herbicides	RL (Aqueous)	RL (Soil)
2,4-D	1.0 ug/L	33 ug/kg
Dalapon	1.0 ug/L	33 ug/kg
2,4-DB	1.0 ug/L	33 ug/kg
Dicamba	1.0 ug/L	33 ug/kg
Dichloroprop	1.0 ug/L	33 ug/kg
Dinoseb	1.0 ug/L	33 ug/kg
MCPA	100.0 ug/L	3300 ug/kg
MCPP	100.0 ug/L	3300 ug/kg
Silvex (2,4,5-TP)	1.0 ug/L	33 ug/kg
2,4,5-T	1.0 ug/L	33 ug/kg

TABLE 2

STANDARD SOLUTIONS

Compound	Level 6	Level 5	Level 4	Level 3	Level 2	Level 1	Std. Spike Concentration *	Std. LCS Concentration *
	(µg/mL)	(µg/mL)	(µg/mL)	(µg/mL)	(µg/mL)	(µg/mL)	(µg/mL)	(µg/mL)
2,4-D	2.0	1.0	0.5	0.2	0.1	0.05	10	10
Dalapon	2.0	1.0	0.5	0.2	0.1	0.05	10	10
2,4-DB	2.0	1.0	0.5	0.2	0.1	0.05	10	10
Dicamba	2.0	1.0	0.5	0.2	0.1	0.05	10	10
Dichloroprop	2.0	1.0	0.5	0.2	0.1	0.05	10	10
Dinoseb	2.0	1.0	0.5	0.2	0.1	0.05	10	10
MCPA	200	100	50	20	10	5	1000	1000
MCPP	200	100	50	20	10	5	1000	1000
Silvex (2,4,5-TP)	2.0	1.0	0.5	0.2	0.1	0.05	10	10
2,4,5-T	2.0	1.0	0.5	0.2	0.1	0.05	10	10
DCAA (Surrogate)	2.0	1.0	0.5	0.2	0.1	0.05	10	10

***** Calculations are based on an initial aqueous sample volume of 1L**,** initial soil sample weight of 30g, and final extract volume of 10mL.

TABLE 3

QC ACCEPTANCE CRITERIA

	Aqueous/Soil	
Surrogate % Recovery	**Lower Control Limit**	**Upper Control Limit**
2,4-Diclorophenylacetic acid (DCAA)	30%	150%

	% Recovery		% RPD		MCP %RPD	
LCS/LCSD	**Lower Control Limit**	**Upper Control Limit**	**waters**	**soils**	**waters**	**soils**
2,4-D	40%	140%	≤ 50%	≤ 50%	≤ 20%	≤ 30%
dalapon						
2,4-DB						
dicamba						
dichloroprop						
dinoseb						
MCPA						
MCPP						
Silvex (2,4,5-TP)						
2,4,5-T						

	% Recovery		% RPD		MCP % RPD	
MS / MSD	**Lower Control Limit**	**Upper Control Limit**	**waters**	**soils**	**waters**	**soils**
2,4-D	30%	150%	≤ 30%	≤ 30%	≤ 20%	≤ 30%
dalapon						
2,4-DB						
dicamba						
dichloroprop						
dinoseb						
MCPA						
MCPP						
Silvex (2,4,5-TP)						
2,4,5-T						

TABLE 4

QC FAILURE ACTION PLAN

Blank Failures	Failure Situation	Action(s)
Surrogate Failure	1 of 2 high or low	Report as is
	Both high	Report as is
	Both low, samples are non-detect with passing surrogates	Report as is
	Both low, samples have hits and/or failing surrogates	Revial/rerun Re-extract if still failing
IS Failure	IS not present (less than 10% recovery)	Add IS Rerun
	IS out high or low	Revial/rerun Re-extract if still failing
Contamination	Below RL; sample(s) non-detect, below RL, or concentration 10 times or more above the blank	Report as is
	Below RL, sample(s) concentration above RL	See team leader/manager
	Above RL, sample(s) concentration 10 times or more above the blank	Report as is
	Above RL with non-detect sample(s)	Report as is
	Above RL, sample(s) concentration less than 10 times above the blank and volume available	Revial/rerun Re-extract if contamination still present
	Above RL, sample(s) concentration less than 10 times above the blank and no volume available	Revial/rerun B-flag affected data

LCS/LCSD Failures	Failure Situation	Action(s)
Surrogate Failure	1 of 2 high or low	Report as is
	Both high or low	Report as is
IS Failure	IS not present (less than 10% recovery)	Add IS Rerun
	IS out high or low	Revial/rerun Re-extract if still failing
Spike Failure	Spike compounds out high and sample(s) are non-detect with passing surrogates	Report as is
	Spike compounds out high and sample(s) have hits	Revial/rerun Re-extract if still high
	Spike compounds out low	Revial/rerun Re-extract if still low
	RPD failure	Report as is

MS/MSD/DUP Failures	Failure Situation	Action(s)
Surrogate Failure	(MS/MSD) 1 of 2 high or low	Report as is
	(MS/MSD) Both high or low	Report as is
	(DUP) 1 or more high, parent sample non-detect	Report as is
	(DUP) 1 of 2 low, parent sample matches	Report as is
	(DUP) 1 or more low, parent sample doesn't match	Revial/rerun Re-extract if still failing
IS Failure	IS not present (less than 10% recovery)	Add IS Rerun
	IS out high or low	Revial/rerun Re-extract if still failing
Spike Failure (MS/MSD only)	Compounds out high or low due to sample matrix or hits	Report as is
	Compounds out high or low due to extraction error	Revial/rerun Re-extract if still failing
	RDP failure	Report as is

PCBs

By Capillary Column Gas Chromatography

Reference Methods: Method 8082A SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update IV, 2007.

Quality Control Requirements and Performance Standards for Analysis of Polychlorinated Biphenyls (PCBs) by Gas Chromatography (GC) in Support of Response Action under the Massachusetts Contingency Plan (MCP), Revision No.2, February 15, 2024.

State of Connecticut, Department of Environmental Protection, RRCP, Version 3.0, May 2024.

1. Scope and Application

Method 8082A is used to determine the concentrations of Polychlorinated Biphenyls (PCBs) as Aroclors in extracts from solid, oil and liquid matrices. This SOP details the analysis for PCBs using fused-silica, open-tubular, capillary columns with electron capture detectors (ECD).

Matrices: Extracts from solid, oil and liquid matrices.

Definitions: See Alpha Laboratories Quality Manual Appendix A

Regulatory Parameter List: The standard compounds listed below are determined by this method.

Parameter	CAS#
Aroclor 1016	12674-11-2
Aroclor 1221	11104-28-2
Aroclor 1232	11141-16-5
Aroclor 1242	53469-21-9
Aroclor 1248	12672-29-6
Aroclor 1254	11097-69-1
Aroclor 1260	11096-82-5
* Aroclor 1262	37324-23-5
*Aroclor 1268	11100-14-4

*Note – not certified by NJ for the oil matrix

The data report packages present the documentation of any method modification related to the samples tested. Depending upon the nature of the modification and the extent of intended use, the laboratory may be required to demonstrate that the modifications will produce equivalent results for the matrix. Approval of all method modifications is by one of the following laboratory personnel before performing the modification: Area Supervisor, Laboratory Director, or Quality Assurance Officer.
This method is restricted to use by or under the supervision of analysts experienced in the operation of the gas chromatograph (GC) and in the interpretation of gas chromatograms. Each analyst must demonstrate

the ability to generate acceptable results with this method by performing an initial demonstration of capability (see section 13.2).

2. Summary of Method

A measured volume or weight of sample (100mL for liquids, 1g for oil and up to 15g for solids) is extracted using the appropriate matrix-specific sample extraction technique.

Liquid samples are extracted at neutral pH with methylene chloride using Method 3510C (separatory funnel), or other appropriate technique. See extraction SOP for details.

Solid samples are extracted with methylene chloride: acetone (1:1) using Method 3540C (Soxhlet), or other appropriate technique. Solid samples may also be extracted with hexane: acetone (1:1) using Method 3546 (microwave). See extraction SOP for details.

Wipe samples are extracted with methylene chloride: acetone (1:1) using Method 3540C (Soxhlet) or other appropriate technique. See extraction SOP for details.

Oil samples are diluted with hexane following the procedure outlined in the extraction SOP.

Sulfuric acid cleanup (Method 3665A), Copper cleanup (Method 3660B) and Silica Gel cleanup (Method 3630) are utilized for PCB extracts. See extraction SOP for details.

After cleanup, the extract is analyzed by injecting 1µL into a gas chromatograph equipped with narrow- or wide-bore fused silica capillary columns and electron capture (GC/ECD) detectors.

2.1 Method Modifications from Reference

Not applicable.

3. Reporting Limits

The reporting limits for this method as outlined is as follows:

- **Aqueous samples**: 0.04 ug/L / Aroclor based on a 100mL extraction
- **Soil Samples**:
  - 33.3 ug/kg / Aroclor based on 15g extraction
  - 50.0 ug/kg / Aroclor based on 10g extraction
  - 100.0 ug/kg / Aroclor based on 5g extraction
  - 250.0 ug/kg / Aroclor based on 2g extraction
- **Oil Samples**: 5 mg/kg based on 1g extraction
- **Solid of Difficult Matrices** (i.e Caulking, Concrete, etc. are logged using the Alpha Low Level 8082 products): based on a 15g extraction
  - Aroclors 1016, 1221, 1232, 1242, 1254: 20 ug/kg
  - Aroclors 1248, 1260: 13.3 ug/kg
  - Aroclors 1262, 1268: 6.67 ug/kg

4. Interferences

4.1 Instrumental

4.1.1 Only high purity gases are used in the GC system to eliminate this source of possible contamination. Both the Hydrogen (carrier gas) and Nitrogen (detector make-up gas) are certified by the gas supplier.

4.1.2 Preventive instrument maintenance is performed routinely, and whenever highly contaminated extracts are analyzed that could result in chromatographic interferences or result in degradation of system performance. Section 10.6 describes the maintenance steps.

4.1.3 Glassware must be scrupulously cleaned. This procedure is detailed in the Organic Extraction Cleaning and Handling SOP/1953. Store dry glassware in a clean environment.

4.2 Parameters

4.2.1 All solvents used are pesticide grade or equivalent, and reagents are purchased as certified contaminant free. All these materials are routinely determined to be free of interferences by analysis of extraction blanks with every extraction batch performed.

4.2.2 Certain compounds (i.e. phthalates) can be extracted from the sample matrix and be detected by the ECD that could possibly result in false positive results or complicate the data interpretation. The use of the cleanup procedures detailed in the extraction SOP minimizes these possible interferences. Analyst experience is also crucial in making compound determinations.

4.2.3 Interferences co-extracted from the samples will vary considerably from waste to waste. While a general cleanup technique is referenced or provided as part of the method, unique samples may require additional cleanup approaches to achieve desired degrees of discrimination and quantitation.

5. Health and Safety

The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound must be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of material data handling sheets is available to all personnel involved in the chemical analysis. PCBs have been tentatively classified as known or suspected human or mammalian carcinogens. Additional references to laboratory safety are available in the Chemical Hygiene Plan.
All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

5.1 Lab coats, safety glasses, and gloves must be worn when handling samples, extracts, standards or solvents.

5.2 All solvent and extract transfers must be handled in the vented bench area in the GC laboratory.

5.3 All stock standards, working standards, and vialed sample extracts must be placed into the waste bucket in the lab, for future disposal by the Hazardous Waste Manager. The container must be labeled properly with hazard warning labels indicating the container contents.

5.4 Bottles containing flammable solvents must be stored in the flammable cabinet.

6. Sample Collection, Preservation, Shipping and Handling

6.1 Sample Collection

Aqueous samples are collected in two 100mL amber glass jars with Teflon-lined lids. Solid samples are collected in one 250mL wide-mouth glass jar with a Teflon-lined lid. Oil samples are collected in a glass jar with Teflon-lined lids. All containers are purchased pre-cleaned and certified from commercial vendors.

6.2 Sample Preservation

Both aqueous and solid samples are then preserved by packing in coolers with ice or ice packs, to maintain a temperature of 4 ± 2° C. Upon receipt at the laboratory, the samples are transferred into sample storage refrigerators to maintain at a temperature of 4 ± 2° C. Preservation is not required for oil samples.

6.3 Sample Handling

- TCLP/SPLP tumbled extracts, NJ DKQP aqueous samples must be extracted within 7 days of sample collection.
- NJ DKQP soil/solid and oil samples within 14 days of collection (NJ DKQP allows 365 days for solids if frozen).
- All other samples, both aqueous and solids, have a 365-day hold time.
- Once extracted, the samples must be analyzed within 40 days of the extraction date.

7. Equipment and Supplies

7.1 Gas Chromatograph, Agilent 6890, 7890: An analytical system completed with gas chromatograph configured for split-splitless injection and all required accessories including syringes, analytical columns, gases, electron capture detectors (ECD), and data system.

7.2 GC Columns: Alpha utilizes dual-column analyses. The dual-column approach involves a single injection that is split between two columns that are mounted in a single gas chromatograph. Typical column pair used is listed below. Other columns may be used as long as method performance criteria can be met.

Column pair:

RTX-CLP: Cat. #11141 from Restek or equivalent; 30m, 0.32mm, 0.32µm

RTX-CLPII Cat. #11324 from Restek or equivalent; 30m, 0.32mm, 0.25µm

7.3 Guard Column: Cat. #10027 from Restek or equivalent; 5m, 0.32mm

7.4 Class "A" Volumetric Flasks: 10mL and 25mL (and other volumes), for standards preparation

7.5 Microsyringes: 10 µL – 1000 µL

7.6 Gooseneck splitless injecton liner, Cat #20799-214.5 from Restek or equivalent

7.7 Universal "Y" Press-tight tee split: Cat. #20406 from Restek or equivalent / **Siltek MXT Connector:** Cat. #21388 from Restek or equivalent

8. Reagents and Standards

Reagent grade or pesticide grade chemicals are used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficient high purity to permit its use without lessening the accuracy of the determination.
NOTE: Store the standard solutions (stock, composite, calibration, internal, and surrogate) at 4 ± 2° C in Teflon(R)-sealed containers in the dark. When a Lot of standards is prepared, aliquots of that Lot are stored in individual small vials. All stock standard solutions must be replaced after one year or sooner if routine QC tests indicate a problem. All other standard solutions must be replaced after six months or sooner if routine QC indicates a problem.

8.1 n-Hexane: Pesticide quality or equivalent.

8.2 Acetone: Pesticide quality or equivalent.

8.3 Organic-free Reagent Water: All references to water in this method refer to organic-free reagent water from Alpha's RO water treatment system.

8.4 Stock Standard Solutions: All stock standard solutions are purchased from commercial vendors as ampullated certified solutions. When an ampullated stock solution is opened, it is transferred to a labeled amber screw-cap vial. The expiration date of the stock solution is either the vendor specified expiration date, or 1 year from the date the ampule was opened, whichever is sooner.

8.5 Calibration Standards: Calibration standards are prepared volumetrically by diluting the appropriate stock standard(s) with hexane. Calibration standards expire 6 months from the date of preparation, or on the earliest expiration date of any of the stock solutions used to prepare the calibration standard. Calibrations are performed at the 6 concentration levels listed in Table 1. The list of ampullated calibration standards is obtain from **Agilent**:

- Aroclor 1016, Cat. #PP-282, at 100ug/mL
- Aroclor 1260, Cat. #PP-361, at 100ug/mL
- Aroclor 1262, Cat. #PP-371, at 100ug/mL
- Aroclor 1268, Cat. #PP-382, at 100ug/mL
- Aroclor 1221, Cat. #PP-292, at 100ug/mL
- Aroclor 1232, Cat. #PP-302, at 100ug/mL

- Aroclor 1242, Cat. #PP-312, at 100ug/mL
- Aroclor 1248, Cat. #PP-342, at 100ug/mL
- Aroclor 1254, Cat. #PP-351, at 100ug/mL

8.5.1 Preparation of Initial Calibration Standards:

8.5.1.1 SOIL ICAL:

- **1660 L7**: (mix of Aroclors 1016 and 1260) is prepared by diluting
  - 5mL 1016 Standard (Agilent, Cat. #PP-282)
  - 5mL 1260 Standard (Agilent, Cat. #PP-361)
  - 6.4mL of PCB ICAL Surrogate Stock

  to 25ml of Hexane to achieve concentration of
  - 1016 and 1260 at 20ug/mL
  - TCMX at 1.28ug/mL and DCB at 2.56ug/mL.

- **2154 L7:** (mix of Aroclors 1221 and 1254) is prepared by diluting
  - 5mL 1221 Standard (Agilent, Cat. #PP-292)
  - 5mL 1254 Standard (Agilent, Cat. #PP-351)

  to 25ml of Hexane to achieve concentration of
  - 1221 and 1254 at 20ug/mL
- **4268 L7** (mix of Aroclors 1242 and 1268), **3262 L7** (mix of Aroclors 1232 and 1262) and **1248 L7;** all are prepared from their respective Stock Standards according to the formula used for L7 of 2154.
- Levels 1-6 are prepared by serial dilutions and a formula with volumes needed can be found in Table 2.

8.5.1.2 RVT ICAL:

- Prepare 2 Intermediate ICAL Standards by diluting 1016/1260 L7 of Soil ICAL:
  - **Stock#1** (10ug/mL): 500uL of 1660 L7 + 500uL of Hexane
  - **Stock#2** (0.5ug/mL): 25uL of 1660 L7 + 975uL of Hexane
- Use the VYPER programs: **pcb_rvt_L1-L6** and **pcb_rvt_L7-L10** to vial 1660 ICAL according to the formula and to achieve the concentrations provided in Table 3.
- Prepare one-point cal standards for all other Aroclors by diluting respective L7 stock solutions by using the VYPER program:

  12.5uL of L7 + 987.5uL of Hexane
  pcb_rvt_1point_set

8.6 Second Source Standards: (ICV) Initial Calibration Verification standards are prepared volumetrically by diluting the appropriate stock standard(s) with hexane. Initial Calibration Verification standards expire 6 months from the date of preparation, or on the

earliest expiration date of any of the stock solutions used to prepare the standard. The list of ampullated standards is obtain from **Accustandard**:

- Aroclor 1016, Cat. #C-216S-H-10X, at 1000ug/ml
- Aroclor 1260, Cat. #C-260S-H-10X, at 1000ug/ml
- Aroclor 1262, Cat. #C-262S-H-10X, at 1000ug/ml
- Aroclor 1268, Cat. #C-268S-H-10X, at 1000ug/ml
- Aroclor 1221, Cat. #C-221S-H-10X, at 1000ug/ml
- Aroclor 1232, Cat. #C-232S-H-10X, at 1000ug/ml
- Aroclor 1242, Cat. #C-242S-H-10X, at 1000ug/ml
- Aroclor 1248, Cat. #C-248S-H-10X, at 1000ug/ml
- Aroclor 1254, Cat. #C-254S-H-10X, at 1000ug/ml

8.6.1 Preparation of ICV Standards:

- **1660 ICV:** is prepared by diluting
  - 50uL 1016 Standard (AccuStandard, Cat. #C-216S-H-10X)
  - 50uL 1260 Standard (AccuStandard, Cat. #C-260S-H-10X)
  - 320uL of PCB CCAL Surrogate Stock

  to 20ml of Hexane to achieve concentration of
  - 1016 and 1260 at 2.5ug/mL
  - TCMX at 0.16ug/mL and DCB at 0.32ug/mL

- **2154, 4268, 3262 and 1248 ICVs** are prepared from their respective Stock Standards according to the formula used for 1660 ICV.

- Prepare **RVT ICVs** for all Aroclor standard solutions by diluting respective ICV stocks by using VYPER's pcb_rvt_icv program:
  - 100uL of ICV to 900uL of Hexane, achieving a concentration of
  - 1016 and 1260 at 0.25ug/mL
  - TCMX at 0.016ug/mL and DCB at 0.032ug/mL

8.7 Internal Standard Solution: 1-Bromo-2-nitrobenzene (Ultra, Cat. #PPS-351) is used as the internal standard and is added to all single-component calibration standards and sample extracts to achieve a concentration of 0.25µg/mL. For RVT, this solution is diluted 10X more, achieving a concentration of 0.025µg/mL.

8.8 Surrogate Standards: Tetrachloro-m-xylene (TCMX) and Decachlorobiphenyl (DCB) are used as surrogates for Aroclor analysis. They are added to the calibration standards at the concentrations listed in Table 1, Continuing Calibration Standards and are spiked into all samples and QC samples prior to extraction.

- **ICAL Surrogates Stock:** is prepared by diluting 500uL of Pesticides Surrogates Standard Spiking Solution (Ultra, Cat. #ISM-320-1) and 500uL of Decachlorobiphenyl (Accustandard, Cat. #CLP-032-R-01) to 20mL of Hexane to achieve concentration of TCMX at 5ug/mL and DCB at 10ug/mL.

- **CCAL Surrogates Stock:** is prepared by diluting 1mL of TCMX&DCB (Accustandard, Cat. #CLP-032-R) and 1mL of Decachlorobiphenyl (Accustandard, Cat. #CLP-032-R-01) to 20mL of Hexane to achieve concentration of TCMX at 10ug/mL and DCB at 20ug/mL.
- **Extraction Surrogates Stock:** is prepared by diluting 10mL of TCMX&DCB (Accustandard, Cat. #CLP-032-R) to 1000mL of Acetone to achieve concentration of TCMX and DCB at 2ug/mL.
- **RVT Extraction Surrogates Stock**: is prepared by diluting 1.25mL of TCMX&DCB (Accustandard, Cat. #CLP-032-R) to 500mL of Acetone to achieve concentration of TCMX and DCB at 0.5ug/mL.
- **PCB Caulking Surrogates Stock:** is prepared by diluting 10mL of TCMX&DCB (Accustandard, Cat. #CLP-032-R) to 100mL of Acetone to achieve concentration of TCMX and DCB at 20ug/mL.
- **PCB Oil Surrogate Stock:** is prepared by diluting 5mL of TCMX&DCB (Accustandard, Cat. #CLP-032-R) to 500mL of Hexane to achieve concentration of TCMX and DCB at 2.0ug/mL.

8.9 LCS/MS Spiking Solutions:

- **PCB Matrix Spike:** The LCS/MS spiking solution is prepared by diluting 6.25mL of Arochlor 1016/1260 (Restek, Cat. #32039) to 500mL of Acetone to achieve concentration of Arochlor 1016/1260 at 12.5ug/ml. For **RVT**, 1.25mL of the stock solution is diluted to 500mL of Acetone to achieve a concentration of Aroclor 1016/1260 at 2.5 ug/mL.

- **PCB Caulking Matrix Spike:** The LCS/MS spiking solution is prepared by diluting 6.25mL of Arochlor 1016/1260 (Restek, Cat. #32039) to 50mL of Acetone to achieve concentration of Arochlor 1016/1260 at 125ug/mL.

- **PCB Oil Matrix Spike:** The LCS/MS spiking solution is prepared by diluting 2.5mL of Arochlor 1016/1260 (Restek, Cat. #32039) to 200mL of Hexane to achieve concentration of Arochlor 1016/1260 at 12.5ug/mL.

9. Quality Control

The laboratory must maintain records to document the quality of data that is generated. Ongoing data quality checks are compared with established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

9.1 Blank(s)

A Method Blank is an aliquot of a clean reference matrix (reagent water for water samples, Ottawa sand for soil/sediment samples, or PCB free transformer oil for oil samples) that is carried through the entire analytical procedure. Extraction blanks are performed with each extraction batch of 20 or less samples, according to the extraction SOPs. The extraction blank must not contain any of the reportable analytes above the reporting limit. If any reportable analytes are detected in the blank, the entire extraction batch is suspect and re-extraction of all associated samples is required, unless the associated samples are non-detect or concentration of the analyte in the samples is 10 times greater than the concentration of this analyte in the blank. The surrogate recoveries must also be within the acceptance criteria listed in Table 4. If surrogate acceptance criteria are exceeded, the extraction batch must be evaluated to determine if re-extraction or re-analysis is necessary. Actions associated with Method Blank failures are listed in Table 6.

9.2 Laboratory Control Sample (LCS)

A Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD) pair is extracted with each analytical batch. The LCS/LCSD consist of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume. For Aroclor analysis, the LCS/LCSD are spiked with a mixture of Aroclor 1016 and 1260 (1660) at the levels listed in Table 5. The recovery acceptance criteria are listed in Table 4. If any recovery criteria are not met, the extract may be re-analyzed. If the criteria are still not met, the **entire batch is re-extracted**, unless the recoveries are high, and the associated samples are non-detect. If this is not possible, due to insufficient sample or holding time exceedances, the analyst must narrate the failure in the LIMS for inclusion in the client report. Actions associated with LCS/LCSD failures are listed in Table 6.

9.3 Initial Calibration Verification (ICV)

Refer to Section 10.2.7.

9.4 Continuing Calibration Verification (CCV)

Refer to Section 10.4.

9.5 Matrix Spike/ Matrix Spike Duplicate (MS/MSD)

Matrix Spike and Matrix Spike Duplicate are field samples spiked with known target analyte(s) at the levels listed in Table 5. Upon client request, an MS/MSD pair is extracted and analyzed with each batch of 20 or less samples. MS samples serve as a measure of extraction accuracy, by allowing the comparison of the found amount(s) of target analyte(s) with the spiked amount(s). An MS/MSD set also allows for the calculation of the extraction precision, by comparing the results of the two samples. The recovery acceptance criteria are listed in Table 4. If the recovery criteria are not met, but are met in the LCS, the failure may be attributed to sample matrix effects. Actions associated with MS/MSD failures are listed in Table 6.

For samples with a state of origin of New Jersey, a MS must be extracted for every twenty samples within a 24hr period.

9.6 Laboratory Duplicate (DUP)

Duplicates are laboratory selected replicate samples, prepared by taking an additional sample aliquot of a sample. Upon client request, a DUP is extracted and analyzed with batch of 20 or

less samples. Duplicates serve as a measure of the extraction precision, by comparing the results of the sample and duplicate. The relative percent difference (RPD) acceptance criteria are listed in Table 4. If the RPD criteria are not met, the failure may be attributed to matrix effect. Actions associated with DUP failures are listed in Table 6.

For samples with a state of origin of New Jersey, a DUP must be extracted for every twenty samples within a 24hr period.

9.7 Surrogates

All extracted samples and associated QC are spiked with surrogates at the levels listed in Table 5. The laboratory must evaluate surrogate recovery data from individual samples and QC samples versus the surrogate control limits listed in Table 4. If the surrogate limits are not met, the extract may be reanalyzed to determine if the failure was due to an instrument problem. If the criteria are still not met, the affected samples must be re-extracted to confirm that the failure was due to sample matrix, unless the surrogate recovery is high, and the associated sample is non-detect. If matrix effect is confirmed, this must be noted on a narrative sheet for inclusion in the client report.

9.8 Method Sequence

Typical Initial calibration (each level and ICV to identified with the standard lot number)

1. Prime
2. Blank
3. Standard Level 1
4. Standard Level 2
5. Standard Level 3
6. Standard Level 4
7. Standard Level 5
8. Standard Level 6
9. Standard Level 7
10. Initial Calibration Verification Standard (ICV)

Repeat steps 3 – 9 as needed for each Aroclor necessary for calibration.

NOTE: If multiple calibration mixtures are analyzed, it is acceptable to analyze appropriate ICVs after all calibration standards have been injected.

Typical Daily Sequence

1. 1660 Continuing Calibration Standard **(identified with the standard lot number)**
2. Extraction Blank

3. Laboratory Control Sample / Laboratory Control Sample Duplicate
4. Matrix Spike / Matrix Spike Duplicate (if requested by Client)
5. Duplicate (if included with batch QC)
6. Samples - **up to 20 field samples**
7. Repeat 1 – 6 as needed.

10. Procedure

10.1 Equipment Set-up

10.1.1 GC Conditions:

The dual-column / dual-detector approach involves the use of the columns listed in section 7.2. The columns are connected to an injection tee or dual injection GC, and separate electron capture detectors. Alpha typical GC conditions are listed below but may be altered as long as method performance criteria are met.

	INSTRUMENT CONDITIONS
Injector temperature	250^{0}C
Injector mode	Split 10:1
Split Flow	60.1 mL/min
Total Flow	78.2 mL/min
Detector temperature	350^{0}C
Carrier gas	Hydrogen
Carrier flow	20mL/min
Carrier mode	Constant flow
Makeup gas	Nitrogen
Total detector flow	60mL/min
Injection Volume	1µL

	OVEN TEMP PROGRAM
Temperature 1	150 ^{0}C
Time 1	0 min
Ramp 1	45^{0}C/minute
Temperature 2	230^{0}C
Time 2	0 min
Ramp 2	30^{0}C/minute
Temperature 3	330^{0}C
Time 3	1 min

10.2 Initial Calibration

10.2.1 Prepare calibration standards using the standards listed in Section 8.5 to achieve the concentrations from Table 1.

For Analysis of Aroclors which use an **Average Response Factor model (AVG)** the minimum requirement is to perform an initial multi-point calibration for a mixture of 1016/1260 and to use a **one-point initial calibration** to determine the calibration factor and pattern recognition for the remaining Aroclors (TNI standard 1.7.1.1.m). The concentrations of the other Aroclors should generally correspond to the mid-point of the linear range of the detector, but lower concentrations may be employed.

10.2.2 Establish the GC operating conditions by loading the appropriate GC method. Typical instrument conditions are listed in section 10.1.1. The same operating conditions are used for calibrations and sample analyses. Create the analytical sequence using the Agilent Chemstation data acquisition software. Record the

calibration standard, unique lot number (PP#) and analyst's initials in the analytical sequence list.

10.2.3 A 1µL injection volume of each calibration standard is typically used. Other injection volumes may be employed, provided that the analyst can demonstrate adequate sensitivity for the compounds of interest. The same injection volume must be used for all standards and samples.

10.2.4 Column adsorption may be a problem when the GC has not been used for a day or more or after system maintenance. The GC column may be primed (or deactivated) by injecting a PCB standard mixture approximately 20 times more concentrated than the mid-concentration standard. Inject this standard mixture prior to beginning the initial calibration or calibration verification.

Alternately, the system may be primed by baking at the final analytical temperature for approximately 30 minutes.

Several analytes may be observed in the injection just following system priming. Always run an instrument blank after system priming.

10.2.5 **Calibration Factor:** Internal Standard Calibration techniques are employed in this method.

10.2.7.1 Internal Standard Procedure. In each standard, calculate the response factor (RF) for each analyte, the average RF, and the relative standard deviation (RSD) of the RFs, using the Enviroquant data processing software. The calculations are performed automatically, using the formula listed in Quality Manual.

Alternatively, standards of the other seven Aroclors are necessary for pattern recognition. When employing the traditional model of a linear calibration through the origin, these standards are also used to determine a single-point calibration factor for each Aroclor, assuming that the Aroclor 1660 mixture has been used to describe the detector response.

The standards for these seven Aroclors should be analyzed before the analysis of any samples with hits above the RL. For example, an Aroclor 1254 standard should be analyzed before a sample with a hit of Aroclor 1254.

10.2.6 Initial Calibration Criteria

- If the **RSD for an analyte is < 20%**, then the response of the instrument for this compound is considered linear over the range and the mean calibration factor can be used to quantitate sample results.
- If the **RSD for any analyte is > 20%**, then linearity through the origin cannot be assumed. The mean response factor cannot be used for quantitation. An alternative calculation may be done using **linear regression** or **quadratic regression** (minimum of six ICAL points are needed and regression must be weighted inversely proportional to concentration) if the correlation coefficient is **>0.990**. If both quantitation methods fail criteria for any compound in the initial calibration, then the system must be reevaluated, and a new calibration curve must be analyzed. If quadratic regression is used for calibration, this must be noted in the laboratory narrative.

- **A minimum of 3 peaks must be chosen** for each Aroclor and preferably 5 peaks (11.4.6.1 8082A).

- **The minimum number of calibration standards** based on the type of calibration curve is listed below:

Type of Calibration Curve	Minimum Number of Calibration Standards
Linear Fit/Avg Response	5
Quadratic Fit	6

- **Removal and replacement of the calibration standards:**
  - The Analyst may remove individual analyte from the lowest (cannot remove RL level) and or the highest calibration levels of the curve. Removal of the individual analyte of interior levels is not permitted.
  - The Analyst may remove an entire single standard calibration level from the interior of the calibration curve when the instrument response demonstrates that the standard was not properly introduced to the instrument, or an incorrect standard was analyzed. The Analyst who chooses to remove a calibration standard from the interior of the calibration shall remove that particular standard calibration level for all analytes.
  - The Analyst may replace a calibration standard provided that:
    - the replacement standard will be analyzed within twenty-four (24) hours of the original calibration standard analysis for that particular calibration level;
    - all analytes of the replacement calibration standard must be replaced if a standard within the interior of the calibration is replaced;
    - the laboratory limits the replacement of calibration standards to one calibration standard concentration.

- **Percent Relative Error (%RE)**: For linear and quadratic fit compounds, the %RE must be calculated for the standard at or near the midpoint and at the lowest level of the initial calibration. The %RE between the calculated and expected concentration of an analyte must be **≤ 30%**, otherwise recalibration is necessary.

10.2.7 Initial Calibration Verification

An initial calibration verification standard must be run immediately after each initial calibration, near the midpoint of the curve. The standard must be prepared using a second source that is different than the source used for the initial calibration. (Standards listed in Section 8.6). The **%D** has to be within **20%** when compared to the mean response factor from the initial calibration.

If recovery is **outside the 80-120% criteria**, the following steps should be taken:

- Analyze the replacement standard. The cause of the failure of the first calibration verification result should be documented.
- If the reanalysis still didn't achieve the criteria, the source of the problem must be investigated, and instrument must be recalibrated.

10.2.8 Retention Time Window

10.2.8.1 The retention time window used for the identification of target analytes is ± 0.07 minutes. These criteria have been adopted from the EPA CLP Statement of Work (OLM04.2). It has been found that these limits work well, being wide enough to eliminate false-negatives while being tight enough to eliminate false-positives. Windows that are calculated using the procedure recommended in Method 8000 tend to be very narrow, creating the risk of false negative results.

10.2.8.2 The windows listed above are used as guidance; however, the experience of the analyst weighs heavily in the interpretation of the chromatograms. For example, it has been observed that certain oil matrices can cause the retention times to shift more dramatically.

10.3 Sample Processing

The determination of PCB Aroclors is accomplished by comparing the sample chromatogram to that of the most similar Aroclor standard. The use of PCB overlays is extremely helpful, either by using hardcopies of chromatograms or by utilizing the Enviroquant software. A choice must be made as to which Aroclor is most similar and whether that standard is truly representative of the PCB in the sample. Both retention time and pattern are important when determining PCBs in a sample.

Samples that contained weathered PCB present special analytical challenges. Weathering could alter the Aroclor pattern to the extent that different peaks have to be selected for quantitation. Samples that contained more than one Aroclor present similar problems. For these samples, the Analyst may have to consider selecting the earlier eluting peaks for the lower boiling Aroclor and selecting the later eluting peaks for the higher boiling Aroclors to minimize overlapping peaks.

Minimum of 3 peaks must be chosen for each Aroclor. In these instances, the Analyst may need request the assistance of someone with more expertise in determining the presence of PCB Aroclor.

If compound identification or quantitation is precluded due to interference (e.g., broad, rounded peaks or ill-defined baselines are present) cleanup of the extract may be needed. If instrument problems are suspected, rerun the extract on another instrument to determine if the problem results from analytical hardware or the sample matrix. Refer to the extraction SOPs for the procedures to be followed in sample cleanup.

- The laboratory must report the ***HIGHER*** of the two results unless obvious interference is present on of the columns.

- The **Relative Percent Difference (RPD)** should be **≤ 40%.** If the RPD exceeds 40, this will be denoted with a P flag. If the RPD exceedance is due to interference, the lower of the dual column values can be reported with I and P flags.

If any peaks are above the calibration, a dilution must be done. The dilution reported is the least dilute level at which the peak area is within the calibration range.

10.4 Continuing Calibration

10.4.1 Verify calibration each **12-hours** shift by injecting calibration verification standards prior to conducting any sample analyses. A calibration standard must also be injected at intervals of not less than **once every twenty filed samples**.

A bracketing CCV is not required with the use of internal standard calibration (Method 8082A 11.6.8)

For Aroclor analysis, the calibration verification standard should be a mixture of Aroclor 1016 and 1260 (1660). The calibration verification process does not require analysis of the other Aroclor standards used for pattern recognition (Method 8082A 11.6.2). However, if the one-point calibration is used for the seven other Aroclor, a calibration standard must be analyzed before the sample for any hits.

10.4.2 The **Response Factor** (for internal standard compounds) for each analyte to be quantitated must not exceed a **± 20% difference** when compared to the initial calibration curve The Enviroquant data processing software automatically calculates the **%D** for all analytes.

10.5 Internal Standard

The use of internal standard calibration does not require that all sample results be bracketed with CCV standard. However, when internal standard calibration is used, the retention times of internal standards and the area response of internal standards should be checked for each analysis (10.4.3).

10.5.1 **IS in CCAL** – The measured area of the internal standard must be no more than ± 50% different from the average area calculated during initial calibration **(-50 to 150%).**

10.5.2 **IS in samples** - The measured area of the internal standard must be no more than -50% to +100% different from the area calculated from opening CCV **(-50 to 200%)**

Retention Time shift >30 seconds from the retention time of the most recent calibration standard are cause for concern and must be investigated.

10.6 Preventive Maintenance

10.6.1 **Preventive Maintenance:** Routine preventive maintenance is performed to maintain GC system performance. This includes periodic replacement of injector septa, replacement of injector liner(s), and replacement of injector seals.

10.6.2 Other Maintenance: ECD detectors may become contaminated, requiring bake out at elevated temperatures, (no greater than 375°C) or repair by the manufacturer.

11. Data Evaluation, Calculations and Reporting

11.1 Quantitation of Aroclors

Per Method 8082A, quantitation is based on the use of a minimum of 3 of the major peaks present in the analyte, although the use of 5 of the major peaks is recommended. Each of these peaks is individually calibrated with a **minimum of five calibration points** based on average response factors. The %RSD must meet the criteria of ≤20% for the ICAL. The five major peaks are calculated as described below. After individual calculation meets criteria, the average of the peaks selected for quantitation is used to determine the final concentration.

11.1.1 Aqueous samples

$$\text{Concentration } (\mu g/L) = \frac{C \times DF \times Vf \times 1000}{Vo}$$

where:
C = Extract concentration (µg/mL), **NOTE**: ng on column = ng/injection volume = ng/uL = ug/mL
DF = Dilution factor
Vf = Final extract volume (mL)
Vo = Sample volume (mL)

11.1.2 Soil/sediment samples

$$\text{Concentration } (\mu g/Kg, \text{ dry weight}) = \frac{C \times DF \times Vf \times 1000}{W\ (gm)} \div \%S$$

where:
C = Extract concentration (µg/mL), **NOTE**: ng on column = ng/injection volume = ng/uL = ug/mL
DF = Dilution factor
Vf = Final extract volume (mL)
W = Weight of the sample extracted (10g for high, 30g for low)
%S = Percent solids, as a decimal value

11.1.3 Reporting Results

11.1.3.1 After performing technical data review, validating that all QC criteria have been met and confirming all positive hits, the data report is sent electronically to the LIMS computer for generation of the client report. There are two levels of review of the data in the LIMS system prior to release of data. These reviews must be done by two separate individuals.

11.1.3.2 Reporting Results for PCBs in Caulking Samples

If in the screen sample Aroclor concentration as calculated above is **≥20000ppm**, the Client is contacted by a Customer Service Representative and these results are sent to the LIMS and reported to the Client.

If the sample concentration as calculated above for any Aroclor is **<20000ppm**, the sample is sent for re-extraction by Method 3540C (Alpha SOP/1954).

11.1.3.3 Summation Rules

"TOTAL" concentrations are calculated for **ALL samples and Quality Control Samples** (i.e. LCS, MS, DUP, BLK).

TOTAL = sum of "reportable" Aroclors

Reportable- all Aroclors reported for associated project.

For dual-column analysis, Total is reported as part of column "A" data, unless all individuals are reported from "B" column. "Total" is calculated based on the associated "Report List". See Work Instruction #14335 for details.

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

Holding time exceedance and/or improper preservation are noted on the nonconformance report form.

Perform instrument maintenance as described throughout this SOP as needed when instrument calibration criteria are not met. Record all maintenance in the instrument logbook.

All batch and sample specific QC criteria outlined in Section 10 are evaluated by the analyst prior to approval of the data. When any QC criteria fail, the cause for the failure must be identified and corrected. This may include instrument recalibration followed by sample reanalysis, sample cleanup, or sample re-extraction. If it is determined that the failure is due to sample matrix effects, a project narrative report is written into the LIMS by the analyst for inclusion in the data report. If there is insufficient sample volume to perform the re-analysis for confirmation, this is also noted in the narrative and included in the client report.

13. Method Performance

13.1 Method Detection Limit Study (MDL) / Limit of Quantitation (LOQ)

The laboratory follows the procedure to determine the MDL, LOD, and/or LOQ as outlined in Pace SOP/1732. These studies performed by the laboratory are maintained on file for review.

13.2 Demonstration of Capability Studies

Refer to Pace SOP/1739 for further information regarding IDC/DOC Generation.

13.2.1 Initial (IDC)

The analyst must make an initial, one-time, demonstration of the ability to generate acceptable accuracy and precision with this method, prior to the processing of any samples.

13.2.2 Continuing (DOC)

The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

Refer to Pace's Chemical Hygiene Plan and Waste Management and Disposal SOP for further pollution prevention and waste management information.

15. Referenced Documents

Chemical Hygiene Plan

SOP/1732 MDL/LOQ Generation

SOP/1739 IDC/DOC Generation

SOP/1728 Waste Management and Disposal SOP

16. Attachments

Table 1: STANDARD SOLUTIONS

Table 2: PCB ICAL PREPARATION

Table 3: PCB RVT ICAL PREPARATION

Table 4: QC ACCEPTANCE CRITERIA

Table 5: SPIKING LEVEL

Table 6: QC FAILURE ACTION PLAN

TABLE 1

STANDARD SOLUTIONS – Suggested Concentrations

STANDARD SOLUTIONS	Stock Solution (ug/mL)	Level 1 (ug/mL)	Level 2 (ug/mL)	Level 3 (ug/mL)	Level 4 (ug/mL)	Level 5 (ug/mL)	Level 6 (ug/mL)	Level 7 (ug/mL)
AROCLORS								
1016,1221,1232,1242, 1248,1254, 1260,1262,1268	100	0.1	0.5	1	2.5	5	10	20
Aroclors 1221, 1232, 1242, 1254, 1262, 1268	100	0.1	0.5	1	2.5	5	10	20
Internal Standard								
1-Bromo-2-Nitrobenzene	5000	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Surrogates:								
Tetrachloro-m-xylene	2.0	0.0064	0.032	0.064	0.16	0.32	0.64	1.28
Decachlorobiphenyl	2.0	0.0126	0.064	0.128	0.32	0.64	1.28	2.56

TABLE 2

PCB SOIL ICAL PREPARATION:

Aroclors: 1660, 2154, 4268, 3262, 1248				
Level	**Conc [ug/L]**	**Spike**	**Spike [uL]**	**Hexane [uL]**
6	10000	L7	5000	10000
5	5000	L6	500	500
4	2500	L6	250	750
3	1000	L6	100	900
2	500	L6	50	950
1	100	L6	10	990

TABLE 3

PCB RVT ICAL PREPARATION:

Level	Aroclor Conc	TCMX/DCB Conc	Stock#	VYPER Program	Stock Vol used	FV
	ug/L	ug/L			uL	mL
L1	4	0.256/0.512	2	**pcb_rvt_L1-L6**	8	1
L2	10	0.64/1.28			20	
L3	20	1.28/2.56			40	
L4	30	1.92/3.84			60	
L5	40	2.56/5.12			80	
L6	50	3.20/6.40			100	
L7	100	6.40/12.8	1	**pcb_rvt_L7-L10**	10	
L8	250	16/32			25	
L9	500	32/64			50	
L10	1000	64/128			100	

TABLE 4

QC ACCEPTANCE CRITERIA

Aqueous, Soils, Oils		
Surrogate	Lower Control Limit	Upper Control Limit
2,4,5,6-Tetrachloro-m-xylene	30%	150%
Decachlorobiphenyl		

	Aqueous, Soils % Recovery	**RPD%**	
		Waters	**Soils**
MS/MSD LCS/LCSD	40-140%	50%	50%
		20% (NJ/CT/MCP)	30% (NJ/CT/MCP)

TABLE 5

SPIKING LEVEL

	LCS\MS\Surr Spiking Level			
	Spike Solution [ug/mL]	**Surr. Solution [ug/mL]**	**Spike Conc [ug/L]**	**Surr Conc [ug/L]**
RVT	2.5	0.5	250	50
Soil/Water	12.5	2	3125	500
Oil	12.5	2	1250	200
Caulking	125	20	3125	200

TABLE 6

QC FAILURE ACTION PLAN

Blank Failures	Failure Situation	Action(s)
Surrogate Failure	1 of 4 high or low	Report as is
	2 or more high	Report as is
	2 or more low, samples are non-detect with passing surrogates	Report as is
	2 or more low, samples have hits and/or failing surrogates	Revial/rerun Re-extract if still failing
IS Failure	IS not present (less than 10% recovery)	Add IS Rerun
	IS out high or low	Revial/rerun Re-extract if still failing
Contamination	Below RL; sample(s) non-detect, below RL, or concentration 10 times or more above the blank	Report as is
	Below RL, sample(s) concentration above RL	See team leader/manager
	Above RL, sample(s) concentration 10 times or more above the blank	Report as is
	Above RL with non-detect sample(s)	Report as is
	Above RL, sample(s) concentration less than 10 times above the blank and volume available	Revial/rerun Re-extract if contamination still present
	Above RL, sample(s) concentration less than 10 times above the blank and no volume available	Revial/rerun B-flag affected data

LCS/LCSD Failures	Failure Situation	Action(s)
Surrogate Failure	1 or more high or low	Report as is
IS Failure	IS not present (less than 10% recovery)	Add IS

		Rerun
	IS out high or low	Revial/rerun Re-extract if still failing
Spike Failure	Spike compounds out high and sample(s) are non-detect with passing surrogates	Report as is
	Spike compounds out high and sample(s) have hits	Revial/rerun Re-extract if still high
	Spike compounds out low	Revial/rerun Re-extract if still low
	RPD failure	Report as is

MS/MSD/DUP Failures	**Failure Situation**	**Action(s)**
Surrogate Failure	(MS/MSD) 1 or more high or low	Report as is
	(MS/MSD) 2 or more high or low	Report as is
	(DUP) 1 or more high, parent sample non-detect	Report as is
	(DUP) 1 or more low, parent sample matches	Report as is
	(DUP) 1 or more low, parent sample doesn't match	Revial/rerun Re-extract if still failing
IS Failure	IS not present (less than 10% recovery)	Add IS Rerun
	IS out high or low	Revial/rerun Re-extract if still failing
Spike Failure (MS/MSD only)	Compounds out high or low due to sample matrix or hits	Report as is
	Compounds out high or low due to extraction error	Revial/rerun Re-extract if still failing
	RDP failure	Report as is

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1.0 SCOPE & APPLICATION

This standard operating procedure (SOP) describes the laboratory procedure used by PAS-Mansfield for the determination of the per- and polyfluoroalkyl substances (PFAS) by liquid chromatography/mass spectrometry (LC-MS/MS) following EPA 1633A, published December 2024.

1.1 Applicable Matrices

The matrices that can be tested using this SOP include:

Aqueous Matrices	Solid Matrices	Other Matrices
Non-Potable Water	Soil/Sediment	Biphasic (Aqueous/Solid)
Landfill Leachate	Biosolid	Oils
TCLP / SPLP Leachate	Tissue	Non-Standard Matrices
Aqueous Film Forming Foam (AFFF)	Articles of Commerce	
Fluorine-Free Foam (F3)	Wipes	

1.2 Routine Analyte List and Limits of Detection & Quantitation

This SOP uses abbreviations for the analyte name. A cross-reference of analyte name to CAS# and abbreviation is provided in Appendix A, Table 1.

The routine analyte list and limit of quantitation (LOQ) that can be determined by this SOP for each matrix is provided in Appendix A, Table 2.

Detection limits for each analyte are kept on file by the laboratory's Quality Department.

Unless otherwise specified, nominal limits of detection and the LOQ used during testing are adjusted on a per-sample basis to account for actual sample quantities used, percent moisture, and dilution factors.

1.3 Statutory and Program Specific Requirements

When statutory or regulatory program requirements for EPA Method 1633A differ from the procedures outlined in the main body of this SOP, the program specific requirements are called out in the relevant section of the SOP or are provided in appendices to the SOP. These requirements take precedence over the main SOP and must be adhered to when performing work under that jurisdiction, unless otherwise specified on a project-specific basis.

2.0 SUMMARY OF METHOD

Samples are prepared and extracted using solid phase extraction (SPE). Extracts are cleaned using carbon cleanup prior to analysis by LC-MS/MS in the multiple reaction monitoring (MRM) mode.

The distribution of printed or electronic copies of this document outside of the PAS electronic document management system (eDMS) is not controlled or tracked. PAS employees must ensure any copy used for daily work, if not accessed directly from PAS eDMS, is the current version of the document.

Sample concentrations are determined by isotope dilution or extracted internal standard quantification using isotopically labeled compounds added to the samples before extraction.

This test procedure is based on USEPA Method 1633A, December 2024, and includes allowable modifications from the reference method to improve performance.

Refer to Section 14 for a detailed list of modifications and their rationale. Supporting documentation to demonstrate equivalency and comparability, when required, is maintained by the laboratory's Quality Department.

3.0 INTERFERENCES

Solvents, reagents, glassware, and other sample processing hardware may yield artifacts and elevated baselines causing misinterpretation of chromatograms. This SOP includes procedures for equipment cleaning to mitigate these interferences.

Interferences co-extracted from samples will vary considerably from source to source, depending on the diversity of the site being sampled. Interfering compounds may be present at concentrations several orders of magnitude higher than the native PFAS. Because low levels of PFAS are measured by this method, elimination of interferences is essential and these steps are incorporated into the procedural sections of this SOP.

The most frequently encountered interferences are fluoropolymers; however, bile salts (e.g., Taurodeoxycholic Acid [TDCA]) may be present in various matrices, including fish and wastewaters, and can interfere in the chromatography. For this reason, analysis of a standard containing TDCA is required when establishing the initial chromatographic conditions and each analytical sequence.

4.0 DEFINITIONS

Refer to the Laboratory Quality Manual for a glossary of common lab terms and definitions.

- **Articles of Commerce:** Solid consumer and related product materials.
- **Extracted Internal Standard (EIS) quantification:** The response of the target compound is compared to the response of the isotopically labeled analog of another compound with chemical and retention time similarities.
- **Isotope dilution (ID) quantitation:** A means of determining a naturally occurring (native) compound by reference to the same compound in which one or more atoms has been isotopically enriched. The labeled PFAS are spiked into each sample and allow identification and correction of the concentration of the native compounds in the analytical process.
- **Isotopically labeled compound:** An analog of a target analyte in the method which has been synthesized with one or more atoms in the structure replaced by a stable (non-radioactive) isotope of that atom. Common stable isotopes used are 13C (Carbon-13) or Deuterium (D or 2H). These labeled compounds do not occur in nature, so they can be used for isotope dilution quantitation or other method-specific purposes.

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5.0 HEALTH & SAFETY

Contact your supervisor or local safety coordinator with questions or concerns regarding safety protocol or safe handling procedures for this procedure.

The following sections provide general health and safety information about chemicals and materials that may be present in the laboratory.

- The toxicity or carcinogenicity of each chemical material used in the laboratory has not been fully established. Each chemical should be regarded as a potential health hazard and exposure to these compounds should be as low as reasonably achievable.
- The laboratory maintains documentation of hazard assessments and OSHA regulations regarding the safe handling of the chemicals specified in each method. Safety data sheets for all hazardous chemicals are available to all personnel. Employees must abide by the health, safety and environmental (EHS) policies and procedures specified in this SOP and in the Pace® Chemical Hygiene / Safety Manual (COR-MAN-0001).
- Personal protective equipment (PPE) such as safety glasses, gloves, and a laboratory coat must be worn in designated areas and while handling samples and chemical materials to protect against physical contact with samples that contain potentially hazardous chemicals and exposure to chemical materials used in the procedure.
- Concentrated corrosives present additional hazards and are damaging to skin and mucus membranes. For procedures that require use of acids, use acids in a fume hood whenever possible with PPE designed for handing these materials. If eye or skin contact occurs, flush with large volumes of water. When working with acids, always add acid to water to prevent violent reactions. For procedures that that emit large volumes of solvents (evaporation/concentration processes), these activities must be performed in a fume hood or apparatus that reduces exposure.

6.0 SAMPLE COLLECTION, PRESERVATION, HOLDING TIME & STORAGE

6.1 Sample Collection & Bottle Kits

PAS does not offer sample collection services for this test method. PAS advises customers to collect samples in accordance with a sampling plan and collection procedures appropriate to meet regulatory requirements and data quality objectives for the project.

Refer to Appendix A, Table 3 for sample collection, preservation, and holding time requirements for each matrix.

PAS will provide containers for sample collection per customer request. Refer to laboratory SOP (ENV-SOP-WEST-0005) for general instruction on bottle kit preparation and refer to Appendix A, Table 3 for sample collection, preservation, and holding time requirements for each matrix.

PFAS Bottle Kit Specifications:

- If the request includes containers for surface wipes, provide a copy of the Pace® PFAS Wipe Sampling Guide in each sampling kit.

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- Kits for aqueous sample kits should include the instruction to fill the container to the gradation marked on the container, or to the shoulder of the container if no gradations are provided.
- If matrix spikes are requested (or required by program), provide additional containers for the collection of MS/MSD and remind the customer to designate the sample for use on the chain-of-custody (COC).

  For example, if an MS/MSD is requested on an aqueous matrix, the customer must collect and provide seven (7) 250 mL containers, two (2) each for the MS, MSD, and parent sample, plus one (1) 60 mL container for prescreening.
- AFFF Concentrate: Customers should notify PAS at the time of request for quote or sampling containers if the matrix of any sample is an AFFF concentrate. Due to the specific handling requirements needed for this matrix, pre-notification ensures that the laboratory is prepared to handle the sample properly to prevent the sample from contaminating the work area and/or other test samples.

6.2 Sample Receipt, Storage and Disposal

Laboratory sample receiving personnel check thermal preservation and compliance with the PAS Sample Acceptance Policy on receipt following the procedures specified in SOP (ENV-SOP-WEST-0003, Sample Receipt and Login), Refer to the Laboratory Quality Manual for the PAS Sample Acceptance Policy.

Unless otherwise specified by contract, samples and extracts are retained for the timeframe specified in the Pace® standard terms and conditions then disposed of in accordance with Federal, State, and Local regulations.

7.0 EQUIPMENT & SUPPLIES

See Appendix A for a complete list of equipment and supplies needed to perform this procedure.

Substitution of instrumentation, equipment, and supplies is permissible only if the replacement meets the specifications outlined in the SOP. If an alternative item does not meet these specifications, it may impact the procedure's performance, necessitating an update and/or revalidation of the procedure.

Plastic containers must be used for all standard, sample, and extraction preparations due to potential adsorption of analytes onto glass. Do not substitute glass for plastic containers.

7.1 Suitability Checks

- Verify the suitability of SPE cartridges, solvents, cryovials, and autosampler vials on a lot-basis by analysis of a method blank; maintain records of the verification for readily available historical access.

8.0 REAGENTS & STANDARDS

See Appendix B for a complete list of standards and reagents needed to perform this procedure and for formulations of standard solutions prepared by the laboratory.

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Substitution of reagents and standards from those listed in Appendix B are permissible only if the replacement meets the specifications outlined in the SOP. If an alternative item does not meet these exact same specifications for purity, composition, or concentration, any formulation in this SOP must be modified to match the material used. If the substitution is permanent, the SOP and formulations in this SOP must be updated.

All purchased standard solutions must be received with a Certification of Analysis (COA). The COA must be maintained on-site in laboratory possession; access to a COA via the vendor's website is generally not acceptable to external regulatory bodies because the COA must be traceable to each lot received. Refer to laboratory SOP (ENV-SOP-MANS-0112, for instructions for receipt and traceability.

9.0 PROCEDURE

9.1 Equipment & Instrument Setup

9.1.1 Support Equipment

9.1.1.1 Top Loading & Analytical Balances

Prior to use on each day of use, verify the calibration verification check on the analytical and/or top loading balance has been performed with working reference weights that bracket the measurements of weights that will be taken.

Verify the balance calibration is within its annual calibration timeframe. If the calibration sticker is missing or the calibration has expired, do not use the balance and notify the quality department of the situation.

If an alternate balance is used: ensure the balance used has been checked for tolerances that bracket the entire range of weight measurements.

9.1.1.2 Drying Oven

Verify the oven is equipped with a calibrated thermometer prior to use.

If the thermometer is missing a calibration label or the calibration has expired, notify the quality department. Do not use the oven until it is equipped with a calibrated thermometer appropriate for the temperature ranges required for the test and the gradients required to record temperatures of use.

If the thermometer used is assigned a correction factor (CF), record the original observation and the temperature corrected for the CF. If the logbook or electronic log does not have a location to record both temperatures, notify the quality department of the gap in traceability.

9.1.1.3 Mechanical Pipettes

Prior to use, check the calibration label of the pipette(s) to verify the accuracy check has not expired. If expired or the calibration label is missing, notify the quality department. Do not use the pipette until its calibration status has been verified.

If a different pipette is used, ensure its calibration has been verified at the volume

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of use before using the pipette.

9.1.1.4 Refrigerators / Freezers

Ensure samples and extracts, and reagents and standards, if stored refrigerated or frozen, are stored separately and the temperature of the units are monitored daily, including weekends and holidays. Refer to the laboratory's SOP, however named, for monitoring procedures and recording of temperature measurements.

9.1.2 Extraction Equipment

9.1.2.1 Suitability Checks

The suitability of SPE cartridges, solvents and other disposable plasticware may need to be verified by lot prior to use.

Supplies are to be verified by simulating their method usage as both a method blank and an LCS.

These supplies are acceptable for use if no target analytes are detected above the detection limit and all spike recoveries meet the acceptance criteria.

9.1.2.2 Cleaning Procedures

Rinse all glassware prior to use with methanolic ammonium hydroxide (1%) and methanol solvent. Air dry after the solvent rinse.

9.1.2.3 SPE Manifold Setup & Use

Inspect sample manifold ports and transfer tubing (if used) prior to use for signs of wear and/or discoloration. Replace manifold ports and transfer tubing as needed.

Clean all parts of the SPE manifold including the chamber prior to use and between samples with methanolic ammonium hydroxide (1%). Air dry before use.

9.1.3 Analytical Instrumentation

9.1.3.1 Instrument Operating Conditions

Set the instrument operating conditions to the following specifications:

LC Gradient					MS Parameters	
Step	**Total Time (min)**	**Flow Rate (µL/min)**	**A (%)**	**B (%)**	**Parameter**	**Setting/Value**
1	0.00	400	80	20	Sample Loop	50 µL
2	6.00		20	80	Injection Volume	2 µL
3	6.50		20	80	Column Oven Temperature	40° C
4	6.52		80	20	MRM Scan Window	60 sec
5	8.50		80	20	Curtain Gas (CUR)	30.0
					Collision Gas (CAD)	9
					Ion Spray Voltage (IS)	-4500 V

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					Source Temperature (TEM)	450° C
					Ion Source Gas 1 (GS1)	30.0
					Ion Source Gas 2 (GS2)	50.0

A: 5% Acetonitrile w/ 2mM Ammonium Acetate / B: Acetonitrile

9.1.3.2 Mass Calibration & Mass Calibration Verification

Perform mass calibration and mass calibration verification following the instrument manufacturer instructions prior to first use and at least annually thereafter to check instrument sensitivity and selectivity. Repeat following major instrument maintenance, movement of the instrument, or when other quality control (QC) failures suggest the need.

Ensure the procedures used for mass calibration and mass calibration verification evaluate an ion range that encompasses the ion range (Q1 and Q2 m/z) of the analytes of interest in this method. If the manufacturer's instructions include options for evaluation of mass resolution, the tightest resolution requirements (typically called unit resolution) must be met.

9.2 Calibration Design

Unless otherwise specified, instrument calibration procedures must comply with the PAS Corporate Policy for *Acceptable Calibration Practices for Instrument Testing* (POL ENV-POL-CORQ-0005). Refer to this policy as needed to learn more about policies and requirements for calibration and calibration verification.

9.2.1 Calibration Model

This SOP includes two (2) calibration models. Each option uses isotopically labeled compounds added to the samples prior to extraction. Option 1 is required for any analytes for which there is a stable isotope analogue.

Option 1: Isotope Dilution Quantification (ID): the response of the target compound is compared to the response of its isotopically labeled analog. Twenty-four (24) target compounds are quantified in this way.

Option 2: Extracted Internal Standard quantification (EIS): the response of the target compound is compared to the response of the isotopically labeled analog of another compound with chemical and retention time similarities; sixteen (16) target compounds are quantified in this way.

9.2.2 Calibration Design

The design of the curve specified in this SOP includes analysis of nine (9) calibration standards; however, not all standards must be included in the final curve.

More than the minimum number of calibration points specified in the published reference method are analyzed to extend the calibration range and to permit exclusion of the lowest or highest standards when needed; the calibration set is designed to leave enough standards remaining to meet the minimum number required for the curve fit, and to ensure that eliminating standards at the low or high end of the calibration does not alter the established LOQ.

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- When linear calibration is used, the calibration curve must minimally include 6 calibration levels, with at least 5 within the quantitation range, and the lowest standard at or below the LOQ.
- When non-linear calibration (Quadratic) is used, the calibration curve must minimally include 7 calibration levels, with at least 6 within the quantitation range, and the lowest standard at or below the LOQ.

Weighting is allowed for linear and non-linear regressions, so long as the weighting is inversely proportional to concentration and is not forced through zero.

When considering the range of quantitation, ensure the LOQ routinely achieves a signal to noise ratio of 3:1, and meets the requirements for the confirmation ion and the ion ratio requirements specified in the published reference method. If a confirmation ion is not specified in the published method for the analyte, the signal to noise ratio must be minimally 10:1.

Each calibration sequence must also include the analysis of a second source standard (ICV); however, this standard is never included in the curve – it is used to evaluate accuracy and/or potential bias of calibration standard preparation and curve fit.

Refer to Appendix B for the formulations for each working calibration standard.

Acceptance criteria for the curve are provided later in this SOP.

9.2.3 Calibration Frequency

Calibrate the instrument at initial setup, when calibration verification (ICV, ISC, CCV) results indicate the calibration is no longer valid, when changes made to the operating conditions may affect calibration performance, after major instrument maintenance, or after any other event that may affect instrument performance, such as moving the instrument.

9.2.4 Calibration Sequence

Prepare the calibration standards and the ICV following the instructions in Appendix B.

Prepare an instrument blank (IBLK) by adding 4925 µL of the IBLK Mix and 50 µL of EIS and 25 µl of NIS to a plastic centrifuge tube; vortex to mix.

Analyze calibration standards L1-L9 in order from lowest to highest concentration.

Analyze the instrument blank (IBLK) after the highest concentration calibration standard, followed by the ICV.

9.3 Calibration Evaluation

Evaluate the calibration for linearity, accuracy, sensitivity, and carryover. If any criteria are not met, troubleshoot to identify and correct the problem, then repeat calibration. All criteria must be met before analysis of test samples.

Suggested Actions:

a) Perform instrument maintenance and reanalyze the calibration sequence.

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b) Remake the standards and analyze a new calibration sequence.

c) Reduce the range of calibration by excluding the highest concentration calibration standards or the first calibration standard. Since CAL L1 is not routinely included in the curve and CAL 2 is the LOQ, no other standards at the low end may be removed. Removal of standards in the interior of the curve is not permitted unless an obvious error with the standard is observed.

9.3.1 Linearity Evaluation

Use one of the following options to evaluate the linearity of the calibration curve. When using a weighted regression, assess linearity with option 2 below.

1) Linear Calibration: calculate the relative standard deviation (RSD) of the Relative Response (RR) or Response Factor (RF) values of the initial calibration standards for each target analyte and isotopically labeled compound. The RSD must be ≤ 20%.

2) Non-Linear Quadratic (2^{nd} Order Fit): calculate the relative standard error (RSE) for each native compound and EIS compound for all the initial calibration standards that were analyzed. The RSE for all target and EIS compounds must be ≤ 20%. See Section 10.4.6 for the equation to calculate RSE. Maintain a record of the calculation and evaluation with the curve for historical recordkeeping and reference.

9.3.2 Initial Calibration Verification (ICV)

To verify the accuracy of the calibration, check the recovery of the ICV. The recovery should be within ±30% of the expected value.

When criteria are not met, it is likely there is a problem with the quality or preparation of the calibration standards and/or the ICV; correct the problem prior to sample analysis.

Suggested actions include:

1) Remake and reanalyze the ICV

2) Remake calibration standards and repeat the calibration sequence.

3) If instrument maintenance is performed: in addition to reanalyzing the ICV, the calibration sequence may need to be reanalyzed if the conditions under which the acceptability of the calibration curve was evaluated have changed.

9.3.3 Instrument Sensitivity Check (ISC)

Check instrument sensitivity daily at the lowest calibration standard included in the quantitation range (CAL L2).

The signal-to-noise ratio of the ISC must be ≥ 3:1 for the quantification ions and the confirmation ions, or ≥ 10:1 if the analyte only has a quantification ion. Recovery of the native and EIS compounds for the ISC must be within 70-130%. If the requirements cannot be met, the problem should be corrected before analyses can proceed.

If an individual target compound recovery in an ISC is above the upper control limit and all associated samples are ND for that compound, the data for those samples may be

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reported. In such cases, a narrative statement must be included in the report indicating the specific compound result that was biased high in the ISC, and that samples were ND for that compound and thus reportable.

See Appendix A, Table 6 for ion associations for each target analyte.

9.3.4 Bile Salts Interference Check

Verify the bile salt peak (TDCA) is detected >1 min outside RT window for PFOS. TDCA is added to multiple calibration standards to facilitate this evaluation.

9.3.5 Initial & Continuing Calibration Blanks (ICB & CCB)

Calibration blanks are used to assess carryover and/or contamination in the instrument system and are included in the initial calibration sequence and each daily analytical sequence thereafter.

In analytical sequences that include calibration, analyze the ICB following the highest concentration ICAL standard before the ICV. In sequences without calibration, analyze a CCB each day prior to sample analysis after the opening CCV.

The concentration of each analyte must be ≤ the MDL.

- If contamination is suspected, troubleshoot to identify and eliminate the source.
- If the failure is due to carryover from a prior standard, either reduce the upper range of the calibration, increase column flush time to reduce potential for carryover.
- If an analyte is present at such levels, analyze one or more additional instrument blanks until the response of the analyte is no longer detectable,

9.3.6 Continuing Calibration Verification (CCV)

Verify the calibration at the beginning of each analytical sequence, after every ten environmental samples, and at the end of the sequence. The ISC may serve as the daily opening CCV. Do not include quality control (MB, LCS), instrument performance check standards (CCV), sample-specific matrix spikes, MS/MSD, field duplicates (FD), or trip blanks in the count of environmental samples.

Use ICAL Level 6 as the CCV and analyze it under the same conditions as the calibration standards.

The recovery of each target analyte and the EIS compounds for the CCVs must be within 70 – 130% to meet CCV criteria.

See Appendix A, Table 6 for ion associations for each target analyte.

If criteria are not met, take corrective action and reanalyze any extracts that were analyzed between the last passing CCV and the one that failed, unless the CCV result is above the upper limit and all associated samples are not detected (ND), in which case, reanalysis is not required.

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Alternately, immediately analyze two CCVs for confirmation. If both confirmation CCV analyses meet the recovery criteria, proceed with analysis; however, samples that were analyzed after the failing CCV and before the 2 passing CCVs must be re-analyzed. If either of the 2 confirmation CCV analyses fails to meet the acceptance criteria, recalibrate the instrument.

9.4 Sample Preparation: General Requirements

9.4.1 Contamination Prevention

To reduce potential contamination or bias, do not use any fluoropolymer articles or task wipes during sample preparation or extraction procedures. Use only HDPE or polypropylene containers; reagents and solvents used for cleaning purposes may be stored in glass containers.

9.4.2 Pre-Screening Procedures

Samples may be pre-screened at the discretion of the laboratory prior to sample preparation and/or analysis. Results of the screen may be used to determine if reduced volume extraction is needed or to target dilution of extracts prior to analysis.

Refer to Appendix C for instructions to prepare screening extracts when screening has been scheduled.

9.4.3 Homogenization, Subsampling, and/or Pre-Preparation Requirements

Different matrices require or may require homogenization, subsampling or pre-preparation as specified in the following subsections before sample preparation and extraction.

9.4.3.1 Aqueous: Non-Potable Water and Landfill Leachate

The sample volume used for preparation and extraction may be subsampled from the original container received when it is known that the sample requires a dilution of >10X or when EIS criteria cannot be met due to matrix interference. When subsampling is required to manage high concentrations, no less than 250 µL of aqueous or leachate samples may be subsampled - if greater dilution is required, serial dilution must be employed. When subsampling is required to manage challenging matrices, no less than 1 mL of samples may be subsampled.

Subsampling must be performed with customer knowledge to confirm the protocol used by the laboratory meets their project-specific requirements.

Refer to Appendix D for subsampling instructions.

9.4.3.2 Aqueous: TCLP or SPLP Leachates

The TCLP or SPLP leachates are generated using the laboratory's routine protocol for leachate generation. The leachate solutions provided by the work area performing this step are used as samples for PFAS extraction and analysis. TCLP/SPLP leachates are prepared following the Landfill Leachate protocol, with nominally 50 mL of sample extracted.

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9.4.3.3 Aqueous: AFFF or F3

Samples composed of AFFF, F3, or other matrices KNOWN to require a large dilution prior to extraction will be subsampled consistently, with approximately 0.01 g of material aliquoted for each discrete sample preparation/analysis; each AFFF or F3 concentrate sample must be prepared in duplicate. After creating and documenting the subsample aliquot in a 60 mL HDPE PFAS sample bottle, add approximately 60 mL of reagent water, cap the vessel, and shake vigorously by hand for 20-30 seconds. After adding the reagent water and agitating, allow at least 3 hours for the subsample aliquot to fully dissolve in the water. If dissolution is incomplete after 3 hours, agitate again and wait another 3 hours; consider applying continuous agitation (orbital shaker) if full dissolution of the aliquot into water requires extended time. Following the extended dissolution time, prepared AFFF/F3 samples should be extracted and analyzed following the routine protocols for aqueous sample processing. Aqueous reporting limits will be used, with values adjusted to account for the actual sample aliquot, assuming 1 g/mL; this constitutes a 25,000X nominal adjustment factor for AFFF/F3 reporting limits, relative to nominal aqueous reporting limits.

Pace STRONGLY DISCOURAGES clients from sending AFFF concentrate material for analysis; this protocol is designed for “as-prepared” AFFF materials (i.e. pre-diluted to application concentration) and newer generation ‘Fluorine Free Foam’ (F3) concentrates. If F3 material (concentrate or as-prepared) or AFFF “as-prepared” material is received, follow the normal routines described in the paragraph above. If an AFFF concentrate material (usually of a thick gel-like consistency) is received for analysis, the above protocol may not be enough of a dilution to protect lab systems; in these cases, the lab shall prepare a serial dilution prior to extraction. First, the protocol above is followed (0.01 g of material fully dissolved into 60 mL water). Then a 6 mL aliquot of the initial aqueous solution is diluted into water, with a final volume of 60 mL (i.e., dilute 6 mL of sample solution into 54 mL of water). This serial dilution constitutes a 250,000X nominal adjustment factor for the AFFF concentrate reporting limits, relative to nominal aqueous reporting limits. Handling of AFFF concentrate should ideally be done in an isolated area outside of the PFAS processing area to prevent gross lab contamination.

9.4.3.4 Solid: Soils and Sediments

If a reduced mass extraction is scheduled, use at least 0.2 g (dry weight) for all solid matrices to ensure the amount used for sample preparation is representative of the total mass of sample collected.

9.4.3.5 Solid: Biosolid

If a reduced mass extraction is scheduled, use at least 0.02 g (dry weight) for all biosolid matrices to ensure the amount used for sample preparation is representative of the total mass of sample collected.

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9.4.3.6 Biphasic

If the sample is biphasic and the customer has requested phase separation: centrifuge the sample to separate the phases following the procedure specified in Appendix F, then prepare and extract each phase separately.

9.4.3.7 Articles of Commerce

Articles of commerce typically need to be milled to a fine powder using the protocol specified in Appendix H before sample preparation. This step may not be required when the material is known to be sufficiently homogenous and more than 95% of the material will pass through a 250 µm sieve.

Perform this step as needed and when specified on a project basis.

9.4.3.8 Tissue

Homogenization of tissue matrices is performed on behalf of all PAS locations by the PAS laboratory located in Green Bay, Wisconsin (PAS-Green Bay) in accordance with their local SOP ENV-SOP-GBAY-0129 *Sample Homogenization Compositing and Sub-Sampling*. PAS personnel may access this SOP via "Qualtrax" (AKA Ideagen Quality Management), the electronic document management system (eDMS) used by PAS for document management, control, and distribution.

If a reduced mass extraction is scheduled, use at least 0.1 g for all tissue matrices to ensure the amount used for sample preparation is representative of the total mass of sample collected.

9.5 Percent Solids Determination

9.5.1 Aqueous Matrices

A percent solids determination is not conducted for aqueous matrices. Instead, the laboratory visually assesses the sample matrix during sample preparation and employs alternative strategies to mitigate the effect of any solids present.

9.5.2 Solid Matrices (excluding tissues and Articles of Commerce)

Percent solids must be determined on all solid and biosolid samples prior to preparation and analysis to determine the sample mass used for extraction in accordance with **ENV-SOP-MANS-0011 Percent Solids Determination 2540G**. Percent solids are logged-in and determined by the same personnel that normally generate this data daily. The percent solids analysis will follow the Method SM2540G protocol.

Percent solids are not determined for tissue, surface wipes or the solid phase of a biphasic sample. These matrices are always reported on a wet weight basis.

9.6 Sample Preparation: Procedure

9.6.1 Aqueous Matrices

Do not filter samples at any point prior to sample preparation.

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Unless a reduced volume extraction is necessary, use the following amounts for sample preparation and analysis:

Routine Extraction Volume for Aqueous Matrices[1]

Non-Potable Water	Landfill Leachate	TCLP/SPLP Leachate	AFFF or F3
250 mL	50 mL	50 mL	0.01 g

[1]Nominal amount on which LOQ in Table 2 is derived. When different sample volumes are used, detection limits and the LOQ are adjusted for the actual amount used.

- For NPW: Use the entire volume from one (1) of the 250 mL containers provided.
- Landfill Leachates: Use entire volume from one (1) of the 60 mL containers provided.
- TCLP/SPLP Leachate: Subsample 50 mL of the filtered leachate generated by pouring the leachate from the container into a 60 mL HDPE PFAS sample bottle. Use the gradations on the bottle as a measuring guide.
- AFFF or F3: Subsample 0.01 g of the material received into a 60 mL HDPE PFAS sample bottle and dilute in 60 mL of reagent water; see Section 9.4.3.3 for the complete pre-extraction preparation protocol.

Create separate preparation batches for aqueous matrices that use different initial volumes because the volume used for the MB and LCS/LLLCS must match the amount used for samples.

Preparation Steps:

1) Remove the sample container from storage. Pull additional containers for each MS/MSD and for the laboratory duplicate, when a duplicate is requested or required, and an additional container has been provided to perform the analysis.

   DoD Accredited Laboratories: If the matrix is AFFF or F3, a duplicate must be performed with each sample. Confirm that there is enough sample available to take the duplicate from the same container.

2) Invert the sample container 3-4 times to homogenize the sample and then allow the sample to settle.

3) Visually inspect each settled sample for settled or suspended solids. Consider any visible indications of particulate matter including settled solids collected on the bottom of the container, cloudiness and/or dark color of the sample, suspended solids within the sample, increased viscosity, etc. If uncertain, seek a second opinion from another analyst, team lead, or supervisor; these matrix characteristics may require reduced-volume extraction.

   a. If potential interferences other than settled solids are observed, take action to mitigate the impacts on data quality. Examples of other sample characteristics that could necessitate precautionary measures with a field sample (i.e., prepare from reduced volume) include presence of standing foam in the sample after shaking, thick/viscous matrix, samples from known highly contaminated

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sites/projects, client notes indicating potential high concentrations, and knowledge of potential hazards to safety, equipment performance, or process integrity due to sample composition. In such cases, confer with a team lead or supervisor to determine the best approach. Use the largest volume possible (i.e., the smallest reduction possible) when performing a reduced-volume extraction to manage challenging matrix characteristics; use no less than 1 mL of sample.

b. If none of these conditions are observed or if the solids observed are less than ½ cm in depth, proceed to Step 4.

c. If settled solids are observed at a depth greater than ½ cm, skip Section 9.6.1 and follow the preparation and extraction instructions specified in Appendix E.

d. If settled or suspended solids appear to be more than 5% of the total volume of the sample:

- Recap the container and shake to homogenize; uncap the container.
- Using a pipet calibrated to quantitatively measure 1 mL, transfer 1 mL of sample into a pre-labeled 50 mL centrifuge tube.
- Add 40 mL of reagent water to the tube.
- Record 1 mL for the volume used for sample preparation and extraction.
- Proceed with Step 5 after initial weight has been determined for all samples in the batch.

4) Weigh the container+sample on the top-loading balance and record the weight measurement in the preparation record to the nearest 0.1 g. This measurement will be used later to calculate the actual volume of sample extracted.

5) Prepare a method blank (MB), laboratory control sample (LCS), and low-level laboratory control sample (LLLCS) by measuring the volume of blank matrix specified into a 500 mL HPDE container. For TCLP / SPLP, prepare 2 MB.

- NPW: Use 250 mL of reagent water.
- Landfill Leachate: Use 50 mL of reagent water.
- TCLP / SPLP Leachate: Use 50 mL of TCLP or SPLP blank solution for the LCS, LLCS and Leachate MB. Prepare another MB using 50 mL of reagent water.
- AFFF / F3: can be batched with NPW; if batched separately, prepare batch QC following NPW routines.

6) Quantitatively add 64 µL of the STK-10X standard mix to LLLCS and 80 µL of EPA-1633PDS solution mix to the LCS.

7) Add 40 µL of EIS solution to each container (all samples and QC).

8) If the batch includes matrix spikes, add 80 µL of EPA-1633PD mix to each matrix spike.

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9) Cap each container and invert to mix.

10) Check the pH of each container using a pH indicator strip to verify the pH is 6.5 ± 0.5. If necessary, adjust the pH with 50% formic acid or ammonium hydroxide (or with 5% formic acid and 3% aqueous ammonium hydroxide). Do not insert the strip into the sample container: use a disposable pipet to transfer a small amount of sample onto the pH indicator strip instead.

11) Proceed to Section 9.7 for extraction and extract cleanup.

9.6.2 Solid Matrices (Non-Tissue)

Unless a reduced mass extraction is necessary, use the following amounts for sample preparation and analysis:

Routine Target Mass for Solid Matrices[1]

Soil/Sediment	Biosolid	Articles of Commerce	Surface Wipe
2. g dry weight	0.2 g dry weight	.8 g	1 wipe

[1]Nominal amount on which LOQ in Table 2 is derived. When different sample mass is used, detection limits and the LOQ are adjusted for actual amount used.

Do not combine biosolids in the same preparation batch as soils/sediments or articles of commerce due to the difference in amount of material used.

Skip Steps 2-4 if the sample matrix is a surface wipe or article of commerce.

1) Remove the sample from storage.

2) Using a wooden tongue depressor, mix each sample in its original jar by stirring from the bottom of the container to the top and in a circular motion along the sides of the jar, breaking particles up by pressing against the side of the container (to <1 mm). The homogenized sample will be even in color and have no separate layers. Store the homogenized material in its original container. If it is not practical to mix the sample within its container, transfer the sample to a larger container to mix.

3) Check the LIMS to obtain the percent solids result for each sample in the batch.

   - If the test results are not available, check to see if a percent solids analysis is included in the work order; if not, notify the Project Manager (PM) they will need to add the test to the log-in.
   - If test results are not available because the department performing the test has not completed the determination, notify your supervisor or contact the leader of the department performing the test to obtain the status. Preparation may not begin until this information is available.
   - If the percent solids result is <5%, notify the PM and request the matrix be changed to landfill leachate; prepare the sample as a landfill leachate.

     If none of these scenarios apply, proceed to Step 4.

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4) Determine the target mass for extraction for soils/sediments and biosolids by dividing the target weight for sample preparation by the percent solids in decimal form.

   For example, if a soil sample is 90% percent solids, the mass used for extraction must be within the range of 5.4-5.8 g.

   a) Convert 90% percent solids to decimal form by dividing 90 by 100. (90/100 = 0.9)

   b) Divide 2 g (target mass) by the percent solids in decimal form (2/0.9=2.22…)

   c) Round 2.22 to the same significance of measurement as the top loading balance[1] (2.2).

   d) Add ± 0.2 g to the target result of 2.2 g to obtain the target weight range of 2.0to 2.4g.

   [1]For biosolids, use an analytical balance and convert the result to the significance of the analytical balance (0.01 g)

5) Place a 50 mL polypropylene centrifuge tube on the balance and tare the balance.

   Measure the target weight of sample into the tube so that the weight is within the range determined in the prior step. Record the amount used to the nearest 0.1 g (top loading) or 0.01 g (analytical).

   NOTE: *Surface wipes should have been received in a 50 mL centrifuge tube. If the wipe was received in a different container, transfer the wipe to a 50 mL centrifuge tube using clean forceps.*

   If matrix spikes or a laboratory duplicate were requested or are required, prepare separate containers for each.

   If the sample is extremely dry, wet the sample with 1.0 g of reagent water, which is the same amount always used to wet the clean matrix used for the MB and LCS.

6) Prepare the MB, LCS and LLLCS using Ottawa Sand wetted with reagent water by adding the clean matrix and water to a 50 mL polypropylene centrifuge tube.

   - Soil/sediment: Use 2 g Ottawa Sand and 1.0 g of reagent water
   - Biosolid: Use 0.2 g of sand and 0.1 g of reagent water
   - Surface Wipe: Use a new ghost wipe from a pre-tested lot
   - Articles of Commerce: Can be batched with soil/sediment; if batched separately, prepare batch QC following soil/sediment routines.

7) Quantitatively add 64 µL of the STK-10X standard mix to LLLCS and 80 µL of EPA-1633PDS mix to the LCS.

8) If the batch includes matrix spikes, add 80 µL of EPA-1633PDS mix to each matrix spike sample.

9) Add 40 µL of EIS solution to each container (all samples and QC)

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10) Using a vortex mixer, vortex the tube to disperse the spike solution and allow to equilibrate for approximately 30 minutes. Alternatively, shake by hand.

11) First Extraction: Add 15 mL of 0.3% methanolic ammonium hydroxide to each centrifuge tube. Vortex to disperse, then shake for 30 minutes on a variable speed mixing table. Next, centrifuge each tube for 10 minutes at 3000 rpm (~2000 RCF) then transfer the supernatant to a clean, labeled 50 mL polypropylene centrifuge tube.

12) Second Extraction: Add 15 mL of 0.3% methanolic ammonium hydroxide to the remaining solid sample in each centrifuge tube. Vortex to disperse, then shake for 30 minutes on a variable speed mixing table. Centrifuge each tube at 3000 rpm (~2000 RCF) for 10 minutes and decant the supernatant from the second extraction into the same centrifuge tube containing the supernatant from the first extraction.

13) Adjust the extraction solution to 100 mL volume using reagent water. A validated comparison bottle may be used to make this adjustment.

14) Check the pH of each sample solution using a pH indicator strip to verify the pH is 5.0 ± 1.0. If necessary, adjust the pH with acetic acid or ammonium hydroxide (or with 3% aqueous ammonium hydroxide). Do not insert the strip into the sample container: use a disposable pipet to transfer a small amount of sample onto the pH indicator strip instead.

15) Proceed to Section 9.7 for extraction and extract cleanup.

9.6.3 Tissue

Thaw the homogenized tissue before starting the preparation procedure.

1) Place a 50 mL polypropylene centrifuge tube on a top loading balance and tare the balance. Weigh .8 g ± 0.2 g of homogenized sample into the tube. Record the weight measurement to the nearest 0.1 g. After each sample in the batch has been subsampled, reseal the containers and return to frozen storage.

2) If matrix spikes or a laboratory duplicate were requested or are required, prepare separate containers for each.

3) Prepare the MB, LCS and LLLCS using a reference tissue matrix.

4) Quantitatively add 64 µL of the STK-10X standard mix to one LCS (LLLCS) and 80 µL of EPA-1633PDS mix to the other.

5) If the batch includes matrix spikes, add 80 µL of EPA-1633PDS mix to each matrix spike sample.

6) Add 40 µL of EIS solution to each container (all samples and QC).

7) Using a vortex mixer, vortex the tube to disperse the spike solution and allow to equilibrate for approximately 30 minutes. Alternatively, shake by hand.

8) First Extraction: Add 15 mL of 0.05M KOH in methanol to each tube. Vortex to disperse then place tubes on a variable speed mixing table to shake for 1 hour. Centrifuge the tube at 3000 rpm (~2000 RCF) for 10 minutes and collect the supernatant in a 125 mL sample bottle.

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9) Second Extraction: Add 10 mL of acetonitrile to remaining tissue in the centrifuge tube, vortex to mix and disperse the tissue. Sonicate for 30 minutes. Centrifuge each tube at 3000 rpm (~2000 RCF) for 10 minutes and collect the supernatant, adding it to the 125 mL bottle containing the initial extract.

10) Adjust the extract solution to 100 mL volume using reagent water. A validated comparison bottle may be used to make this adjustment.

11) Check the pH of each sample solution using a pH indicator strip to verify the pH is 5.0 ± 1.0. If necessary, adjust the pH with acetic acid or ammonium hydroxide (or with3% aqueous ammonium hydroxide). Do not insert the strip into the sample container: use a disposable pipet to transfer a small amount of sample onto the pH indicator strip instead.

12) Proceed to Section 9.7 for extraction and extract cleanup.

9.7 SPE Extraction & Carbon Cleanup

Use the same procedure for all matrices.

1) Prepare an SPE cartridge for each sample and QC by packing clean silanized glass wool into the bottom of a WAX SPE cartridge barrel, to a height of ~1 cm. Ensure the glass wool is not densely packed to allow for proper sample flow.

   a. If using stacked WAX/GCB cartridges, substitute stacked cartridges for WAX SPE cartridges.

2) Set up the vacuum manifold with one prepared WAX SPE cartridge, with a reservoir adaptor and reservoir stacked on each cartridge, ensuring all connections are tight. If using plastic transfer lines instead of reservoirs, ensure the connecting caps are snug in each cartridge and the transfer lines are placed within the appropriate sample. Label each reservoir or cartridge tube with the associated sample ID.

3) Pre-condition the cartridges with 15 mL of 1% methanolic ammonium hydroxide followed by 5 mL of 0.3M formic acid. Perform each rinse separately. Do not allow the WAX SPE to go dry. Discard the wash solvents.

4) Pour the sample into the reservoir taking care to avoid splashing while loading; or, if using transfer lines, begin opening the stopcocks on the vacuum manifold. Do not pipette the sample in this step. Adjust the vacuum/stopcocks to pass each sample through the cartridge at a rate of approximately 5-10 mL/min; discard the eluate. Retain the empty sample bottle for solvent rinsing.

   If the SPE cartridge becomes clogged during sample transfer, refer to Appendix G for troubleshooting steps and mitigation strategies.

5) Rinse the walls of the reservoir twice with 5 mL reagent water, followed by 5 mL of 1:1 0.1M formic acid/methanol. Pass each rinse through the cartridge using vacuum. If using sample transfer lines for loading, add the 3 rinses to the original sample container and load each rinse through the transfer lines to the cartridge, one reagent at a time. Discard the rinse solutions.

6) Dry the cartridges by pulling air through them for ~ 5 minutes.

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7) If using separate GCB cartridges, while the WAX cartridges are drying, condition the carbon cartridges (GCB) by rinsing with two aliquots of 5 mL of MeOH. Perform this step on a separate vacuum manifold or on the unused ports of the same manifold as the WAX cartridges.

   Insert the narrow end of a 5 mL or 10 mL plastic pipette tip into the top of the GCB cartridge and use it like a reservoir for the rinse solvent. Apply a light vacuum to pull the rinse solvent through the cartridge; discard the rinsates. Do not allow the GCB cartridges to go completely dry during/after this step. Remove the pipette tip from the GCB cartridge and discard.

8) When the WAX cartridges are sufficiently dry, remove each WAX cartridge and reservoir out of its manifold port and stack it on a conditioned GCB cartridge by inserting the outlet of the WAX cartridge into the inlet of the GCB cartridge. Place the dual cartridge-reservoir stack back in the same manifold port that the WAX cartridge originally occupied. This cartridge stacking should be done one cartridge at a time to avoid mixing up manifold locations.

   If using transfer lines: follow the same cartridge stacking process but ensure that the transfer line connecting caps are snug in each cartridge and the transfer lines are placed within the appropriate sample bottle after stacking the two cartridges.

9) Place a clean collection tube in the manifold rack for each cartridge so that the extract delivery needles are not touching the walls of the tubes. Resume vacuum and ensure a proper seal is achieved. DO NOT add NIS to these collection tubes.

10) Rinse the inside of each sample container using 5 mL of 1% methanolic ammonium hydroxide. Then pour the rinse from each sample container to transfer the rinse to the associated SPE reservoir to wash the walls of the reservoir. If using sample transfer lines, transfer the container rinse from each sample container to its associated cartridge using vacuum. Whether using reservoirs or transfer lines, allow the elution solvent to soak the SPE sorbent for 2 minutes, then use vacuum to pull the elution solvent through the cartridge and into the collection tubes in a slow, dropwise manner.

11) Aqueous samples: air dry the empty sample container after the rinse is transferred. Weigh the empty container with the cap on and subtract that from the weight of the bottle with sample, determined in Section 9.6.1, step 4.

12) Add 25 µL of concentrated acetic acid and 20 µL of NIS mix to each collection tube and vortex to mix. Transfer a portion of each extract into an autosampler vial for LC-MS/MS analysis. Cap the collection tubes containing the remaining extract and store the extract at 0 - 6°C.

13) Proceed to Section 9.8 for analysis.

9.8 Analysis

Analyze the extracts by LC-MS/MS in multiple reaction monitoring (MRM) mode, with unit mass resolution. Allow the extracts to warm to room temperature prior to aliquoting into autosampler vials and loading on the instrument.

On each day of analysis:

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1) Flush the column with 100% Acetonitrile for at least 30 minutes to clear any accumulated impurities and interferences from the sample pathway and to equilibrate the system. Open the purge valve(s) on the pumps for the first ~1 minute of flush time and/or use the "purge" function available as part of the pump functionality and purge the autosampler injector flow path using the "purge" function, if available.

2) Equilibrate the column by flushing the column for ~15 mins with 50:50 Mobile Phase A: Mobile Phase B followed by ~15 minutes of 98:2 Mobile Phase A: Mobile Phase B.

3) Verify system pressure is stable.

4) Bring standards and samples to room temperature, vortex to homogenize, then transfer a portion to an autosampler vial in preparation for analysis.

5) Following any initial priming injections on days when a calibration is not needed, an ISC and an instrument blank (IBLK) will be analyzed to demonstrate system suitability and the absence of system contamination prior to sample analysis.

6) After acceptable ISC and IBLK results are confirmed, load and submit extracted samples for analysis, typically starting with batch QC with field samples following. A CCV and CCB must be analyzed after every 10 (or fewer) field samples.

Arrange standards and samples in an autosampler to run in sequence as follows:

Order of Sequence with ICAL	Order of Sequence w/o ICAL
Cal L1-9 in order of lowest to highest	Opening ISC/CCV
IBLK	IBLK
ICV	MB
Follow same sequence as w/o ICAL, starting at MB	LLLCS
	LCS
	Samples (10 or fewer)
	CCV
	CCB
	Samples (10 or fewer)
	Closing CCV

[1]*The closing CCV analysis may be used as the opening solution for the next analytical sequence when criteria for the opening CCV are also met.*

10.0 Data Analysis & Calculations

Data is reduced using the acquisition software provided by the instrument manufacturer.

10.1 Retention Time (RT) Window

Establish RT Windows for all analytes, EIS and NIS with each ICAL event and at the beginning of each analytical sequence thereafter. Analytical conditions must be set to allow a separation of at least 1 minute between TDCA and the retention time window of PFOS. If this is not achieved the problem must be corrected. The RT window used must be of sufficient width to detect earlier-eluting branched isomers.

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- In sequences that include an initial calibration curve (ICAL) use the midpoint standard of the curve to set the RT for analytes, EIS and NIS.
- In sequences that do not include ICAL, use the beginning CCV retention times to set the RT for analytes, EIS and NIS.

10.2 Qualitative Identification

The presence of target analytes, EIS, and NIS compounds are qualitatively confirmed when the criteria in Sections 10.2.1. through 10.2.5. are met.

If identification criteria are not met and, based on analyst discretion, the analyte may be present, the presence of a target analyte may be reported. In such cases, data will be reported with a qualifier alerting the data user that qualitative identification could not be confirmed because the detection did not meet the method-required criteria but based on analyst discretion, the compound may be present and should be considered an estimated value.

If the criteria listed below are not met for the standards, the laboratory must stop analysis of samples and correct the issue.

10.2.1 Integration

The response of all isomers in the quantitative standards should be used to define integration parameters and ion ratios.

In samples, the total integrated response should include the branched isomer peaks that have been identified in the quantitative standard, if present. For compounds with identified branched and linear isomer peaks, the reported concentration is the sum of all isomers. If standards (either quantitative or qualitative) containing a mix of isomers are not available for purchase for a particular compound, only the linear isomer can be identified and quantitated in samples.

10.2.1.1 Manual Integration

Manual integration is sometimes necessary to correct inaccurate automated integrations but must never be used to meet QC criteria or to substitute for proper instrument maintenance and/or method set-up. To assure that all manual integrations are justified and proper, all manual integrations must be performed, documented, reviewed, and approved in accordance with corporate SOP ENV-SOP-CORQ-0006, *Manual Integration*. Refer to this SOP for guidance on manual integration techniques and required procedures.

10.2.2 Retention Time (RT)

The RTs for the target analytes, EIS, and NIS compounds must fall within ±0.4 minutes of the predicted retention times from the midpoint standard of the ICAL or initial daily CCV, whichever was used to establish the RT window position for the analytical batch. All branched isomer peaks identified in the calibration standards also must fall within 0.4 minutes of the retention times set for the analytical batch.

For all target analytes with exact corresponding isotopically labeled analogs, target analytes must elute within ±0.1 minutes of the associated EIS compound.

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10.2.3 Signal-to-Noise Ratio (S/N)

Peak responses of the quantitation and confirmation ions must be at least three times the background noise level (S/N 3:1); if there is no confirmation ion, S/N must be >10:1.

If the S/N ratio is not met in a standard or QC sample due to high background noise, correct the problem (e.g., perform instrument maintenance).

If the S/N ratio is not met in a blank or sample, then detection of the analyte cannot be confirmed; the analyte is “not detected”.

10.2.4 Ion Ratio Criteria

For any compound that meets S/N and RT criteria, the ratio of the total (branched and linear isomer) quantification ion response to the total (branched and linear isomer) confirmation ion response – referred to as the Ion Ratio – must fall within ± 50% of the ratio observed in the mid-point ICAL standard.

The ion ratio requirement does not apply for PFPrA, PFBA, PFPeA, NMeFOSE, NEtFOSE, PFMPA, or PFMBA because suitable secondary transitions are unavailable (not detectable or inadequate S/N).

10.2.5 Detection Limit

The calculated concentration (see Section 10.4) of the target analyte must be greater than the adjusted detection limit (DL) to be reported. Quantified results below the DL cannot be confirmed and will be reported as “not detected.”

10.3 Quantitative Analysis

Test results are quantified by automated data reduction software using the equations in Section 10.4.

10.4 Calculations

All data is reduced by automated software, no manual calculations are performed for this test.

10.4.1 Target Analyte Concentration

Concentrations of the target analytes are determined with respect to the extracted internal standard (EIS) which is added to the sample prior to extraction (see Appendix A, Table 6). Other equations may be used if the laboratory demonstrates that those equations produce the same numerical result as produced by the equation below.

$$\boldsymbol{Concentration\ (ng/L\ or\ ng/g) = \frac{Area_N M_{EIS}}{Area_{EIS}(\overline{RR}\ or\ \overline{RF})}\ x\ DF\ x\ \frac{Vf}{Vi}}$$

$Area_N$	The measured area of the quantitation ion for the unlabeled PFAS target analyte
$Area_{EIS}$	The measured area of the quantitation ion for the EIS compound
M_{EIS}	The expected concentration of the EIS in the extract (ng/L)
RR	Average response ratio used to quantify target compounds by the isotope dilution method

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RF	Average response factor used to quantify target compounds by the extracted internal standard method
DF	Extract Dilution Factor; if no extract dilution was performed, DF=1
Vf	Final extract volume (L)
Vi	Initial sample volume (L) or weight (g)

10.4.2 EIS Concentration

The EIS compounds are quantitated with respect to an NIS, as shown in Appendix A Table 6, using the response factors from the most recent initial calibration. Other equations may be used if the laboratory demonstrates that those equations produce the same numerical result as produced by the equation below.

$$\boldsymbol{Concentration\ (ng/L\ or\ ng/g) = \frac{Area_{EIS} M_{NIS}}{Area_{NIS} \overline{RF_S}}\ x\ DF\ x\ \frac{Vf}{Vi}}$$

$Area_{EIS}$	The measured area of the quantitation ion for the EIS compound
$Area_{NIS}$	The measured area of the quantitation ion for the associated NIS compound
M_{NIS}	The expected concentration of the NIS in the extract (ng/L)
$\overline{RF_S}$	Average response factor used to quantify the EIS compound by the non-extracted internal standard method
DF	Dilution Factor; if no extract dilution was performed, DF=1.
Vf	Final extract volume (L)
Vi	Initial sample volume (L) or weight (g)

10.4.3 ICAL Relative Response (RR)

Used to calculate the response ratio (RR) for each target analyte calibrated by isotope dilution quantitation.

$$\boldsymbol{RR = \frac{Area_t M_{EIS}}{Area_{EIS} M_t}}$$

$Area_t$	Measured area of the quantitation ion for the target analyte
$Area_{EIS}$	Measured area of the quantitation ion for the corresponding labeled PFAS used as the EIS in the calibration standards
M_{EIS}	Concentration of the isotopically labeled PFAS used as the EIS in the calibration standards (ng/L)
M_t	Concentration of the target analyte in the calibration standard (ng/L)

10.4.4 ICAL Response Factor (RF): Target Analyte

Used to calculate the response factor (RF) for each target analyte calibrated by extracted internal standard quantitation.

$$\boldsymbol{RF = \frac{Area_t M_{EIS}}{Area_{EIS} M_t}}$$

$Area_t$	Measured area of the quantitation ion for the target analyte

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$Area_{EIS}$	Measured area of the quantitation ion for the corresponding labeled PFAS used as the EIS in the calibration standards
M_{EIS}	Concentration of the isotopically labeled PFAS used as the EIS in the calibration standards (ng/L)
M_t	Concentration of the target analyte in the calibration standard (ng/L)

10.4.5 ICAL Response Factor (RF): EIS

$$RF_S = \frac{Area_{EIS} M_{NIS}}{Area_{NIS} M_{EIS}}$$

$Area_{EIS}$	Measured area of the quantitation ion for the EIS compound in the calibration standard
$Area_{NIS}$	Measured area of the quantitation ion for the NIS compound in the calibration standard
M_{NIS}	Concentration of the NIS compound in the calibration standard (ng/L)
M_{EIS}	Concentration of the EIS compound in the calibration standard (ng/L)

10.4.6 ICAL Relative Standard Error (RSE)

Used to assess linearity of quadratic curve fits.

$$RSE = 100\,x \sqrt{\sum_{i=1}^{n} \frac{\left[\frac{x_i' - x_i}{x_i}\right]^2}{n - p}}$$

x_i	Nominal concentration (true value) of each calibration standard
x_i'	Measured concentration of each calibration standard
n	Number of standard levels in the curve
p	Type of curve (2 = linear, 3 = quadratic)

10.4.7 Other Calculations

For common calculations such as percent recovery and relative percent difference, refer to laboratory SOP (ENV-SOP-WEST-0124).

10.5 Reporting Specifications

Unless otherwise specified on a project basis, report final test results as follows:

Matrix	Units	Comment
Aqueous: All Matrices	ng/L	If alternate protocols are used to manage matrix characteristics or high concentrations, narrate sample data accordingly.

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Soils/Sediments & Biosolids	ng/g dry weight	Test results are adjusted for percent moisture. Include the test information from percent solids determination in the test report.
Biphasic: Solid phase	ng/g wet weight basis	
Tissue	ng/g wet weight basis	
Surface Wipe	ng/wipe	
Article of Commerce	ng/g as received	Indicate if cryomilling was performed before preparation.

Adjust the DL and LOQ for sample volume or mass and any dilution factor before using it as the threshold value for reporting quantitative test results. Unless otherwise specified, test results between the DL and the LOQ, when reported, are qualified as estimated.

The recovery of associated EIS compounds for each target analyte must be included for each sample in the test report, regardless of the type of deliverable provided.

If the sample was diluted, include the DF in the test report to identify the factor by which the final test results were adjusted. Results for any analyte found in a sample or extract that has been diluted will be reported at the least dilute level for which the measured concentration is within the calibration range (e.g., above the LOQ for the analyte and below the highest calibration standard) and in which isotopically labeled compound recoveries are within their respective QC acceptance criteria. This may require reporting results for some analytes in the same sample from different analyses.

For compounds with identified branched and linear isomer peaks, the reported concentration is the sum of all isomers. If standards (either quantitative or qualitative) containing a mix of isomers are not available for purchase for a particular compound, only the linear isomer can be identified and quantitated in samples.

11.0 Quality Control & Method Performance

11.1 Method Performance Validation

The performance of this SOP was verified in accordance with the PAS corporate SOP for Method Validation and Instrument Verification. Records of verification are kept by the Quality Department in accordance with the PAS policy for Record Management (ENV-POL-0013).

Detection limits (DL or MDL, including LOD for DoD) and limits of quantitation (LOQ) were established in accordance with ENV-SOP-CORQ-0023 during initial method setup.

These limits are continuously verified and updated in accordance with USEPA procedures for determining method detection limits, as well as the requirements specified in the TNI Standard and DoD/DOE QSM, as applicable. Customers should be informed that the laboratory is obligated to update these limits when verification checks reveal a change in sensitivity or method performance, regardless of customer approval.

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11.1.1 Initial Precision and Recovery (IPR)

To verify the performance of the laboratory's SOP against the specifications of the test method, a demonstration of capability (DOC) must be conducted for each matrix following the procedure outlined in Section 9.2.1 of EPA Method 1633A. Refer to the method published in January 2024 by the USEPA Office of Water (Document EPA 821-R-24-001) for detailed instructions. In summary, the lab must follow the SOP protocol to extract and analyze four (4) samples prepared as LCS, along with at least one MB, for each matrix to be tested. The average percent recovery and RSD of the target analyte results are tabulated and compared to method acceptance criteria.

The results of the IPR must be within the accuracy and precision limits specified in Appendix A, Table 10. There are no IPR mean or RSD criteria for EIS compounds; %REC of each IPR sample must meet the criteria in Appendix A, Table 9.

11.2 Analyst Demonstration of Capability (DOC)

Before conducting unsupervised (independent) work on any client samples, analytical personnel (including sample preparation) must demonstrate their ability to achieve accurate and precise test results using the procedures specified in this SOP (IDOC) and redemonstrate this capability on an annual basis thereafter (ODOC).

Refer to the laboratory's Quality Manual and to laboratory SOP ENV-SOP-WEST-0122 for more information about the requirements and procedure for IDOC and CDOC.

The average recovery of the target analytes in the DOC samples must be within the accuracy limits for LCS specified in Appendix A, Table 8 and the RSD must be within the precision limits for IPR specified in Appendix A, Table 10. There are no mean or RSD criteria for EIS compounds in the DOC; %REC of each DOC sample must meet the criteria in Appendix A, Table 9.

The IPR study may also suffice as IDOC for the analyst who performed the study.

11.3 Matrix Impact (MS/MSD)

Matrix spikes are used to assess potential impact of matrix interference on the accuracy or precision of the procedure on samples of the same or similar matrix – samples of similar matrix are usually classified as samples of the same matrix type collected from the same sampling site.

According to EPA Method 1633A, matrix spikes (MS/MSD) generally are not required for methods that employ isotopic dilution because the recovery of the EIS compounds spiked into every sample reflects the effect the matrix has on recovery of target compounds.

Therefore, matrix spikes are not required for compliance monitoring. However, the EPA method acknowledges that some projects or programs may be interested in this information.

Customers interested in using information from matrix spikes to understand potential matrix impact on their samples must request MS/MSD, provide additional sample material to the laboratory to perform the test, and identify which sample to use on the chain-of-custody (COC).

If no customer has requested MS/MSD on any sample in the preparation batch, an MS/MSD is not performed.

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11.4 Sampling Impact (Field Duplicate)

A field duplicate (FD) refers to the testing of a replicate container of sample collected with all other samples from a sampling event and used to measure precision of the field sampling technique.

Customers requiring a field duplicate must request this analysis and provide a separate container for analysis. The FD must be logged in as a routine environmental sample; it may not be subsampled from the same container of any other sample.

11.5 Quality Control (QC)

The laboratory prepares and analyzes the following QC at the frequency specified in the table below. Refer to Appendix A, Table 7 for acceptance criteria and requirements for corrective action(s) and/or data qualification.

Item[1]	Acronym	Frequency
Mass Calibration		Annually and as needed
Mass Calibration Verification		After mass calibration
Initial Calibration	ICAL	Initially at instrument setup, then as needed
Initial Calibration Verification	ICV	With each ICAL, prior to sample analysis
Instrument Blank	IBLK/ICB	Daily prior to analysis and after high concentration standards
Instrument Sensitivity Check	ISC	Daily prior to analysis
Continuing Calibration Verification	CCV	At the beginning (ISC) and every 10 samples
Continuing Calibration Blank	CCB	After each bracketing CCV
RT Window	RTW	During ICAL and at the beginning of each analytical sequence
Bile Check	TDCA	With each ICAL and daily with each CCV
Method Blank	MB	1 per batch of 20 or fewer samples
Laboratory Control Samples	LCS & LLLCS	1 pair per batch of 20 or fewer samples
Laboratory Duplicate	DUP	See Section 11.5.1

[1]*Extracted (EIS) and Non-extracted Internal Standards (NIS) are included in each QC item.*

11.5.1 Laboratory Duplicate (AKA Matrix Duplicate)

A laboratory duplicate is a duplicate preparation and analysis of a sample whose aliquot was taken from the same container as the parent sample and used to measure precision.

EPA Method 1633A does not require laboratory duplicates for NPDES compliance monitoring, but the method acknowledges that a duplicate may be needed on a project-specific basis. Some accreditation programs, such as DoD ELAP, require a duplicate for each sample of certain matrices, such as AFFF or F3.

To support project needs, the laboratory will perform a duplicate when the customer has requested this measure, designated which sample from their sampling event to use as the duplicate on the chain-of-custody (COC), and have provided sufficient additional sample material for the test.

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However, customers should be advised that when the duplicate is taken from a different container, which is necessary for certain matrices, the duplicate effectively becomes a field duplicate and the results for precision are inclusive of potential bias from sampling error.

Instructions for DUP to Laboratory Personnel by Matrix:

- **NPW:** Laboratory duplicates must be prepared from a separate container because the entire sample is consumed during routine preparation and extraction and subsampling is only allowed for primary dilutions of samples expected to have high concentrations of target analytes, or to manage sample matrix characteristics.

  If a duplicate is requested and no sample has been designated for use, confer with the PM to determine which sample to use and verify that more than two (2) 250 mL containers were received. If two or less containers were received; there is insufficient sample volume available to perform the duplicate – notify the PM of the sampling nonconformity. If more than two (2) 250 mL containers were received, use one (1) for the parent sample and one (1) for the duplicate.

  Do not perform reduced volume extraction to provide a DUP.

- **Surface Wipes**: The entire sample is consumed during preparation and extraction. Given the nature of the matrix and collection technique, this sample matrix is not suitable for analysis of a laboratory duplicate.

  If a duplicate is requested, notify the PM that the matrix is not suitable for this determination and cancel the request.

- **AFFF/F3, Soil/Sediment, Biosolid, Articles of Commerce, and Tissue**: A laboratory duplicate is performed when requested by the customer and when there is enough material to take the duplicate aliquot from the same container. Note that DoD QSM 6.0 requires a laboratory duplicate on a sample basis for AFFF and F3 matrices. Thus, for DoD project work, customers must provide sufficient mass for each sample to meet this program requirement.

11.5.2 Extracted Internal Standards (EIS)

To assess method performance on the sample matrix, the laboratory must spike all samples and QC with the EIS solution. Analyze each sample according to the procedures in this SOP. Compute the percent recovery of the EIS compound concentration using the NIS quantitation method; see Appendix A, Table 9 for acceptance criteria.

If the recovery of any EIS compound is outside of the acceptance limits in the original, undiluted analysis, prepare and analyze a limited extract dilution and/or a re-extraction using a reduced sample amount.

Prior to calculating EIS percent recovery, the calculated concentration of the EIS are always adjusted to account for any extract dilutions prepared for analysis.

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11.5.3 Non-extracted Internal Standard (NIS)

To assess method performance, the laboratory must spike all sample extracts with the NIS solution prior to analysis. Percent recovery of the NIS compound is calculated by comparing the measured response in each analysis to the average response of the same compound measured in the ICAL.

Calculate the ratio of the NIS peak areas from the QC and field samples relative to the mean area of the corresponding NIS in the most recent initial calibration to check for possible bad injections of NIS solution or loss of instrument sensitivity. If the NIS areas are low for all the field samples and QC samples in the analytical batch, it suggests a loss of instrument sensitivity, while low areas in only some field or QC samples suggests a possible bad injection. See Appendix A, Table 9 for acceptance criteria.

11.5.4 Sample Dilutions

Samples with quantified target analytes exceeding the upper calibration range must be diluted and reanalyzed to bring the result within the calibration range. However, if it is known that the analytes are not compounds of concern for the project, test results may be reported over the calibration range, if they are qualified to disclose the situation and documented client consent for reporting this way is obtained.

If the extract dilution required is greater than 10X, repeat sample preparation using a reduced sample amount, guided by the magnitude of the original over-range results.

The response of the EIS in the diluted extract must meet the S/N and RT requirements for qualitative identification and must be within the limits specified in Appendix A, Table 9. If EIS criteria are not met, then the compound cannot be measured reliably in the diluted extract, and sample preparation and analysis must be repeated with a smaller subsample.

The amount used for re-extraction should be consistent with the dilution applied to the original extract. For example, if a 10X dilution was needed for an aqueous sample, 25 mL of sample should be subsampled for re-prep and extraction. (Divide the original amount of sample prepared by 10 – this is the sample amount.)

12.0 Data Review & Corrective Action

12.1 Data Review

The data review process of Pace® Analytical Services includes a series of checks performed at different stages of the process by different people to ensure that SOPs were followed, the analytical record is complete and properly documented, QC criteria were met, proper corrective actions were taken for QC failure and other nonconformance(s), and test results are reported with proper qualification, when necessary.

The review and checks that are performed by the employee performing the task is called primary review.

All data and test results are also peer reviewed. This process, known as secondary review, is performed to verify SOPs were followed, that calibration, instrument performance, and QC criteria were met and/or proper corrective actions were taken, qualitative ID and quantitative

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measurement is accurate, all manual integrations are justified, documented, and approved in accordance with the Pace® Analytical Services SOP for manual integration, calculations are correct, the analytical record is complete and traceable, and that results are properly qualified.

Lastly, a third-level review, called a completeness check, is performed by reporting or project management staff to verify the test report is complete.

Refer to laboratory SWI ENV-SWI-WEST-0087 SVOA Data Review Work Instructions for specific instructions and requirements for each step of the data review process.

12.2 Corrective Action

Corrective action is required when QC or sample results are not within acceptance criteria.

Refer to Appendix B for a complete summary of QC, acceptance criteria, and recommended corrective actions for QC associated with this test method.

If corrective action is not taken or was not successful, the decision/outcome must be documented in the analytical record. The primary analyst has primary responsibility for taking corrective action when QA/QC criteria are not met. Secondary data reviewers must verify that appropriate action was taken and/or that results reported with QC failure are properly qualified.

Corrective action is also required when carryover is suspected and when results are over range. Samples analyzed after a high concentration sample must be checked for carryover and reanalyzed if carryover is suspected. Carryover is usually indicated by low concentration detects of the analyte in successive samples analyzed after the high concentration sample.

Sample results at concentrations above the upper limit of quantitation must be diluted and reanalyzed. The result in the diluted samples should be within the working concentration range of the instrument calibration. If dilution is not performed, any result reported above the upper range is considered a qualitative measurement and must be qualified as an estimated value.

13.0 Pollution Prevention & Waste Management

Refer to laboratory SOP ENV-GUI-WEST-0020, or however named, for waste handling and management practices pertaining to the waste streams created at this facility.

Pace® proactively seeks ways to minimize waste generated during work processes. Some examples of pollution prevention include but are not limited to reduced solvent extraction, solvent capture, use of reusable cycletainers for solvent management, and real-time purchasing.

The EPA requires that laboratory waste management practices comply with all applicable federal and state laws and regulations. Excess reagents, samples, and method process wastes are characterized and disposed of in an acceptable manner in accordance with the Pace® Chemical Hygiene Plan / Safety Manual. Refer to this manual for these procedures.

14.0 Modifications

The procedures in this SOP have been modified from the reference method to improve overall performance. Supporting documentation to demonstrate equivalency and comparability, when required, is maintained by the Quality Department.

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Modification	Section of Reference Method Modified	Justification for Modification	Validation of Modification
Changed EIS quantitation association for PFMPA, 7:3FTCA, ADONA, 9Cl-PF3ONS, & 11Cl-PF3OUdS	Section 20, Table 10	Improved performance (allowable modification), more appropriate correlation	MDL, IPR, PT
Updated product ion used for measurement of 13C4-PFOA from m/z 172 to m/z 372	Section 20, Table 10	Match ion transition used for EIS 13C8-PFOA and native PFOA	MDL, IPR, PT
Increased the size of the SPE sorbent bed to 250 mg and tube size to 20 mL	Section 6.7.1	Improved performance (allowable modification); wider cartridge improves sample loading, reduces chances of clogs	MDL, IPR, PT
Added option for WAX/GCB stacked media with same 250 mg bed mass	Section 6.7.1	Improved performance (allowable modification). Improves efficiency or extraction, reduces variability between extraction.	MDL, IPR
Increased flow rate to allow up to 10 mL/min	Section 12.1.4	Comparable and validated performance	MDL, IPR, PT
Omit TSS determination for aqueous samples; utilize centrifugation to minimize clogging of SPE	Section 11.1 & 11.2.4	Allowable modifications per method	Not applicable.
Solid matrix extraction: eliminated 3rd liquid-solid extraction step and omitted concentration step	Section 11.3.4, 11.3.6, and 11.3.9	Improved performance & reduced sample processing time	MDL, IPR, PT
Use pre-packed GCB cartridges; omit syringe filtration	All refences to carbon cleanup	Improved performance, reduced sample processing time, & ease of use	MDL, IPR, PT
Tissue matrix extraction: reduced shake time, eliminated 3rd liquid-solid extraction, and omitted concentration step	Section 11.4.4, 11.4.6, 11.4.8	Comparable and validated performance	MDL, IPR, PT

15.0 RESPONSIBILITIES

PAS employees that perform any part this procedure in their work activities must have a signed Read and Acknowledgement Statement (R&A) in their training file for the version(s) of the SOP that were in effect during the time the employee performed the activity.

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PAS supervisors and managers, however named, are responsible for training employees on the procedures in this SOP, implementing the SOP in the work area, and monitoring on-going adherence to the SOP in the work area(s) they oversee.

PAS employees are responsible for following the procedures in this SOP. Unauthorized deviations or departures from this SOP are not allowed except with documented approval from the local QM and only when those deviations do not violate the Pace® Code of Ethics or Professional Conduct (COR-POL-0004) or associated policy and procedure(s). Hand-edits or manual changes to the SOP are not permitted. If a change is desired or necessary, Pace® employees must follow the procedures for document revision specified in corporate SOPs ENV-SOP-CORQ-0015, *Document Management* and ENV-SOP-CORQ-0016, *SOP for Creation of SOP and SWI.*

16.0 ATTACHMENTS

- **Appendix A: Tables**
  - Table 1: Analyte Name / Abbreviation / CAS Number Cross-Reference Table
  - Table 2: Routine Analyte List and LOQ by Matrix
  - Table 3: Sample Collection, Preservation, and Holding Time Requirements
  - Table 4: Required Instruments, Equipment, and Supplies
  - Table 5: Prepared Concentration of Working Calibration Standards
  - Table 6: Identification and Quantitation Ions by Analyte, EIS, and NIS
  - Table 7: QC Acceptance Criteria, Corrective Action and Data Qualification Requirements
  - Table 8: LCS/LLLCS Acceptance Limits
  - Table 9: EIS and NIS Acceptance Limits
  - Table 10: IPR Limits for Method Validation
- **Appendix B: Reference Materials – Reagents, Standards & Formulations**
- **Appendix C: Sample Screening Protocol**
- **Appendix D: Subsampling Procedure for Aqueous Matrices**
- **Appendix E: Aqueous Sample Preparation – Settled Solids Depth > ½ cm**
- **Appendix F: Biphasic Sample Separation Procedure**
- **Appendix G: SPE Clog Mitigation Procedure**
- **Appendix H: Particle Size Reduction by Cryomill for Articles of Commerce**
- **Appendix I: Procedure for Total Oxidizable Precursors (TOP)**
- **Appendix J: Surface Wipe PFAS Analysis by 1633**
- **Appendix K: TCLP/SPLP by 1633**

17.0 REFERENCES

- EPA. Method 1633A, Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS. December 2024.

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- DoD-EDQW and DOE-DQW. DoD/DOE Quality Systems Manual (QSM) for Environmental Laboratories, Version 6.0, 2025 – Table B-24)
- Standard Method for the Examination of Water and Wastewater, 23rd Edition, 2017 – Total, Fixed, and Volatile Solids in Solid and Semisolid Samples, Method 2540.
- ENV-POL-CORQ-0005, *Acceptable Calibration Practices*, current version.
- ENV-SOP-CORQ-0006, *Manual Integration*, current version.
- ENV-SOP-CORQ-0011, *Method Validation and Instrument Verification*, current version.
- ENV-SOP-CORQ-0015, *Document Management*, current version.
- ENV-SOP-CORQ-0016, *Standard Operating Procedures and Standard Work Instructions,* current version.
- COR-POL-0004, *Code of Ethics and Professional Conduct*, current version.
- COR-MAN-001, *Pace® Safety Manua*l, current version.
- *ENV-MAN-WEST-0001, Quality Manual*, current version.
- Articles of Commerce: 3M, STANDARD TEST METHOD, Determination of PFOA in articles of commerce: disassembly, disjointment, and mechanical preparation of solid samples, sample preparation of aqueous polymer systems, sample extraction, and LC-MS quantitative analysis, June 2020.

18.0 Revision History

Revisions Made from Prior Version

Section	Description of Change
1.1	Added Table of Matrices
6.0	Moved table to Appendix A
9.1.1	Added detailed support equipment sections
9.1.2	Added detailed Extraction Equipment sections
9.2	Calibration has been re-written for calibration
9.4	Added General Requirements
9.4.3	Added detailed for specific matrices
Throughout	Updated extraction weights and volumes

Document Succession: This version replaces the following document(s):

Document Number	Version	Document Title	Effective Date:
ENV-SOP-MANS-0111	2	Preparation and Analysis of PFAS in Aqueous, Solid, and Tissue by EPA Method 1633A	7/31/2025

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Appendix A: Tables

Table 1: Analyte Name / Abbreviation / CAS Number Cross-Reference Table

Analyte Name	Abbreviation	CAS #
Perfluoropropanoic acid	PFPrA	442-62-0
Perfluorobutanoic acid	PFBA	375-22-4
Perfluoropentanoic acid	PFPeA	2706-90-3
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorononanoic acid	PFNA	375-95-1
Perfluorodecanoic acid	PFDA	335-76-2
Perfluoroundecanoic acid	PFUnA	2058-94-8
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluorotridecanoic acid	PFTrDA	72629-94-8
Perfluorotetradecanoic acid	PFTeDA	376-06-7
Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluoropentanesulfonic acid	PFPeS	2706-91-4
Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluoroheptanesulfonic acid	PFHpS	375-92-8
Perfluorooctanesulfonic acid	PFOS	1763-23-1
Perfluorononanesulfonic acid	PFNS	68259-12-1
Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorododecanesulfonic acid	PFDoS	79780-39-5
1H,1H, 2H, 2H-Perfluorohexane sulfonic acid	4:2 FTS	757124-72-4
1H,1H, 2H, 2H-Perfluorooctane sulfonic acid	6:2 FTS	27619-97-2
1H,1H, 2H, 2H-Perfluorodecane sulfonic acid	8:2 FTS	39108-34-4
Perfluorooctanesulfonamide	PFOSA	754-91-6
N-methyl perfluorooctanesulfonamide	NMeFOSA	31506-32-8
N-ethyl perfluorooctanesulfonamide	NEtFOSA	4151-50-2
Bis (trifluoromethylsulfonyl)amine	TFSI	82113-65-3
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	2355-31-9
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	2991-50-6
N-methyl perfluorooctanesulfonamidoethanol	NMeFOSE	24448-09-7
N-ethyl perfluorooctanesulfonamidoethanol	NEtFOSE	1691-99-2
Hexafluoropropylene oxide dimer acid (GenX)	HFPO-DA	13252-13-6

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Analyte Name	Abbreviation	CAS #
4,8-Dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
Perfluoro-3-methoxypropanoic acid	PFMPA	377-73-1
Perfluoro-4-methoxybutanoic acid	PFMBA	863090-89-5
Nonafluoro-3,6-dioxaheptanoic acid	NFDHA	151772-58-6
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	756426-58-1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
Perfluoro(2-ethoxyethane)sulfonic acid	PFEESA	113507-82-7
3-Perfluoropropyl propanoic acid (FPrPA)	3:3 FTCA	356-02-5
2H,2H,3H,3H-Perfluorooctanoic acid (FPePA)	5:3 FTCA	914637-49-3
3-Perfluoroheptyl propanoic acid (FHpPA)	7:3 FTCA	812-70-4
Extracted Internal Standards (EIS)		
Perfluoro-n-[13C3] propanoic acid	13C3-PFPrA	NA
Perfluoro-n-[13C4] butanoic acid	13C4-PFBA	NA
Perfluoro-n-[13C5] pentanoic acid	13C5-PFPeA	NA
Perfluoro-n-[1,2,3,4,6-13C5] hexanoic acid	13C5-PFHxA	NA
Perfluoro-n-[1,2,3,4-13C4] heptanoic acid	13C4-PFHpA	NA
Perfluoro-n-[13C8] octanoic acid	13C8-PFOA	NA
Perfluoro-n-[13C9] nonanoic acid	13C9-PFNA	NA
Perfluoro-n-[1,2,3,4,5,6-13C6] decanoic acid	13C6-PFDA	NA
Perfluoro-n-[1,2,3,4,5,6,7-13C7] undecanoic acid	13C7-PFUnA	NA
Perfluoro-n-[1,2-13C2] dodecanoic acid	13C2-PFDoA	NA
Perfluoro-n-[1,2-13C2] tetradecanoic acid	13C2-PFTeDA	NA
Perfluoro-1-[2,3,4-13C3] butanesulfonic acid	13C3-PFBS	NA
Perfluoro-1-[1,2,3-13C3] hexanesulfonic acid	13C3-PFHxS	NA
Perfluoro-1-[13C8] octanesulfonic acid	13C8-PFOS	NA
1H,1H,2H,2H-Perfluoro-1-[1,2-13C2] hexanesulfonic acid	13C2-4:2FTS	NA
1H,1H,2H,2H-Perfluoro-1-[1,2-13C2] octanesulfonic acid	13C2-6:2FTS	NA
1H,1H,2H,2H-Perfluoro-1-[1,2-13C2] decanesulfonic acid	13C2-8:2FTS	NA
Perfluoro-1-[13C8] octanesulfonamide	13C8-PFOSA	NA
N-methyl-D3-perfluoro-1-octanesulfonamide	D3-NMeFOSA	NA
N-ethyl-D5-perfluoro-1-octanesulfonamide	D5-NEtFOSA	NA
N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid	D3-NMeFOSAA	NA

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Analyte Name	Abbreviation	CAS #
N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid	D5-NEtFOSAA	NA
N-methyl-D7-perfluorooctanesulfonamidoethanol	D7-NMeFOSE	NA
N-ethyl-D9-perfluorooctanesulfonamidoethanol	D9-NEtFOSE	NA
Tetrafluoro-2-heptafluoropropoxy-13C3-propanoic acid	13C3-HFPO-DA	NA
NIS		
Perfluoro-n-[2,3,4-13C3] butanoic acid	13C3-PFBA	NA
Perfluoro-n-[1,2-13C2]hexanoic acid	13C2-PFHxA	NA
Perfluoro-n-[1,2,3,4-13C4]octanoic acid	13C4-PFOA	NA
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acid	13C5-PFNA	NA
Perfluoro-n-[1,2-13C2]decanoic acid	13C2-PFDA	NA
Perfluoro-1-hexane[18O2]sulfonic acid	18O2-PFHxS	NA
Perfluoro-n-[1,2,3,4-13C4] octanesulfonic acid	13C4-PFOS	NA

Table 2: Routine Analyte List and LOQ[1] by Matrix

Abbreviation	CAS #	Aqueous (NPW) (ng/L)	Leachate (Landfill/TCLP/ SPLP) (ng/L)	Solids (Soil/Sediment) (ng/g)	Biosolid (ng/g)	Surface Wipe (ng/wipe)	Tissue (ng/g)
PFPrA	422-64-0	6.4	32	0.8	8	1.6	2.0
PFBA	375-22-4	6.4	32	0.8	8	1.6	2.0
PFPeA	2706-90-3	3.2	16	0.4	4	0.8	1.0
PFHxA	307-24-4	1.6	8	0.2	2	0.4	0.5
PFHpA	375-85-9	1.6	8	0.2	2	0.4	0.5
PFOA	335-67-1	1.6	8	0.2	2	0.4	0.5
PFNA	375-95-1	1.6	8	0.2	2	0.4	0.5
PFDA	335-76-2	1.6	8	0.2	2	0.4	0.5
PFUnA	2058-94-8	1.6	8	0.2	2	0.4	0.5
PFDoA	307-55-1	1.6	8	0.2	2	0.4	0.5
PFTrDA	72629-94-8	1.6	8	0.2	2	0.4	0.5
PFTeDA	376-06-7	1.6	8	0.2	2	0.4	0.5
PFBS	375-73-5	1.6	8	0.2	2	0.4	0.5
PFPeS	2706-91-4	1.6	8	0.2	2	0.4	0.5
PFHxS	355-46-4	1.6	8	0.2	2	0.4	0.5

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Abbreviation	CAS #	Aqueous (NPW) (ng/L)	Leachate (Landfill/TCLP/ SPLP) (ng/L)	Solids (Soil/Sediment) (ng/g)	Biosolid (ng/g)	Surface Wipe (ng/wipe)	Tissue (ng/g)
PFHpS	375-92-8	1.6	8	0.2	2	0.4	0.5
PFOS	1763-23-1	1.6	8	0.2	2	0.4	0.5
PFNS	68259-12-1	1.6	8	0.2	2	0.4	0.5
PFDS	335-77-3	1.6	8	0.2	2	0.4	0.5
PFDoS	79780-39-5	1.6	8	0.2	2	0.4	0.5
4:2 FTS	757124-72-4	6.4	32	0.8	8	1.6	2.0
6:2 FTS	27619-97-2	6.4	32	0.8	8	1.6	2.0
8:2 FTS	39108-34-4	6.4	32	0.8	8	1.6	2.0
PFOSA	754-91-6	1.6	8	0.2	2	0.4	0.5
NMeFOSA	31506-32-8	1.6	8	0.2	2	0.4	0.5
NEtFOSA	4151-50-2	1.6	8	0.2	2	0.4	0.5
TFSI	82113-65-3	3.2	16	.4	4	0.8	1.0
NMeFOSAA	2355-31-9	1.6	8	0.2	2	0.4	0.5
NEtFOSAA	2991-50-6	1.6	8	0.2	2	0.4	0.5
NMeFOSE	24448-09-7	16	80	2.0	20	4	5.0
NEtFOSE	1691-99-2	16	80	2.0	20	4	5.0
HFPO-DA	13252-13-6	6.4	32	0.8	8	1.6	2.0
ADONA	919005-14-4	6.4	32	0.8	8	1.6	2.0
PFMPA	377-73-1	3.2	16	0.4	4	0.8	1.0
PFMBA	863090-89-5	3.2	16	0.4	4	0.8	1.0
NFDHA	151772-58-6	3.2	16	0.4	4	0.8	1.0
9Cl-PF3ONS	756426-58-1	6.4	32	0.8	8	1.6	2.0
11Cl-PF3OUdS	763051-92-9	6.4	32	0.8	8	1.6	2.0
PFEESA	113507-82-7	3.2	16	0.4	4	0.8	1.0
3:3 FTCA	356-02-5	8	40	1.0	10	2	2.5
5:3 FTCA	914637-49-3	40	200	5.0	50	10	12.5
7:3 FTCA	812-70-4	40	200	5.0	50	10	12.5

[1]LOQ effective on SOP effective date; values are subject to change. If you are an external party using this SOP for reference, please contact the laboratory for the most up-to-date information.

Table 3: Sample Collection, Preservation[1] and Holding Time Requirements

Matrix	Container per Sample	Minimum Sample Size[2]	Preservation	Holding Time Collection to Prep	Holding Time

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					Prep to Analysis
Aqueous: Nonpotable Water (NPW)	Linerless HDPE 2 x 250 mL + 1 x 60 mL[3]	250 mL	Option 1: 0-6°C Option 2: Frozen	Option 1: 28 Days Exception: 7 days, if NMeFOSE, NEtFOSE, NMeFOSAA, and/or NEtFOSAA are analytes of interest Option 2: 90 Days	28 Days
Aqueous: Landfill Leachate	Linerless HDPE 2 x 60 mL	50 mL	Option 1: 0-6°C Option 2: Frozen	Option 1: 28 Days Exception: 7 days, if NMeFOSE, NEtFOSE, NMeFOSAA, and/or NEtFOSAA are analytes of interest Option 2: 90 Days	28 Days
Aqueous: TCLP or SPLP	See TCLP / SPLP SOP(s): Leachates are generated using methods for TCLP and/or SPLP and then processed per this SOP for PFAS				
Solid: Soil / Sediment	Linerless Polypropylene 1 x 3 oz/90 mL wide mouth container	2 g	Option 1: 0-6°C Option 2: Frozen	Option 1: 90 Days Exception: 3 days, if NFDHA is an analyte of interest Option 2: 90 Days Exception: 3 days, if NFDHA is an analyte of interest	28 Days
Solid: Biosolid	Linerless HDPE 1x 125 mL	0..2 g	Option 1: 0-6°C Option 2: Frozen	Option 1: 90 Days Option 2: 90 Days	28 Days
Tissue: Unhomogenized Fish	Sampling team should wrap the fish in aluminum foil or insert into food-grade polyethylene tubing or a resealable zip-top bag for shipment to the lab.	Whole Fish or Fillet (for homogenization)	Frozen	45 Days	N/A
Tissue: Homogenized Fish	Linerless Polypropylene 1 x 3 oz/90 mL wide mouth container	0.8 g	Frozen	90 Days	28 Days

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Solid: Surface Wipe	Polypropylene Centrifuge Tube 1 x 50 mL, shipped with individually packaged pre-soaked ghost wipe	1 Wipe	0-6°C	90 days	28 days
Solid: Articles of Commerce	PFAS Free Container (HDPE bottle, resealable zip-top bag)	0.8 g	0-6°C	365 Days	28 Days
Aqueous: AFFF/F3	Linerless HDPE 1 x 60 mL or 1 x 90 mL	0.01 g	0-6°C	28 Days	28 Days

[1:] *Preservation at time of collection and on receipt at laboratory. Unless otherwise specified, samples are stored after receipt in the laboratory under the same conditions as preservation until time of preparation or analysis.*

[2:] *Nominal amount of sample required for each discrete test. Solid and biosolid sample amounts reflect dry weight.*

[3:] *Used for pre-screening analyses.*

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Table 4: Required Instruments, Equipment, and Supplies

Item	Specification	Vendor	Model	Catalog #
LC MS/MS	Tandem Quadrapole Mass Spectrometer	Sciex	5500+	5068379
Analytical Column	2.1 x 50 mm (1.7 µm)	Waters	Acquity® BEH C18	186002350
Guard Cartridge/Column	2.1 x 5 mm, 1.8 um	Agilent	Zorbax Eclipse Plus C18	821725-901
Trap / Delay Colum	2.1 X 50mm	Waters	Isolator Column	186004476
Oven	Stable Temperature of 105±5°C	Binder	ED 115	9010-0336
Analytical Balance	Measurement to 0.0001g	Varied	Varied	Varied
Top Loading Balance	Measurement to 0.01g	Varied	Varied	Varied
Ultrasonic Mixer (Sonicator)		Fisherbrand	CPX3800	See catalog
Vortex Mixer	Multi-Tube	Fisher Scientific	Fisherbrand™ Digital Multi-Tube Vortexer	02-215-542
	Alternative Option: Single Tube	VWR	Heavy Duty Vortex	97043-564
Mixing Table	Variable Speed	New Brunswick	Innova 2300	M1191-0020
Centrifuge	3000 RPM (~2000 RCF)	Beckman Coulter	Avanti J-15 IVD	C01994
Centrifuge Bottles	Sterile, Polypropylene, Conical, 500mL	Fisher Scientifc	Corning™ Polypropylene Centrifuge Tubes, Sterile	07-200-621
Vacuum Manifold	Designed for SPE Cartridges	Waters	Extraction Manifold, 20-position with rack for 16x100 mm tubes	WAT200609
Manifold Liners	Compatible with SPE manfiold	Waters	Long Needle Valve for Sep-Pak Device Vacuum Manifold, 20/pk	WAT200685
Vacuum Pump	Vacuum of ~10-15 inches of mercury	GAST	Modelo 115V, 4.2 A, 60HZ	DOA-P704-AA
Vacuum Tubing	1/4”ID, 5/8” OD, 3/16” Wall	Fisher Scientific	10’ Length	14-176-6B
SPE Cartridges	Designed for PFAS	Phenomenex (locally approved)	Strata-X-AW 33uM Polymeric Weak Anion-PFAS 250mg/20m Tubes	8B-S541-FEG
SPE Cartridges	Designed for PFAS	Phenomenex (locally approved)	Strata-X-AW 33uM Polymeric Weak Anion-PFAS 250mg/100mg GCB; 20m Tubes	CS0–9220
SPE Reservoirs	60mL, polypropylene	Phenomenex	Empty SPE Tubes 60cc	AHO-7189
Adapter Caps	To fit 12, 20, 60mL SPE tubes	MilliporeSigma	Cartridge Adapter	57267
Adapter Tubing	LLDPE – 1/8” OD, 1/16” ID	Freeline-Wade	500’ Reel	1C-109-10
Adjustable-volume Mechanical Pipettes	10uL to 10mL	Various	Various	Various
Disposable Pipette Tips	HDPE or Polypropylene:	Various	Various	Various

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Item	Specification	Vendor	Model	Catalog #
	volume of 10uL to 5mL			
Solvent Evaporator	Nitrogen Evaporation	Oganomation		
Carbon Cartridges	Graphitized Carbon Black Solid Phase Extraction Absorbent	Phenomenex	Strata GCB, 25mg/1mL Pass Through Cartridge	8B-S528-CAJ
Glass Wool	Silanized	VWR	Corning Pyrex 3950	89219-589
Water System	PFAS Free	Thermo	Barnstead	7119
pH Indicator Strips	Range 0-14, Sensitivity 0.5 pH unit 0 to 9, 1 pH unit 9-14	MilliporeSigma	Whatman Panepha™	WHA0360005
Bottles	HDPE or Polypropylene with linerless caps of same material	QEC (Pace Approved)	65 ml	
			90 mL	6214-003PPGBC-P
			125 mL	6213-U004BC-P
			250 mL	6212-Q008BC-P
			500 mL	6212-Q016/BC-150 PACE
Tubes	HDPE or Polypropylene with linerless caps of same material	Fisher Scientific	Falcon™ 15 mL conical	05-527-90
			Falcon™ 50 mL conical	14-432-22
Containers	Narrow Mouth HDPE	Thermo	4 mL	2002-9125
			8 mL	2002-9025
			15 mL	2002-9050
	Polyethylene	Grainger	Cryogenic Vial 2 mL	6EMV1
	Microcentrifuge Tube	Fisher	1.5 mL	05-408-129
Screw Top Vials	Polypropylene vial	Waters	300 µL	186004112
Screw Top Vials	Polypropylene vial	Waters	700 µL	186005219
Screw Top Vials	Polypropylene vial	VWR	2 ml	89524-188A
Screw Top Cap	9mm clear propylene, thin polypropylene-silicone septa	Waters	Screw Style Cap	186004169
Single-step Filter Vials	0.2 µm nylon membrane	Restek	SINGLE StEP® Standard Filter Vials	25891
Surface Wipe	Pre-wetted with methanol	Environmental Express (locally approved)	Ghost Wipes for Methamphetamine testing	SC5000
Ottawa Sand	30-40 mesh size	VWR	500 grams, Poly bottle	BDH9274-500G
Reference Tissue	Cod	Various	Filets	N/A
Cryogenic Mill	30 Hz; -200C	Retsch	CryoMill, 10/240 V, 50/60 Hz	207490001
Grinding Balls	25 mm; Stainless Steel	Retsch	25 mm; Stainless Steel	053680105

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Item	Specification	Vendor	Model	Catalog #
Grinding Jars	Stainless Steel	Retsch	50 mls	014620332
Scissors or Heavy Plate Shears	Various Size			
Cleaning Brushes	Various Size			

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Table 5: Prepared Concentration of Working Calibration Standards (ng/mL)[1]

Compound	L1	L2[2]	L3	L4	L5	L6[3]	L7	L8	L9
Perfluoroalkyl carboxylic acids									
PFPrA	0.2	0.4	0.8	2	10	20	50	100	200
PFBA	0.2	0.4	0.8	2	10	20	50	100	200
PFPeA	0.1	0.2	0.4	1	5	10	25	50	100
PFHxA	0.05	0.1	0.2	0.5	2.5	5	12.5	25	50
PFHpA	0.05	0.1	0.2	0.5	2.5	5	12.5	25	50
PFOA	0.05	0.1	0.2	0.5	2.5	5	12.5	25	50
PFNA	0.05	0.1	0.2	0.5	2.5	5	12.5	25	50
PFDA	0.05	0.1	0.2	0.5	2.5	5	12.5	25	50
PFUnA	0.05	0.1	0.2	0.5	2.5	5	12.5	25	50
PFDoA	0.06	0.1	0.2	0.5	2.5	5	12.5	25	50
PFTrDA	0.05	0.1	0.2	0.5	2.5	5	12.5	25	50
PFTeDA	0.05	0.1	0.2	0.5	2.5	5	12.5	25	50
Perfluoroalkyl sulfonic acids									
PFBS	0.044	0.089	0.178	0.444	2.22	4.44	11.1	22.2	44.4
PFPeS	0.047	0.094	0.188	0.470	2.35	4.70	11.8	23.5	47.0
PFHxS	0.046	0.091	0.182	0.456	2.28	4.56	11.4	22.8	45.6
PFHpS	0.048	0.095	0.190	0.476	2.38	4.76	11.9	23.8	47.6
PFOS	0.046	0.093	0.186	0.464	2.32	4.64	11.6	23.2	46.4
PFNS	0.048	0.096	0.192	0.480	2.40	4.80	12.0	24.0	48.0
PFDS	0.048	0.096	0.193	0.482	2.41	4.82	12.1	24.1	48.2
PFDoS	0.048	0.097	0.194	0.484	2.42	4.84	12.1	24.2	48.4
Fluorotelomer sulfonic acids									
4:2FTS	0.188	0.375	0.750	1.87	9.37	18.7	46.9	93.7	187
6:2FTS	0.190	0.380	0.761	1.90	9.51	19.0	47.6	95.1	190
8:2FTS	0.192	0.384	0.768	1.92	9.6	19.2	48	96	192
Perfluorooctane sulfonamides									
PFOSA	0.05	0.1	0.2	0.5	2.5	5	12.5	25	50
NMeFOSA	0.05	0.1	0.2	0.5	2.5	5	12.5	25	50
NEtFOSA	0.05	0.1	0.2	0.5	2.5	5	12.5	25	50
Perfluoromethane sulfonamide									
TFSI	0.1	0.2	.4	1	5	10	25	50	100
Perfluorooctane sulfonamidoacetic acids									
NMeFOSAA	0.05	0.1	0.2	0.5	2.5	5	12.5	25	50
NEtFOSAA	0.05	0.1	0.2	0.5	2.5	5	12.5	25	50
Perfluorooctane sulfonamide ethanols									
NMeFOSE	0.5	1	2	5	25	50	125	250	500

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Compound	L1	L2[2]	L3	L4	L5	L6[3]	L7	L8	L9
NEtFOSE	0.5	1	2	5	25	50	125	250	500
Per- and polyfluoroether carboxylic acids									
HFPO-DA	0.2	0.4	0.8	2	10	20	50	100	200
ADONA	0.189	0.378	0.756	1.89	9.45	18.9	47.25	94.5	189
PFMPA	0.1	0.2	0.4	1	5	10	25	50	100
PFMBA	0.1	0.2	0.4	1	5	10	25	50	100
NFDHA	0.1	0.2	0.4	1	5	10	25	50	100
Ether sulfonic acids									
9Cl-PF3ONS	0.187	0.373	0.746	1.87	9.33	18.7	46.7	93.3	187
11Cl-PF3OUdS	0.189	0.377	0.754	1.89	9.43	18.9	47.2	94.3	189
PFEESA	0.089	0.178	0.357	0.892	4.46	8.92	22.3	44.6	89.2
Fluorotelomer Carboxylic Acids									
3:3FTCA	0.25	0.5	1	2.5	12.5	25	62.5	125	250
5:3FTCA	1.25	2.5	5	12.5	62.5	125	313	625	1250
7:3FTCA	1.25	2.5	5	12.5	62.5	125	313	625	1250
TOP Assay Control Surrogates (EIS)									
13C2,D4-4:2FTS	5	5	5	5	5	5	5	5	5
13C2-PFOA	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Extracted Internal Standards (EIS)									
13C3-PFPrA	10	10	10	10	10	10	10	10	10
13C4-PFBA	10	10	10	10	10	10	10	10	10
13C5-PFPeA	5	5	5	5	5	5	5	5	5
13C5-PFHxA	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
13C4-PFHpA	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
13C8-PFOA	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
13C9-PFNA	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
13C6-PFDA	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
13C7-PFUnA	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
13C2-PFDoA	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
13C2-PFTeDA	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
13C3-PFBS	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
13C3-PFHxS	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
13C8-PFOS	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
13C2-4:2FTS	5	5	5	5	5	5	5	5	5
13C2-6:2FTS	5	5	5	5	5	5	5	5	5
13C2-8:2FTS	5	5	5	5	5	5	5	5	5
13C8-PFOSA	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
D3-NMeFOSA	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

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Compound	L1	L2[2]	L3	L4	L5	L6[3]	L7	L8	L9
D5-NEtFOSA	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
D3-NMeFOSAA	5	5	5	5	5	5	5	5	5
D5-NEtFOSAA	5	5	5	5	5	5	5	5	5
D7-NMeFOSE	25	25	25	25	25	25	25	25	25
D9-NEtFOSE	25	25	25	25	25	25	25	25	25
13C3-HFPODA	10	10	10	10	10	10	10	10	10
Non-Extracted Internal Standards (NIS)									
13C3-PFBA	5	5	5	5	5	5	5	5	5
13C2-PFHxA	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
13C4-PFOA	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
13C5-PFNA	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
13C2-PFDA	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
18O2-PFHxS	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
13C4-PFOS	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

[1] Concentration of each target analyte, EIS, and NIS in each calibration level when the formulations specified in Appendix B are used to prepare the working standards.

[2] L2 is the set LOQ.

[3] L6 is used as the CCV.

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Table 6: Identification and Quantification Ions by Analyte, EIS, NIS

Abbreviation	CAS #	Ion Mass			Quantification Reference
		Parent	Quantification	Confirmation	
PFPrA	422-64-0	163	119	NA	13C3-PFPrA
PFBA	375-22-4	213	169	NA	13C4-PFBA
PFPeA	2706-90-3	263	219	69	13C5-PFPeA
PFHxA	307-24-4	313	269	119	13C5-PFHxA
PFHpA	375-85-9	363	319	169	13C4-PFHpA
PFOA	335-67-1	413	369	169	13C8-PFOA
PFNA	375-95-1	463	419	219	13C9-PFNA
PFDA	335-76-2	513	469	219	13C6-PFDA
PFUnA	2058-94-8	563	519	269	13C7-PFUnA
PFDoA	307-55-1	613	569	319	13C2-PFDoA
PFTrDA	72629-94-8	663	619	169	13C2-PFDoA
PFTeDA	376-06-7	713	669	169	13C2-PFTeDA
PFBS	375-73-5	299	80	99	13C3-PFBS
PFPeS	2706-91-4	349	80	99	13C3-PFHxS
PFHxS	355-46-4	399	80	99	13C3-PFHxS
PFHpS	375-92-8	449	80	99	13C8-PFOS
PFOS	1763-23-1	499	80	99	13C8-PFOS
PFNS	68259-12-1	549	80	99	13C8-PFOS
PFDS	335-77-3	599	80	99	13C8-PFOS
PFDoS	79780-39-5	699	80	99	13C8-PFOS
4:2 FTS	757124-72-4	327	307	81	13C2-4:2FTS
6:2 FTS	27619-97-2	427	407	81	13C2-6:2FTS
8:2 FTS	39108-34-4	527	507	81	13C2-8:2FTS
PFOSA	754-91-6	498	78	478	13C8-PFOSA
NMeFOSA	31506-32-8	512	219	169	D3-NMeFOSA
NEtFOSA	4151-50-2	526	219	169	D5-NEtFOSA
TFSI	82113-65-3	280	78	147	13C3-HFPO-DA
NMeFOSAA	2355-31-9	570	419	483	D3-NMeFOSAA
NEtFOSAA	2991-50-6	584	419	526	D5-NEtFOSAA
NMeFOSE	24448-09-7	616	59	NA	D7-NMeFOSE
NEtFOSE	1691-99-2	630	59	NA	D9-NEtFOSE
HFPO-DA	13252-13-6	285	169	185	13C3-HFPODA
ADONA	919005-14-4	377	251	85	13C4-PFHpA
PFMPA	377-73-1	229	85	NA	13C4-PFBA
PFMBA	863090-89-5	279	85	NA	13C5-PFPeA
NFDHA	151772-58-6	295	201	85	13C5-PFHxA
9Cl-PF3ONS	756426-58-1	531	351	533→353	13C8-PFOS
11Cl-PF3OUdS	763051-92-9	631	451	633→453	13C8-PFOS
PFEESA	113507-82-7	315	135	83	13C5-PFHxA
3:3FTCA	356-02-5	241	177	117	13C5-PFPeA
5:3FTCA	914637-49-3	341	237	217	13C5-PFHxA
7:3FTCA	812-70-4	441	317	337	13C9-PFNA
Extracted Internal Standards (EIS)					
13C3-PFPrA	NA	166	121	NA	13C4-PFBA

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Abbreviation	CAS #	Ion Mass			Quantification Reference
		Parent	Quantification	Confirmation	
13C4-PFBA	NA	217	172	NA	13C3-PFBA
13C5-PFPeA	NA	268	223	NA	13C2-PFHxA
13C5-PFHxA	NA	318	273	NA	13C2-PFHxA
13C4-PFHpA	NA	367	322	NA	13C2-PFHxA
13C8-PFOA	NA	421	376	NA	13C4-PFOA
13C9-PFNA	NA	472	427	NA	13C5-PFNA
13C6-PFDA	NA	519	474	NA	13C2-PFDA
13C7-PFUnA	NA	570	525	NA	13C2-PFDA
13C2-PFDoA	NA	615	570	NA	13C2-PFDA
13C2-PFTeDA	NA	715	670	NA	13C2-PFDA
13C3-PFBS	NA	302	80	NA	18O2-PFHxS
13C3-PFHxS	NA	402	80	NA	18O2-PFHxS
13C8-PFOS	NA	507	80	NA	13C4-PFOS
13C2-4:2FTS	NA	329	81	NA	18O2-PFHxS
13C2-6:2FTS	NA	429	81	NA	18O2-PFHxS
13C2-8:2FTS	NA	529	81	NA	18O2-PFHxS
13C8-PFOSA	NA	506	78	NA	13C4-PFOS
D3-NMeFOSA	NA	515	219	NA	13C4-PFOS
D5-NEtFOSA	NA	531	219	NA	13C4-PFOS
D3-NMeFOSAA	NA	573	419	NA	13C4-PFOS
D5-NEtFOSAA	NA	589	419	NA	13C4-PFOS
D7-NMeFOSE	NA	623	59	NA	13C4-PFOS
D9-NEtFOSE	NA	639	59	NA	13C4-PFOS
13C3-HFPO-DA	NA	287	169	NA	13C2-PFHxA
Non-Extracted Internal Standards (NIS)					
13C3-PFBA	NA	216	172	NA	NA
13C2-PFHxA	NA	315	270	NA	NA
13C4-PFOA	NA	417	372	NA	NA
13C5-PFNA	NA	468	423	NA	NA
13C2-PFDA	NA	515	470	NA	NA
18O2-PFHxS	NA	403	84	NA	NA
13C4-PFOS	NA	503	80	NA	NA

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Table 7: QC Acceptance Criteria, Corrective Action and Data Qualification Requirements

QC Item	Acceptance Criteria	Corrective Action	Qualification
Mass Calibration	Must meet manufacturer's acceptance criteria.	Identify and correct source of problem, repeat Mass Calibration.	None. Do not proceed with analysis.
Mass Calibration Verification	Must meet manufacturer's acceptance criteria.	Identify and correct source of problem, repeat Mass Calibration.	None. Do not proceed with analysis.
Initial Calibration (ICAL)	Must meet linearity requirement specified in Section 9.3.1 for type of curve fit used.	Identify and correct source of problem, repeat.	None. Do not proceed with analysis.
Initial Calibration Verification (ICV)	All analytes must be within ± 30% of their true values. (%R)	Identify and correct source of problem, re-analyze. If repeat failure, repeat ICAL.	If corrective action is not taken, qualify or disclose nonconformity for data user to assess impact on project samples.
Calibration Blank (ICB)	No targets detected greater than MDL.	Identify and correct source of contamination or performance issue. Alternately, re-calibrate using a lower concentration standard for the highest point.	None. Do not proceed with analysis.
RT Window Position	Set position using the mid-point of the ICAL on the day ICAL is performed; otherwise, the opening CCV is used. RT Window is ± 60 secs from RT position.	NA	NA
Instrument Sensitivity Check (ISC)	All native and isotopically labelled compounds within ± 30% recovery.	Identify and correct source of problem and reanalyze ISC. If problem persists, repeat ICAL.	None. Do not proceed with analysis.
Bile Salts Check	Bile Salt peak detected >1 min outside RT window for PFOS.	Identify and correct source of problem, then reevaluate Bile Salts separation from PFOS.	None. Do not proceed with analysis.

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QC Item	Acceptance Criteria	Corrective Action	Qualification
Continuing Calibration Verification (CCV)	All native and isotopically labelled compounds within ±30% recovery.	See Section 9.3.6 for required corrective actions based on circumstance.	Qualify test results associated with CCV failure.
Instrument Blank (IBLK) / Continuing Calibration Blanks (CCB)	No targets detected > MDL.	Identify and correct source of contamination or performance issue. Reanalyze IBLK.	No samples shall be analyzed until opening IBLK has met acceptance criteria, unless the samples to be analyzed will not report the compound(s) detected in the IBLK.
Extracted Internal Standards (EIS)	See Table 9.	If batch QC is acceptable, reanalyze to confirm failure. If confirmed, re-extract from reduced sample amount and reanalyze sample, if possible. If failure persists, no further action is needed.	Qualify outages
Non-extracted Internal Standards (NIS)	NIS areas in all samples must be within 50 – 200% of the average area of the corresponding NIS in the ICAL.	Troubleshoot instrument performance. Reanalyze samples.	Qualify outages
Method Blank (MB)	No targets detected greater than the LOQ or 1/10 of the concentration detected in associated sample(s), whichever is greatest.	If IBLK is acceptable, reanalyze MB to confirm. If confirmed, re-extract and reanalyze associated impacted samples if sufficient amount remains and samples are within holding time; otherwise qualify associated test results.	Qualify outages
LCS/LLLCS	%R: See Table 8	If the most recent ISC/CCV is acceptable, reanalyze LCS to confirm. If low-failure results are confirmed, re-extract and reanalyze associated samples (if sufficient sample	Qualify outages

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QC Item	Acceptance Criteria	Corrective Action	Qualification
		remains). If insufficient sample remains for reprep, narrate and report data associated with low-failure LCS. If high-failure results are confirmed and sample(s) is ND for failing compound, narrate and report sample data.	
MS/MSD	%R: See Table 8 RPD ≤30%		Qualify outages
Laboratory Duplicate	RPD from parent sample ≤30%		Qualify outages.

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Table 8: LCS/LLLCS Acceptance Limits (%R)

Analyte	CAS #	Aqueous/Leachate	Solid: All Matrices	Tissue
PFPrA	422-64-0	70-140	70-140	60-140
PFBA	375-22-4	70-140	70-140	60-140
PFPeA	2706-90-3	65-135	60-150	60-145
PFHxA	307-24-4	70-145	65-140	60-160
PFHpA	375-85-9	70-150	65-145	60-145
PFOA	335-67-1	70-150	70-150	60-150
PFNA	375-95-1	70-150	70-155	60-145
PFDA	335-76-2	70-140	70-155	60-150
PFUnA	2058-94-8	70-145	70-155	60-155
PFDoA	307-55-1	70-140	70-150	60-140
PFTrDA	72629-94-8	65-140	65-150	60-150
PFTeDA	376-06-7	60-140	65-150	60-140
PFBS	375-73-5	60-145	65-145	60-150
PFPeS	2706-91-4	65-140	55-160	60-145
PFHxS	355-46-4	65-145	60-150	60-155
PFHpS	375-92-8	70-150	65-155	60-140
PFOS	1763-23-1	55-150	65-160	60-160
PFNS	68259-12-1	65-145	55-140	45-140
PFDS	335-77-3	60-145	40-155	50-140
PFDoS	79780-39-5	50-145	25-160	25-140
4:2 FTS	757124-72-4	70-145	60-150	55-150
6:2 FTS	27619-97-2	65-155	55-200	60-150
8:2 FTS	39108-34-4	60-150	70-150	60-170
PFOSA	754-91-6	70-145	70-140	60-150
NMeFOSA	31506-32-8	60-150	70-155	60-160
NEtFOSA	4151-50-2	65-145	70-140	60-150
TFSI	82113-65-3	70-140	70-140	60-140
NMeFOSAA	2355-31-9	50-140	65-155	60-145
NEtFOSAA	2991-50-6	70-145	65-165	60-145
NMeFOSE	24448-09-7	70-145	70-140	40-180
NEtFOSE	1691-99-2	70-135	70-135	60-205
HFPO-DA	13252-13-6	70-140	70-145	60-145
ADONA	919005-14-4	65-145	70-160	55-165
PFMPA	377-73-1	55-140	30-140	25-145
PFMBA	863090-89-5	60-150	60-150	60-150
NFDHA	151772-58-6	50-150	60-155	60-180
9Cl-PF3ONS	756426-58-1	70-155	70-150	60-170
11Cl-PF3OUdS	763051-92-9	55-160	45-160	50-170
PFEESA	113507-82-7	70-140	70-140	50-150
3:3 FTCA	356-02-5	65-130	45-130	30-140
5:3 FTCA	914637-49-3	70-135	60-130	60-160
7:3 FTCA	812-70-4	50-145	60-150	60-200

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Table 9: EIS and NIS Acceptance Limits (%R)

Labeled Compound	Aqueous	Leachate	Solid:	Biosolid	Tissue
13C3-PFPrA	5-130	5-130	8-130	5-130	5-130
13C4-PFBA	5-130	5-130	8-130	5-130	5-130
13C5-PFPeA	40-130	40-130	35-130	35-130	10-185
13C5-PFHxA	40-130	40-130	40-130	40-130	25-170
13C4-PFHpA	40-130	40-130	40-130	40-130	25-150
13C8-PFOA	40-130	40-130	40-130	40-130	25-150
13C9-PFNA	40-130	40-130	40-130	40-145	35-185
13C6-PFDA	40-130	40-130	40-130	40-130	30-150
13C7-PFUnA	30-130	40-130	40-130	40-130	30-180
13C2-PFDoA	10-130	35-130	40-130	40-130	35-180
13C2-PFTeDA	10-130	25-130	20-130	10-160	20-160
13C3-PFBS	40-135	40-130	40-135	40-150	25-190
13C3-PFHxS	40-130	40-130	40-130	40-140	35-175
13C8-PFOS	40-130	40-130	40-130	40-130	40-160
13C2-4:2FTS	40-200	40-220	40-165	40-300	30-300
13C2-6:2FTS	40-200	40-170	40-215	40-300	35-300
13C2-8:2FTS	40-300	40-145	40-275	40-300	40-365
13C8-PFOSA	40-130	40-130	40-130	20-140	25-180
D3-NMeFOSA	10-130	40-130	10-130	20-130	5-130
D5-NEtFOSA	10-130	35-130	10-130	20-130	5-130
D3-NMeFOSAA	40-170	35-130	40-135	30-150	30-250
D5-NEtFOSAA	25-135	30-130	40-150	20-140	30-235
D7-NMeFOSE	10-130	20-130	20-130	25-130	5-160
D9-NEtFOSE	10-130	20-130	15-130	20-130	5-130
13C3-HFPODA	40-130	40-130	40-130	40-130	20-185
13C3-PFBA	50-200	50-200	50-200	50-200	50-200
13C2-PFHxA	50-200	50-200	50-200	50-200	50-200
13C4-PFOA	50-200	50-200	50-200	50-200	50-200
13C5-PFNA	50-200	50-200	50-200	50-200	50-200
13C2-PFDA	50-200	50-200	50-200	50-200	50-200
18O2-PFHxS	50-200	50-200	50-200	50-200	50-200
13C4-PFOS	50-200	50-200	50-200	50-200	50-200

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Table 10: IPR Limits for Method Verification

Analyte	CAS #	Aqueous/Leachate		Solid: All Matrices		Tissue	
		%R	RPD	%R	RPD	%R	RPD
PFPrA	422-64-0	70-140	20	70-140	20	70-140	20
PFBA	375-22-4	70-135	21	70-140	17	70-135	20
PFPeA	2706-90-3	70-135	23	70-140	26	70-130	20
PFHxA	307-24-4	70-135	24	70-135	23	70-140	20
PFHpA	375-85-9	70-135	28	70-140	21	70-140	20
PFOA	335-67-1	65-155	27	70-140	23	70-130	25
PFNA	375-95-1	70-140	28	65-145	24	70-140	20
PFDA	335-76-2	65-140	26	70-145	26	70-135	20
PFUnA	2058-94-8	70-135	29	70-145	26	70-135	20
PFDoA	307-55-1	70-130	21	70-145	25	70-135	20
PFTrDA	72629-94-8	60-145	29	55-160	26	55-160	20
PFTeDA	376-06-7	70-145	27	70-145	24	70-140	25
PFBS	375-73-5	70-140	23	60-145	25	70-145	20
PFPeS	2706-91-4	70-135	25	65-140	29	70-150	20
PFHxS	355-46-4	70-135	27	65-145	28	70-140	25
PFHpS	375-92-8	70-140	30	70-140	27	70-145	20
PFOS	1763-23-1	70-140	29	70-135	27	70-135	30
PFNS	68259-12-1	70-135	29	70-140	27	60-130	20
PFDS	335-77-3	70-135	30	50-150	31	55-135	20
PFDoS	79780-39-5	45-135	35	40-140	40	25-145	45
4:2 FTS	757124-72-4	70-135	27	70-135	27	65-140	30
6:2 FTS	27619-97-2	70-135	32	60-160	50	70-140	25
8:2 FTS	39108-34-4	70-140	33	70-140	27	70-150	25
PFOSA	754-91-6	70-135	22	70-140	19	70-140	20
NMeFOSA	31506-32-8	70-135	30	65-145	26	70-140	30
NEtFOSA	4151-50-2	70-130	26	70-135	19	70-140	40
TFSI	82113-65-3	70-140	20	70-140	20	70-140	20
NMeFOSAA	2355-31-9	65-140	32	65-145	31	70-140	20
NEtFOSAA	2991-50-6	70-135	28	60-150	31	70-140	25
NMeFOSE	24448-09-7	70-135	29	70-140	19	60-150	20
NEtFOSE	1691-99-2	70-130	21	70-135	17	70-145	40
HFPO-DA	13252-13-6	70-135	23	70-140	25	70-140	25
ADONA	919005-14-4	70-135	23	70-155	26	70-145	20
PFMPA	377-73-1	60-140	23	70-140	25	70-145	40
PFMBA	863090-89-5	65-145	27	55-145	33	70-140	20
NFDHA	151772-58-6	65-140	37	45-145	27	70-155	30
9Cl-PF3ONS	756426-58-1	70-145	30	65-135	23	70-140	20
11Cl-PF3OUdS	763051-92-9	50-150	35	50-135	31	65-140	20
PFEESA	113507-82-7	70-135	25	70-140	20	70-145	25
3:3 FTCA	356-02-5	70-130	23	45-155	32	55-130	25
5:3 FTCA	914637-49-3	70-130	24	70-135	28	70-145	20
7:3 FTCA	812-70-4	55-130	34	70-145	39	70-155	20

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Appendix B: Reference Materials – Reagents, Standards & Formulations

Purchased Reagents

Name	Grade	Vendor	Catalog	Storage
Acetic Acid	ACS	VWR	BDH3098-3.8LP	Room Temperature
Acetonitrile[1]	UPLC	Supelco	AX0142-1	Room Temperature
Ammonium Acetate	LC/MS	VWR	BDH9204-500G	2-8°C, replace every 2 years
Aqueous Ammonium Acetate	1M	Waters	186006693-1	Manufacturer Specification
Ammonium Hydroxide	Certified ACS+	Fisher	A470-500	Room Temperature
Formic Acid	>96% purity	Thermo	270480025	Room Temperature
Methanol	HPLC, 99.9% purity	Honeywell	230-4	Room Temperature
Potassium Hydroxide	Certified ACS	VWR	BDH9262-500G	Room Temperature
Liquid Nitrogen	>99.999%	Airgas	NI BLK	Bulk

[1] Verify Acetonitrile, Methanol, and Laboratory Generated Regent Water by lot/batch before use.

Purchased Standard Solutions[1]

Name	Vendor	Catalog	Purpose
EPA 1633 Native PFAS Mix	Wellington Laboratories	EPA-1633STK	Primary Source Standard
L-PFPrA Native Stock Solution (50 µg/ml)	Wellington Laboratories	PFPrA	Primary Source Standard
Lithium bis(trifluoromethanesulfonyl)imide (HQ-115) Native Stock Solution (50 µg/ml)	Wellington Laboratories	LiPFMeSI	Primary Source Standard
1633-PFCs Calibration Standard Mix	Absolute Standards	65735	Second Source Standard
PFPrA Native Stock (50 µg/mL)	Cambridge Isotopes	ULM-11323-A-S	Second Source Standard
TFSI Native Stock (100 µg/mL)	Accustandard	PFOS-030S	Second Source Standard
Sodium 1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS) ($^{13}C_2$, 99%; D_4, 98%) (50 µg/mL)	Cambridge Isotopes	CDLM-10753-1.2	TOP Assay Control Surrogate
Perfluoro-n-(1,2-13C2)octanoic acid (50 µg/ml)	Wellington Laboratories	M2PFOA	TOP Assay Control Surrogate
Mass-labelled PFAS Extraction Standard Mix	Wellington Laboratories	MPFAC-HIF-ES	EIS
13C3-PFPrA Stock (50 µg/mL)	Cambridge Isotopes	CLM-11324-A-S	EIS
Mass-labelled PFAS Injection Standard Mix	Wellington Laboratories	MPFAC-HIF-IS	NIS
Neat Taurodeoxycholic Acid (TDCA)	Sigma Aldrich	580221-5GM	Bile Salt Interference

[1] Unless other storage conditions are specified by the manufacturer, store the purchased standard solutions in the dark at 4 °C, in tightly sealed screw-capped vials. Place a mark on the vial at the level of the solution after each use so that solvent loss by evaporation can be detected. Replace the solution if solvent loss has occurred. Properly discard or remove from the work area unused material on the expiration date to prevent inadvertent use of expired material.

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Purchased standard solutions must be received with a Certificate of Analysis (COA), which must be retained on-site in the laboratory and be traceable to each corresponding lot received. Refer to laboratory SOP 1816 Reagent, Solvent and Standard Control for the procedures for standard receipt and traceability.

Substitution of reagents and standards from those listed in these tables is permissible only if the replacement meets the specifications outlined in the SOP. If an alternative item does not meet these exact same specifications for purity, composition, or concentration, any formulation in this SOP must be modified to match the material used. If the substitution is permanent, the SOP and formulations in this SOP must be updated.

Prepared Reagents & Standard Solution Formulations:

Plastic containers must be used for all standard, sample, and extraction preparations due to potential adsorption of analytes onto glass. Do not substitute glass for plastic containers.

18O-mass labeled perfluoroalkyl sulfonates may undergo isotopic exchange with water under certain conditions, which lowers the isotopic purity of the standards over time - monitor standards for degradation and replace as needed.

Modifications to these formulations are not permitted unless the formulation of the parent component changes, in which case the formulation must be adjusted accordingly.

Laboratory Prepared Reagent Formulation Table

Name	Component	Amount	Volume	Expires
Mobile Phase A: 2mM ammonium acetate in 95:5 water/acetonitrile	5 Ammonium Acetate	2.0 mL	1 L	60 Days
	Acetonitrile	50 mL		
	Reagent Water	948 mL		
Instrument Blank Mix (IBLK Mix): Methanol with 4% Water, 1% Ammonium Hydroxide, and 0.625% Acetic Acid	Methanol	94.4 mL	100 mL	30 Days
	Ammonium Hydroxide	3.3 mL		
	Acetic Acid	0.625 mL		
	Reagent Water	1.67 mL		
Acetic Acid (0.1%)	Acetic Acid	1 mL	1 L	90 Days
	Reagent Water	999 mL		
Ammonium Hydroxide (3%): Aqueous	Ammonium Hydroxide	10 mL	100 mL	90 Days
	Reagent Water	90 mL		
Ammonium Hydroxide (0.3%): Methanolic	Ammonium Hydroxide	1 mL	100 mL	30 Days
	Reagent Water	99 mL		
Ammonium Hydroxide (1%): Methanolic	Ammonium Hydroxide (30%)	3.3 mL	100 mL	30 Days
	Methanol	96.7 mL		

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Name	Component	Amount	Volume	Expires
Ammonium Hydroxide (2%): Methanolic	Ammonium Hydroxide (30%)	6.6 mL	100 mL	30 Days
	Methanol	93.4 mL		
Formic Acid (0.1 M): Aqueous	Formic Acid	3.77 mL	1 L	2 Years
	Regent Water	996.33 mL		
Formic Acid (0.3 M): Aqueous	Formic Acid	11.31 mL	1 L	2 Years
	Regent Water	988.69 mL		
Formic Acid (5% v/v): Aqueous	Formic Acid	5 mL	100 mL	2 Years
	Regent Water	95 mL		
Formic Acid (50% v/v): Aqueous	Formic Acid	50 mL	100 mL	2 Years
	Regent Water	50 mL		
Formic Acid (50% v:v): Methanolic	Formic Acid (0.1M)	50 mL	100 mL	2 Years
	Methanol	50 mL		
Potassium Hydroxide (0.05M): Methanolic	Potassium Hydroxide	3.3 g	1 L	90 Days
	Methanol	1 L		
Reagent Water (ASTM 1)	Laboratory Generated			60 Days

Laboratory Prepared Intermediate Standard Solutions

Name	Component	Amount	Volume	Storage	Expires
TDCA Stock (2000 µg/mL)	Neat TDCA	10 mg	5 mL	Frozen <0°C	1 Year
	Methanol	5 mL			
1633 PDS (Concentrations vary)	EPA-1633STK	5000 µL	10 mL	0-6°C	30 Days or with each new lot of parent standard
	PFPrA stock	100 µL			
	TFSI stock	50 µL			
	Methanol	4850 µL			
STK-10X (5X of PDS, concentrations Vary)	EPA-1633 PDS	600 µL	3 mL	0-6°C	30 Days or with each new lot of parent standard
	Methanol	2.7 mL			
ICV Add PDS (1 µg/mL)	PFPrA Native Stock (50 µg/mL)	80 µl	4 mL	0-6°C	30 Days or with each new lot of parent standard
	TFSI Native Stock (100 µg/mL)	40 µl			
	Methanol	3880 µl			
	CDLM-10753-1.2	40 µl	4 mL		30 Days

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TOP Assay Surr mix (Concentrations vary)	M2PFOA	20 µl		0-6°C	
	Methanol	3940 µl			
EIS-PDS (Concentrations vary)	MPFAC-HIF-ES	5000 µL	10 mL	0-6°C	30 Days
	13C3-PFPrA stock	100 µL			
	Methanol	4900 µL			

Laboratory Prepared Working Standard Solutions

Name	Component	Amount	Volume	Storage	Expires
ICV	1633-PFCs Calibration Standard Mix	20 µL	4 mL	0-6°C	30 Days
	ICV Add PDS	10 µl			
	EIS-PDS	40 µL			
	~~MPFAC-HIF-ES~~	~~20 µL~~			
	MPFAC-HIF-IS	20 µL			
	IBLK Mix	3890 µL			
CAL L1	EPA1633-PDS	16 µL	4 mL	0-6°C	30 Days
	EIS-PDS	40 µL			
	TOP Assay Surr Mix	20µl			
	MPFAC-HIF-IS	20 µL			
	IBLK Mix	3904 µL			
CAL L2	EPA1633-PDS	32 µL	4 mL	0-6°C	30 Days
	EIS-PDS	40 µL			
	MPFAC-HIF-IS	20µL			
	TOP Assay Surr Mix	20 µl			
	TDCA Stock (2000 µg/mL)	20 µL			
	IBLK Mix	3868 µL			
CAL L3	EPA1633-PDS	64 µL	4 mL	0-6°C	30 Days
	TOP Assay Surr Mix	20 µl			
	EIS-PDS	40 µL			
	MPFAC-HIF-IS	20 µL			
	IBLK Mix	3856 µL			
CAL L4	EPA1633-PDS_10X	160 µL	4 mL	0-6°C	30 Days
	TOP Assay Surr Mix	20 µl			
	EIS-PDS	40 µL			

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Name	Component	Amount	Volume	Storage	Expires
	MPFAC-HIF-IS	20 µL			
	IBLK Mix	3760 µL			
CAL L5	EPA1633-PDS	80 µL	4 mL	0-6°C	30 Days
	EIS-PDS	40 µL			
	MPFAC-HIF-IS	20 µL			
	TOP Assay Surr Mix	20µl			
	IBLK Mix	3840 µL			
CAL L6	EPA1633-PDS	160 µL	4 mL	0-6°C	30 Days
	TOP Assay Surr Mix	20 µl			
	EIS-PDS	40 µL			
	MPFAC-HIF-IS	20 µL			
	TDCA Stock (2000 µg/mL)	20 µL			
	IBLK Mix	3740 µL			
CAL L7	EPA1633-PDS	400 µL	4 mL	0-6°C	30 Days
	EIS-PDS	40 µL			
	MPFAC-HIF-IS	20 µL			
	TOP Assay Surr Mix	20 µl			
	IBLK Mix	3520 µL			
CAL L8	EPA1633-PDS	800 µL	4 mL	0-6°C	30 Days
	EIS-PDS	40 µL			
	MPFAC-HIF-IS	20 µL			
	TOP Assay Surr Mix	20 µl			
	IBLK Mix	3120 µL			
CAL L9	EPA1633-PDS	1600 µL	4 mL	0-6°C	30 Days
	EIS-PDS	40 µL			
	MPFAC-HIF-IS	20 µL			
	TOP Assay Surr Mix	20 µl			
	TDCA Stock (2000 µg/mL)	20 µL			
	IBLK Mix	2300 µL			

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Appendix C: Sample Screening Protocol

Samples that are known or suspected to contain high concentrations of target analytes may be pre-screened to determine if a reduced volume or mass should be used for extraction or if an extract dilution should be performed prior to initial analysis. Other pre-screening procedures may be used.

This screen protocol may be used for all matrices included in this SOP, except surface wipes because there is insufficient representative sample to perform the screen procedure.

Aqueous Matrices (Non-Potable Water, Landfill Leachate, TCLP/SPLP Leachate)

Always take the aliquot for screening from the 60 mL container; do not take a subsample from the sample container to be used for sample preparation or analysis (except in the case of TCLP/SPLP).

1) Mix the sample to ensure it is homogenous. Measure 1 mL of sample into a 15 mL centrifuge tube.
2) Add 1 mL of methanol and 40 µL of EIS-PDS and 20 µL of MPFAC-HIF -NIS to the sample and vortex to mix.
3) Filter 1 mL of the sample through 0.2-µm membrane filter into a microvial.
4) Analyze the screen extract and use the test result to determine if a reduced volume should be extracted or if the extract from the routine procedure should be diluted prior to analysis.

Soil/Sediment, Biosolid, Tissue, and Articles of Commerce: (10X Dilution)

1) Measure 0.5 g (±0.1) of sample into a 50 mL polypropylene centrifuge tube.
2) Add 20 mL of 0.3% methanolic ammonium hydroxide to the sample. Vortex to mix for 10 min. Let the sample sit to settle and/or centrifuge to produce a clear extract.
3) Filter using a 0.2 µm filter vial:
    a. Add 40 µL of EIS-PDS to a clean filter vial (chamber).
    b. Add 400 µL of clear extract from step 2 to the vial. Carefully vortex to mix.
    c. Use filter/plunger to filter the extract.
4) Transfer 30 µL of extract to a ~300 µL polypropylene microvial and dilute to 300 µL with 0.3% methanolic ammonium hydroxide. Add 1.5 µL of NIS to the resulting solution.
5) Analyze the screen extract and use the test result to determine if a reduced volume should be extracted or if the extract from the routine procedure should be diluted prior to analysis.

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Appendix D: Subsampling Procedure for Aqueous Matrices

Due to the propensity of some target analytes to stratify within the sample matrix or to adhere to walls of the sample container, subsampling of aqueous samples may only be done on a project-specific basis, with client approval.

In this context, subsampling refers to the taking of an aliquot of sample from the container provided to the laboratory for extraction in lieu of using the entire sample volume collected. This is sometimes necessary when high concentrations of target analytes are expected in the sample or for other project-specific reasons.

Subsampling Procedure for Non-Potable Water (NPW), Landfill Leachate, TCLP/SPLP:

1) Determine the volume (mL) for extraction based on screen results or project specifications. The amount subsampled must be at least 125 µL. If additional dilutions are needed, these must be made by serial dilution of the sample.
2) Place an uncapped, HDPE bottle onto the weigh pan of a top loading balance and tare the balance. Select an appropriately sized bottle for the volume of sample to be aliquoted. Regardless of volume subsampled, the sample aliquot should be diluted to at least 50 mL prior to SPE.
3) Gently invert the sample to mix 3-4 times then transfer the sample into the HDPE bottle until the target volume is achieved, assuming sample density of 1 g/mL.
    - If foam forms during inversion and more than 5 mL is required, pour the sample to transfer, but avoid the transfer of foam.
    - If foam forms and less than 5 mL is needed, use a pipette to draw sample from ½ cm below the foam.
    - If no foam forms, the transfer may be done by pouring or by pipette.
4) Fill the bottle with reagent water.
5) Proceed to Section 9.6 and prepare the sample using the same stepwise procedure used for aqueous samples.

Subsampling Procedure for AFFF and F3 and Other Challenging Aqueous Matrices

The following protocol is designed for “as prepared” AFF materials and newer generation F3 concentrates and other challenging matrices, such as viscous or cloudy matrices, or those with standing foam. Consult with technical specialist or supervisor to determine when to use this protocol.

If concentrated AFF (thick gel-like matrix) was received, notify the supervisor to determine where to perform the subsampling procedure. Subsampling of the concentrate must be done in an isolated area to prevent the material from contaminating the work area and other samples.

1) Prepare 2 samples for all matrices designated AFFF or F3.
2) Place an uncapped 60 mL HDPE bottle onto the weigh pan of a top loading balance and tare the balance.
3) Measure 0.01 g of sample into the HDPE bottle. Record the actual mass subsampled.

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4) Add approximately 60 mL of reagent water to the bottle, cap the bottle.

5) Shake by hand vigorously for 20-30 seconds.

6) Set the sample aside for at least 3 hours for complete dissolution.

7) Check the sample after 3 hours to verify dissolution is complete. If full dissolution has not occurred, place the sample bottle on an orbital shaker for 15 minutes, then allow the sample to settle for 3 hours.

8) If the sample is an AFFF concentrate gel, go to step 9; otherwise, proceed to Section 9.6 and prepare the sample using the same stepwise procedure used for aqueous samples.

9) Dilute the AFFF concentrate subsample solution by quantitatively measuring 6 mL of the 60 mL solution into a new 125 mL HDPE container and dilute to 60 mL with reagent water. The serial dilution, when the above protocol is followed without deviation, represents a 250,000X primary dilution. Proceed to Section 9.6 and extract the prepared sample using the same stepwise procedure used for aqueous samples.

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Appendix E: Aqueous Sample Preparation – Settled Solids Depth > ½ cm

As allowed by EPA Method 1633A PAS uses alternate strategies in lieu of the total suspended solids (TSS) determination to mitigate solid materials or other interferences present in aqueous matrices.

Use this procedure in lieu of Section 9.6.1 (steps 1-9) when settled solids in the sample appear to be of a depth > ½ cm and less than 5% of the total volume.

1) Label a 500 mL conical centrifuge bottle with the sample ID. Set the labeled tube in a rack and remove the cap.

2) Spike each sample with 40 µL of **EIS-PDS** in its original sample container.

3) If the sample is a MS or MSD, add 80 µL of 1633PDS to each.

   NOTE: The MS/MSD or laboratory duplicate must be processed the same way as the parent sample and vice versa.

4) Cap the container and vigorously shake to mix.

5) Pour the sample into the labeled centrifuge bottle, taking care to transfer all the solids present in the original sample bottle to the centrifuge bottle. Tightly cap the centrifuge bottle when done.

6) Place the tubes in the centrifuge rotor, ensuring that the carousel is symmetrically balanced. Close the top and centrifuge at 3000 RPM (~2000 RCF) for 6 minutes. Record the start and end time in the preparation log.

7) Decant the centrifuged sample back into its original container, taking care to avoid transfer of the settled solids.

8) Weigh the original sample container + decanted sample and record the weight measurement in the preparation log.

9) Extract the decanted sample using the procedure in Section 9.6.1, starting with step 10. If the SPE cartridge begins to clog during sample transfer, refer to Appendix G for troubleshooting steps and mitigation strategies.

10) When the SPE cartridges have been dried and the carbon cartridges added to the SPE stack, rinse the original sample bottle following the protocol in Step 10 of Section 9.7, but do not start elution.

11) Add 5mL of 1% methanolic ammonium hydroxide to each centrifuge bottle and swirl to rinse. If the condensed solids become re-suspended during this step, centrifuge the container to separate.

12) Using a pipet, transfer the rinsates from the original sample container and the centrifuge bottle to the associated sample's cartridge/reservoir stack. Elute the cartridge with both rinsate volumes; allow the elution solvent to soak the SPE sorbent for 2 minutes, then use vacuum to pull the elution solvent through the cartridge and into the collection tubes in a slow, dropwise manner.

    If using sample transfer lines, add the rinsate from the centrifuge bottle to the original sample bottle for transfer to the cartridge and then elute as above.

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13) Add 5 mL of 1% methanolic ammonium hydroxide directly to the SPE reservoir of all batch QC samples (MB/LCS/LLLCS) and elute with the normal 5 mL bottle rinse described in Step 10 of Section 9.7.

14) Concentrate the extract to ~3.5 mL using nitrogen blowdown at an approximate flow rate of 1.2 L/min. Adjust to final volume to 4 mL with 1% methanolic ammonium hydroxide using a validated comparison vial.

15) Weigh the empty sample bottle with cap and record the weight measurement. Subtract this weight from the initial container+sample weight from Step 8 to determine initial sample volume.

16) Add 25 µL of concentrated acetic acid and 20 µL of NIS mix to each extract and vortex to mix. Transfer a portion of each extract into an autosampler vial for LC-MS/MS analysis. Cap the collection tubes containing the remaining extracts and store at 0 - 6 °C until analysis.

17) Document in the preparation log which samples in the prep batch were centrifuged prior to SPE; these samples must be identified in the test report to alert the customer and data user of the deviation from routine protocol.

18) Record any other observations or anomalies observed during the centrifugation or extraction process, particularly if any issues were encountered during the sample loading step of the SPE process.

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Appendix F: Biphasic Sample Separation Procedure

Use this procedure when the customer has requested separation of a biphasic sample into aqueous and solid phases.

1) Verify the log-in has been updated to specify sample preparation for each matrix. Be sure the log-in for the solid fraction does not include percent solids determination: the solid phase of a biphasic sample is reported on a wet weight basis.

2) Label a 250 mL conical centrifuge bottle with the sample ID. Set the labeled bottle in a rack and remove the cap.

3) Vigorously shake the sample in its original container then completely transfer the entire sample to the corresponding centrifuge bottle and cap the centrifuge bottle.

4) Place the centrifuge bottle(s) in the centrifuge rotor, ensuring that the carousel is symmetrically balanced. Close the top and centrifuge at 3000 RPM (~2000 RCF) for 6 minutes. Record the start and end time in the preparation log.

5) Transfer the liquid portion of sample back into the original sample container; avoid transferring solid material as much as possible.

6) Tare a top loading balance then weigh the original container + liquid sample and record this measurement to the nearest 0.1 g on the preparation log as initial weight for the aqueous phase.

7) Proceed to Section 9.6.1 to add the sample to a routine NPW preparation batch and complete the preparation process starting with Step 7.

8) Label a 50 mL centrifuge tube with the sample ID.

9) Place the tube on a top loading balance and tare the balance.

10) Using a wooden tongue depressor, transfer the solid material from the 250 mL centrifuge bottle to the 50 mL container.

11) Record the amount transferred to the nearest 0.1 g on the preparation log as initial weight, targeting 5 g for preparation.

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Appendix G: SPE Clog Mitigation Procedure

This appendix provides instructions on what to do when an SPE cartridge has become clogged.

Indications that an SPE cartridge may be or will become clogged include discoloration of the cartridge frit or absorbent bed, coloration or sedimentation on the bottom of the reservoir, and a slowing of the sample loading rate.

When these conditions are observed do not add any more sample volume to the reservoir of the clogging cartridge. The goal is to stop the process before the cartridge seizes up completely, so that a sample extract can still be collected from the cartridge.

- If there is >10 mL remaining in the reservoir, close the manifold port to stop sample loading. After all other samples have finished loading, carefully remove the cartridge-adaptor-reservoir assembly and transfer the remaining sample volume back into the original sample container.
- If there is <10 mL remaining, allow the sample to continue to load. If the sample has not finished after all other samples have passed through their cartridge, close all other ports except for the sample loading, then apply more vacuum pressure to pull the sample through. Do this step one at a time for each clogged SPE. If it is obvious that the cartridge has seized, do not attempt this step. Instead, remove the cartridge and return the remaining sample volume to its original container.

The extraction process may continue as follows; if QA acceptance criteria are not met for the resulting extract, the sample should be re-extracted with reduced volume.

- Replace the cartridge from the abandoned sample and finish the SPE elution process (Step 5 from Section 9.7) to collect what extract is available from the SPE. If the SPE clogs completely, abandon the elution process; the sample must be diluted and the extraction repeated.
- To obtain the volume of sample used for preparation and extraction, reweigh the empty container and subtract this weight from the original container+sample weight measurement.
- Record in the preparation log that SPE extraction could not be completed with full sample volume.

Alternatively,

- Option 1: Reprepare and re-extract the sample following the centrifuge procedure in Appendix E. This option may be appropriate when centrifugation was not originally performed on the sample that clogged.
- Option 2: Reprepare the sample using a reduced volume. No less than 1 mL of homogenized sample may be used for extraction in these cases.
- Option 3: With client approval, re-log the sample as a biosolid matrix and prepare following the biosolid matrix extraction protocols, targeting 0.25 g of sample. In this case, the sample results will generally not be corrected for dry weight.
- Option 4: With client approval, re-log and reprepare the sample as two separate phases (aqueous and solid). Attempt phase separation of the aqueous and solid phases of the sample following Appendix F and, if successful, prepare as two separate samples.
- Option 5: Test procedure is not applicable. This may be the only option when the matrix interference and/or the modification to the procedure become so extreme that the resulting test result is unreliable.

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In all cases, the protocol followed must be recorded, disclosed to the customer, and test results adjusted for actual amounts used.

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Appendix H: Particle Size Reduction by Cryomill for Articles of Commerce

Clients may submit solid samples of various consumer and related product materials for analysis of PFAS. To effectively mobilize any PFAS that may be present within the structure of the material, samples must be milled to a fine powder using a cryogenic mill (Cryomill). Use this procedure to mill articles of commerce to a fine powder prior to sample preparation, when needed.

Examples of common articles requiring milling prior to extraction and analysis are molded articles, coated wire, textiles, paper, leather, food, and LDPE and polypropylene.

Sample Processing Procedure:

1) Remove the sample from storage.

2) If possible, use scissors or heavy plate shears to roughly cut the material into smaller pieces, preferably to a size ~10 X 10 mm. The optimum size depends on the equipment used for milling.

3) Use a Retsch Cryomill (ball mill) with automatic liquid nitrogen feed to mill the material to ~ 100 um in diameter using the specifications in the table below.

Sample Type[1]	Cycles	Preset	Frequency (Hz)	PCT (minutes)	MT (minutes)	ICT (minutes)
Elastomers (FKM, FFKM, FEPM, and agglomerates)	1	1	30	Auto	2	NA
Compacted Cake	5	NA	30	Auto	2	2
Melt Extruded Pellets and Molded Articles	7	2	30	Auto	4	2
Coated Wire	3	3	30	Auto	2	2
Textiles, Paper, Leather	3	4	25	10	2.5	0
Food (meat, cheese)	1	5	25	8	2	NA
LDPE and PP	2	6	25	10	2	2

[1]: Use Feed Mass of 5g for most applications

PCT = Processing Time / MT: Milling Time / ICT: In-Between Cooling Time

4) Make sure to follow the User Manual for installing and removing the grinding jar. This includes the two lock rings on the left side of the mechanism.

   a. Make sure outer LOCK RINGS are loosened.

   b. Screw in the grinding jar (from the right side of the mechanism). Tighten with black plastic tightening aid.

   c. Tighten two LOCK RINGS: Outside ring tightened first (hand-tighten only); inner ring tightened second (snug), using the tool.

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d. Perform grinding cycle.

e. Loosen those two LOCK RINGS: Inside ring loosened first, outer ring loosened second. To loosen either ring, the tool will be needed because of icing.

f. Unscrew grinding jar.

g. When cryomill is not in use, make sure to replace the cooling jacket seal.

5) When the milling process is complete, sweep the milled material into a labeled 50 mL centrifuge tube.

6) Immediately proceed to Section 9.6.2 for sample preparation or freeze the sample at a temperature of ≤ -10°C until preparation.

7) Clean the mill between each sample to avoid cross-contamination (see procedure below).

Mill Cleaning Procedure:

1) Remove any residual material with DI water and a brush. If needed, also use a clean polish cloth or cotton ball/swab.

2) Rinse all parts with methanol followed by DI, using an ultrasonic bath as needed with each rinse.

3) Repeat Steps 1-2 until clean.

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Appendix I: Procedure for Total Oxidizable Precursors (TOP)

The following modifications to the referenced SOP are as follows:

Equipment: Water Bath – Capable of monitoring recording to .1 C maintaining 85 C.

Reagents: Sodium Hydroxide (NaOH, CAS#: 1310-73-2) – High purity, demonstrated to be free of analytes and interferences.

Potassium Persulfate ($K_2S_2O_8$, CAS#: 7727-21-1) - High purity, demonstrated to be free of analytes and interferences.

Hydrochloric Acid (HCl, CAS#: 7647-01-0) - High purity, demonstrated to be free of analytes and interferences.

Additional table to be added:

Table 1

Isotope Labeled Standard	Conc. Top Surr Stock (ng/mL)	Vol. of Top Surr Stock (µl)	Final Vol. of Top Surr PDS (mL)	Final Conc. of Top Surr PDS (ng/mL)
$^{13}C_2$-PFOA	50,000	40	4.0	500
$^{13}C_2D_4$-4:2FTS	50,000	80	4.0	1000

For Aqueous samples, prior to SPE extraction in section 9.6, add to each 50 ml sample with Potassium Persulfate until 60 mM (about 1 gram). Add Sodium Hydroxide until the sample is 125 mM (about .313 grams).

Sample should have a pH >12.

Fortify each sample with 20 µl of TOP pre-assay surrogate containing 1 negative control surrogates and 1 positive control surrogates from table 1.

Place sample in a water bath at 85 C for 6 hours.

Remove sample from water bath and adjust pH 6-8 with Hydrochloric Acid.

Following pre-treatment, follow the aqueous extraction protocol from section 9.7 unaltered.

An additional calculation is added for the final reporting of the TOP assay results.

TOP Assay = Result of Post TOP assay extraction – Result of analysis from Pre-Top Assay extraction.

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For Soil samples, fortify each sample with 20 µl of TOP pre-assay surrogate containing 1 negative control surrogates and 1 positive control surrogates from table 1 in place of EIS to each 0.4 gram sample.

Extract soil sample as dictated in section 9.6.

Following extraction, evaporate extracts in an Orgaomation NVAP system at 55 degrees C to approximately 250ul remains.

Re-constitute sample extract to 50 ml DI water.

Place sample in a water bath at 85 C for 6 hours.

Remove sample from water bath and adjust pH 6-8 with Hydrochloric Acid.

Following pre-treatment, add 20 ul of EIS solution and follow the SPE clean-up protocol from section 9.7 unaltered.

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Appendix J: Surface Wipe PFAS Analysis by 1633

Clients may submit wipe samples for PFAS analysis by 1633; wipes can be used as a proxy measurement of surface contamination in production facilities, labs, etc. The lab provides sampling kits for users which consist of a 50 mL centrifuge tube paired with a packaged ghost wipe for each surface to be sampled (ghost wipes: Environmental Express Part# SC5000). The wipe is used to swab a defined area of the surface or item of interest and is placed in the accompanying centrifuge tube, which is then capped, labeled, and shipped back to the lab for preparation and analysis.

Used wipe samples are prepared directly in the container in which they are received, following the protocols for solid matrices described in Section 9.6.2; analysis follows normal 1633 routines. No correction will be made for percent solids, and results are reported as ng/wipe.

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Appendix K: TCLP/SPLP by 1633

Clients may submit samples (solid or aqueous) for PFAS following TCLP or SPLP procedures. For solid samples, the TCLP and SPLP procedures are used to simulate the leaching of environmental contaminants over extended periods of time from a solid material into the environment. A subsample of the client's sample is weighed out and combined with a leaching solution and mechanically tumbled for a set period. Each leachate prep method (TCLP: Method 1311 or SPLP: Method 1312) employs a unique leaching solution dictated by the parent methods. After the sample has been tumbled/leached by the Organic prep department, the leachate is filtered by the Organic Prep department and delivered to the PFAS sample holding area. The PFAS department is notified by email when the leachate solutions are ready for PFAS prep. The filtered leachate solutions are prepared by the PFAS prep analysts using the 1633 aqueous prep method, at a 1:5 dilution (50 mL of leachate solution).

1) Samples requested for PFAS by SPLP/TCLP analysis will be batched and leached by the normal SPLP/TCLP procedures used by the Westborough Alpha Organic Prep department. Organic Prep will be the initial responsible party for samples analyzed for PFAS by SPLP/TCLP.

2) When the leaching process is complete, Organic Prep will collect approximately 500mL (at minimum 100mL) of the leachate solutions in clean HDPE containers provided by the Emerging Contaminants department.

3) After collecting the leachate solution, an Organic Prep analyst will filter approximately 500 mL (at minimum 100mL) of each leachate solution using a Flipmate apparatus, using normal protocols for Flipmate filtration.

4) After filtering the leachates, the Organic Prep analyst will deliver the filtrates to the Sample management department for transport to the Emerging Contaminants Department (EC) at the Alpha Mansfield Facility. Leachates will be transferred to the EC department's designated sample storage refrigerator.

5) Samples to be analyzed for PFAS following TCLP/SPLP will appear on a separate PFAS prep worklist, the title of which will contain "SPLP" or "TCLP." From these worklists, PFAS analysts will select the samples to be extracted.

6) Pour ~100 mL of filtrate solution into a pre-labeled HDPE PFAS sample bottle, using the gradations marked on the bottle as a guide. Record the actual amount of filtrate by weighing the sample bottle. LOQs for samples prepared in this way will be ~5X higher than normal Aqueous matrix LOQs.

7) Following the instructions in step 7, use the leachate blank solution (typically has sample ID L0000000-01) to prepare three bottles for use as batch QC. Volume for the leachate blank, LLLCS, and LCS will be recorded as 50 mL.

8) After preparing the diluted filtrate, filtrate batch QC, and 1633 MB bottles, follow the normal extraction steps for aqueous matrices. Each sample will be spiked with EIS as normal. The filtrate LLLCS and LCS will be spiked with target analytes according to the routine aqueous protocol for LLLCS and LCS target spiking.

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9) Leachate batch QC (MB/LLLCS/MS/MSD) are documented in LIMS as leachate blank (MB), and LLLCS (LCS).

10) Following the SPE process, the instrumental analyst will analyze the extracts by the 1633 method, as normal.

11) After processing, reviewing, generating reports for the data, and importing the data into LIMS, the TCLP/SPLP tumble date must be input into the analytical results from the leachate logs.

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Appendix L: Oil samples for PFAS Analysis by 1633

Clients may submit oil samples for PFAS analysis by 1633; oil samples can be extracted up to 0.5 grams and follow the solid extraction procedure in section 9.6.2. An extraction weight of 0.5 grams PFAS free mineral oil are used for laboratory QC samples.

Analysis follows normal 1633 routines. Percent solids are not calculated for this matrix, and a 100% solid is assumed with results being reported as ng/g.

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Appendix M: Sample preparation of non-standard matrices for PFAS Analysis by 1633

Clients may submit samples (solid or aqueous) for PFAS following FDA procedures. For all samples, the QuEChERS procedures are used to extract PFAS compounds from various matrices including food, feed and agricultural matrices. Following extraction, extracts are volumized in deionized water and passed undergo the same SPE clean-up procedure as aqueous samples.

Due to the physical nature of the applicable matrices, sample pretreatment such as tissue prep and homogenization and/or cryomill size reduction may need to be employed prior to sample extraction. Where such procedures are applicable, see the pertinent sections of this SOP prior to proceeding.

Unless a reduced mass extraction is necessary, use the following amounts for sample preparation and analysis:

Routine Target Mass for non-standard Matrices[1]

Aqueous matrices including milk	Plant matter	Dairy including cheese and yogurt	Prepared food products
10.0 g	2.0 g	2.0 g	4.0 g

1. Remove the sample from storage.
2. Using a stainless-steel spatula, mix each sample in its original jar by stirring from the bottom of the container to the top and in a circular motion along the sides of the jar, breaking particles up by pressing against the side of the container (to <1 mm). The homogenized sample will be even in color and have no separate layers. Store the homogenized material in its original container. If it is not practical to mix the sample within its container, transfer the sample to a larger container to mix.
3. Check the LIMS to obtain the percent solids result for each sample in the batch where applicable.
    a. If the test results are not available, check to see if a percent solids analysis is included in the work order; if not, notify the Project Manager (PM) they will need to add the test to the log-in.
    b. If test results are not available because the department performing the test has not completed the determination, notify your supervisor or contact the leader of the department performing the test to obtain the status. Preparation may not begin until this information is available.
    c. If none of these scenarios apply, proceed to Step 4.
4. Determine the target mass for extraction for soils/sediments and biosolids by dividing the target weight for sample preparation by the percent solids in decimal form. For example, if a sample is 90% percent solids, the mass used for extraction must be within the range of 2.0 and 2.4 g.

    Convert 90% percent solids to decimal form by dividing 90 by 100. (90/100 = 0.9)

    Divide 2 g (target mass) by the percent solids in decimal form (2/0.9=2.22…)

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Round 2.22 to the same significance of measurement as the top loading balance[1] (2.2).

Add ± 0.2 g to the target result of 2.2 g to obtain the target weight range of 2.0to 2.4g.

5. Place a 50 mL polypropylene centrifuge tube on the balance and tare the balance. Measure the target weight of sample into the tube so that the weight is within the range determined in the prior step. Record the amount used to the nearest 0.1 g (top loading) or 0.01 g (analytical).

   If matrix spikes or a laboratory duplicate were requested or are required, prepare separate containers for each.

6. Prepare the MB, LCS and LLLCS using Ottawa Sand or reagent water by adding the clean matrix and water to a 50 mL polypropylene centrifuge tube. Solid: Use 4.0 g Ottawa Sand Aqueous: Use 10.0 g of reagent waterPrepared food products: Use 4.0 g Ottawa Sand.

7. Quantitatively add 64 µL of the STK-10X standard mix to LLLCS and 80 µL of EPA-1633PDS mix to the LCS.

   If the batch includes matrix spikes, add 80 µL of EPA-1633PDS mix to each matrix spike sample.

8. Add 40 µL of EIS solution to each container (all samples and QC)

9. Using a vortex mixer, vortex the tube to disperse the spike solution and allow to equilibrate for approximately 30 minutes. Alternatively, shake by hand.

10. Add 10 mL of acetonitrile to each centrifuge tube. Vortex to disperse, then shake for 30 minutes on a variable speed mixing table.

11. Add 10 mL of deionized water to the sample in each centrifuge tube, then vortex to disperse.

    a. If aqueous samples of 10 grams or more were extracted, do not add any deionized water.

    b. If aqueous samples containing less than 10.0 grams were extracted, add additional deionized water till the aqueous content of the extract is 10.0 mls.

       Example: if 5.0 grams of a sample was weighed out, then add 5.0 mls of deionized water to the tube.

5) Add QuEChERS salt packet (6000 mg MgSO4 and 1500 mg NaOAc; Phenomenex P/N# AH0-9043) and shake vigorously for 1 minute to avoid clumping of sorbent.

6) Centrifuge the extract at 2500 rpm for 10 minutes

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7) Transfer supernatant (top layer) to a 15 mL PP conical centrifuge tube with dSPE sorbent (1200 mg MgSO4, 400 mg PSA, 400 mg C18E and 400 mg graphitized carbon black; Phenomenex P/N# HS0-9518).
8) Shake vigorously for 2 minutes.
9) Centrifuge the extract at 2500 rpm for 10 minutes
10) Filter the extract with a 0.2 µm polypropylene syringe filter and transfer to a 125 mL HDPE bottle, recording the volume of the extract recovered in the ELN clean-up tab under clean-up volume.
11) Bring the extract volume up to 100 ml with deionized water
12) Check the pH of each sample solution using a pH indicator strip to verify the pH is 5.0 ± 1.0. If necessary, adjust the pH with acetic acid or ammonium hydroxide (or with 3% aqueous ammonium hydroxide). Do not insert the strip into the sample container: use a disposable pipet to transfer a small amount of sample onto the pH indicator strip instead.
13) Proceed to Section 9.7 for extraction and extract cleanup.

Note: Extraction protocol defined in this appendix is based on the procedure found in FDA METHOD NUMBER: C-010.03. Target analytes PFPrA, PFOSA, NMeFOSA, NEtFOSA, NMeFOSAA, NEtFOSAA, NMeFOSE, NEtFOSE, 3:3FTCA, 5:3FTCA, 7:3FTCA, PFMBA, PFMPA, NFDHA, PFEESA and the extracted internal standards 13C3-PFPrA, 13C8-PFOSA, d3-NMeFOSA, d5-NEtFOSA, d3-NMeFOSAA, d5-NEtFOSAA, d7-NMeFOSE, d9-NEtFOSEare not included in the reference method C-010.03, and there is no published performance available for these analytes when extracted by C-010.03. EPA-1633A soil recovery criteria is to be reported, however, any recovery greater than 10% will be subsequently reported with associated narration and potential biases for these analytes.

END OF APPENDIX

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Total Solids Dried at 103°C-105°C

and Total Volatile Solids dried at 550°C

Reference Methods: **Total Solids SM 2540B and Total Volatile Solids SM 2540E**, Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods 2020.

1. Scope and Application

Matrices: This method is suitable for the determination of total solids in potable, surface, and saline waters, as well as domestic and industrial wastewaters.

Definitions: Refer to Alpha Analytical Quality Manual.

"Solids" refer to matter suspended or dissolved in water or wastewater. Solids may affect water or effluent quality adversely in a number of ways. Waters with high dissolved solids generally are of inferior palatability and may induce an unfavorable physiological reaction in the transient consumer. For these reasons, a limit of 500 mg dissolved solids/L is desirable for drinking waters. Highly mineralized waters also are unsuitable for many industrial applications. Waters high in suspended solids may be esthetically unsatisfactory for such purposes as bathing. Solids analyses are important in the control of biological and physical wastewater treatment processes and for assessing compliance with regulatory agency wastewater effluent limitations.

"Total solids" is the term applied to the material residue left in the vessel after evaporation of a sample and its subsequent drying in an oven at a defined temperature. Total solids include "total suspended solids," the portion of total solids retained by a filter, and "total dissolved solids," the portion that passes through the filter.

"Fixed solids" is the term applied to the residue of total, suspended, or dissolved solids after heating to dryness for a specified time at a specified temperature. The weight loss on ignition is called "volatile solids." Determinations of fixed and volatile solids do not distinguish precisely between inorganic and organic matter because the loss on ignition is not confined to organic matter. It includes losses due to decomposition or volatilization of some mineral salts.

The data report packages present the documentation of any method modification related to the samples tested. Depending upon the nature of the modification and the extent of intended use, the laboratory may be required to demonstrate that the modifications will produce equivalent results for the matrix. Approval of all method modifications is by one or more of the following laboratory personnel before performing the modification: Area Supervisor, Department Supervisor, Laboratory Director, or Quality Assurance Officer.

This method is restricted to use by or under the supervision of trained analysts. Each analyst must demonstrate the ability to generate acceptable results with this method by performing an initial demonstration of capability.

2. Summary of Method

A well-mixed sample is evaporated in a weighed dish and dried to constant weight in an oven at 103 to 105°C. The increase in weight over that of the empty dish represents the total solids.

If Total Volatile Solids analysis is required, the dishes are also dried at 550°C to a constant weight following the completion of the TS determination. The results may not represent the weight of actual dissolved and suspended solids in wastewater samples.

2.1 Method Modifications from Reference

Method specify that duplicate determination should agree within 5% of their average weight; Alpha is using in-house control limits.

3. Reporting Limits

This method is suitable for the determination of total solids in potable, surface, and saline waters, as well as domestic and industrial wastewaters in the range up to 20,000 mg/L. The RDL is 10mg/L using a 100mL sample and analytical balance sensitive to 0.1mg. A lower RDL may be achieved by using a larger sample (repeated evaporation of 100mL aliquots) or the use of a more sensitive balance.

4. Interferences

4.1 Highly mineralized water with a significant concentration of calcium, magnesium, chloride, and/or sulfate may be hygroscopic and require prolonged drying, proper desiccation and rapid weighing.

4.2 Exclude large floating particles or submerged agglomerates of nonhomogeneous materials from the sample if it is determined that their inclusion is not desired in the final result.

4.3 Disperse visible floating oil and grease with a blender before withdrawing a sample portion for analysis.

4.4 Because excessive residue in the dish may form a water-trapping crust, limit sample to no more than 200mg residue. If a crust layer forms in the dish, use a clean spatula to gently crack the layers and remove any air pockets.

4.5 Place the oven trays so they do not risk contamination from particulate matter falling into the dishes.

4.6 Humidity in the Laboratory may cause a longer desiccation period in order for a stable weight to be reached.

4.7 Negative errors during weighing of dishes due to the loss of volatile matter during drying.

5. Health and Safety

The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of material safety data sheets is available to all personnel involved in the chemical analysis. Additional references to laboratory safety are available in the Chemical Hygiene Plan.

All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

6. Sample Collection, Preservation, Shipping and Handling

6.1 Sample Collection

Use resistant-glass or plastic bottles, provided that the material in suspension does not adhere to container walls.

Sampling, subsampling, and pipetting two-phase or three-phase samples may introduce serious errors. Make and keep such samples homogenous during transfer. Use special handling to insure sample integrity when subsampling.

6.2 Sample Preservation

None.

6.3 Sample Shipping

No specific requirements.

6.4 Sample Handling

Begin analysis as soon as possible because of the impracticality of preserving the sample. Mix small samples with a magnetic stirrer. If suspended solids are present, pipet with widebore pipets. If part of a sample adheres to the sample container, consider this in evaluation and reporting results. Some samples dry with the formation of a crust that prevents water evaporation; special handling is required to deal with this. Avoid using a magnetic stirrer with samples containing magnetic particles.

Refrigerate sample at 4°C up to the time of analysis to minimize microbiological decomposition of solids. Preferably do not hold samples more than 24 hrs. In no case hold sample more than 7 days. Bring samples to room temperature before analysis.

7. Equipment and Supplies

7.1 Evaporating Dishes: Dishes of 100-mL capacity made of Porcelain, 90-mm diameter.

7.2 Dessicator: With a desiccant containing a color indicator of moisture concentration or an instrumental indicator.

7.3 Drying oven: For operation at 103°C to 105°C.

7.4 Muffle Furnace: Capable of maintaining 550°C.

7.5 Drying oven: For operation at 85-90 °C.

7.6 Analytical Balance: Capable of weighing to 0.1 mg.

7.7 Magnetic stirrer: With TFE stirring bar.

7.8 Wide-bore pipets.

7.9 Graduated Cylinders: 100mL glass, or plastic.

7.10 Oven trays: Aluminum or other sturdy material; used to transport the evaporation dishes to appropriate locations, without the risk of dirt contamination.

8. Reagents and Standards

8.1 Reagent Water: Deionized (DI) water.

8.2 LCS Solution: To a 1L volumetric flask, add 0.5g of K_2SO_4. Bring to volume with DI water. Transfer the solution to a 1L plastic bottle that is labeled with a unique ID (see below). . Solution is stored at room temperature by the filtering station. The LCS Solution is valid for 1 year.

Unique ID for LCS Solutions on each bottle's label:

TDS-date made-LCS A, B, C, or D (note: Same LCS used for TSC analysis)

Expiration Date, Initials.

9. Quality Control

The laboratory must maintain records to document the quality of data that is generated. Ongoing data quality checks are compared with established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

9.1 Blank(s)

Prepare and analyze one Blank of 100mL DI water per batch of 20 samples or less. Results must be less than the Reporting Limit (RL). If Blank results are less than 10 times the RL and the sample results are greater than 10 times the RL, the data is reported. If Blank results are greater than 10 times the RL, and there is sufficient sample volume remaining, the entire batch is reset and reanalyzed. A narrative is included with the report.

9.2 Laboratory Control Sample (LCS)

One LCS is analyzed per batch of 20 samples or less. % Recovery must be within 80-120%.

NOTE: The LCS is not required if only TVS analysis is required.

9.3 Initial Calibration Verification (ICV)

Not Applicable

9.4 Continuing Calibration Verification (CCV)

Not Applicable

9.5 Matrix Spike

Not Applicable

9.6 Laboratory Duplicate

One duplicate sample is analyzed per batch of 10 samples or less. Duplicate determinations should be within in-house control limits. Current limits are $\leq$ 11% for %RPD, subject to change.

9.7 Method-specific Quality Control Samples

None.

9.8 Method Sequence

- Prepare the evaporation dishes.
- Weigh the clean evaporation dishes.
- Pour or pipet the appropriate volumes of sample and QC samples into the evaporation dishes.
- Initially, evaporate the samples in a 85-90 °C oven to prevent boiling and splattering.
- Transfer samples to the 103 – 105°C oven for final drying. (Following completion of TS analysis, transfer dishes to 550°C muffle furnace for TVS analysis if required.)
- Dry for a minimum of 2 hours.
- Cool in a dessicator until temperature is constant.
- Weigh the dishes until the weight change is less than 4% of the previous weight or 0.5mg, whichever is less.
- Calculate results.

10. Procedure

10.1 Equipment Set-up

10.1.1 Preparation of Evaporating Dish

10.1.1.1 Heat a clean evaporating dish to 103°C to 105°C for at least 2 hours in an oven. (For best results, heat dishes overnight before use.)

10.1.1.2 Dry the dish in an oven at 103-105ºC for at least two hours.

Note: For TVS the dish must be pre-washed and dried at 550ºC for at least 2 hours.

10.1.1.3 Cool the evaporation dishes in a dessicator for approximately 1 hour per tray. (Cool for a longer time period if the humidity in the laboratory is high.)

10.2 Initial Calibration

Not Applicable

10.3 Equipment Operation and Sample Processing

10.3.1.1 Total Solids and Total Volatile Solids

10.3.1.1.1 Weigh the clean, desiccated evaporation dishes immediately before use. Record the weights for each dish onto the computer worksheet.

10.3.1.1.2 Choose a sample volume that will yield a residue between 10 and 200mg. When very low total suspended solids are encountered (less than 10 mg/L), less residue may be collected; compensate for this by using a larger volume of sample.

10.3.1.1.3 Samples

10.3.1.1.3.1 Shake sample container until complete homogenization has occurred. Pour 100mL of the sample into a clean 100mL graduated cylinder. Pour the sample aliquot into its corresponding evaporation dish. Rinse the cylinder three times with DI water, pouring the rinsate into the dish each time, to ensure all solids have been transferred to the dish.

10.3.1.1.3.2 If the sample contains a high amount of sediment, oil or other thick substance, then pipet a measured volume of well-mixed sample into a pre-weighed evaporation dish. Stir the sample with a magnetic stirrer during transfer. Record the sample volume used onto the computer worksheet.

10.3.1.1.4 Quality Control Samples

LCS: Pour 50mL of the LCS Solution (Section 8.2) into an evaporation dish. Record the Unique ID of the LCS used for analysis onto the excel sheet.

10.3.1.1.4.1 **Blank:** Pour 100mL of DI water into an evaporation dish.

10.3.1.1.4.2 **Duplicate:** Pour a second identical volume aliquot of a sample into a separate evaporation dish.

10.3.1.1.5 Initially evaporate the samples and QC samples in a drying oven at 85-90°C to prevent boiling and splattering.

10.3.1.1.6 Transfer the samples and QC samples to dry for at least 2 hours in an oven set at 103°C to 105°C.

- Following removal from the drying oven (Section 10.3.1.1.5), record the date, time out, and the oven temp onto the computer worksheet.
- Following the placement of the samples and QC samples in the 103°C to 105°C (Section 10.3.1.1.6), record the date, time in, and the oven temperature onto the computer worksheet.

10.3.1.1.7 If necessary, add successive sample portions to the same dish after evaporation, so that the final residue weight is $\geq$ 0.01g.

10.3.1.1.8 Cool the evaporating dishes in a dessicator to a constant temperature, and weigh. Repeat cycle of drying, cooling, desiccating, and weighing until a constant weight is obtained, or until weight change is less than 4% of previous weight or 0.5 mg, whichever is less. When weighing the dried sample, be alert to changes in weight due to air exposure and/or sample degradation.

10.3.1.2 Total Volatile Solids

10.3.1.2.1 If TVS analysis is required, place the evaporation dishes from Section 10.3.1.1.8 into a 550°C muffle furnace to dry for at least 2 hours to ensure ignition has occurred. Record the date, time in, and the furnace temperature onto the computer worksheet.

10.3.1.2.2 Following removal from the furnace, record the date, time out, and the furnace temperature onto the computer worksheet. Cool the evaporating dishes in a dessicator to a constant temperature, and weigh. Repeat cycle of drying, cooling, desiccating, and weighing until a constant weight is obtained, or until weight change is less than 4% of previous weight or 0.5 mg, whichever is less. When weighing the dried sample, be alert to changes in weight due to air exposure and/or sample degradation.

10.3.1.2.3 When all weighing is completed, print a hardcopy of the computer worksheet to save for the Solids binder notebook.

10.4 Continuing Calibration

Not Applicable.

10.5 Preventive Maintenance

An instrument service company calibrates the oven and furnace temperatures, and calibrates the balances on an annual basis. Certificates are kept on file.

10.5.1 The temperature of the laboratory ovens is recorded constantly on a data logger system, and monitored once daily by laboratory analysts.

11. Data Evaluation, Calculations and Reporting

11.1 Total Solids

$$\text{mg total solids / L} = \frac{(\mathbf{A} - \mathbf{B}) \times 1000}{\text{sample volume, (mL)}}$$

where:

A = Final weight (weight of dried residue + dish, mg)

B = Initial weight (weight of dish, mg)

11.2 Total Volatile Solids

$$\text{mg Total Volatile Solids/L} = \frac{(\mathbf{A} - \mathbf{B}) \times 1000}{\text{sample volume, (ml)}}$$

Where:

A = wt of residue + dish before ignition, mg

B = wt of residue + dish after ignition, mg

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

Holding time exceedence and improper preservation are noted on the nonconformance report form.

Review of blank, LCS and duplicate response for acceptable performance occurs for each batch of samples. Record any trends or unusual performance on a nonconformance action form.

If the LCS recovery range falls outside the designated acceptance range, the laboratory performance is judged to be out of control and the problem must be immediately identified and corrected. The analytical result is suspect and is only reported for regulatory compliance purposes with the appropriate nonconformance action form. Immediate corrective action includes reanalyzing all affected samples by using any retained sample before the expiration of the holding time.

13. Method Performance

13.1 Method Detection Limit Study (MDL) / Limit of Detection Study (LOD) / Limit of Quantitation (LOQ)

The laboratory follows the procedure to determine the MDL, LOD, and/or LOQ as outlined in Alpha SOP/1732. These studies performed by the laboratory are maintained on file for review.

13.2 Demonstration of Capability Studies

Refer to Alpha SOP/1739 for further information regarding IDC/DOC Generation.

13.2.1 Initial (IDC)

The analyst must make an initial, one-time, demonstration of the ability to generate acceptable accuracy and precision with this method, prior to the processing of any samples.

13.2.2 Continuing (DOC)

The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

Refer to Alpha's Chemical Hygiene Plan and Waste Management and Disposal SOP for further pollution prevention and waste management information.

15. Referenced Documents

Chemical Hygiene Plan

SOP/1732 MDL/LOD/LOQ Generation

SOP/1739 IDC/DOC Generation

SOP/1728 Management and Disposal SOP

16. Attachments

None.

APPENDIX L

Professional Profiles

PROFESSIONAL PROFILE

CONTACT INFORMATION

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EDUCATION

BCE, Civil Engineering,
University of Delaware, 1987
MBA, Management, Adelphi
University, 1992

PROFESSIONAL LICENSES

Professional Engineer:
New York, New Jersey, Pennsylvania, Rhode Island, Connecticut, Vermont, Virginia, North Carolina, Ohio, Michigan, and Montana

Charles J. McGuckin, PE

Vice President | Principal Engineer

EXPERIENCE SUMMARY

Over thirty years of experience: Principal, Senior and Project Engineer with Roux Associates, Inc.; President of Remedial Engineering, P.C.; and Design Engineer at Dvirka and Bartilucci Consulting Engineers.

TECHNICAL SPECIALTIES

Engineering design of soil and groundwater remediation systems. Brownfields clean-up plans, stormwater studies, and engineered natural treatment systems.

REPRESENTATIVE PROJECTS

- Principal Engineer for remedial investigation scoping, fate and transport analysis, and feasibility study preparation for a 1300+ acre Former Aluminum Smelter USEPA Superfund Site, Montana. Due to the size, complexity, and unique exposure areas of the Site it was broken up into multiple decision units including landfills, percolation ponds, operational areas, river area, soil, and groundwater. The contaminants of concern included metals, PAHs, cyanide, and fluoride. Remedial technologies evaluated in detail included landfill capping, groundwater extraction and treatment, pond and river dredging, soil excavation, slurry wall containment, in situ stabilization, and in situ groundwater treatment. Detailed effectiveness, implementability, and cost evaluations were prepared to support preferred remedial alternatives for each decision unit.
- Principal Engineer for remedial action implementation for a 2.5-acre former subway transit power station along the Gowanus Canal, Brooklyn, New York. The project remedial action was completed under an extremely tight deadline to obtain the certificate of completion under the NYSDEC BCP program. The project also involves close coordination with USEPA due to the adjacent canal superfund status. The investigation required in depth review of historic facility operations and sampling of subsurface tunnel structures. The remedy included excavation of PCB impacted soils, LNAPL recovery, shoreline stabilization, concrete scarification, sewer cleaning and capping. The project has required close coordination with the development team to ensure management of impacted materials in conformance with the Site Management Plan.
- Principal Engineer for the preparation of field implementation plans, construction monitoring, and Engineers Certification Report for a former manufactured gas Plant (MGP) site in West Chelsea, Manhattan, New York. The site was one of the first projects completed under the NYS Brownfields Clean-up Program. The remedy included soil excavation and offsite thermal treatment, a sheet pile barrier wall, a vapor barrier, and basement ventilation system. A comprehensive air monitoring program was conducted due to the concerns over coal tar residue emissions and odors on the surrounding community. The remedy was incorporated into the design and construction of the headquarters office building of an international media company.
- Principal engineer for the preparation of the feasibility study, IRM plans, and remedial design/remedial action plans for a 40-acre former manufacturing facility in Rensselaer, New York. IRM Soil remediation included excavation of over 10,000 cubic yards of CVOC and metals source material for disposal at multiple facilities based on waste characteristics. Basement cleaning was performed in three large buildings to remove accumulated process sludges. Lagoon closure plans included sediment removal, dewatering, soil washing, and soil capping. The final remedy for the site includes a groundwater perimeter containment trench and 40 gpm treatment system for metals and VOCs and a 9-acre vegetated cap for a former landfill.

- Principal Engineer for the feasibility studies and remedial action work plans for multiple operable units of a large railyard located in Sunnyside, Queens, New York under the NYSDEC Inactive hazardous waste program. For the former engine house and maintenance area unit, pre-design studies included product plume thickness data collection and modeling, ex situ biopiles treatment, in situ enhanced bioremediation, and in situ chemical oxidation. The final design consisted of decontamination and removal of structures, excavation of hot spot soils for PCBs and lead, UST closures, a dual phase high vacuum extraction system and in situ bioremediation.
- Project Engineer for the design and construction management of a 600 gpm groundwater extraction and treatment system to prevent offsite migration at a petroleum storage and pipeline transfer facility in Providence, Rhode Island. The treatment system was designed to remove iron, BTEX, and naphthalene from the groundwater to below surface water discharge standards for the Providence River. The system processes consisted of equalization, aeration, de-aeration, flocculation, clarification, air stripping, dual media filtration, granular activated carbon adsorption (liquid and vapor phase), and sludge thickening and dewatering. The system included an outfall diffuser designed in accordance with the CORMIX computer model.
- Senior Engineer responsible for the design, construction management, and O&M of a 60,000-gpd constructed wetlands treatment system for a former manufacturing facility in Virginia. The 16-acre treatment system was designed within an existing phragmites wetland to remove zinc and iron from landfill leachate prior to discharge to an adjacent creek. The treatment system consisted of alkalinity producing cells, toxic ponds, compost and limestone berms, anaerobic cells, and aerobic cells. The design included a 400-foot reinforced earthen dike together with hydraulic control structures and piping to maintain cell water levels and flow rates. The system also includes a pump station and force main for both effluent discharge and irrigation purposes. Joint wetlands and local permit approvals were obtained for the project.
- Senior Engineer for the performance of a feasibility study and remedial design for the closure of a concrete oil/water separator filled with refinery sludge and demolition materials impacted with lead at a former refinery in Providence, Rhode Island. Remedial alternatives were developed and evaluated including capping and containment using a perimeter slurry wall, sheet piling or concrete wall sealing; excavation and disposal; and in situ solidification. The capping and containment using a slurry wall alternative was selected for implementation of the remedial design. The design consisted of removal and replacement of existing monitoring wells, sealing of separator wall openings, a 2-acre multi-layer cap, a 1200-foot long by 30-foot deep soil-bentonite slurry wall, and a perimeter drainage swale. The multi-layer cap included a 40-mil HDPE geomembrane and a geosynthetic clay liner. The slurry wall was keyed into the existing clay confining layer beneath the separator. The design incorporated disposal of an additional 10,000 cubic yards of petroleum impacted soil under the cap.
- Principal Engineer for environmental consulting support services for a large landfill O&M contract under review by the New York City Department of Investigation. The work entailed reviewing the scope of routine vs. non-routine work performed over a one-year period for compliance with contract requirements. The O&M Work included routine cover maintenance, groundwater and gas monitoring, landfill gas extraction, major system repairs and waste handling. Memos of findings were prepared assessing acceptability of work, compliance with permit regulations and providing recommendations for improvements.
- Principal Engineer for the independent engineering review of change orders for the New York MTA Office of the Inspector General associated with electric utility substations reconstruction damaged during the 2012 Superstorm Sandy. The cost review focused on contracting procedures, waste classification of impacted structures and soils, proper waste management and disposal. Findings were compiled in a report to determine if costs were legitimate and justifiable and providing recommendations for improved specifications for bidding and of management waste handling contracts.
- Principal Engineer for remedial action plan implementation oversight and certification for the CornellTech campus development on Roosevelt Island, New York. The first phase of the campus development included lead paint and ACM abatement and demolition of the former Goldwater Hospital, construction of six main campus buildings, new utilities, roadways, and lawn/landscaped areas. Responsibilities include oversight of soil/subsurface structures excavation handling, disposal, and reuse; community air monitoring; dewatering permit compliance; and SWPPP inspections.
- Senior and Principal Engineer for the decommissioning and decontamination of a pharmaceutical facility covering seven city blocks as a part of a NYSDEC Voluntary Cleanup Agreement in Brooklyn, New York. The former office and laboratory complex would be decontaminated for reuse as a school and small business space. Multiple other buildings were demolished. Responsibilities included preparation of interior abatement plans to address mercury, lead and PCBs in building materials and review of Interim Remedial Measure (IRM) work plans for lead, benzene and mercury-contaminated soil excavation and disposal. Groundwater remediation design

included air sparge/soil vapor extraction, in situ oxidation and a reactive barrier wall using colloidal carbon and ZVI.

- Principal Engineer for the performance of a Brownfields Demonstration Pilot Program in the Hamlet of New Cassel for the Town of North Hempstead, New York. Under an EPA grant, Roux Associates created an inventory of 50 potential commercial/industrial properties within New Cassel and evaluated these properties based on perceived contamination and potential for redevelopment/reuse. Eight sites exhibiting the greatest potential for redevelopment were selected to perform Phase I Environmental Site Assessments. Of these eight sites, four sites were selected for Brownfield Site investigations to identify the nature and extent of contamination in soil and groundwater and provide potential remedial alternatives and cleanup costs to revitalize these properties. The Brownfields Demonstration Pilot Program also included community outreach activities to promote a unified approach to the redevelopment of Brownfields in new Cassel.
- Principal Engineer responsible for engineering certification of all remediation activities related to the seven-city-block Barclay's Arena and Atlantic Yards redevelopment in Brooklyn, New York. This multi-billion-dollar redevelopment includes the Arena, which will be focal point of the largest redevelopment project in Brooklyn, consisting of an urban complex of housing, commercial and retail space, as well as several acres of landscaped public open space. The existing properties being redeveloped are residential, commercial, and industrial properties, including a large railroad yard. Engineering certification included multiple RAWPs under NYSDEC Spills Program, UST removals, soil excavation, in situ groundwater treatment and remedy oversight services. The project also includes ACM abatement, building demolition, soil pre-waste-classification, coordination (with the receiving facilities), and oversight of the removal of 1,000,000 cubic yards of soil (~550,000 yards removed to date), representing one of the largest excavation and soil removal projects performed in New York City.
- Principal Engineer responsible for the preparation of the remediation completion report at Captain's Cove former municipal landfill State Superfund Site located in Glen Cove, New York. This work has been performed in accordance with Title 3 of the NYS Environmental Quality Bond Act under contract to the City of Glen Cove. Design elements included excavation plans, radiological waste monitoring, demo debris and waste separation and screening, dewatering water management, waste disposal, and site restoration. Additional work included the delisting of a six acre "clean" portion of the site to allow the development of a ferry terminal and esplanade and development of alternative cleanup standards consistent with future site uses. Site remediation will accommodate site redevelopment as a commercial waterfront and operating ferry service and seaport area.
- Principal Engineer providing program management of interior building materials surveys for 22 residential buildings along the south shore of long island under an Army Corps of Engineers contract for dune reconstruction. Building materials surveys included testing and analysis of suspect contaminants and reporting in support of building abatement and demolition planning. Testing was completed using multiple teams on a tight timeline to meet project schedule requirements.
- Principal Engineer for the remediation of a former Manufactured Gas Plant (MGP) facility in Brooklyn, NY, including oversight of the excavation of both the former gasholders, and adjacent contaminated hotspots requiring offsite thermal desorption of over 30,000 tons of coal tar impacted soil. Directed the Community Air Monitoring Program (CAMP) specific to the MGP impacted soil removal, as required by both New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH). Remedial activity met all substantive requirements of the NYSDEC approved Remedial Action Work Plan for the Site. The remedy included design of a passive subsurface vapor monitoring/recovery system for a 500,000 sq. ft. retail structure in Brooklyn, NY. The system design integrated a perforated piping system complemented by a protective vapor barrier below the structural floor slab to monitor and mitigate volatile organic compound vapors. Multiple vapor barrier options were evaluated to determine the optimum design based on the site conditions.
- Principal Engineer providing expert settlement support services to a county municipality in New York State. The case involved an EPA Order for underground storage tank (UST) compliance for over 50 county operated facilities with over 125 USTs. The project involved the field inventory of the USTs at each facility and development of both Interim and final compliance plans to comply with EPA, NYSDEC and local UST regulations. Detailed cost estimates were prepared for multiple scenarios for upgrading USTs including tightness testing, manway repairs, leak detection and overfill protection monitoring systems, UST removal and replacement, and new piping. The upgrade evaluation and negotiations included incorporation of Supplemental Environmental Project (SEPs) in accordance with EPA requirements. SEPs included centralized monitoring systems for leak detection and inventory control.
- Principal Engineer for preparation of a site management plan for redevelopment of a former watch case factory in Sag Harbor, New York. The primary engineering controls for the former factory conversion to a residential building consisted of a vapor barrier and an active sub slab depressurization system

(SSDS) to address chlorinated VOCs. The SSDS system was complicated due to the existing 100-year-old structure. A unique raised floor approach was designed to allow for the SSDS installation. The system design, approved by NYSDEC and NYSDOH includes multiple legs, dual blowers, low vacuum alarms and monitoring points.

- Principal Engineer for the Remedial Action Work Plan (RAWP) for redevelopment of a shopping center in the Bronx, New York. The RAWP elements included soil and groundwater management plans, stormwater management, air monitoring and vapor mitigation systems. To address vapor intrusion, active sub slab depressurization systems were designed for two pad buildings. One system for a new retail building construction and one retrofit system for an existing building to be used as a restaurant. Closure reports were prepared and certified documenting all remediation work and approved by NYC Mayor's Office of Environmental Remediation (OER).
- Principal Engineer for the preparation of a preliminary remedial design for the remediation and restoration of a pond and surface water tributaries to Canaan Lake that have been impacted from leachate generated from an upgradient former municipal landfill located in Holtsville, New York. Completed a preliminary remedial design for the construction of a compost-based permeable reactive barrier for the removal and treatment of leachate prior to discharge to the surface water, followed by restoration of the surface water body and surrounding wetlands. The project included development of a long term remedial strategy to reduce rainfall infiltration into the landfill and minimize leachate generation. Current plans to reduce rainfall infiltration include the planting of 3,250 hybrid poplars, regrading and lining of drainage swales, and the resurfacing of low lying areas consistent with recreational facilities.
- Principal Engineer for final capping elements and wetlands restoration work and completion of the Final Engineering Report for an inactive hazardous waste site in Syracuse, New York. The project included onsite consolidation of lead impacted waste; 7-acre landfill cap with vegetated layer, cover soil, and geomembrane; stormwater runoff controls; reconstruction of wastewater ponds; and an 8-acre wetland restoration. An O &M Plan was prepared and implemented consisting of groundwater, surface water and landfill gas monitoring, and annual cap and wetland inspections.
- Principal Engineer for the preparation of the remedial action work plan for an 11-acre former Department of Defense owned Site that manufactured airplane parts along Hempstead Harbor in Manorhaven, New York. The project is regulated under the NYSDEC Voluntary Cleanup Program. The remedial design consisted of both soil vapor extraction/air sparging and in situ enhanced bioremediation systems for Site groundwater impacted by chlorinated VOCs. The final remedial design and site management plan are expected to include soil capping, vapor barriers and passive ventilation systems to be incorporated into a residential redevelopment with waterfront access.
- Senior Engineer for the performance of a stormwater runoff evaluation for a manufacturing facility in Watertown, New York. Roux Associates was retained as third party to evaluate the drainage design and construction elements for an industrial landfill cap. The evaluation was performed for the facility owner in support of potential litigation arising from onsite building flooding incidents following a severe snow and rainstorm event. The scope of work included an evaluation of the existing onsite storm sewer system capacity, calculation of runoff flow rates for the 300-acre contributing area, review of landfill cap surface drainage design, review of erosion control measures implemented during construction, and analysis of specific flooding incident causes. The runoff analyses were performed using the TR 55 Method for three conditions: pre-capped, capping under construction prior to establishment of vegetation, and final vegetated cap design. Recommendations were made to improve the site drainage including design of surface drainage swales, temporary berms and sediment traps during construction and modification of snow handling practices.
- Principal Engineer for the management of a soil and groundwater remediation system for a nationwide overnight delivery distribution center in Brooklyn, New York as part of the NYSDEC Voluntary Cleanup Program. A risk-based remedial approach that called for the remediation of "hot spot" source area soils, and mass-reduction of VOCs was successfully utilized for the Site. As a result, the focus of remediation was on reducing the mass of VOCs in on-site groundwater to a level where natural attenuation would be effective in remediation of VOCs. To address the contamination in the source area, a soil vapor extraction (SVE) and air sparge (AS) system consisting of 8 SVE wells and 17 AS wells was designed, constructed, operated and maintained for a period of approximately 3 years. Permanent shutdown of the system was approved by the NYSDEC.
- Senior Engineer for the design and construction management of a soil remediation and stormwater management project at a 16-acre former pesticide warehouse facility in Dayton, New Jersey. The Site was redeveloped for storage and trailer parking. The project consisted of consolidation of pesticide contaminated soils; asphalt capping of the 3.5-acre contaminated soils area; stormwater collection, conveyance, and detention; and site regrading. The evaluation included TR-55 runoff modeling for pre and post capping and development conditions. The storm sewer system consisted of

multiple catch basins, over 2,000 linear feet of reinforced concrete pipe ranging in size from 15 to 30 inches, and a recharge basin. A Soil Erosion and Sedimentation Control Plan and a NJPDES General Permit were prepared for the project.

- Project Principal for the performance of LNAPL remediation studies at the New Jersey Transit former Lake Street Bus Garage in Newark, New Jersey. The studies involved evaluating remedial alternatives for free product recovery, performance of an LNAPL recovery pilot test and cost estimating. A RAWP and engineering design plans were prepared for both the bus garage and the adjacent park properties. The remedy included excavation of the source area, horizontal recovery wells, a vertical recovery trench, in situ oxidation injections and product recovery using vacuum extraction.
- Senior Engineer for the performance of a stormwater management analysis for a 28-acre industrial landfill in Virginia. The principal objective of the study was to identify engineering controls to minimize stormwater runoff to a metals-contaminated sediment impoundment. The study included TR-55 runoff modeling and storage analyses for multiple detention ponds. Three engineering control alternatives were identified including landfill cap regrading, diversion using berms and swales, and diking and weir raising.
- Senior Engineer for the investigation, design, and construction management of the closure of a 2-acre fire-water supply pond and modification of the stormwater conveyance system at a former manufacturing facility in Williamsburg, Virginia. The investigation phase of the project was focused on determining the sources and loading of metals influent to the pond. Field activities included examination of the existing stormwater drainage system, sub watershed delineation, groundwater monitoring, and installation of automatic stormwater sampling devices. The final design included 400 feet of open concrete channels, 250 feet of culvert replacement, slip lining of 370 feet of 36-inch RCP culvert, reconstruction of five catch basins, placement of 10,000 cubic yards of clay fill within the pond and regrading of existing drainage ditches. Erosion control measures and slope stabilization were also included as well as the design of a special outlet structure for minimizing erosion at the outfall.
- Project Principal for the investigation and closure of five USTs at the New Jersey Transit Broad Street Station site in Summit, New Jersey. Tank sizes ranged from 20,000 to 30,000-gallon capacity. UST closure program completed in accordance with the NJDEP Technical Requirements for Site Remediation. Closure report prepared and submitted to the NJDEP and subsequent issuance of a No Further Action letter from the NJDEP.
- Project Engineer of the underground storage tank (UST) program for a major retail chain store in the New York, New Jersey, and Pennsylvania region. Responsibilities included preparation of a UST management plan based on federal, state, and local regulations and costs to prioritize UST maintenance. The tank designs included plans and specifications for the removal and replacement, or upgrading, of USTs to meet regulatory requirements. The engineering design involved fuel requirements for dual heating and back-up generator usage, mechanical pumping equipment and fire wall design.
- Project Engineer for the design and construction management of a 1,000 sq. ft. hazardous and flammable materials storage facility in Syosset, New York. The facility included concrete secondary containment dikes, access ramps, sprinkler system modifications, and lighting. The separate flammable materials area included 2-hour fire rated concrete block walls and doors, ventilation equipment and a fire alarm system. Permitting services were performed for the Nassau County Department of Health, the Nassau County Fire Marshall, and the Building Department.
- Project Engineer for the design of a 2,000 sq. ft. hazardous waste storage facility in Astoria, New York. Prior to construction, demolition of an existing building was required and included removal of asbestos and lead paint. The project included driving treated timber piles and excavation and removal of contaminated soil and groundwater. The structure consisted of a steel frame with a metal standing seam roof system, decorative masonry block walls, and a roll-up door. Temporary and permanent fencing were required along with concrete sidewalk replacement.
- Senior Engineer providing construction management services in support of the BNYCP Cogeneration Facility construction and Brooklyn Navy Yard facility decommissioning. Work included preparation of construction management plans, supervision of soil, concrete, and sediment disposal activities, asbestos surveys, and PCB sampling and analysis work. A NYCDEP wastewater discharge permit was prepared for the million gallon per day stream condensate and wastewater backwash flow rate.
- Project Principal for performing remedial alternative cost estimating for a New Jersey Transit site in Montclair, New Jersey, which is to be redeveloped as a firehouse. A cost estimate prepared by another consultant was reviewed as part of the scope of work. The proposed remedial alternative for the site consisted of excavation and disposal of PAH-impacted fill material and capping. The alternative remedy proposed by Roux Associates was a more risk-based approach, resulting in a cost savings of approximately $100,000 for New Jersey Transit.

- Project Engineer for the design and construction management of cap repair and drainage improvement measures for an industrial hazardous waste landfill in Tennessee. Components of the design included replacement of the primary clay cover material, temporary and permanent erosion and sedimentation control measures, and a lined drainage channel to minimize the generation of landfill leachate. The project included the performance of a focused feasibility study to characterize the flow, quality, and treatability of the leachate. A feasibility study was also performed in order to evaluate constructed wetlands remedial technology as a method of effective and economical treatment of leachate.
- Senior Engineer for the remedial design and construction management of a 7-acre off-spec asphalt waste pond at a former refinery in New England. The asphalt material exhibited a low load bearing capacity combined with a viscous, tacky surface. An in situ solidification mix design was developed consisting of liquification using hot water and a 2-stage lime kiln dust reagent injection and mixing step. Gravel was added to the mix when the existing subgrade material was of insufficient bearing capacity. Solidified material was tested for unconfined compressive strength, durability, and TCLP. The final cover material consisted of a 6-inch vegetated layer.
- Principal Engineer for the performance of LNAPL remediation studies for a former bus maintenance facility and a segment of a Metropolitan Subway System in Newark, New Jersey. The studies involved evaluating groundwater and soil monitoring data, performance of LNAPL recovery pilot tests, evaluation of remedial alternatives and cost estimating. Recommendations included the use of mobile high vacuum extraction methods to collect LNAPL while minimizing capital expenditures and permanent low vacuum extraction methods to minimize odors to subway cars and surrounding communities.

Litigation Support Experience

- Project Engineer for the evaluation of remedial investigations and remedial cost estimates for a 30-acre former book publishing facility in Poughkeepsie, New York. The evaluation included the review of Phase I and Phase II investigation reports, remedial investigation (RI) and feasibility study (FS) reports, and the remedial investigation work plan. The findings included the presence of chlorinated volatile organic compounds in the soil and groundwater as well as identification of underground storage tanks. Deficiencies were identified in both the RI and FS reports by comparing with the NYSDEC's required criteria and recommendations were proposed for the RI work plan to further delineate source areas. Based on the remedial investigation review, revised costing assumptions were made, and remedial cost estimates were prepared totaling $3.6 million.
- Project Engineer for the evaluation of expected remedial costs for nine hazardous waste sites, two of which are federal superfund sites. The evaluation of both single and multiple PRP sites was performed to identify costs for an insurance claim. The expected remedial costs for nine sites, which include landfills or facility surface impoundments, totalled approximately $65 million. Remedial plans evaluated for multiple site operable units included groundwater pump and treat, alternative water supply systems, soil/sludge in situ solidification and treatment, and wetlands restoration. Additional work included evaluating invoices for site work previously performed and allocating expenses into their appropriate operable unit and work type, i.e., defense or indemnity.

Water Treatment Experience

- Senior Engineer for the engineering design of a 10 gpm groundwater recovery and treatment system at a former tank farm in Rhode Island. The recovery system included a 200-foot slotted HDPE horizontal well, a 400-foot coated concrete swale and curbing, and a series of seepage collection points manifolded to a common receiving structure. The entire system was designed for passive recovery and gravity flow transmission targeting free-product seepage areas. The treatment system consisted of a collection sump retrofitted within an existing separator, a coalescing plate oil/water separator, a surge tank, a bag filter, and carbon adsorption units. The project included a permit modification for discharge to the Providence River.
- Design Engineer for the design and start-up operation of a 2 mgd packed tower aeration system for potable water in Williston Park, New York. The primary contaminants were trichloroethane and tetrachloroethene which were stripped below drinking water standards. The design process included full scale pilot testing to assure proper removal levels.
- Design Engineer for the design, construction, and start-up operation of a 5 mgd industrial cooling water treatment system utilizing mechanical surface aeration. The system consisted of two lined aeration basins operating in series with floating mechanical aerators to remove volatile organic contaminants to levels suitable for recharge into the Long Island groundwater aquifer. The primary contaminants were 1,1-dichloroethene, trichloroethane, tetrachloroethene and vinyl chloride.
- Design Engineer for the design and construction of a 4 mgd granular activated carbon system for potable water in Hempstead, New York. The primary contaminants consisted of more than 8 volatile and semi volatile organic compounds. Responsibilities included site inspection for the installation of the six vessels containing 20,000 lbs. of carbon in each. The

system was designed for 99.9% removal efficiency with two units operating in series.

Constructed Wetlands Experience

- Senior engineer for the conceptual design of a constructed wetlands stormwater treatment system for a coal handling freight railroad facility in Norfolk, Virginia. The design consists of treatment of contaminated stormwater runoff generated from maintenance and fuel handling areas onsite. The design treatment performance objective is the reduction of total suspended solids, oil and grease, and selected metals to levels below the SPDES permit discharge standards established for two of the site's outfalls discharging to the Elizabeth River. The 3 acre system consists of a passively operated 200,000 gpd subsurface-type constructed wetlands with a low visual impact and specialized structural design to meet the needs of a busy railyard facility. Additional design components include stormwater bypass structures, jacking beneath tracks, a grit chamber, a lift station, and outfall modifications. A joint wetlands permit will be prepared for the project.
- Senior Engineer for the feasibility study, conceptual design, and construction of four constructed wetlands units and sedimentation basin for a stormwater treatment system along Cedar Swamp Creek for the City of Glen Cove, New York. The project consisted of review of stormwater studies of the 12 square mile contributing watershed, compilation of USGS water quality and flow data, evaluation of stormwater treatment methods and best management practices and optimum site selection along the creek. The constructed wetlands design included a forebay, high and low marsh cells, a micropool, and stormwater bypass structures for removal of sediment, nitrogen, phosphorus, and trace metals during first flush events. Final design for the first 1.8 acre constructed wetlands unit was completed and performance of construction management is ongoing. Design activities include structural and hydraulic design tasks with specific emphasis on storm water bypass. The design has been integrated into an into an intermodal transportation project with the addition of bicycle and walking paths. NYSDEC and Army Corps permits were obtained for the project.
- Project Engineer for the design of a 7,000 gpd subsurface flow-type constructed wetlands treatment system for a refinery site in Rhode Island. The system was designed to treat a surface-water stream impacted by petroleum hydrocarbons. The system's high aesthetic, low visual impact appeal was ideal for its golf course setting. Both phragmites SPP and Typha SPP wetland species were incorporated in the design in order to assess the biodegradation/biotransformation processes effectiveness. A growth and maturation plan and a treatment evaluation plan were developed in order to evaluate the system performance.
- Lead Engineer responsible for technical review of a design for modifications to a constructed wetlands system in Nicholas County, West Virginia. The system was designed to treat the leachate from a solid waste landfill at a maximum capacity of 30 gpm. The complete water-tight treatment system consisted of a sedimentation basin, stabilization basin, a series of three wetland cells and a finishing ditch. The wetland cells consisted of a double liner system with leachate collection piping overlaid with stone fill and a matrix of plant life. The technology combines physical, geochemical, and biological removal mechanisms operating simultaneously.

Permitting/Compliance Plans

- Project Engineer for the preparation of a Spill Prevention Control and Countermeasure (SPCC) Plan and a Storm Water Pollution Prevention Plan (SWPPP) for an 850-acre petroleum storage terminal in New England. The SPCC Plan involved the inventory of 50 bulk storage tanks and miscellaneous storage vessels and an assessment of barge loading areas, truck loading racks, additive loading areas, pumping stations, and a network of aboveground pipelines. The SWPPP encompassed an inventory and surveying of the existing storm sewer system, an evaluation of oil/water separator performance and identification of storm water management controls and practices.
- Project Engineer for the design of modifications to multiple discharge facilities along the Providence and Runnins Rivers in Rhode Island. Permitting activities were performed with the following agencies: Rhode Island Department of Environmental Management (RIDEM) Pollutant Discharge Elimination System (RPDES), RIDEM Division of Freshwater Wetlands, Coastal Resources Management Council (CRMC), and the Army Corps of Engineers.

Sanitary Experience

- Design Engineer for the evaluation of a municipal sanitary sewer system consisting of approximately 70 miles of piping ranging in size from 8 inches to 16 inches, in Garden City, New York. The sewer system was evaluated for existing and proposed flow capacity, surcharging, infiltration of groundwater, inflow of storm water, root encroachment, and sewer breaks. Evaluation methods consisted of hydraulic profile analysis, television inspection of piping, field inspection of manholes, and flow measurement. Sewer upgrading methods were evaluated including direct replacement, manhole restoration and pipe slip lining, and a rehabilitation program was implemented.
- Design Engineer for the City of Glen Cove's industrial wastewater pretreatment program which was established to monitor significant industrial users discharging to the city's wastewater treatment plant to minimize upsets to the

biological treatment mechanisms. The program work included annual facility inspections, wastewater discharge sampling, review and evaluation of quarterly self-monitoring results, calculation of discharge penalty fees, preparation of annual monitoring reports for each facility and development of wastewater discharge permits to comply with City regulations.

- Design Engineer for a heavy metals study for the municipal sanitary sewer system in the City of Glen Cove, New York. The heavy metals study consisted of the development and performance of a city-wide sewer sampling program to identify the sources of heavy metals loadings on the wastewater treatment plant. The evaluation included industrial sources, scavengers, non-industrial sources, the plant operation itself, and review of existing heavy metal studies. Recommendations were provided for minimization of loadings and pretreatment to protect the plant operations.

Stormwater Experience

- Design Engineer for the evaluation and conceptual design of a water management plan for a 200-acre proposed office complex in Bethpage, New York. The design included inlets, piping and recharge basin sizing for peak storm water runoff flows as well as a system of architectural ponds and level control structures. For dry periods, the design included flow controls connected to an existing cooling water system to maintain pond levels and for utilization as a water supply for an irrigation sprinkler system during the growing season.
- Design Engineer for the design of a municipal storm drainage system for a 200-acre contributing area in Garden City, New York. The purpose of the drainage system was to alleviate severe flooding problems for eight homes located in a local low point of a residential neighborhood. The system included over 4,800 linear feet of reinforced concrete piping ranging in size from 12 to 60 inches. Design considerations included hydraulic gradient analysis, inlet capacity, utility crossings, minimization of removals of established trees, a county road crossing, utilization of existing structures and piping, and a headwall discharge to a recharge basin. Additional design items included pavement restoration, service line relocations, curbs and sidewalks, and maintenance and protection of traffic.

Site Assessment Experience

- Senior Engineer for coordination and review of Phase I environmental site assessments for five large research and development complexes located throughout the eastern United States for a major chemical company. The site assessments were performed for due diligence prior to engaging in long-term property lease agreements. The site assessments evaluated chemical storage and handling areas and previous site usage.
- Senior Engineer for coordination and review of Phase I environmental site assessments for 12 properties associated with tennis centers acquisition on Long Island, New York. The properties were either active tennis center facilities or vacant parcels available for new construction. All site assessments were conducted in accordance with ASTM standards for commercial real estate transactions. Primary concerns identified were USTs, drum storage areas, and unauthorized dumping.
- Project Manager representing a group of banks investing in a 20 acre commercial property in Westchester, New York. The onsite soil was contaminated with several volatile and semi volatile organics. Performed an evaluation of the remediation plan which included onsite biological treatment of soils and aeration and oil water separation of groundwater.

Water Main Experience

- Project Engineer for the design of over 6,000 feet of ductile iron water main in sizes from 4 to 16 inches for Town of Hempstead, New York Department of Water and the Nassau County, New York Department of Public Works. The designs included wet and dry connections to existing mains, fittings, valves, copper services and fire hydrants. Restoration work included replacement of asphalt pavement, concrete sidewalk and curbs, and grass areas.
- Design Engineer for the design and construction management of over 10,000 feet of ductile iron water main in sizes from 6 to 12 inches for the Town of Wallkill, New York. The designs included booster pump station upgrades, a stream crossing, a wetlands crossing, jacking of 36-inch casing beneath a state highway, air release chambers, copper service re-connections, fire hydrants, valves, and appurtenances. Restoration work included wetlands restoration, backfilling, and regrading within a NYSDOT right-of-way and grass and pavement replacement.
- Design Engineer for the design and construction management of upgrades to a 3.7 mgd potable water booster pump station for the Town of Wallkill, New York. The design featured the replacement of a hydropneumatic tank and pump system with three larger capacity centrifugal pumps. The upgrades were performed while maintaining the pump station service. The pump station revisions included piping, pump pads, shut-off valves, silent check valves, pressure relief valves, gauges, ventilation equipment and a motor control center.

Feasibility Study Experience

- Senior Engineer for the performance of a feasibility study and remedial design of a free product containment and recovery system at a former refinery in New England. The areal extent of the free-product plume was approximately 10 acres with a measured thickness of up to eight feet. Pilot testing activities consisted of pump tests, baildown tests, and funnel and gate

systems with and without sheeting. The selected remedial alternative consisted of re-routing and repair of active storm sewer piping, closure-in place of a former 72-inch storm drain using clay fill material to form a barrier wall, and installation of multiple recovery trenches totaling 450 linear feet. The recovery trenches were installed to a depth of 14 feet using a deep trenching machine and were completed with gravel, horizontal perforated piping, recovery wells, and monitoring wells to accommodate both passive and active product recovery pumping equipment. Product recovery enhancement pilot testing was also performed by using non-ionic surfactants, mechanical reworking of soil and vacuum extraction methods.

- Project Engineer for the performance of a feasibility study for the containment of a free-product plume beneath a refinery site in Rhode Island. The feasibility study included analysis of groundwater modeling, bench and pilot scale treatability studies, groundwater quality characterization, identification and screening of discharge alternatives, and treatment process evaluations. The work also included the evaluation of the discharge of treatment system effluent to several receptors including groundwater, wetlands, sanitary sewers, and storm sewers. Discharge requirements were evaluated for process water, off-gas air, and residual wastes. Several treatment processes were also evaluated including metals precipitation and sludge dewatering, VOC and SVOC removal, and off-gas treatment. Preferred alternatives for each process were selected for remedial design development.
- Project Engineer for the performance of a feasibility study for a hazardous waste landfill located at a Superfund site in Tennessee. The feasibility study focused on the characterization and quantification of landfill leachate consisting of chlorinated organic compounds as well as proprietary pesticide compounds. The remedial technologies which were evaluated included leachate collection alternatives, onsite treatment alternatives and offsite disposal methods. An analysis was performed for onsite treatment technologies which included constructed wetlands, biological fluidized bed reactor, and granular activated carbon adsorption. The technologies were assembled into four feasible remedial alternatives and treatability studies were recommended to confirm the suitability of selected processes.

PROFESSIONAL AFFILIATIONS

National Society of Professional Engineers

American Society of Civil Engineers

WEF Hazardous Waste Committee, 1996–1998

PUBLICATIONS

Assessment and Remediation of Off-Spec Asphalt Disposal Areas - Co-authored, Contaminated Soils, Volume 3, Amherst Scientist Publishers, 1998

Use of a Subsurface Flow Constructed Wetlands for Collection and Removal of Water Containing BTEX, Co-authored, Proceedings of the 2000 Petroleum Hydrocarbons and Organic Chemicals in Groundwater Conference, National Ground Water Association

PROFESSIONAL PROFILE

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EDUCATION

MS, Environmental Engineering, Polytechnic University, 2001
BS, Chemical Engineering, Universidade Federal do Rio Grande do Sul, Brazil, 1997

Wendy Shen

Senior Engineer II

EXPERIENCE SUMMARY

Over twenty-five years of experience: Senior Engineer, Project Engineer, Staff Engineer, and Staff Assistant Engineer with Roux.

TECHNICAL SPECIALTIES

Management of construction and remediation projects, including Brownfield redevelopment, building construction, excavation and disposal of impacted soil, engineering services for the investigation, design, construction, and operation and maintenance of remedial systems for the treatment of contaminated soil and groundwater.

REPRESENTATIVE PROJECTS

- Senior Engineer responsible for the management of investigation and remediation various Brownfields redevelopment sites containing hazardous and non-hazardous soils in New York City and surrounding. These projects included investigation, implementation of in situ waste characterization sampling program, Interim Remedial Measures, Remedial Action Work Plans, which included excavation of soils below grade and management of soils including transportation and disposal and coordination with various disposal facilities. Most of these sites were accepted into the New York City Office of Environmental Remediation (NYC OER) Brownfield Cleanup Program (BCP) or the New York State BCP.
- Senior Engineer responsible for the management of a former manufactured gas plant (MGP) project in Brooklyn, New York. Responsibilities include investigation, preparation and implementation of the remedial action plan, waste characterization, submittals review, management and tracking of project budget and schedule, regulatory reporting, and coordination with project team.
- Senior Engineer responsible for scheduling at a large petroleum remediation project in Brooklyn, New York. Responsibilities included management of all present and future tasks to be completed including operations and maintenance, remedial investigation, design and construction, facility upgrades, special operations, permitting and compliance tracking, health and safety, audits/assessments, sampling and regulatory reporting.
- Project Engineer for the remediation of soil and groundwater at 100+ facilities owned and/or operated by various city agencies in New York City. Activities included preparation of administrative/contractual requirements, work plans, and monitoring reports, cost estimates, proposals, engineering support, and construction oversight.
- Project Engineer for the design of an air sparge and soil vapor extraction system in Andover, Massachusetts.
- Project Engineer for the remediation of soil and groundwater at a former chemical manufacturing company in Rensselaer, New York. Activities included construction oversight, preparation of reports including Feasibility Study, Interim Remedial Measures, Community Air Monitoring Plans, Sampling Plans, Bid Review, Invoice Review, and various field investigations.
- Project Engineer for the closure of an underground storage tank (UST) at a shipping facility in Queens, New York. Activities included preparation of cost estimate, work plans, and field management.

- Project Engineer for an investigation and remediation at a former petroleum refinery in Buffalo, New York. Responsible for assisting in the preparation of multiple work plans and reports of results for field investigations including soil borings and sampling, well installation, and groundwater sampling. Also responsible for reviewing and assisting in the preparation of activities related to the operation of the remediation systems at the Site, including maps, evaluation summaries, plans and compliance monitoring reports.
- Project and Resident Engineer for the soil remediation of the Captain's Cove Condominiums Site, a federal NPL site, located in Glen Cove, New York. Activities include: supervision of Contractor's activities, regulatory interaction, compile daily field reports, manage laboratory database for excavated and reclaimed soil, shop drawing review, change order preparation, and Health and Safety compliance. Site remediation was completed in September 2001 to accommodate site redevelopment as a commercial waterfront and operating seaport area. Currently managing OM&M groundwater monitoring program at the Site.
- Staff Engineer for a 450-gpm, dual-phase, product recovery system in Greenpoint, Brooklyn, New York. Tasks include: operation and maintenance of groundwater recovery and treatment system and free product recovery system. Also assisted in reviewing drawings and specs related to installation of aboveground storage tanks.
- Staff Engineer for the remediation of soil and groundwater at a former chemical company facility in Brooklyn, New York, using a Soil Vapor Extraction and Air Sparging System. Tasks include: review of performance data for air sparge system, operation and maintenance for the SVE/AS System, progress report preparation, and monthly groundwater sampling.
- Staff Engineer for a divestment assessment at a service station in Stratford, Connecticut. Tasks include: oversight, soil sampling, FOIA investigation, coordination with subcontractor and regulatory agencies, and preparation of letters and reports.
- Resident Engineer for the soil remediation at a former chemical company facility in Dayton, New Jersey. Activities include: construction oversight, Health and Safety compliance, field sampling, and completion report preparation.
- Responsible for assisting in preparing cost estimates, proposals, feasibility studies, interim remedial measures, remedial action plans, health and safety plans, and technical specifications for a variety of soil and groundwater remedial objectives.
- Student/Research Assistant at Laboratory of Polymers, Universidade Federal do Rio Grande do Sul, POA, Brazil. Performed experiments on the metallization of plastics using polyaniline.
- Intern/Researcher at Laboratory of Research and Development at a petrochemical company, Ipiranga Petroquimica, Brazil. Conducted laboratory tests involving additives used in polymers and responsible for quality control/assurance of products.

PROFESSIONAL TRAININGS

OSHA 40 Hour Health and Safety Course

OSHA 8 Hour Refresher Courses

PROFESSIONAL PROFILE

CONTACT INFORMATION
Main: (781) 569-4000
Direct: (781) 569-4054
Email: jhauri@rouxinc.com
Website: www.rouxinc.com

200 Summit Drive, Suite 500
Burlington, MA 01803

EDUCATION
PhD, Environmental Engineering, University of California, 2001
MS, Environmental Science (concentration in environmental chemistry), Indiana University, 1993
BA, Biochemistry, University of Texas, 1991

James Hauri, PhD

Senior Scientist I

EXPERIENCE SUMMARY
Dr. Hauri is a broad-based environmental scientist with more than thirty years of experience in environmental science, engineering, and chemistry. His professional experience includes Roux, Senior Scientist I (2022 – present); Assumption University, Associate Professor (tenured), (2007-2012, 2014-2022) and Assistant Professor (2001-2007); Exponent, Senior Scientist (2012-2015); Harvard University, School of Public Health, Visiting Scientist (part time: 2008-2012); CH2M-Hill, Environmental Consultant (2001); San Francisco Estuary Institute, Intern, (1997-1998); and Southwest Research Institute, Scientist (1993-1994).

TECHNICAL SPECIALTIES
Dr. Hauri's multidisciplinary background has included field sampling, environmental analytical chemistry, toxicity testing and data analysis. Much of his work has explored the nexus between the chemistry and ecotoxicity of environmental contaminants.

Dr. Hauri's areas of expertise include:

- Heavy metal speciation and toxicology;
- Environmental data analysis;
- Validation of environmental lab data;
- Analysis of ecotoxicology data; and
- Aquatic chemistry and contamination.

REPRESENTATIVE PROJECTS

- **Deep Water Horizon Oil Spill.** Evaluated the appropriateness of new methods to solubilize oil used with toxicity tests during the DWH spill. Compared the composition and concentration changes in polycyclic aromatic hydrocarbons (PAHs) associated with the new preparatory methods with field collected samples in order to determine if the toxicity tests performed were relevant to the actual toxicity expected to be seen in the field. Performed a literature review of case studies or laboratory experiments quantifying cardiotoxicity in fish due to early life stage exposure to oil. The review considered both functional and morphological cardiotoxic endpoints due to exposure to three tricyclic polyaromatic hydrocarbons (PAHs): dibenzothiophene, fluorene, and phenanthrene. This review was combined with PAH concentrations from samples taken from the Gulf of Mexico during the Deep Water Horizon oil spill in order to determine whether enough data was available to make an injury assessment for fish in the Gulf of Mexico impacted by the oil spill.
- **Alameda Corridor Transportation Authority (ACTA).** Provided technical expertise to gain a unique temporary discharge waiver for a multi-billion-dollar construction project in California. ACTA gained a waiver to discharge dewatering effluent during construction into the LA-Long Beach Harbor. The waiver regulated the effluent based on bioavailable (labile) metal concentration rather than total or dissolved concentrations, and then the project ensured non-detect labile metal concentration via the addition of EDTA.
- **Insurance Client.** Evaluated historical reports and contemporarily collected chemical data to help determine responsibility for a regional airport with contaminated groundwater from historical (1940s-1970s) use of chlorinated solvents as part of both military and civilian airport operations. Considered historical solvent use and disposal practices at airports along with fate and transport chemistry of chlorinated solvents in soil and water to create conceptual site model for airport. Helped to create rebuttal to adverse consultant reports, as well as prepared principal and insurance lawyer for deposition and trial testimony.
- **Industrial Client.** Evaluated historical reports as well as analyzed organic and metal data from more recently collected samples to determine potential responsibility among several industrial sources for superfund contaminated lake sediments. Evaluated the analysis by adverse consultants and helped to create rebuttal to adverse consultant reports.

- **Industrial Client.** Evaluated historical operations and waste disposal processes of products containing PFAS in the context of available (at the time) knowledge of PFAS as well as standard of practice for disposal across the industry.
- **Agricultural Health Study.** Part of the field team in Iowa and North Carolina that collected multi-media samples from farms and the farming population over several weeks for a multi-agency study that explored potential causes of cancer among farmers and their families. Part of the analytical team that analyzed collected samples for a suite of pesticides with the data used to inform how the

REPRESENTATIVE EXPERT RETENTIONS/APPEARANCES

Analytical Environmental Chemistry

- Knurr, B. and J. Hauri (2021) Connecting Bomb Calorimetry to Environmental Issues: Two Bomb Calorimetry Experiments. Presented at the Fall ACS National Meeting, August 22-26. Atlanta, GA.
- Hauri, J. and B. Niece. (2018) Fingerprinting White Wines with Excitation-Emission Matrix Fluorescence. Poster presented at the Fall ACS National Meeting, August 19-23. Boston, MA.
- Hauri, J. (2017) Variation to the Excitation-Emission Matrix Fluorescence Characterization of Allochthonous Dissolved Organic Carbon due to pH changes. Poster presented 38th Annual Society of Environmental Toxicology and Chemistry National Meeting, 12 - 16 November, Minneapolis, MN.
- J. Hauri and K. Wierzbicki. (2011) Excitation-Emission Matrix Fluorescence Characterization of Dissolved Organic Carbon Leached from Leaves from Various Tree Species. Poster presented at the Society of Environmental Toxicology and Chemistry National Meeting, 13 - 17 November, Boston, MA.
- Miller, M. and J.F. Hauri. (2005) Development of an HPLC/UV Method for the Detection of Ibuprofen in River Water. Poster presented at the National Conference on Undergraduate Research, April 21-23, Lexington, VA.
- Parnass, K. and J.F. Hauri. (2004) Development of an HPLC/UV Method for the Measurement of Environmentally Relevant Concentrations of Ibuprofen. Poster presented at the North Atlantic Regional Chapter of the Society of Environmental Toxicology and Chemistry Meeting, June 9-11, Portsmouth, RI.

Chemistry and Toxicology

- S. Kane Driscoll, J. Hauri, K. Kulacki, A. M. Morrison, M. McArdle, A. Schierz, K. Yozzo, and M. Edwards. (2016) The Influence of Mixing Energy on the Concentration and Composition of Oil in Laboratory Toxicity Tests. Poster presented 37th Annual Society of Environmental Toxicology and Chemistry National Meeting, 6 - 10 November, Orlando, FL.
- Yozzo, K. S. Kane Driscoll, J. Hauri, M. McArdle, and A.M. Morrison. (2016) Review of Current Literature of Cardiotoxicity of Oil to Early Life Stages of Fish and the Use in Injury Assessments. Presentation at 37th Annual Society of Environmental Toxicology and Chemistry National Meeting, 6 - 10 November, Orlando, FL.
- Kane Driscoll, S., R. Wells Whittlesey, J. Hauri, K. Kulacki, A. Schierz, T.L. Morse, A.M. Morrison, and K. Yozzo. (2016) The Influence of Mixing energy on the Concentration, Composition, Toxicity, and Relevance of the Laboratory Toxicity Tests. Poster presented at the Gulf of Mexico Oil Spill and Ecosystem Science Conference. 1-4 February, Tampa Bay, Fl.
- Frazier, K., K. Cushing, and J. Hauri (2010) A visual documentation of acute toxicity in zooplankton. Poster presented at the North Atlantic Regional Chapter of the Society of Environmental Toxicology and Chemistry Meeting, June 2-4, Narragansett, RI.
- Hauri, J.F. and A.J. Horne. (2002) Copper toxicity reduction via EDTA addition: a real-world application. Presentation at the Society of Environmental Toxicology and Chemistry National Meeting, 16 - 20 November, Salt Lake City, UT.
- Hauri, J.F. and A.J. Horne. (2002) Copper toxicity reduction via EDTA addition: a real-world application. Poster presented at the American Chemical Society National Meeting, 18-22 August, Boston, MA.
- Hauri, J.F., K.D. Zoh, A. Steding, and A.J. Horne. (1999) Trinitrotoluene toxicity reduction to Ceriodaphnia dubia by humic acid complexation. Poster presented at the 19th NALMS Annual Meeting, 1-4 December, Reno, Nevada.
- Hauri, J.F., and A.J. Horne. (1997) Toxicity and chemistry of copper in urban runoff from San Francisco Bay creeks. Presented before the CALMS Annual Meeting, November, California.
- Hauri, J.F., and A.J. Horne. (1997) Influence of food on bioavailability of copper in the 7-day Ceriodaphnia dubia bioassay. Poster presented at the 18th SETAC Annual Meeting, 16-27 November, San Francisco, California.
- Hauri, J.F., and A.J. Horne. (1997) Toxicity and chemistry of copper in urban runoff from San Francisco Bay creeks. Presented before the 17th NALMS Annual Meeting, 2-6 December, Houston, Texas

Misc. Environmental Chemistry

- Drumm, E., and J. Hauri (2020) Analysis of Existing Water Quality Datasets of Lake Quinsigamond, Massachusetts. Poster accepted at North Atlantic Regional Chapter of the Society of Environmental Toxicology and Chemistry Meeting, April 13-14, Avery Point, CT. Accepted, but conference was cancelled.
- Hauri, J. (2007) Adapting research for laboratory experiments in undergraduate environmental chemistry courses. Presented at the 234th ACS National Meeting, August 19-23, Boston, MA.
- Kulevich, S. J. Van Doren, and J. Hauri. (2006) Green arsenic remediation. Presented at the 231st ACS National Meeting, March 26-30, Atlanta, GA.
- Hauri, J. and B. Niece. (2005) Removal of Ibuprofen through a Wastewater Treatment Plant. Poster presented Society of Environmental Toxicology and Chemistry National Meeting, 14 - 17 November, Baltimore, MD.
- Hauri, J.F., P. Frank, and A.J. Horne. (1999) Acid mine drainage in rural and urban environments. Presented before the 19th NALMS Annual Meeting, 1-4 December, Reno, Nevada.

PROFESSIONAL AFFILIATIONS

American Chemistry Society (ACS)

Society of Environmental Toxicology and Chemistry (SETAC)

NAC SETAC – board of directors 2005-2008, VP 2008-2009, Pres 2009-2010

PUBLICATIONS

Analytical Environmental Chemistry

Knurr, B. and J.F. Hauri. (2020) An Alternative to Recycling: Measurement of Combustion Enthalpies of Plastics via Bomb Calorimetry. Journal of Chemical Education. V.97, pp 1465-1469.

Niece, B. and J.F. Hauri. (2013) Determination of Mercury in Fish: A Low-Cost Implementation of Cold-Vapor Atomic Absorbance for the Undergraduate Environmental Chemistry Laboratory. Journal of Chemical Education. V.90 (14), pp 487–489.

Hauri, J. and B. Niece. (2011) Leaching of silver from silver-impregnated food containers. Journal of Chemical Education. V.88 (10), pp 1407–1409.

Chemistry and Toxicology

Hauri, J.F. and A.J. Horne. (2006) Copper toxicity reduction via EDTA addition: a real-world application. Water Environment Research. v. 78, pp. 2508-2513.

Hauri, J.F. and A.J. Horne. (2004) Reduction in Labile Copper in the 7 Day Ceriodaphnia dubia Toxicity Test due to the interaction with zooplankton food. Chemosphere. v. 56, pp. 717-723.

Misc. Environmental Chemistry

Hauri, J.F., C. Daughton, and R. Klaper. (2016) The Challenge: Establishing Policy in an Uncertain World: What can be done to address emerging environmental contaminants having indeterminate or subtle ecological or human impacts? Environmental Toxicology and Chemistry. V.35(2), pp. 266-270.

Hauri, J.F. and L.A. Schaider. (2009) Remediation of Acid Mine Drainage with Sulfate Reducing Bacteria. Journal of Chemical Education. v. 86 (2), pp. 216-218. Other Publications

Lincoln, R., C. Amarasiriwardena, J. Shine, A. Ettinger, C. Paciorek, J. Hauri, R. Wright, J. Spengler (2011) Meconium as a biomarker for prenatal metals exposure: Methodological considerations and variations in serial samples over time (Diss. Chapter). Biomarkers of Metals Exposure in Two High-Risk Communities. School of Public Health, Harvard University.

Hauri, J.F. (1998) Scoping study of air deposition monitoring information relevant to water quality of San Francisco Bay, Final Report. Bay Area Stormwater Management Agencies Association.

Hauri, J.F., and Alex J. Horne. (1997) Bioavailability and toxicity of heavy metals in urban runoff in simulated natural conditions. University of California Water Resources Center.

APPENDIX M

Request to Import/Reuse Fill Material Form

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Request to Import/Reuse Fill or Soil

This form is based on the information required by DER-10, Section 5.4(e) and 6NYCRR Part 360.13. Use of this form is not a substitute for reading the applicable regulations and Technical Guidance document.

SECTION 1 – SITE BACKGROUND

Site Name:

Site Number:

The allowable site use is: Choose an item

Have Ecological Resources been identified? Choose an item

Is this soil originating from the site? Choose an item

How many cubic yards of soil will be imported/reused? Choose an item

If greater than 1000 cubic yards will be imported, enter volume to be imported:

SECTION 2 – MATERIAL OTHER THAN SOIL

Is the material to be imported gravel, rock or stone? Choose an item

Does it contain less than 10%, by weight, material that passes a size 100 sieve? Choose an item

Is this virgin material from a permitted mine or quarry? Choose an item

Is this material recycled concrete or brick from a DEC registered processing facility? Choose an item

SECTION 3 - SAMPLING

Provide a brief description of the number and type of samples collected in the space below:

Example Text: 5 discrete samples were collected and analyzed for VOCs. 2 composite samples were collected and analyzed for SVOCs, Inorganics & PCBs/Pesticides.

If the material meets requirements of DER-10 section 5.4(e)5 (other material), no chemical testing needed.

SECTION 3 CONT'D - SAMPLING

Provide a brief written summary of the sampling results or attach evaluation tables (compare to DER-10, Appendix 5):

Example Text: Arsenic was detected up to 17 ppm in 1 (of 5) samples; the allowable level is 16 ppm.

If Ecological Resources have been identified use the "If Ecological Resources are Present" column in Appendix 5.

SECTION 4 – SOURCE OF FILL

Name of person providing fill and relationship to the source:

Name and address of fill source:

Location where fill was obtained:

Identification of any state or local approvals as a fill source:

If no approvals are available, provide a brief history of the use of the property that is the fill source:

Provide a list of supporting documentation included with this request:

The information provided on this form is accurate and complete.

_____ _____

Signature Date

_____

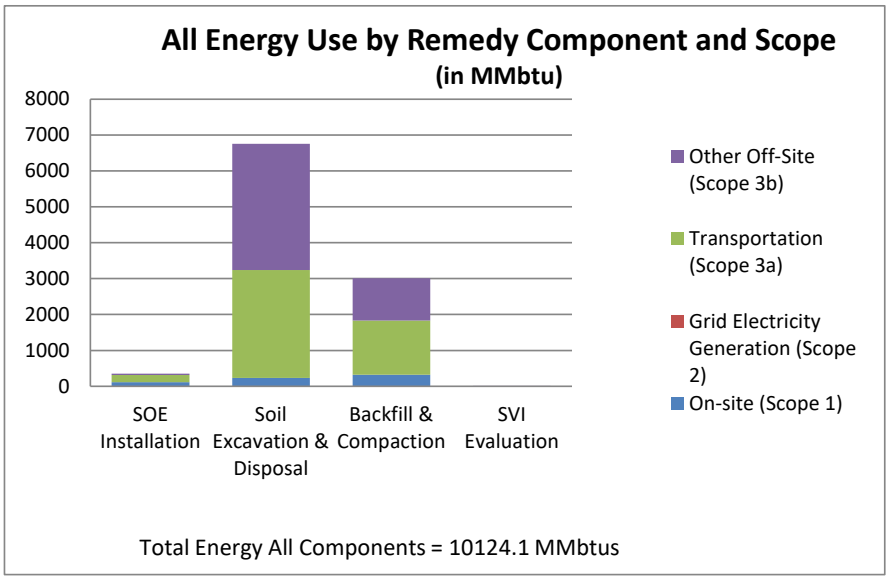
Print Name

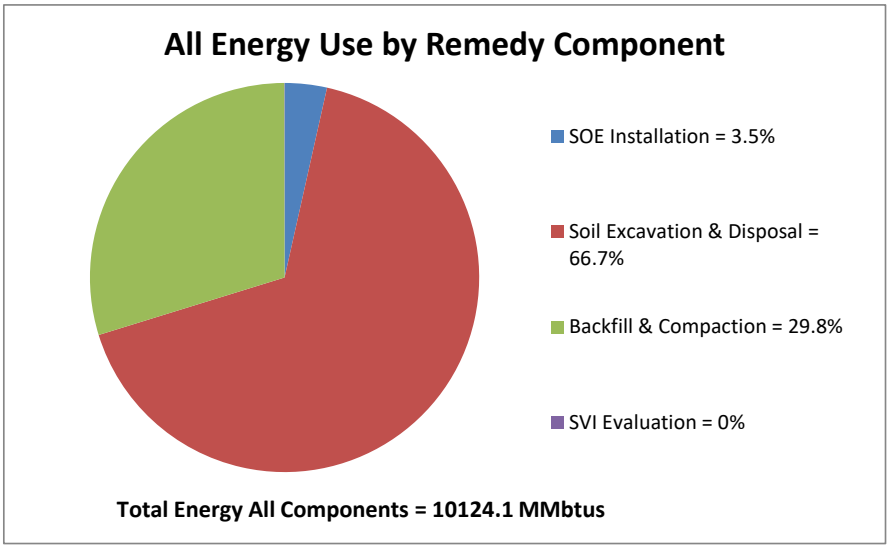
_____

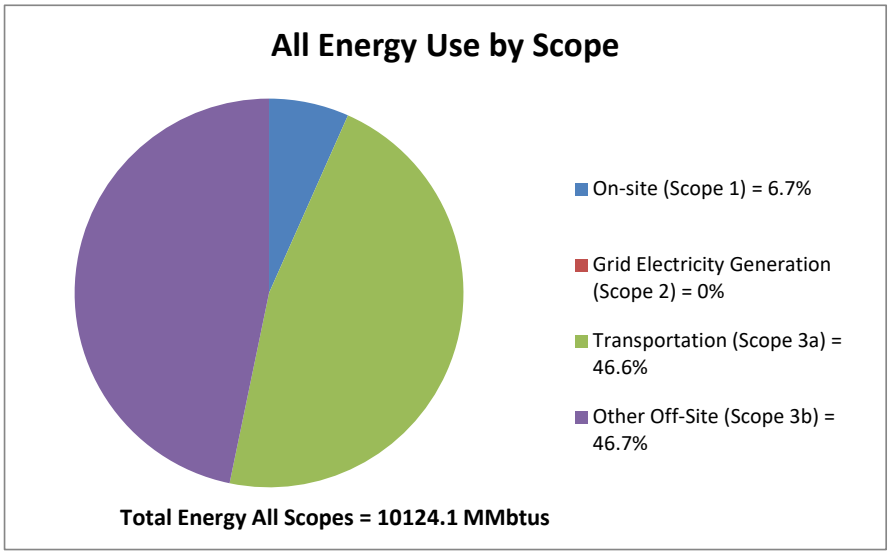
Firm

APPENDIX N

GSR Worksheets


All Energy Use by Remedy Component and Scope
(in MMbtu)
8000
7000
6000
5000
4000
3000
2000
1000
0
SOE Installation
Soil Excavation & Disposal
Backfill & Compaction
SVI Evaluation
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
Total Energy All Components = 10124.1 MMbtus


All Energy Use by Remedy Component
SOE Installation = 3.5%
Soil Excavation & Disposal = 66.7%
Backfill & Compaction = 29.8%
SVI Evaluation = 0%
Total Energy All Components = 10124.1 MMbtus


All Energy Use by Scope
On-site (Scope 1) = 6.7%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 46.6%
Other Off-Site (Scope 3b) = 46.7%
Total Energy All Scopes = 10124.1 MMbtus

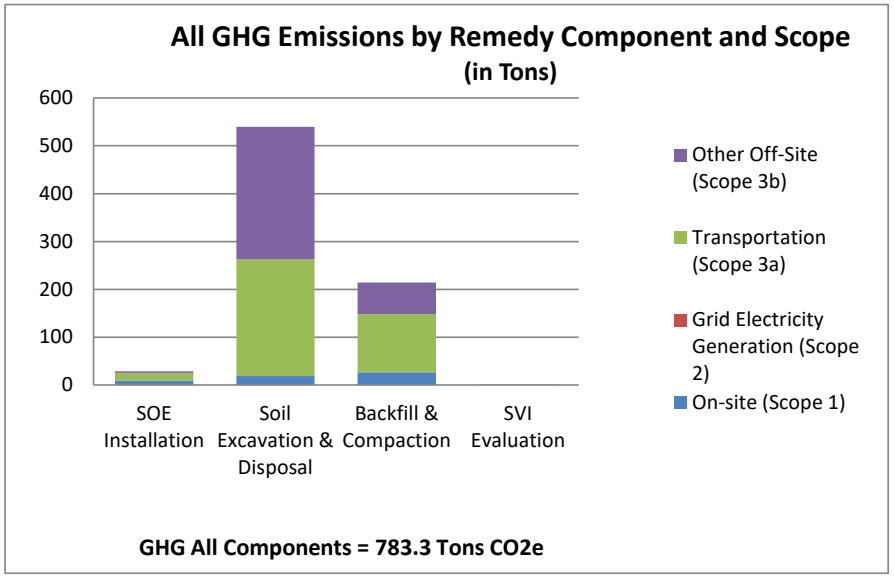
Total Energy
MMbtus

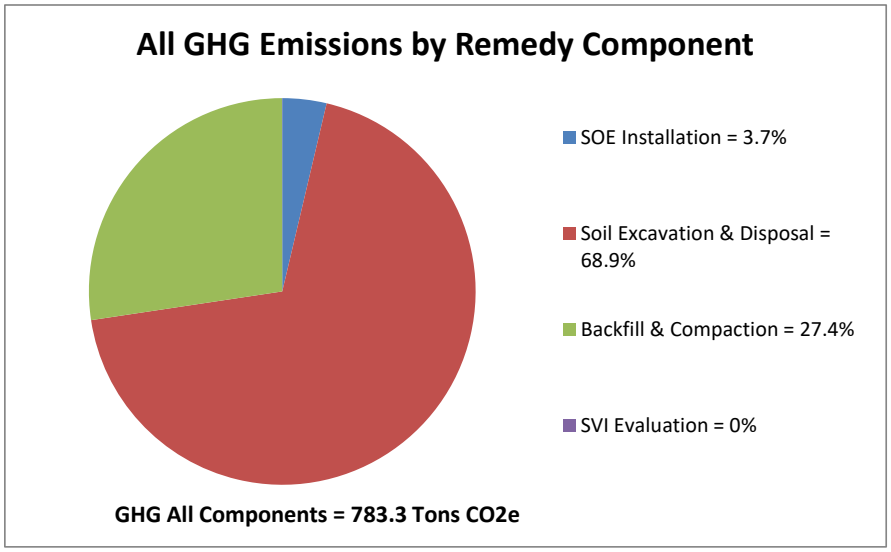
	SOE Install	Soil Excava	Backfill & C	SVI Evaluat	< Compon	< Compon	Total	
On-site (Scope 1)	114.7	233.5	325.7	0.0	0.0	0.0	673.9	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
nsportation (Scope 3a)	200.4	3,010.2	1,506.0	1.3	0.0	0.0	4,717.9	Tran
ner Off-Site (Scope 3b)	39.9	3,511.0	1,180.3	1.1	0.0	0.0	4,732.3	Oth
Total	355.0	6,754.8	3,012.0	2.4	0.0	0.0	10,124.1	

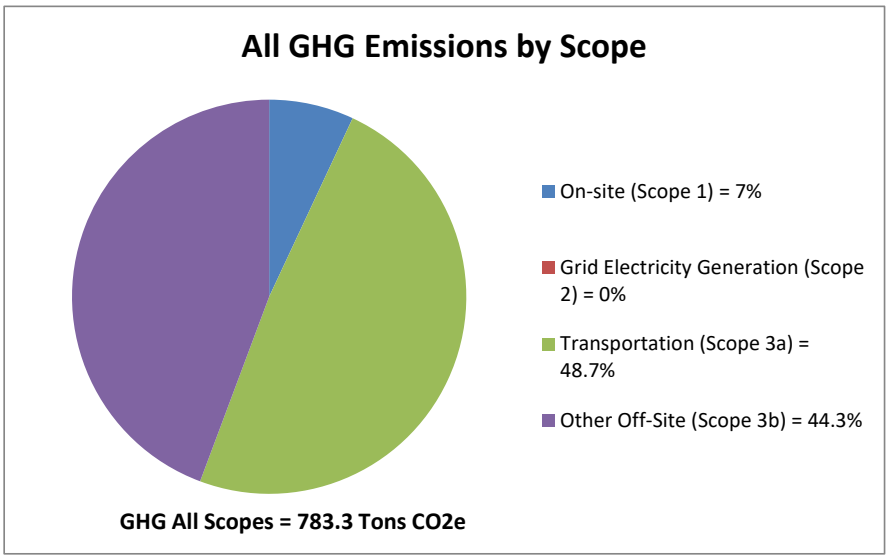
SOE Installation = 3.5%
Soil Excavation & Disposal = 66.7%
Backfill & Compaction = 29.8%
SVI Evaluation = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 6.7%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 46.6%
Other Off-Site (Scope 3b) = 46.7%

Total Energy All Components = 10124.1 MMbtus
Total Energy All Scopes = 10124.1 MMbtus


All GHG Emissions by Remedy Component and Scope
(in Tons)
600
500
400
300
200
100
0
SOE Installation
Soil Excavation & Disposal
Backfill & Compaction
SVI Evaluation
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
GHG All Components = 783.3 Tons CO2e


All GHG Emissions by Remedy Component
SOE Installation = 3.7%
Soil Excavation & Disposal = 68.9%
Backfill & Compaction = 27.4%
SVI Evaluation = 0%
GHG All Components = 783.3 Tons CO2e

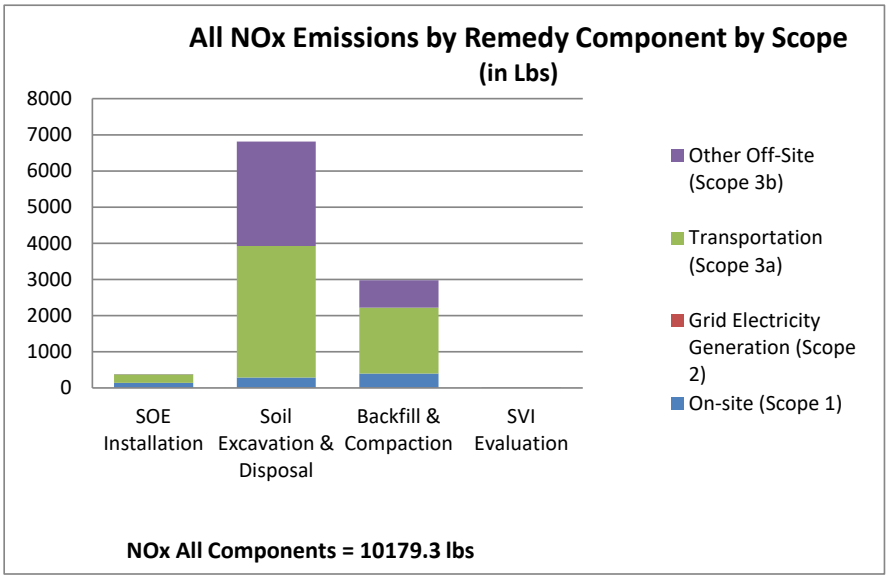

All GHG Emissions by Scope
On-site (Scope 1) = 7%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 48.7%
Other Off-Site (Scope 3b) = 44.3%
GHG All Scopes = 783.3 Tons CO2e

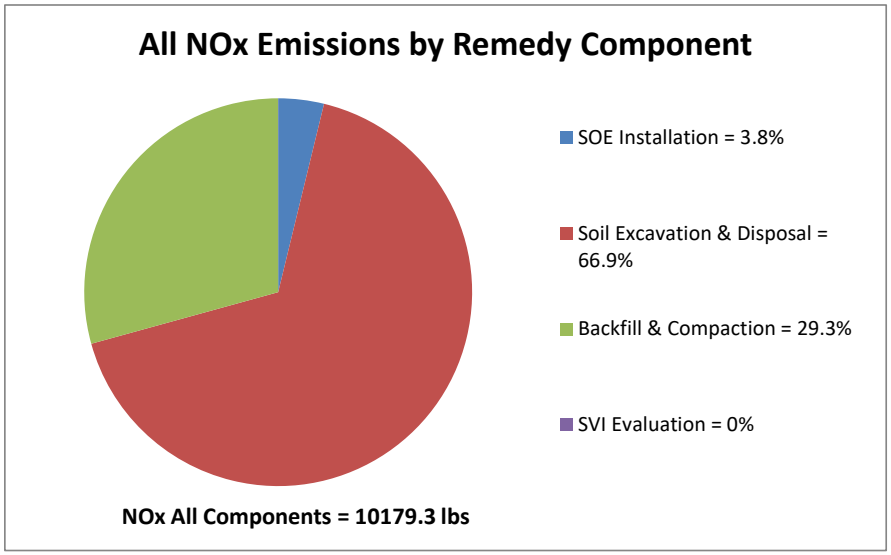
GHG Tons CO2e	SOE Install	Soil Excava	Backfill & C	SVI Evaluat	< Compon	< Compon	Total	
On-site (Scope 1)	9.3	18.9	26.4	0.0	0.0	0.0	54.5	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
ısportation (Scope 3a)	16.2	243.6	121.9	0.1	0.0	0.0	381.8	Tran
ıer Off-Site (Scope 3b)	3.4	277.5	66.0	0.1	0.0	0.0	347.0	Oth
Total	28.9	540.0	214.3	0.2	0.0	0.0	783.3	

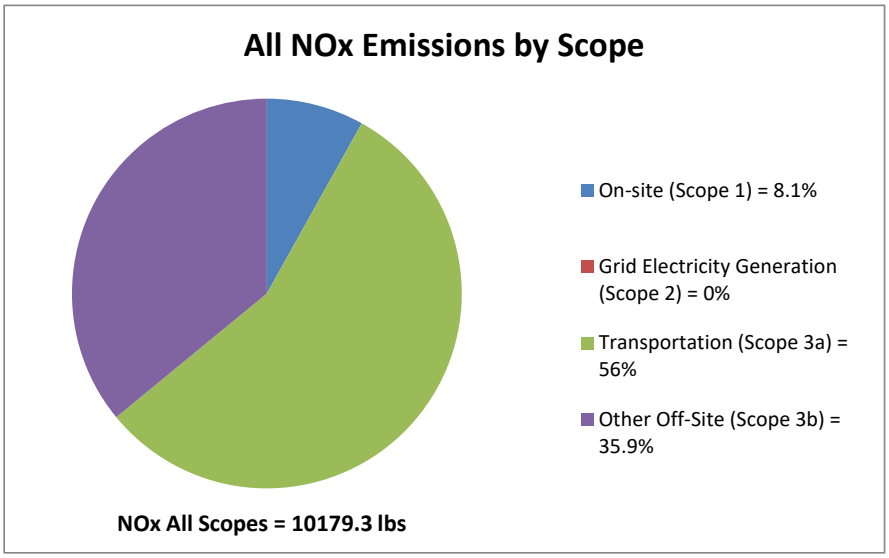
SOE Installation = 3.7%
Soil Excavation & Disposal = 68.9%
Backfill & Compaction = 27.4%
SVI Evaluation = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 7%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 48.7%
Other Off-Site (Scope 3b) = 44.3%

GHG All Components = 783.3 Tons CO2e
GHG All Scopes = 783.3 Tons CO2e


All NOx Emissions by Remedy Component by Scope
(in Lbs)
8000
7000
6000
5000
4000
3000
2000
1000
0
SOE Installation
Soil Excavation & Disposal
Backfill & Compaction
SVI Evaluation
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
NOx All Components = 10179.3 lbs


All NOx Emissions by Remedy Component
SOE Installation = 3.8%
Soil Excavation & Disposal = 66.9%
Backfill & Compaction = 29.3%
SVI Evaluation = 0%
NOx All Components = 10179.3 lbs


All NOx Emissions by Scope
On-site (Scope 1) = 8.1%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 56%
Other Off-Site (Scope 3b) = 35.9%
NOx All Scopes = 10179.3 lbs

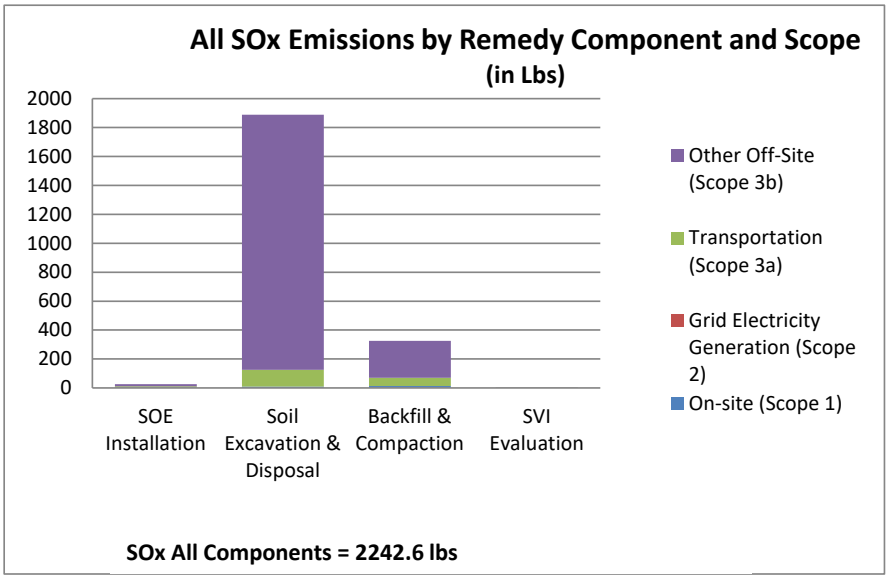
NOx
lbs

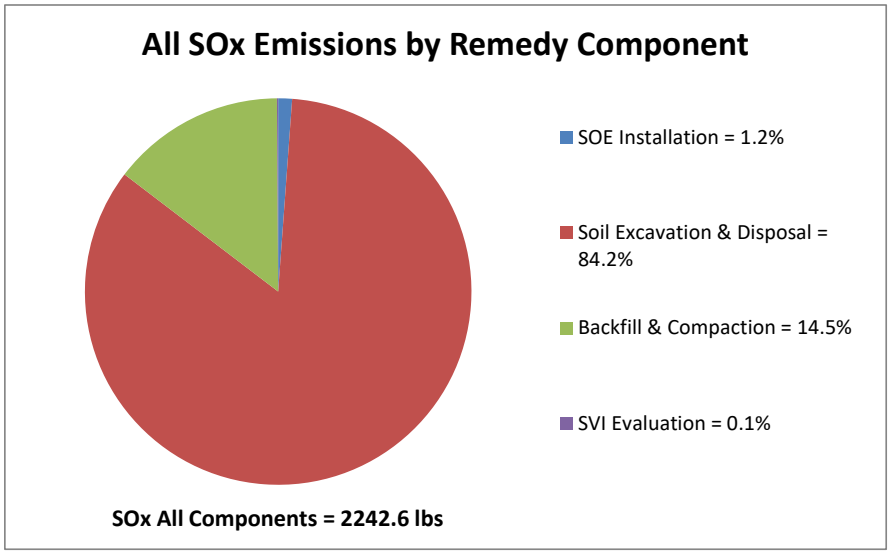
	SOE Install	Soil Excava	Backfill & C	SVI Evaluat	< Compon	< Compon	Total	
On-site (Scope 1)	140.3	285.6	398.3	0.0	0.0	0.0	824.2	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
ısportation (Scope 3a)	235.2	3,638.8	1,822.1	0.3	0.0	0.0	5,696.4	Tran
ıer Off-Site (Scope 3b)	11.6	2,886.9	759.2	1.1	0.0	0.0	3,658.8	Oth
Total	387.0	6,811.3	2,979.7	1.4	0.0	0.0	10,179.3	

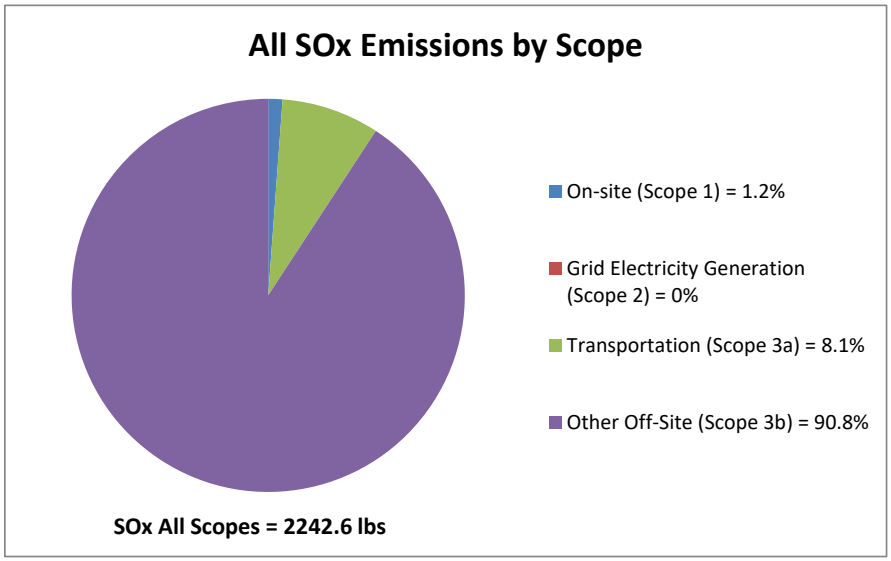
SOE Installation = 3.8%
Soil Excavation & Disposal = 66.9%
Backfill & Compaction = 29.3%
SVI Evaluation = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 8.1%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 56%
Other Off-Site (Scope 3b) = 35.9%

NOx All Components = 10179.3 lbs
NOx All Scopes = 10179.3 lbs


All SOx Emissions by Remedy Component and Scope
(in Lbs)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
SOE Installation
Soil Excavation & Disposal
Backfill & Compaction
SVI Evaluation
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
SOx All Components = 2242.6 lbs


All SOx Emissions by Remedy Component
SOE Installation = 1.2%
Soil Excavation & Disposal = 84.2%
Backfill & Compaction = 14.5%
SVI Evaluation = 0.1%
SOx All Components = 2242.6 lbs

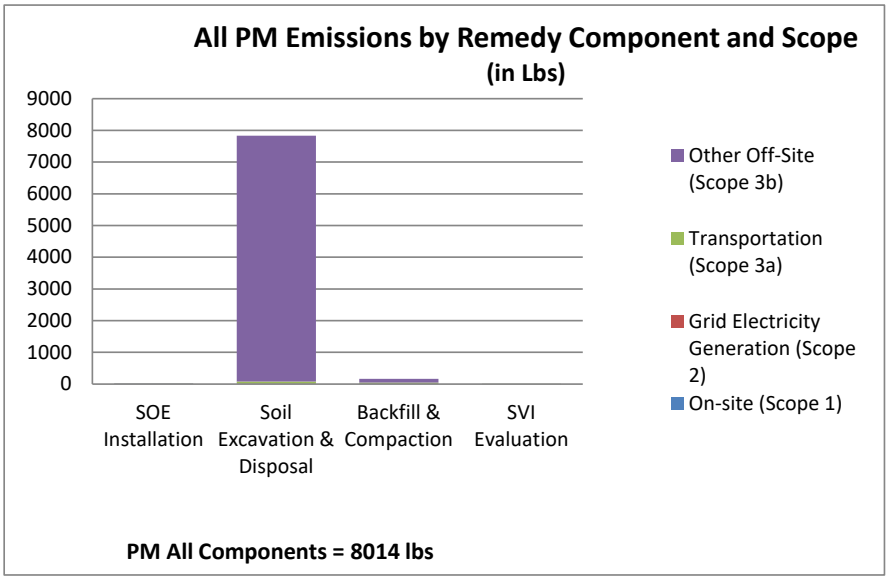

All SOx Emissions by Scope
On-site (Scope 1) = 1.2%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 8.1%
Other Off-Site (Scope 3b) = 90.8%
SOx All Scopes = 2242.6 lbs

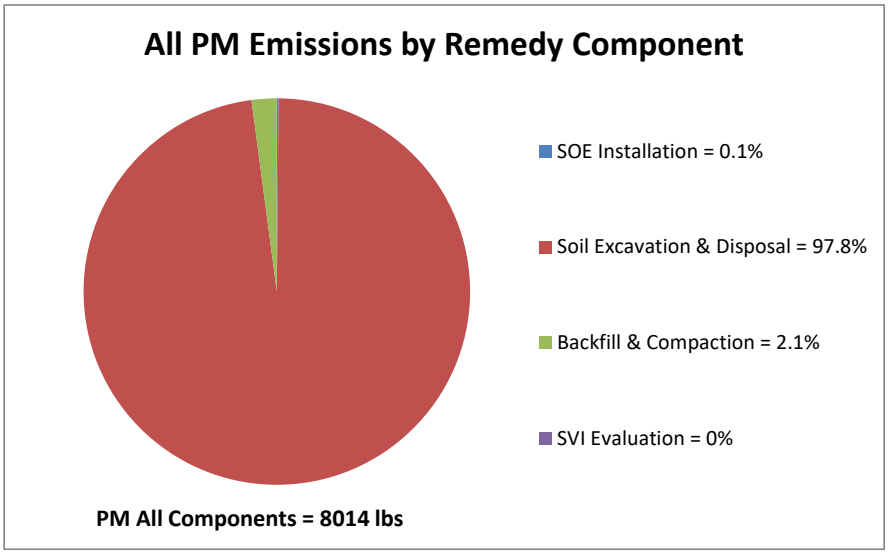
SOx lbs	SOE Install	Soil Excava	Backfill & C	SVI Evaluat	< Compon	< Compon	Total	
On-site (Scope 1)	4.5	9.1	12.7	0.0	0.0	0.0	26.2	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
ısportation (Scope 3a)	7.4	115.4	57.8	0.0	0.0	0.0	180.6	Tran
ıer Off-Site (Scope 3b)	14.0	1,764.1	255.4	2.3	0.0	0.0	2,035.8	Oth
Total	25.9	1,888.6	325.8	2.3	0.0	0.0	2,242.6	

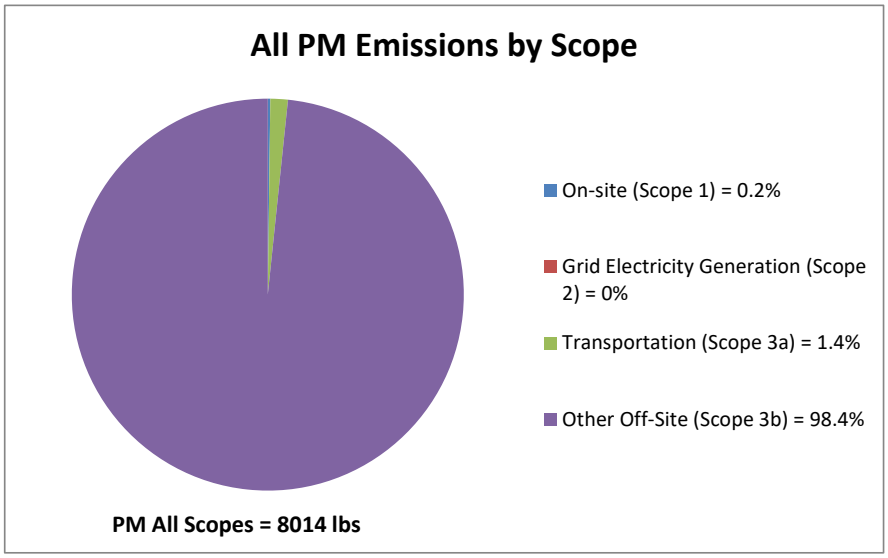
SOE Installation = 1.2%
Soil Excavation & Disposal = 84.2%
Backfill & Compaction = 14.5%
SVI Evaluation = 0.1%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 1.2%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 8.1%
Other Off-Site (Scope 3b) = 90.8%

SOx All Components = 2242.6 lbs
SOx All Scopes = 2242.6 lbs


All PM Emissions by Remedy Component and Scope
(in Lbs)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
SOE Installation
Soil Excavation & Disposal
Backfill & Compaction
SVI Evaluation
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
PM All Components = 8014 lbs


All PM Emissions by Remedy Component
SOE Installation = 0.1%
Soil Excavation & Disposal = 97.8%
Backfill & Compaction = 2.1%
SVI Evaluation = 0%
PM All Components = 8014 lbs

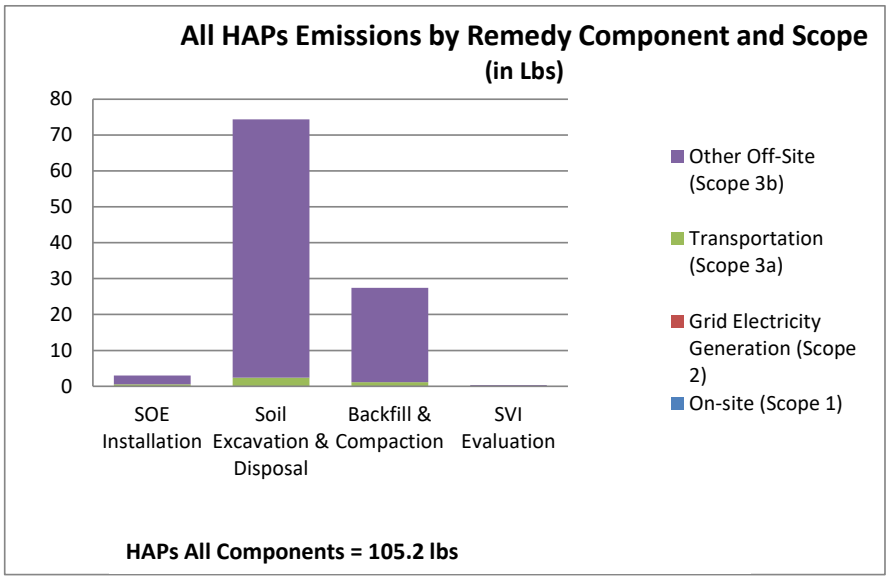

All PM Emissions by Scope
On-site (Scope 1) = 0.2%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 1.4%
Other Off-Site (Scope 3b) = 98.4%
PM All Scopes = 8014 lbs

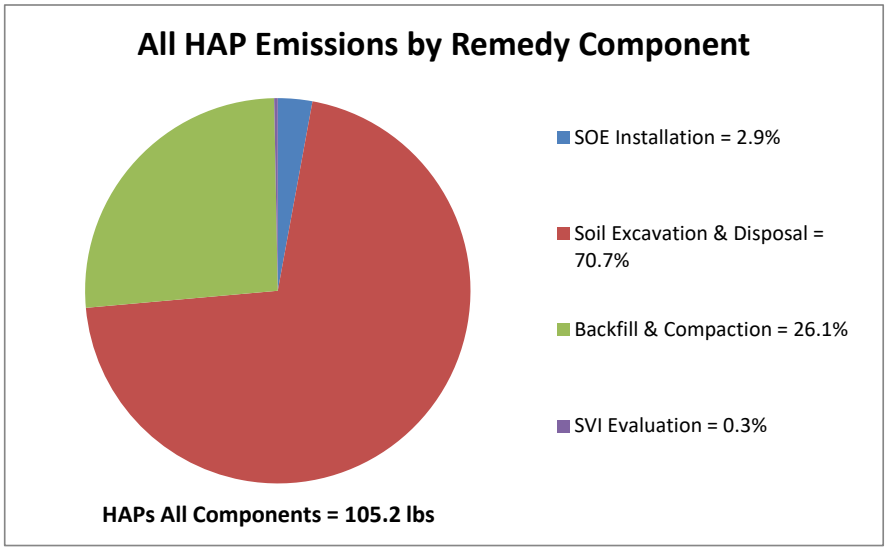
PM lbs	SOE Install	Soil Excava	Backfill & C	SVI Evaluat	< Compon	< Compon	Total	
On-site (Scope 1)	2.8	5.7	8.0	0.0	0.0	0.0	16.5	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
ısportation (Scope 3a)	4.9	73.6	36.8	0.0	0.0	0.0	115.4	Tran
ıer Off-Site (Scope 3b)	3.9	7,755.2	122.7	0.4	0.0	0.0	7,882.1	Oth
Total	11.6	7,834.5	167.5	0.4	0.0	0.0	8,014.0	

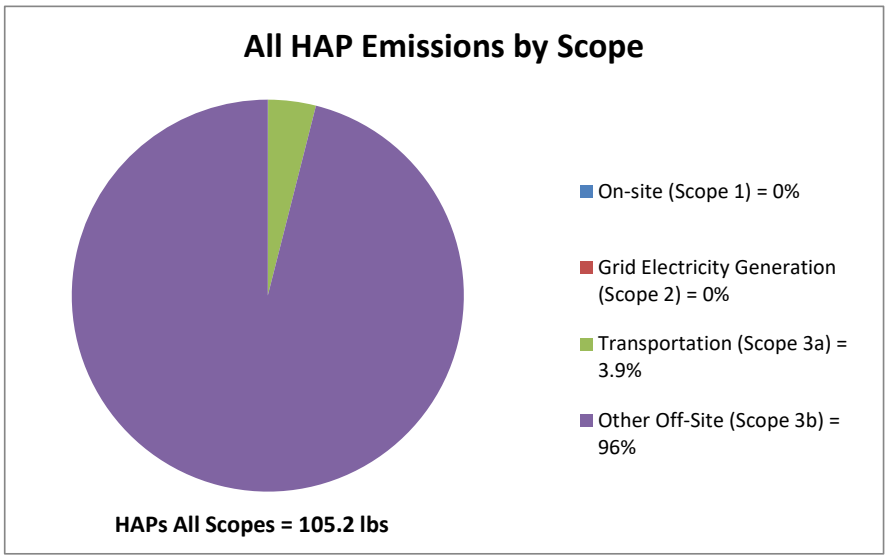
SOE Installation = 0.1%
Soil Excavation & Disposal = 97.8%
Backfill & Compaction = 2.1%
SVI Evaluation = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 0.2%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 1.4%
Other Off-Site (Scope 3b) = 98.4%

PM All Components = 8014 lbs
PM All Scopes = 8014 lbs


All HAPs Emissions by Remedy Component and Scope
(in Lbs)
80
70
60
50
40
30
20
10
0
SOE Installation
Soil Excavation & Disposal
Backfill & Compaction
SVI Evaluation
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
HAPs All Components = 105.2 lbs


All HAP Emissions by Remedy Component
SOE Installation = 2.9%
Soil Excavation & Disposal = 70.7%
Backfill & Compaction = 26.1%
SVI Evaluation = 0.3%
HAPs All Components = 105.2 lbs

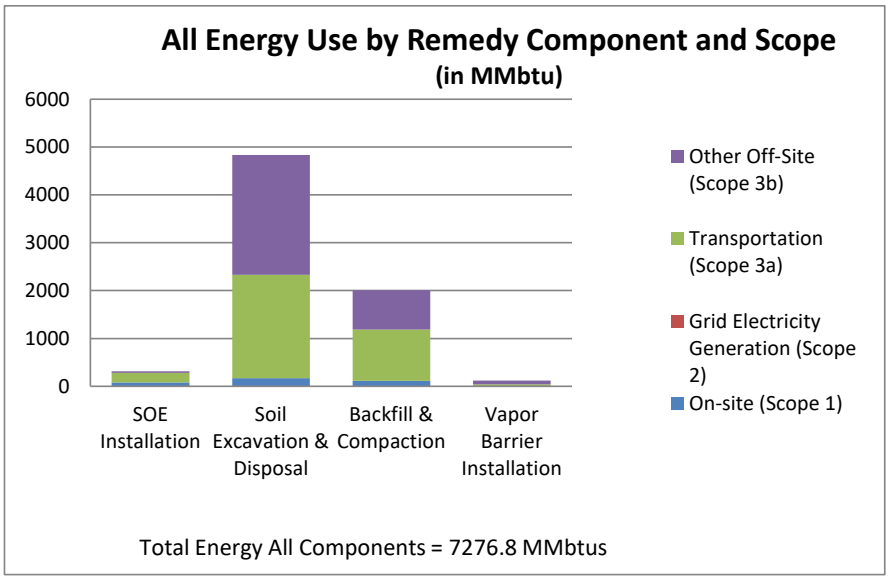

All HAP Emissions by Scope
On-site (Scope 1) = 0%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 3.9%
Other Off-Site (Scope 3b) = 96%
HAPs All Scopes = 105.2 lbs

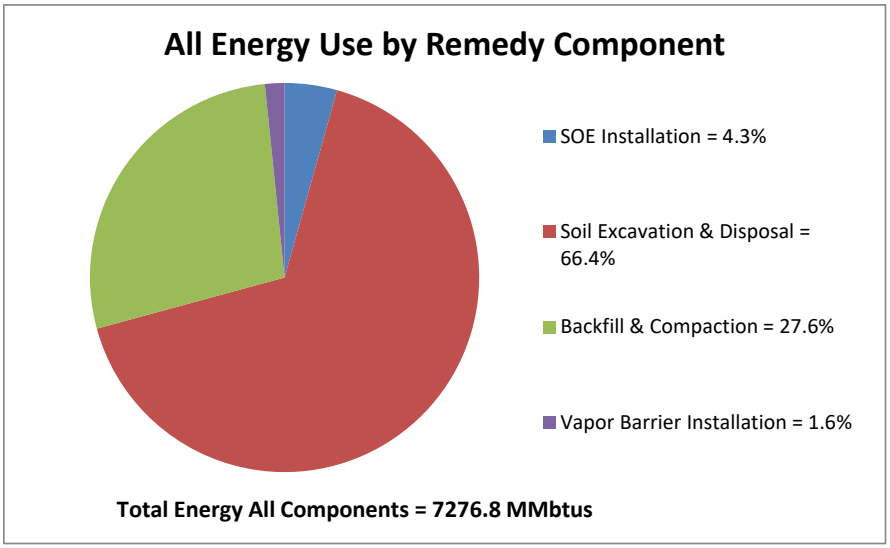
HAPs lbs	SOE Install	Soil Excava	Backfill & C	SVI Evaluat	< Compon	< Compon	Total
On-site (Scope 1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ısportation (Scope 3a)	0.5	2.4	1.1	0.1	0.0	0.0	4.1
ıer Off-Site (Scope 3b)	2.5	72.0	26.3	0.2	0.0	0.0	101.0
Total	3.0	74.4	27.5	0.3	0.0	0.0	105.2

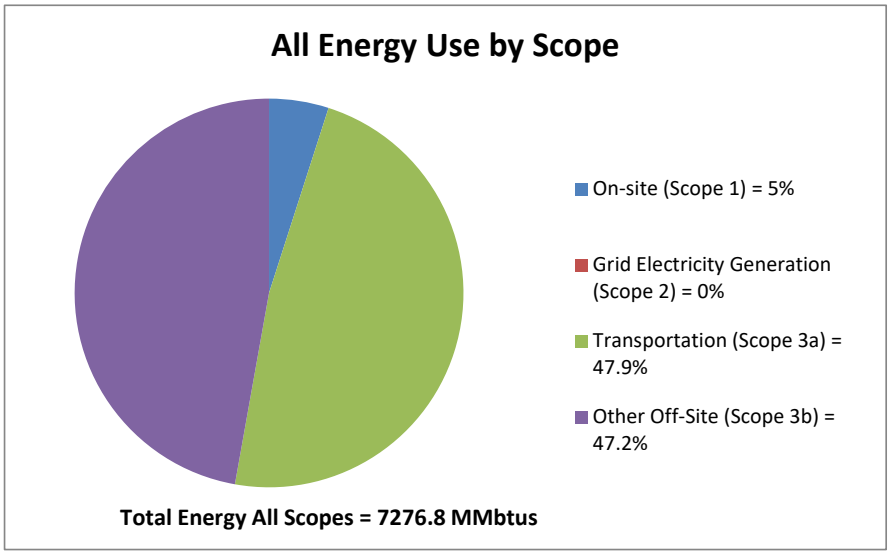
SOE Installation = 2.9%
Soil Excavation & Disposal = 70.7%
Backfill & Compaction = 26.1%
SVI Evaluation = 0.3%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 0%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 3.9%
Other Off-Site (Scope 3b) = 96%

HAPs All Components = 105.2 lbs
HAPs All Scopes = 105.2 lbs


All Energy Use by Remedy Component and Scope
(in MMbtu)
6000
5000
4000
3000
2000
1000
0
SOE Installation
Soil Excavation & Disposal
Backfill & Compaction
Vapor Barrier Installation
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
Total Energy All Components = 7276.8 MMbtus


All Energy Use by Remedy Component
SOE Installation = 4.3%
Soil Excavation & Disposal = 66.4%
Backfill & Compaction = 27.6%
Vapor Barrier Installation = 1.6%
Total Energy All Components = 7276.8 MMbtus


All Energy Use by Scope
On-site (Scope 1) = 5%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 47.9%
Other Off-Site (Scope 3b) = 47.2%
Total Energy All Scopes = 7276.8 MMbtus

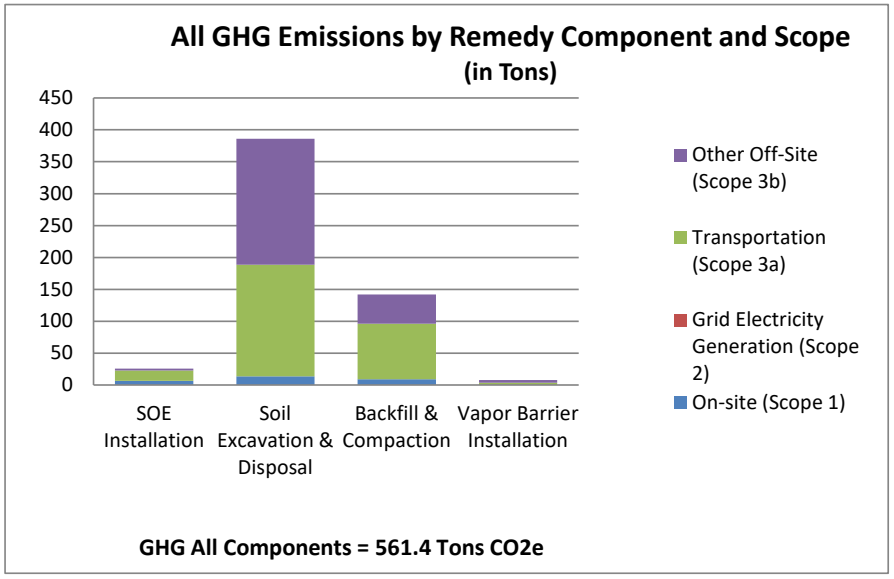
Total Energy
MMbtus

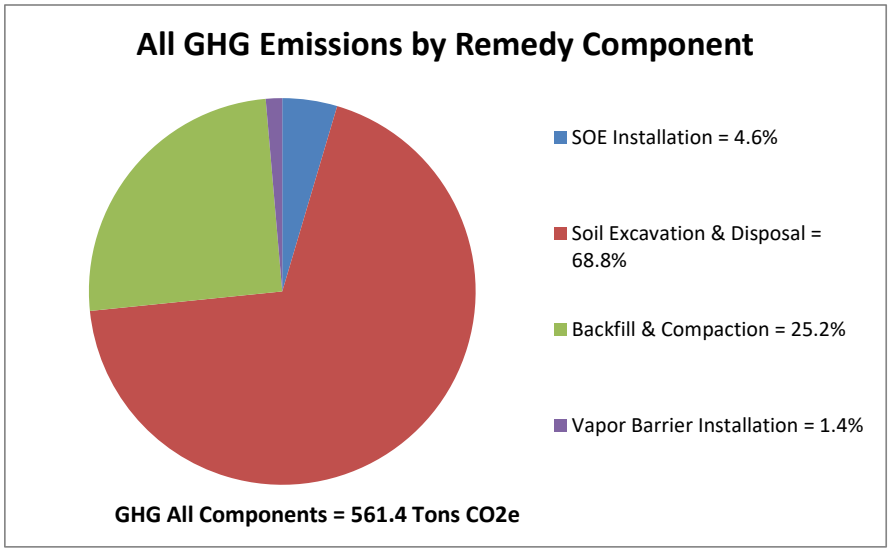
	SOE Install	Soil Excava	Backfill & C	Vapor Barr	< Compon	< Compon	Total	
On-site (Scope 1)	80.3	167.8	112.6	0.0	0.0	0.0	360.7	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
nsportation (Scope 3a)	200.4	2,164.0	1,075.1	42.8	0.0	0.0	3,482.3	Tran
ner Off-Site (Scope 3b)	35.7	2,501.3	821.7	75.1	0.0	0.0	3,433.8	Oth
Total	316.4	4,833.1	2,009.5	117.9	0.0	0.0	7,276.8	

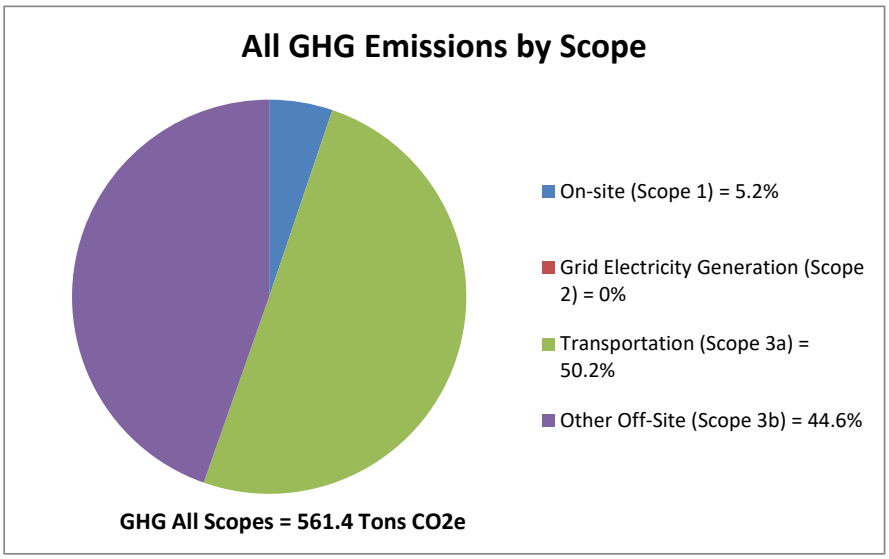
SOE Installation = 4.3%
Soil Excavation & Disposal = 66.4%
Backfill & Compaction = 27.6%
Vapor Barrier Installation = 1.6%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 5%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 47.9%
Other Off-Site (Scope 3b) = 47.2%

Total Energy All Components = 7276.8 MMbtus
Total Energy All Scopes = 7276.8 MMbtus


All GHG Emissions by Remedy Component and Scope
(in Tons)
450
400
350
300
250
200
150
100
50
0
SOE Installation
Soil Excavation & Disposal
Backfill & Compaction
Vapor Barrier Installation
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
GHG All Components = 561.4 Tons CO2e


All GHG Emissions by Remedy Component
SOE Installation = 4.6%
Soil Excavation & Disposal = 68.8%
Backfill & Compaction = 25.2%
Vapor Barrier Installation = 1.4%
GHG All Components = 561.4 Tons CO2e

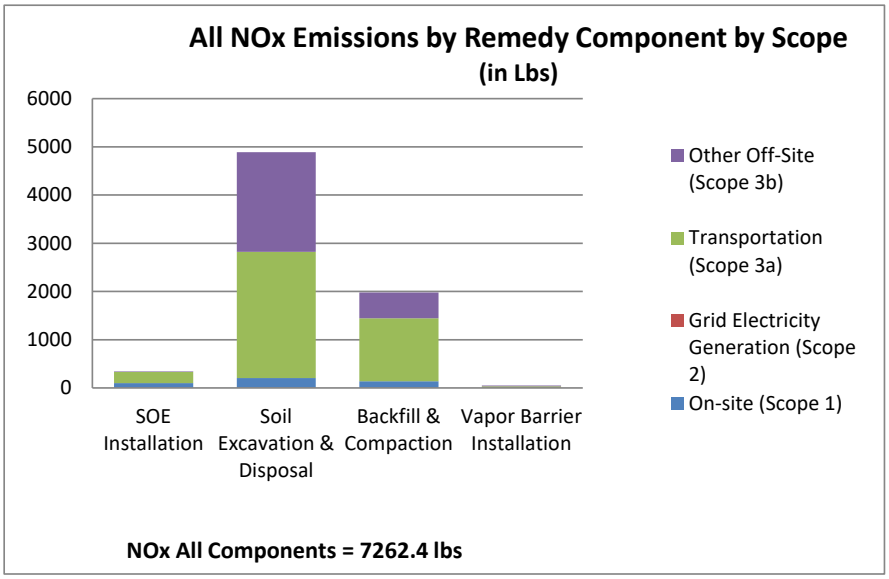

All GHG Emissions by Scope
On-site (Scope 1) = 5.2%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 50.2%
Other Off-Site (Scope 3b) = 44.6%
GHG All Scopes = 561.4 Tons CO2e

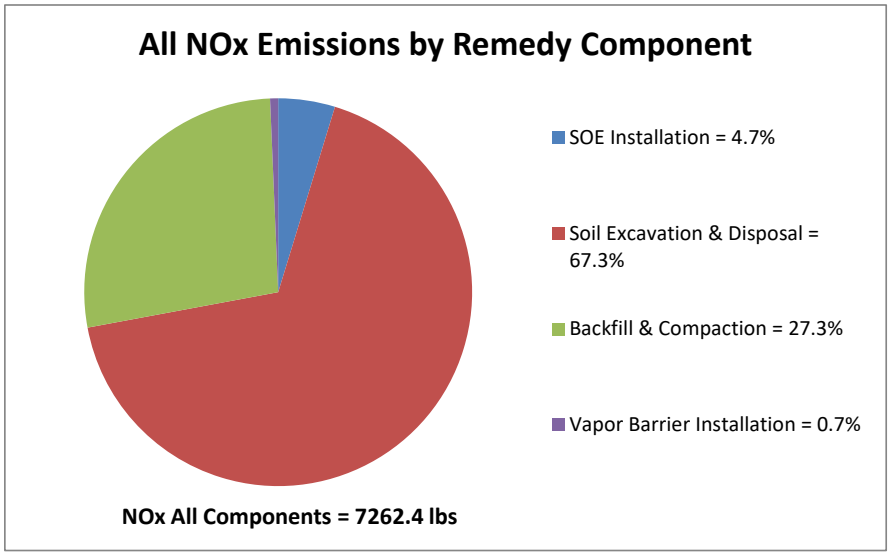
GHG Tons CO2e	SOE Install	Soil Excava	Backfill & C	Vapor Barr	< Compon	< Compon	Total	
On-site (Scope 1)	6.5	13.6	9.1	0.0	0.0	0.0	29.2	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
ısportation (Scope 3a)	16.2	175.1	87.0	3.4	0.0	0.0	281.8	Tran
ıer Off-Site (Scope 3b)	3.1	197.5	45.6	4.2	0.0	0.0	250.4	Oth
Total	25.8	386.2	141.7	7.7	0.0	0.0	561.4	

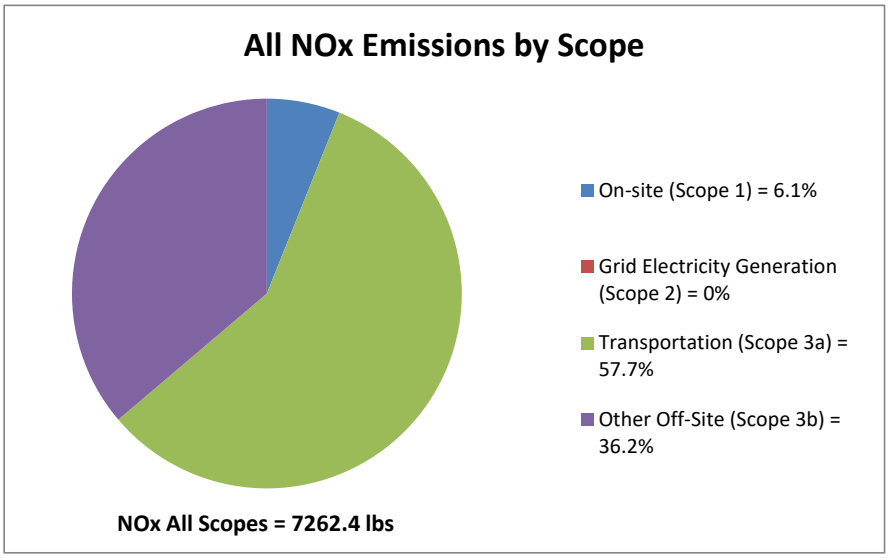
SOE Installation = 4.6%
Soil Excavation & Disposal = 68.8%
Backfill & Compaction = 25.2%
Vapor Barrier Installation = 1.4%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 5.2%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 50.2%
Other Off-Site (Scope 3b) = 44.6%

GHG All Components = 561.4 Tons CO2e
GHG All Scopes = 561.4 Tons CO2e


All NOx Emissions by Remedy Component by Scope
(in Lbs)
6000
5000
4000
3000
2000
1000
0
SOE Installation
Soil Excavation & Disposal
Backfill & Compaction
Vapor Barrier Installation
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
NOx All Components = 7262.4 lbs


All NOx Emissions by Remedy Component
SOE Installation = 4.7%
Soil Excavation & Disposal = 67.3%
Backfill & Compaction = 27.3%
Vapor Barrier Installation = 0.7%
NOx All Components = 7262.4 lbs


All NOx Emissions by Scope
On-site (Scope 1) = 6.1%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 57.7%
Other Off-Site (Scope 3b) = 36.2%
NOx All Scopes = 7262.4 lbs

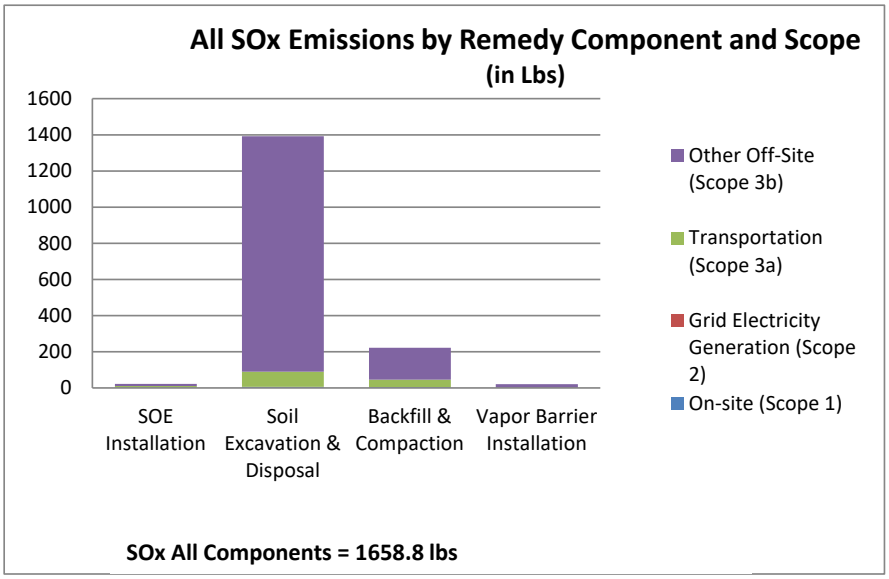
NOx
lbs

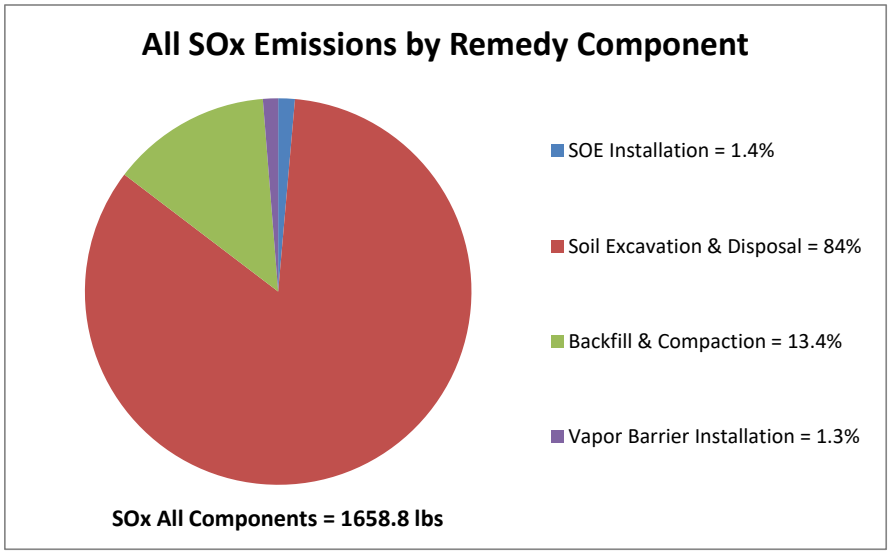
	SOE Install	Soil Excava	Backfill & C	Vapor Barr	< Compon	< Compon	Total	
On-site (Scope 1)	98.2	205.3	137.7	0.0	0.0	0.0	441.2	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
sportation (Scope 3a)	235.2	2,616.1	1,308.2	32.6	0.0	0.0	4,192.1	Tran
ier Off-Site (Scope 3b)	10.3	2,069.0	533.9	15.9	0.0	0.0	2,629.1	Oth
Total	343.7	4,890.4	1,979.8	48.5	0.0	0.0	7,262.4	

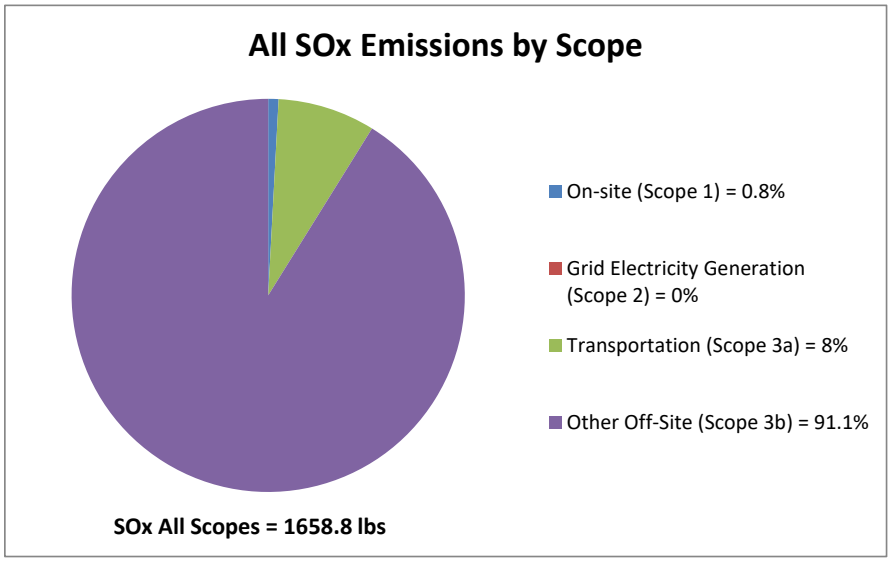
SOE Installation = 4.7%
Soil Excavation & Disposal = 67.3%
Backfill & Compaction = 27.3%
Vapor Barrier Installation = 0.7%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 6.1%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 57.7%
Other Off-Site (Scope 3b) = 36.2%

NOx All Components = 7262.4 lbs
NOx All Scopes = 7262.4 lbs


All SOx Emissions by Remedy Component and Scope
(in Lbs)
1600
1400
1200
1000
800
600
400
200
0
SOE Installation
Soil Excavation & Disposal
Backfill & Compaction
Vapor Barrier Installation
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
SOx All Components = 1658.8 lbs


All SOx Emissions by Remedy Component
SOE Installation = 1.4%
Soil Excavation & Disposal = 84%
Backfill & Compaction = 13.4%
Vapor Barrier Installation = 1.3%
SOx All Components = 1658.8 lbs

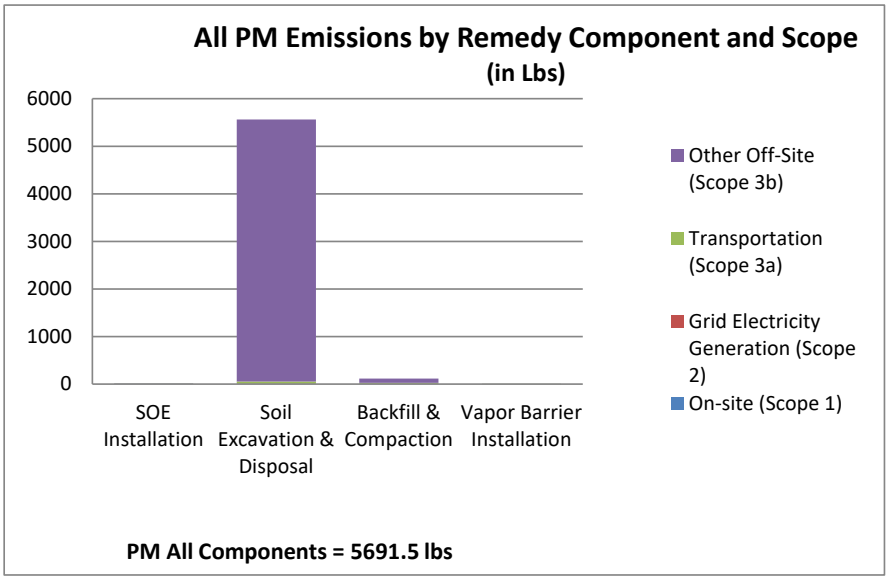

All SOx Emissions by Scope
On-site (Scope 1) = 0.8%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 8%
Other Off-Site (Scope 3b) = 91.1%
SOx All Scopes = 1658.8 lbs

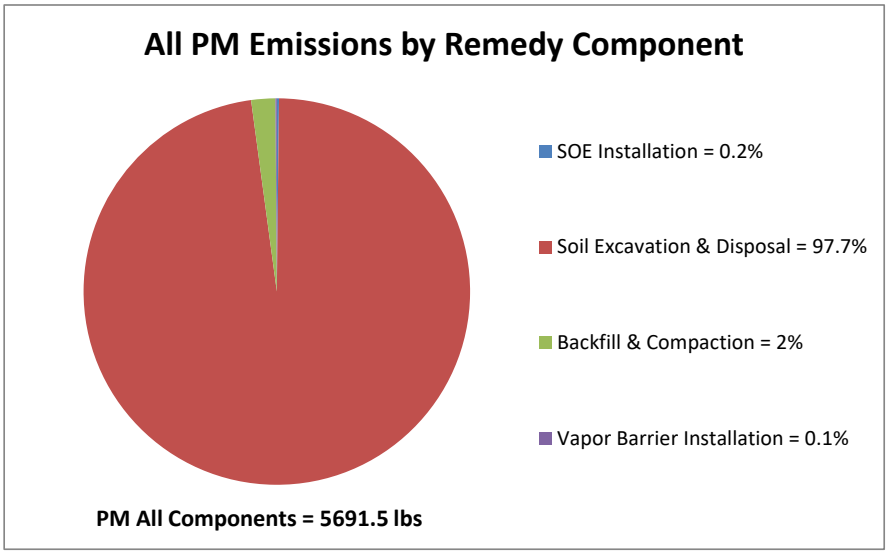
SOx lbs	SOE Install	Soil Excava	Backfill & C	Vapor Barr	< Compon	< Compon	Total	
On-site (Scope 1)	3.1	6.5	4.4	0.0	0.0	0.0	14.0	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
nsportation (Scope 3a)	7.4	83.0	41.5	1.0	0.0	0.0	132.9	Tran
ıer Off-Site (Scope 3b)	12.5	1,303.2	176.1	20.1	0.0	0.0	1,511.8	Oth
Total	23.0	1,392.7	222.0	21.0	0.0	0.0	1,658.8	

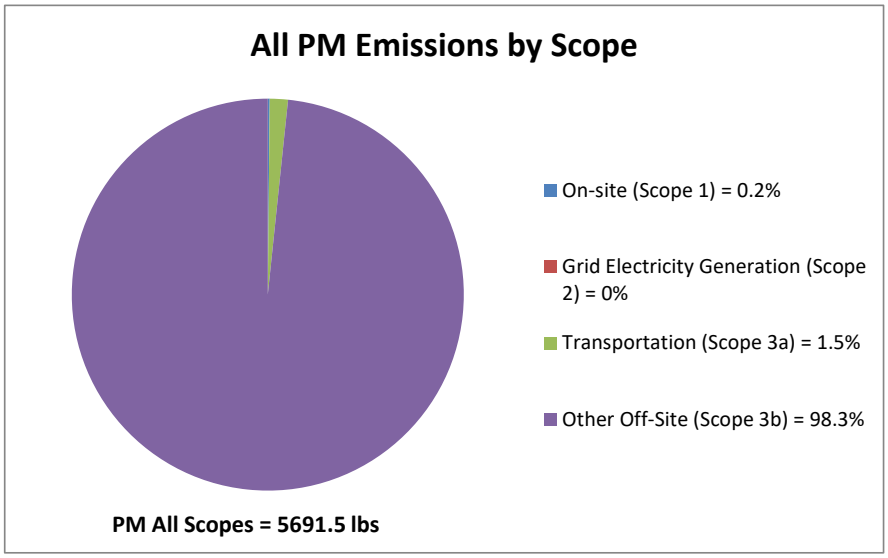
SOE Installation = 1.4%
Soil Excavation & Disposal = 84%
Backfill & Compaction = 13.4%
Vapor Barrier Installation = 1.3%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 0.8%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 8%
Other Off-Site (Scope 3b) = 91.1%

SOx All Components = 1658.8 lbs
SOx All Scopes = 1658.8 lbs


All PM Emissions by Remedy Component and Scope
(in Lbs)
6000
5000
4000
3000
2000
1000
0
SOE Installation
Soil Excavation & Disposal
Backfill & Compaction
Vapor Barrier Installation
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
PM All Components = 5691.5 lbs


All PM Emissions by Remedy Component
SOE Installation = 0.2%
Soil Excavation & Disposal = 97.7%
Backfill & Compaction = 2%
Vapor Barrier Installation = 0.1%
PM All Components = 5691.5 lbs

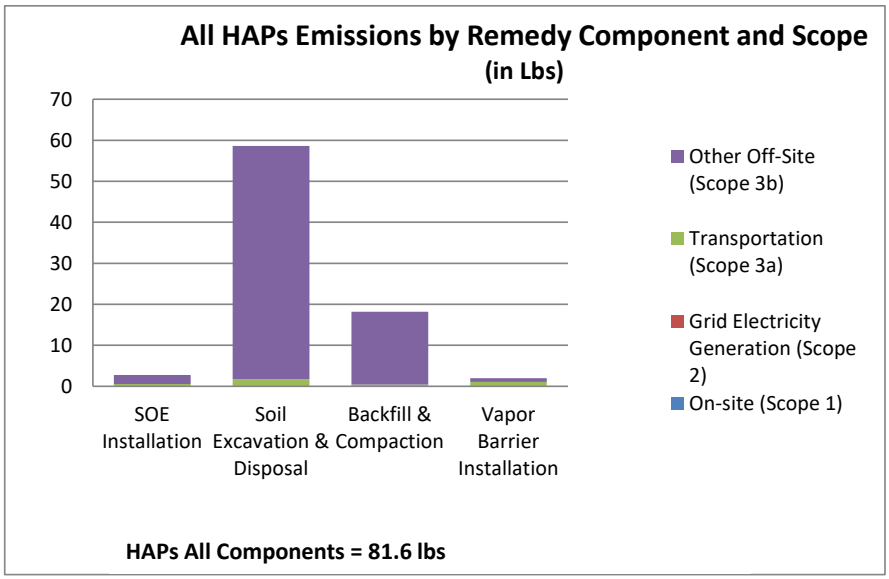

All PM Emissions by Scope
On-site (Scope 1) = 0.2%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 1.5%
Other Off-Site (Scope 3b) = 98.3%
PM All Scopes = 5691.5 lbs

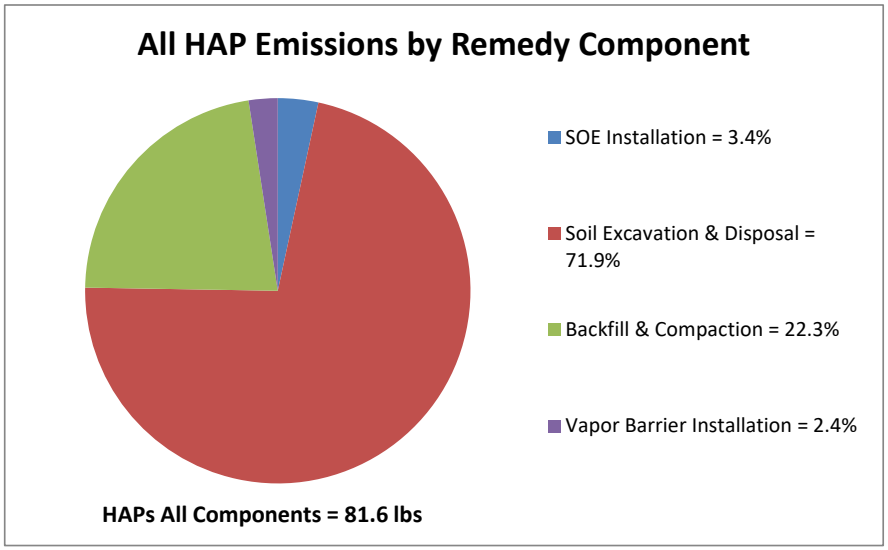
PM lbs	SOE Install	Soil Excava	Backfill & C	Vapor Barr	< Compon	< Compon	Total	
On-site (Scope 1)	2.0	4.1	2.8	0.0	0.0	0.0	8.8	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
ısportation (Scope 3a)	4.9	52.9	26.3	1.0	0.0	0.0	85.2	Tran
ıer Off-Site (Scope 3b)	3.4	5,502.8	85.6	5.6	0.0	0.0	5,597.5	Oth
Total	10.3	5,559.8	114.7	6.7	0.0	0.0	5,691.5	

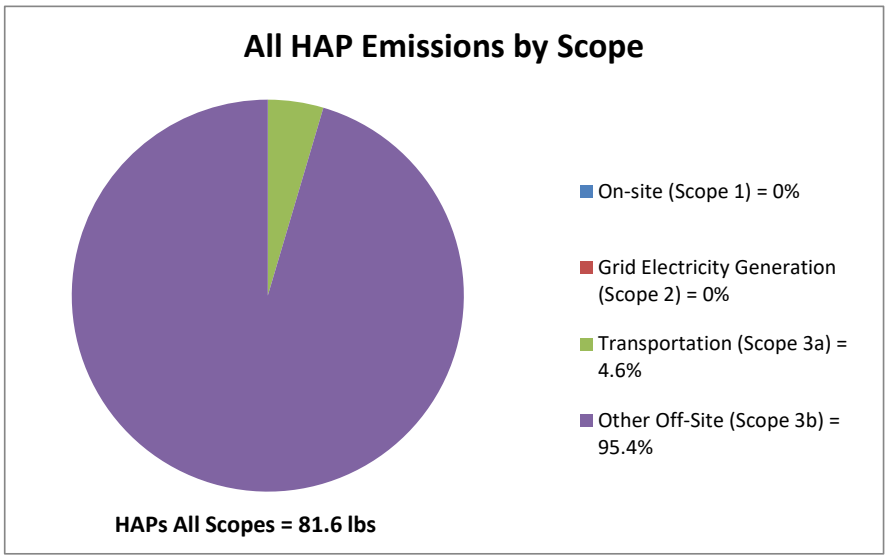
SOE Installation = 0.2%
Soil Excavation & Disposal = 97.7%
Backfill & Compaction = 2%
Vapor Barrier Installation = 0.1%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 0.2%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 1.5%
Other Off-Site (Scope 3b) = 98.3%

PM All Components = 5691.5 lbs
PM All Scopes = 5691.5 lbs


All HAPs Emissions by Remedy Component and Scope
(in Lbs)
70
60
50
40
30
20
10
0
SOE Installation
Soil Excavation & Disposal
Backfill & Compaction
Vapor Barrier Installation
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
HAPs All Components = 81.6 lbs


All HAP Emissions by Remedy Component
SOE Installation = 3.4%
Soil Excavation & Disposal = 71.9%
Backfill & Compaction = 22.3%
Vapor Barrier Installation = 2.4%
HAPs All Components = 81.6 lbs


All HAP Emissions by Scope
On-site (Scope 1) = 0%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 4.6%
Other Off-Site (Scope 3b) = 95.4%
HAPs All Scopes = 81.6 lbs

HAPs
lbs

	SOE Install	Soil Excava	Backfill & C	Vapor Barr	< Compon	< Compon	Total
On-site (Scope 1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ısportation (Scope 3a)	0.5	1.7	0.4	1.1	0.0	0.0	3.7
ıer Off-Site (Scope 3b)	2.2	56.9	17.8	0.9	0.0	0.0	77.8
Total	2.8	58.6	18.2	2.0	0.0	0.0	81.6

SOE Installation = 3.4%
Soil Excavation & Disposal = 71.9%
Backfill & Compaction = 22.3%
Vapor Barrier Installation = 2.4%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 0%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 4.6%
Other Off-Site (Scope 3b) = 95.4%

HAPs All Components = 81.6 lbs
HAPs All Scopes = 81.6 lbs

APPENDIX O

SWPPP

Stormwater Pollution Prevention Plan

Acronyms

Acronym	Definition
BEPA	Bureau of Environmental Planning and Administration
BMP	Best Management Practice
CFR	Code of Federal Regulations
CGP	Construction General Permit
CPESC	Certified Professional in Erosion and Sediment Control
Cp_V	Channel Protection Volume
CSS	Combined Sewer System
DEC	Department of Environmental Conservation
DEP	Department of Environmental Protection
DOB	Department of Buildings
EPA	Environmental Protection Agency
ESC	Erosion and Sediment Control
HSG	Hydrologic Soil Group
NNI	No Net Increase
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NRCC	Northeast Regional Climate Center
NRCS	Natural Resources Conservation Service
NYCDEP	New York City Department of Environmental Protection
NYS	New York State
NYSESCCP	New York State Erosion and Sediment Control Certificate Program
NYSDEC	New York State Department of Environmental Conservation
PE	Professional Engineer
POC	Pollutant of Concern
QI	Qualified Inspector
RLA	Registered Landscape Architect
RR_V	Runoff Reduction Volume
SMP	Stormwater Management Practice
SPCC	Spill Prevention Control and Countermeasure
SPDES	State Permit Discharge Elimination System
SWM	Stormwater Manual
SWMDM	Stormwater Management Design Manual
SWPPP	Stormwater Pollution Prevention Plan
SWPTS	Stormwater Permitting and Tracking System
TC	Trained Contractor
TN	Total Nitrogen
USCS	Unified Soil Classification System
USWR	Unified Stormwater Rule
WQ_V	Water Quality Volume

Stormwater Pollution Prevention Plan (SWPPP)

for

73 Empire Blvd. – Demolition & Remediation

73 Empire Blvd., Brooklyn, NY, 11225

Brooklyn/Block 1306/Lots 20, 30, 25 & 28

Prepared For:

Galaxy Developers, LLC

505 Flushing Avenue, Brooklyn, NY 11205

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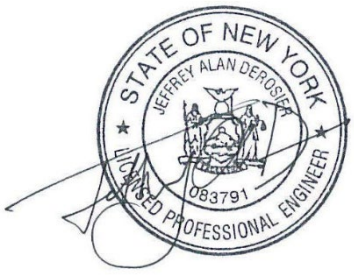
SWPPP Preparation Date:

April 22, 2026



Jeffrey A. Derosier, PE

Derosier Engineering

Professional Engineer – 083791

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Section 1: Contact Information and Responsibilities

Instructions (CGP Part III.A.6):

- This section is intended to be completed after the SWPPP is approved by DEP and before construction begins. Once completed, this section shall be attached to the approved SWPPP and kept on site.
- Identify the Contractor(s) that will be responsible for the installation, construction, repair, replacements, inspection, and maintenance of the erosion and sediment control (ESC) practices, or the post-construction stormwater management practices (SMP) at the site.
- See additional requirements in:
    - Appendix E: Certifications
    - Appendix F: Inspections

Retain this instruction for use during construction.

TABLE 1 – CONSTRUCTION TEAM	
PRIMARY CONTRACTOR *Principal entity retained by the Owner/Applicant to construct the covered development project.* *Responsible for compliance with the SWPPP.*	**NAME** Insert Name **COMPANY/ORGANIZATION** Insert Company/Organization **ADDRESS** Insert Address **PHONE NUMBER** Insert Phone Number **EMAIL** Insert Email
SUB-CONTRACTOR(S) *Entity retained to construct some elements of the covered development project.* *Responsible for compliance with the SWPPP.*	**NAME** Insert Name **COMPANY/ORGANIZATION** Insert Company/Organization **ADDRESS** Insert Address **PHONE NUMBER** Insert Phone Number **EMAIL** Insert Email
TRAINED CONTRACTOR(S) *Person employed with the Primary Contractor or a Sub-Contractor and knowledgeable in the principles and practices of ESC.* *Responsible for conducting daily inspections that ensure compliance with the SWPPP.*	**NAME** Insert Name **COMPANY/ORGANIZATION** Insert Company/Organization **ADDRESS** Insert Address **PHONE NUMBER** Insert Phone Number **EMAIL** Insert Email **NYS DEC EROSION AND SEDIMENT CONTROL TRAINING:** • **CERTIFICATE NUMBER:** Insert Number • **EXPIRATION DATE:** Insert Date
QUALIFIED PROFESSIONAL(S)[1] *Licensed professional knowledgeable in the principles and practices of stormwater management.* *Responsible for certifying correct installation of SMPs*	**NAME** Insert Name **COMPANY/ORGANIZATION** Insert Company/Organization **ADDRESS** Insert Address **PHONE NUMBER** Insert Phone Number **EMAIL** Insert Email **QUALIFYING LICENSE:** ☐ PE ☐ RLA

QUALIFIED INSPECTOR(S) *Licensed or Certified professional knowledgeable in the principles and practices of ESC.* *Responsible for conducting and/or certifying QI inspections at the required frequency for the project.*	**NAME** Insert Name **COMPANY/ORGANIZATION** Insert Company/Organization **ADDRESS** Insert Address **PHONE NUMBER** Insert Phone Number **EMAIL** Insert Email **NYS DEC EROSION AND SEDIMENT CONTROL TRAINING** • **CERTIFICATE NUMBER:** Insert Number • **EXPIRATION DATE:** Insert Date **QUALIFYING CREDENTIALS[2]:** ☐ PE ☐ RLA ☐ CPESC ☐ NYSESCCP
SUPERVISED QUALIFIED INSPECTOR(S)[3] *A person working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect.* *May conduct QI inspections, under the supervision of the Licensed QI, provided they have received four (4) hours of NYS DEC endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District or other NYSDEC endorsed entity.*	**NAME** Insert Name **COMPANY/ORGANIZATION** Insert Company/Organization **ADDRESS** Insert Address **PHONE NUMBER** Insert Phone Number **EMAIL** Insert Email **NYS DEC EROSION AND SEDIMENT CONTROL TRAINING:** • **CERTIFICATE NUMBER:** Insert Number • **EXPIRATION DATE:** Insert Date **QUALIFYING SUPERVISOR[3]:** Insert name of Licensed QI under whose supervision the Supervised QI will work

[Add rows as needed.]

[1]The Qualified Professional must be a licensed Professional Engineer (PE) or Registered Landscape Architect (RLA) in the State of New York. The Qualified Professional may also serve as the Qualified Inspector.

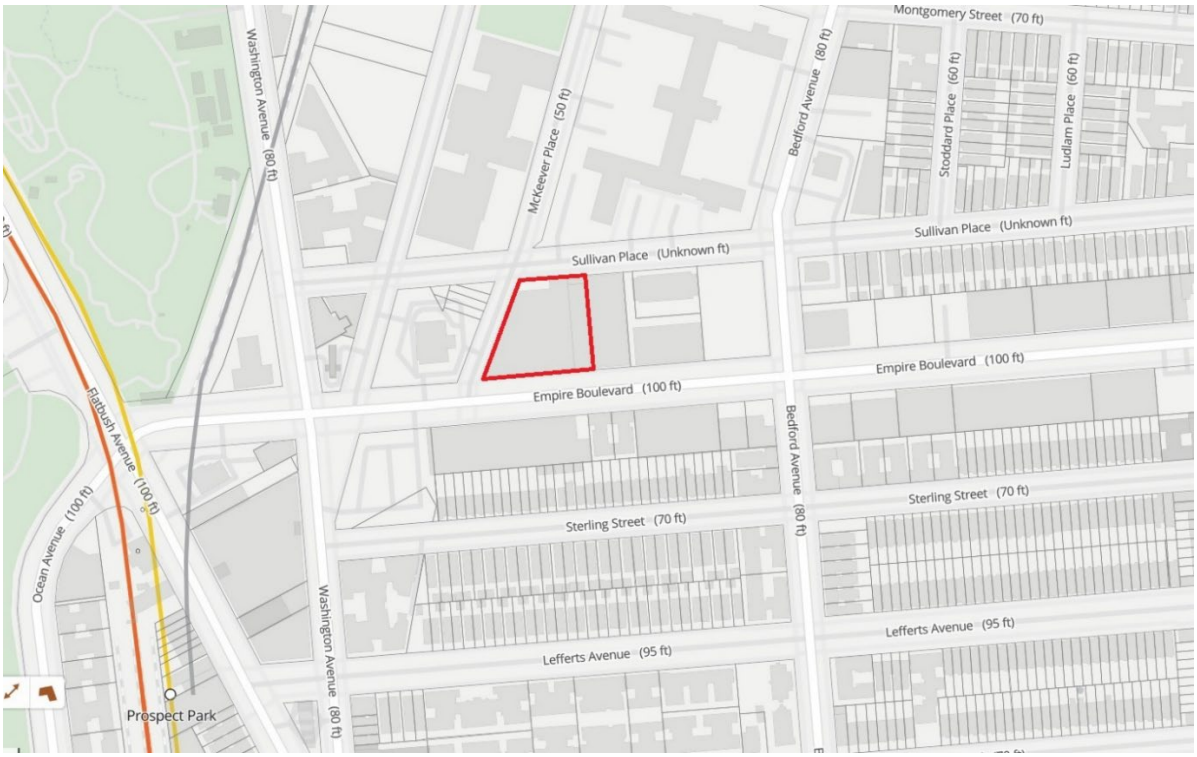
[2]On projects that include post-construction SMPs, the Qualified Inspector must be a licensed Professional Engineer (PE) or Registered Landscape Architect (RLA) in the State of New York. On projects that only include ESC practices, the Qualified Inspector may be a CPESC or a NYSESCCP.

[3]The supervised Qualified Inspector must work at the same company and under the direct supervision of the Qualified Inspector listed in this table. This field only applies to projects with post-construction SMPs.

Section 2: Project Location

TABLE 2 – PROJECT LOCATION AND PLAN	
PROJECT/SITE NAME(S):	73 Empire Blvd
PROJECT/SITE STREET ADDRESS(ES):	73 Empire Blvd., Brooklyn, NY 11225
PROJECT PLAN OF DEVELOPMENT	**Is this project part of a Larger Common Plan of Development[1]?** ☐ No ☒ Yes, the project is part of a Larger Common Plan of Development: Building will be submitted under a separate SWPPP

Please insert location plan below.



Section 3: Project Introduction

Section 3.1: Project and Site Description

TABLE 3.1 – NATURE OF CONSTRUCTION			
COVERED DEVELOPMENT PROJECT:	Are all of the development activities that are proposed for this project listed in Table 2.2 of NYC SWM? ☒ Yes, all activities are listed in Table 2.2 of NYC SWM ☐ No, at least one activity is not listed in Table 2.2 of NYC SWM		
TOTAL PROPERTY AREA	**DISTURBED AREA**	**EXISTING IMPERVIOUS IN DISTURBED AREA**	**FUTURE IMPERVIOUS IN DISTURBED AREA**
38,119 sf	Total = 48,734 sf On-Site = 38,119 sf ROW = 10,615 sf	Total = 45,948 sf On-Site = 35,333 sf ROW = 10,615 sf	Total = 48,734 sf On-Site = 0 sf ROW = 10,615 sf

Section 3.1.1: Project Scope and Development Activity Description

The project site formerly consisted of single tax lots that identified as Lots 28 in Block 1306 in the Borough of Brooklyn. The site is being divided into four (4) tax lot shown as Lots 20, 25, 28 and 30. The combined site is a trapezoidal shaped corner lot with 238.21 feet of frontage on Empire Blvd. (100 feet wide), 221.52 feet of frontage on McKeever Place (50 feet wide) and 142.98 feet of frontage on Sullivan Place (unknown width). The site contains 38,119 square feet (0.875 acres) and is located in a combined sewer district.

The proposed development includes the demolition of an existing building floor slab and foundation elements and the removal of soil for compliance with a Remedial Action Work Plan. The project is a covered development under Table 2.2. A NOI is not required.

Section 3.1.2: Existing Site Conditions

The project site was formerly improved with an existing building which occupied 93% of the site, which has been demolished down to the floor slab. The non-building areas consisted of two small sections that had trees, as per historic aerial imagery. One at the northwest corner of the site and one interior to the building. These areas have been assumed to 100% pervious.

The existing street frontages are paved and have concrete sidewalk and concrete or steel faced concrete curbs.

The site is a listed brownfield and the project owner has entered into a Brownfield Cleanup Program (BCP)(Index No. C224343) with the NYS Department of Environmental Conservation (NYSDEC). A Remedial Action Work Plan (RAWP) has been prepared by Roux Environmental Engineering and Geology, D.P.C.

Section 3.1.3: Proposed Site Conditions

The proposed development includes the demolition of an existing building floor slab and foundation elements and the removal of soil for compliance with a Remedial Action Work Plan. No development is proposed at this time. All stormwater from the proposed site will be retained on-site.

The construction of the project is estimated to take approximately 5 months.

Section 3.1.4: Soils Information

TABLE 3.2 – HYDROLOGIC SOIL GROUP			
HSG A	**HSG B**	**HSG C**	**HSG D**
0 %	100 %	0 %	0 %

The USDA/NRCS Soil survey indicates that the soils are UtB – Urban Land Till substratum, designated as HSG B. The ULA soils have 2 major components: Urban Land, till substratum (92%) with other minor components (8%).

The Urban Land, till substratum are characterized as cemented material to a depth of 15 inches underlain by gravelly sandy loam. A HSG is not assigned for Urban Land based on the fact that an impervious stratum (cemented material) exists within the top 20 inches. The underlying gravelly sandy loam would be classified as a HSG B.

A site specific subsurface soil investigation was performed by Structural Engineering Technologies, PC, PC. A review of the soil textural classification of the top 5 feet is consistent with a HSG B. The following is a description of the subsurface soils, per their report:

> The subsurface conditions depicted in the borings generally consisted of a layer of fill material overlying natural soils of glacial origin. Generalized descriptions of these strata are presented below in order of increasing depth.
>
> **Stratum 1 –Uncontrolled Fill and Loose Sand [NYC Class 7,6]**
>
> Surficial uncontrolled fill and loose sand was observed and documented immediately below the ground surface and was reported to depths up to 8 feet below grade within the borings. This fill and loose sand are described as granular (sand and gravel) with pieces of bricks and concrete. Typical N-values varied from 3 to 29 blows per foot (bpf) and the material is considered Class 7 in accordance with 2022 New York City Building Code (NYCBC).
>
> **Stratum 2 – Medium Dense to Dense Sand and Gravel [NYC Class 3b, 3a, 2a]**
>
> Medium dense to dense sand and gravel was generally observed starting between 6 to 10 feet below grade and extended to the termination depth of all borings. The N-values for the layer varied significantly from 17 bpf to split spoon refusal (over 100 blows per foot), averaging about 54 bpf. The layer is considered Class 3b, 3a and 2a per NYCBC.

Groundwater

Groundwater was observed and documented about 52 feet below grade in borings performed during a Phase 1 Investigation.

Section 3.1.5: Flood Hazard Area

The site is not located in a Special Flood Hazard Area per FEMA Panel #3604970212F, which is not printed.

Section 3.3: Applicable Stormwater Management Requirements

TABLE 3.3 – APPLICABLE REQUIREMENTS		
REQUIREMENT	**WHEN APPLICABLE**	**APPLICABLE ON THIS PROJECT?**
EROSION & SEDIMENT CONTROL (ESC)	All covered development projects	☒ Yes
WATER QUALITY (WQ_v)	Covered development project Except for activities listed in NYC SWM Table 2.2	☐ Yes ☒ No
RUNOFF REDUCTION (RR_v)	Covered development project Except for activities listed in NYC SWM Table 2.2	☐ Yes ☒ No
NO-NET INCREASE (NNI)	Project area of 20,000 sf or more AND Project located in MS4 area AND Discharges to an impaired water body (NYC SWM Table 2.4) AND increases impervious area	☐ Yes ☒ No
SEWER OPERATIONS (V_v)	Project is connected to or will be connected to a sewer.	☐ Yes ☒ No
CHANNEL PROTECTION VOLUME (CP_v)	Covered development project Except in the following circumstances: - Reduction of the entire Cp_v volume is achieved at a site through green infrastructure or infiltration systems - The site discharges directly to tidal water, fifth order (fifth downstream) or larger systems or CSS.	☐ Yes ☒ No
OVERBANK FLOOD CONTROL (Q_P)	Covered development project Except in the following conditions: - The site discharges directly to tidal water, fifth order (fifth downstream) or larger systems or CSS. - A downstream analysis reveals that overbank control is not needed	☐ Yes ☒ No
EXTREME FLOOD CONTROL (Q_F)	Covered development project Except in the following circumstances: - The site discharges directly to tidal waters or fifth order (fifth downstream) or larger systems or CSS - Development is prohibited within the ultimate 100-year floodplain - A downstream analysis reveals that 100-year control is not needed	☐ Yes ☒ No

Section 4: Erosion and Sediment Control (ESC)

Section 4.1: Construction Phasing, Staging, and Sequencing of Development Activities

The construction of the site will occur in 2 Phases:

1. Demolition 1 Months
2. Excavation 4 Months

Within each Phase, specific activities will occur as outlined in the following tables.

TABLE 4.1(a) – CONSTRUCTION SEQUENCING			
PHASE # 1: Demolition			
CONSTRUCTION ACTIVITY (in sequential order)	**PRACTICE(S) INSTALLED PRIOR TO ACTIVTY[1]**	**PRACTICE(S) INSTALLED DURING ACTIVTY[1]**	**PRACTICE(S) INSTALLED WITHIN ONE BUSINESS DAY OF COMPLETING ACTIVTY[1]**
Secure the site.	None	None	None
Identify and establish limits of disturbance.	None	None	None
Install Construction Fence, Stabilized Construction Entrance and Silt Fence	None	Silt Fence Stabilized Construction Entrance	None
Establish construction field office, sanitary facilities and staging areas	Silt Fence Stabilized Construction Entrance	None	None
Demolish Existing Improvements	Silt Fence Stabilized Construction Entrance	None	None

TABLE 4.1(b) – CONSTRUCTION SEQUENCING			
PHASE # 2: Excavation			
CONSTRUCTION ACTIVITY (in sequential order)	**PRACTICE(S) INSTALLED PRIOR TO ACTIVTY[1]**	**PRACTICE(S) INSTALLED DURING ACTIVTY[1]**	**PRACTICE(S) INSTALLED WITHIN ONE BUSINESS DAY OF COMPLETING ACTIVTY[1]**
Install SOE	Silt fence Stabilized construction entrance	Concrete Truck Washout, Dust Control	None
Excavate and remove excess material	Silt Fence Stabilized Construction Entrance	Dust Control	None
Backfill and Remove SOE	Silt Fence Stabilized Construction Entrance	Dust Control	
Stabilize Site			None

Section 4.2: Conforming ESC Practices

During each of the Phases outlined in the previous section, the Contractor shall install ESC practices conforming to the NYS Standards and Specifications for Erosion and Sediment Control (NYS SSESC), as indicated. The following is a general narrative of the ESC practices to be implemented.

Contractor shall provide Site Pollution Prevention during all Phases. Construction materials are to be stored in designated areas. Contractor shall install Stabilized Construction Entrance(s), with Dust Control, to prevent sediment from being tracked from the Site into public roadways and sewers. Silt Fencing shall be installed at the perimeter of the site to intercept any runoff that may occur prior to excavation. No stockpiles of erodible material are anticipated. All disturbance is to occur at an elevation below grade and all stormwater will be retained on-site. Contractor shall provide a Concrete Truck Washout during concrete work.

If the contractor wishes to halt construction activity due to winter weather, they need to file for a Temporary Shutdown on the DEP SWPTS after fulling installing Winter Stabilization controls. Site must be fully and permanently stabilized (i.e. 80% uniform density of permanent vegetation in vegetated area, permanent mulch/stone where applicable, 80% of live plants coverage of vegetation layer in vegetated SMP before applying for Temporary Shutdown.

Section 4.2.1: Temporary Controls

TABLE 4.2(a) – CONFORMING ESC PRACTICE: Site Pollution Prevention	
DESCRIPTION OF PRACTICE	A collection of management practices intended to control non-sediment pollutants associated with construction activities to prevent the generation of pollutants due to improper handling, storage and spills and prevent the movement of toxic substances from the site into surface waters.
INTENT	Runoff Control
REFERENCE DETAIL	ESC-100 – ESC 104
REFERENCED STANDARD /	NYS SSESC Site Pollution Prevention
MINIMUM MAINTENANCE REQUIREMENTS	Inspect pollution prevention measures weekly and after each rainfall event. Any needed repairs shall be made immediately. Site Pollution Prevention must be in place prior to construction and remain in place until the site is stabilized.
STABILIZATION COMPLETION TIMELINE[1]	Not Applicable

TABLE 4.2(b) – CONFORMING ESC PRACTICE: Stabilized Construction Access	
DESCRIPTION OF PRACTICE	Entrance / Exit point to the site per Standard Detail.
INTENT	Sediment Control
REFERENCE DETAIL	ESC-100 Detail 2
REFERENCED STANDARD /	NYS SS ESC Stabilized Construction Access
MINIMUM MAINTENANCE REQUIREMENTS	During routine inspections check for condition of surface. Top dress as needed.
STABILIZATION COMPLETION TIMELINE[1]	After completion of Foundation.

TABLE 4.2(c) – CONFORMING ESC PRACTICE: Dust Control - Sprinkling	
DESCRIPTION OF PRACTICE	The control of dust resulting from land-disturbing activities to prevent surface and air movement of dust from disturbed soil surfaces that may cause off-site damage, health hazards and traffic safety problems. Provide sprinkling capability at construction access points.
INTENT	Sediment Control
REFERENCE DETAIL	ESC-100 – Detail 5
REFERENCED STANDARD	NYS SSESC 2.25
MINIMUM MAINTENANCE REQUIREMENTS	Maintain dust control measures during dry weather periods until all disturbed areas are stabilized.
STABILIZATION COMPLETION TIMELINE	Click or tap here to enter text.After completion of Foundation.

TABLE 4.2(d) – CONFORMING ESC PRACTICE: Silt Fence	
DESCRIPTION OF PRACTICE	Silt Fence at perimeter of site.
INTENT	Sediment Control
REFERENCE DETAIL	ESC-100 Detail 2
REFERENCED STANDARD	NYS SSESC Silt Fence (Page 5.56)
MINIMUM MAINTENANCE REQUIREMENTS	Routine inspection schedule. Remove sediment and replace barrier as needed.
STABILIZATION COMPLETION TIMELINE	N/A

TABLE 4.2(e) – CONFORMING ESC PRACTICE: Concrete Truck Washout	
DESCRIPTION OF PRACTICE	Contractor shall provide a pre-fabricated concrete truck washout on the site during concrete placement activities.
INTENT	Runoff Control
REFERENCE DETAIL	ESC-100 Detail 5
REFERENCED STANDARD /	NYS SSESC Concrete Truck Washout
MINIMUM MAINTENANCE REQUIREMENTS	Inspect daily. Damaged or leaking facilities shall be deactivated and repaired or replaced immediately. Excess rainwater that has accumulated over hardened concrete should be pumped to a stabilized area. Accumulated hardened material shall be removed when 75% of storage capacity of the structure is filled. Any excess wash water shall be pumped into a containment facility and property disposed of off-site. The plastic liner shall be replaced with each cleaning.
STABILIZATION COMPLETION TIMELINE[1]	After completion of concrete work.

Section 4.2.2: Permanent Controls

Permanent/Final stabilization of exposed soil will include a 3 inch layer of crushed stone.

Site must be fully and permanently stabilized (i.e. 80% uniform density of permanent vegetation in vegetated area, permanent mulch/stone where applicable, 80% of live plants coverage of vegetation layer in vegetated SMP by the end of compliance period) before applying for Notice of termination (NOT).

Section 4.3: Non-Conforming ESC Practices

None.

Section 4.4: Allowable Non-Stormwater Discharges

TABLE 4.3 – AUTHORIZED NON-STORMWATER DISCHARGES	
TYPE OF AUTHORIZED NON-STORMWATER DISCHARGE	**LIKELY TO BE PRESENT ON SITE?**
LANDSCAPE IRRIGATION	☐ Yes ☒ No
WATERS USED TO WASH VEHICLES AND EQUIPMENT (CLEANSERS ARE NOT USED)	☐ Yes ☒ No
WATER USED TO CONTROL DUST	☒ Yes ☐ No
POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHINGS	☐ Yes ☒ No
EXTERNAL BUILDING WASH DOWN (SOAPS/SOLVENTS ARE NOT USED, AND EXTERNAL SURFACES DO NOT CONTAIN HAZARDOUS SUBSTANCES)	☐ Yes ☒ No
PAVEMENT WASH WATERS (SPILLS OR LEAKS HAVE NOT OCCURRED)	☐ Yes ☒ No
UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE*	☐ Yes ☒ No
UNCONTAMINATED, NON-TURBID DISCHARGES OF GROUND WATER OR SPRING WATER*	☐ Yes ☒ No
FOUNDATION OR FOOTING DRAINS*	☐ Yes ☒ No
DISCHARGES FROM CONSTRUCTION DE-WATERING OPERATIONS*	☐ Yes ☒ No

**Require permits from DEP's Bureau of Water and Sewer Operations, DEP's Bureau of Wastewater Treatment, Department of Buildings and/or NYSDEC.*

Section 4.5: Pollution Prevention Measures

TABLE 4.4 – POTENTIAL SOURCE OF POLLUTION PRESENT ON SITE	
MATERIALS OR ACTIVITY	**LIKELY TO BE PRESENT ON SITE?**
Dewatering Operations	☐ Yes ☒ No
Paving Operations	☐ Yes ☒ No
Concrete, Paint and Stucco Washout	☒ Yes ☐ No
Fuelling and Maintenance of Equipment Vehicles	☒ Yes ☐ No
Washing of Equipment, Vehicles, and Buildings	☒ Yes ☐ No
Storage, Handling, and Disposal of Chemicals *(e.g. asphalt sealants, copper flashing, roofing materials, adhesives, concrete fixtures, gravel, mulch stockpiles)*.	☒ Yes ☐ No
Construction and Domestic Wastes *(e.g. packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, styrofoam, concrete)*	☒ Yes ☐ No
Landscape Materials, Fertilizers, Pesticides, Herbicides	☐ Yes ☒ No
Detergents	☐ Yes ☒ No
Sanitary Waste	☒ Yes ☐ No
Hazardous and Toxic Materials and Wastes (e.g. paints, solvents, petroleum-based products, wood preservatives, additives, curing compounds, acids)	☐ Yes ☒ No
Other: Click or tap here to enter text.	☐ Yes ☐ No

Section 4.5.1: Concrete Washout

General

Contractor shall provide a Concrete Truck Washout on-site during all concrete activities. See Section 4.1 for standards. The facility shall be located a minimum of 100 feet from any receiving waters, if present.

Section 4.5.2: Fueling and Maintenance of Equipment Vehicles

General

Fuel for construction equipment shall either be obtained from a licensed distributor of petroleum products or from an approved above ground storage tank on-site. Only ultra-low sulfur diesel fuel (ULSD) with a max sulfur content of no more than 15 parts per million (ppm) sulfur by weight shall be used. A distributor may be contracted to arrive periodically and fill all equipment as necessary. All distributors of petroleum products must have adequate liability insurance to mitigate and clean up any spills that occur on-site as well as obtain appropriate permits and licenses from the NYSDEC. All aboveground storage tanks (ASTs) shall be installed pursuant to 6 NYCRR Part 614 Standards for New and Substantially Modified Petroleum Storage Facilities.

Fuel from construction vehicles may come into contact with stormwater when vehicles are stored outside. Good housekeeping and preventative maintenance procedures shall be implemented to ensure fuel spills and leaks are minimized during refueling and storage. Any small-scale fuel or oil spills must be remedied immediately, and contaminated soils shall be disposed of appropriately. The designated spill prevention and response team shall handle large-scale gasoline spills. The spill hotline number is 1 (800) 457-7362 and all spills greater than or equal to 5 gallons shall be reported.

Oil and other petroleum products may be stored on-site in limited quantities to ensure the continued operation of construction equipment in the event a scheduled delivery is unavailable. Items shall be stored in their original containers within temporary structures and shall not be exposed to stormwater. Used oil and petroleum products shall be stored in approved containers until recycled or disposed of at an approved disposal facility.

Preventative Maintenance

All on-site vehicles shall be inspected on a regular basis for fluid leaks. All leaks shall be repaired immediately. If the leak cannot be repaired immediately, it shall be temporarily mitigated to prevent contamination of any soil or stormwater. If necessary, the reservoir will be drained to stop the flow of contaminants, or the vehicle shall be moved under cover.

Section 4.5.3: Washing of Equipment and Vehicles

General

Vehicles and equipment shall be washed off-site in accordance with all federal, state, and local requirements. Vehicle wheels or undercarriages which must be washed on site to prevent tracking of sediment to public roadways shall be washed at designated areas, with wash water directed away from stormwater inlets or landscape beds, and into the concrete washout.

Section 4.5.4: Storage, Handling and Disposal of Construction Products, Materials and Wastes

Section 4.5.4.1: Building Products

General

Areas used for Contractor storage of hazardous substances and material (e.g., fuels) shall be lined with plastic and inspected regularly for any leakage of chemicals or fuels to the ground. Any such leakage will be reported to the NYSDEC Hotline within two hours of discovery and will be rectified immediately upon discovery.

If the contractor must store deleterious materials such as paint, gasoline, oil etc., a lockable storage shed, marked with all required precaution labels and meeting all local, state and federal requirements for public and private storage of such materials will be required. Any material partially used shall be stored in an approved sealable container for storage after each use.

Section 4.5.4.2: Construction and Domestic Waste

(Note: Examples include packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, Styrofoam, concrete, and other trash or building materials.)

General

The contractor is required to keep a secure trash receptor, with tarp, on site at all times. Trash and unwanted construction debris will be collected daily, and the receptor shall be picked up as necessary. If the contractor must store deleterious materials such as paint, gasoline, oil etc., a lockable storage shed, marked with all required precaution labels and meeting all local, state and federal requirements for public and private storage of such materials will be required. Any material partially used shall be stored in an approved sealable container for storage after each use.

Section 4.5.4.3: Sanitary Waste

General

The Contractor shall supply one temporary sanitary facility per 10 workers on site (portable toilets) at the site throughout the construction phase. The toilets shall be located in the contractor staging area, at least 50 feet away from any stormwater inlet. The portable toilets shall have collection pans beneath as secondary containment. All sanitary waste shall be collected from the portable facilities a minimum of once per week. The toilets shall be inspected each time waste is collected from them, and shall be replaced should any leaks be discovered in the holding tanks.

Section 4.5.4.4: Washing of Applicators and Containers used for Paint or Other Material

General

Comply with state, federal and local standards for the washing of applicators and containers. Wash water shall be collected to a containment facility and disposed of as required.

Section 5: Construction Inspections

TABLE 5 – OVERVIEW OF INSPECTION REQUIREMENTS	
TC INSPECTION FREQUENCY	☒ **Daily**
QI INSPECTION FREQUENCY[1]	☒ **Standard inspection frequency applies:** The Qualified Inspector shall conduct a site inspection at least once every seven (7) calendar days. ☐ **Enhanced inspection frequency:** The Qualified Inspector shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days. This applies if one or both of the following conditions have been met: • Sites that have received approval to disturb greater than five (5) acres of soil at any one time • Sites that discharge to a 303(d) waterbody identified in Appendix E of the NYSDEC CGP.

[1]*During a temporary shutdown, the Developer will be responsible for having a Qualified Inspector visit the site and inspect it, at least once every 30 days during the shutdown. Refer to NYC Rules Section 19.01-03 (b)(9)(ix) for additional requirements applicable to temporary shutdowns.*

Section 6: Post-Construction Stormwater Management

Section 6.1: Project Requirements

Section 6.1.1: Requirements Applicable to All Areas

Project is listed in Table 2.2 and only ESC measures are required.

Appendix A: Drawings

☒ Existing Site Plan & Drainage Area Map: SWM-101

☒ Proposed Site Plan & Drainage Area Map: SWM-102

☐ Surface and Space Constraint Plan: SWM-103

☐ Soil, Subsurface, and Hotspot Constraint Plan: SWM-103

☒ Construction Sequencing and ESC Site Plans: ESC-100 – ESC-102

☒ Erosion and Sediment Control Practice Detail Plans: ESC-100

☐ Final Landscaping and Stabilization Plan: SWM-102

☐ SMP Section/Detail Plans: SWM-105

If any of the above documents are not included, explain why below:

Project is listed in Table 2.2 and only requires ESC components.

LEGEND

- ROOF
- PAVEMENT
- GREEN ROOF
- POROUS PAVEMENT
- SYNTHETIC TURF
- STONE / GRAVEL
- UNDEVELOPED
- GRASS, BIO & LANDSCAPE
- DRAINAGE AREA BOUNDARY
- LIMIT OF DISTURBANCE

AREA SUMMARY - LOT 20

DISTURBED AREA (Entire Project):	Ad	=	48,734 s.f. (1.119 Acre)
SITE AREA (Excludes ROW):	As	=	11,522 s.f. (0.265 Acre)
LAND COVER			EXISTING (*e)
ROOF (C = 0.95)	Ar	=	9,466 s.f.
PAVEMENT (C = 0.85)	Ap	=	0 s.f.
GREEN ROOF (C = 0.70)	Agr	=	0 s.f.
POROUS PAVEMENT (C=0.70)	App	=	0 s.f.
SYN. TURF FIELD (C=0.70)	Atf	=	0 s.f.
GRAVEL PARKING LOT (C=0.65)	Agp	=	0 s.f.
UNDEVELOPED AREA (C=0.30)	Au	=	0 s.f.
GRASS, BIO OR LAND. (C = 0.20)	Ag	=	2,076 s.f.
TOTAL		=	11,522 s.f.
WEIGHTED C	Cw	=	0.815
IMPERVIOUS COVER	Ai	=	11,522 s.f.
PERCENT IMPERVIOUS	I	=	82%

AREA SUMMARY - LOT 30

DISTURBED AREA (Entire Project):	Ad	=	48,734 s.f. (1.119 Acre)
SITE AREA (Excludes ROW):	As	=	8,930 s.f. (0.205 Acre)
LAND COVER			EXISTING (*e)
ROOF (C = 0.95)	Ar	=	8,221 s.f.
PAVEMENT (C = 0.85)	Ap	=	0 s.f.
GREEN ROOF (C = 0.70)	Agr	=	0 s.f.
POROUS PAVEMENT (C=0.70)	App	=	0 s.f.
SYN. TURF FIELD (C=0.70)	Atf	=	0 s.f.
GRAVEL PARKING LOT (C=0.65)	Agp	=	0 s.f.
UNDEVELOPED AREA (C=0.30)	Au	=	0 s.f.
GRASS, BIO OR LAND. (C = 0.20)	Ag	=	709 s.f.
TOTAL		=	8,930 s.f.
WEIGHTED C	Cw	=	0.890
IMPERVIOUS COVER	Ai	=	8,930 s.f.
PERCENT IMPERVIOUS	I	=	92%

AREA SUMMARY - LOT 25

DISTURBED AREA (Entire Project):	Ad	=	48,734 s.f. (1.119 Acre)
SITE AREA (Excludes ROW):	As	=	9,028 s.f. (0.207 Acre)
LAND COVER			EXISTING (*e)
ROOF (C = 0.95)	Ar	=	9,028 s.f.
PAVEMENT (C = 0.85)	Ap	=	0 s.f.
GREEN ROOF (C = 0.70)	Agr	=	0 s.f.
POROUS PAVEMENT (C=0.70)	App	=	0 s.f.
SYN. TURF FIELD (C=0.70)	Atf	=	0 s.f.
GRAVEL PARKING LOT (C=0.65)	Agp	=	0 s.f.
UNDEVELOPED AREA (C=0.30)	Au	=	0 s.f.
GRASS, BIO OR LAND. (C = 0.20)	Ag	=	0 s.f.
TOTAL		=	9,028 s.f.
WEIGHTED C	Cw	=	0.950
IMPERVIOUS COVER	Ai	=	9,028 s.f.
PERCENT IMPERVIOUS	I	=	100%

AREA SUMMARY - LOT 28

DISTURBED AREA (Entire Project):	Ad	=	48,734 s.f. (1.119 Acre)
SITE AREA (Excludes ROW):	As	=	8,638 s.f. (0.198 Acre)
LAND COVER			EXISTING (*e)
ROOF (C = 0.95)	Ar	=	8,638 s.f.
PAVEMENT (C = 0.85)	Ap	=	0 s.f.
GREEN ROOF (C = 0.70)	Agr	=	0 s.f.
POROUS PAVEMENT (C=0.70)	App	=	0 s.f.
SYN. TURF FIELD (C=0.70)	Atf	=	0 s.f.
GRAVEL PARKING LOT (C=0.65)	Agp	=	0 s.f.
UNDEVELOPED AREA (C=0.30)	Au	=	0 s.f.
GRASS, BIO OR LAND. (C = 0.20)	Ag	=	0 s.f.
TOTAL		=	8,638 s.f.
WEIGHTED C	Cw	=	0.950
IMPERVIOUS COVER	Ai	=	8,638 s.f.
PERCENT IMPERVIOUS	I	=	100%

GRAPHIC SCALES

1" = 20' — 20' 10' 0' 20' 40'

1 EXISTING SITE PLAN & DRAINAGE AREA MAP
SCALE: 1" = 20'

PLANS PREPARED BY:
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NO.	REVISION / ISSUED TO DESCRIPTION	DATE
1	SWPPP RESUBMISSION	04/22/2026

PROJECT

73 EMPIRE BLVD.

NEW BUILDING

73 EMPIRE BLVD.

BROOKLYN, NEW YORK

DRAWING TITLE

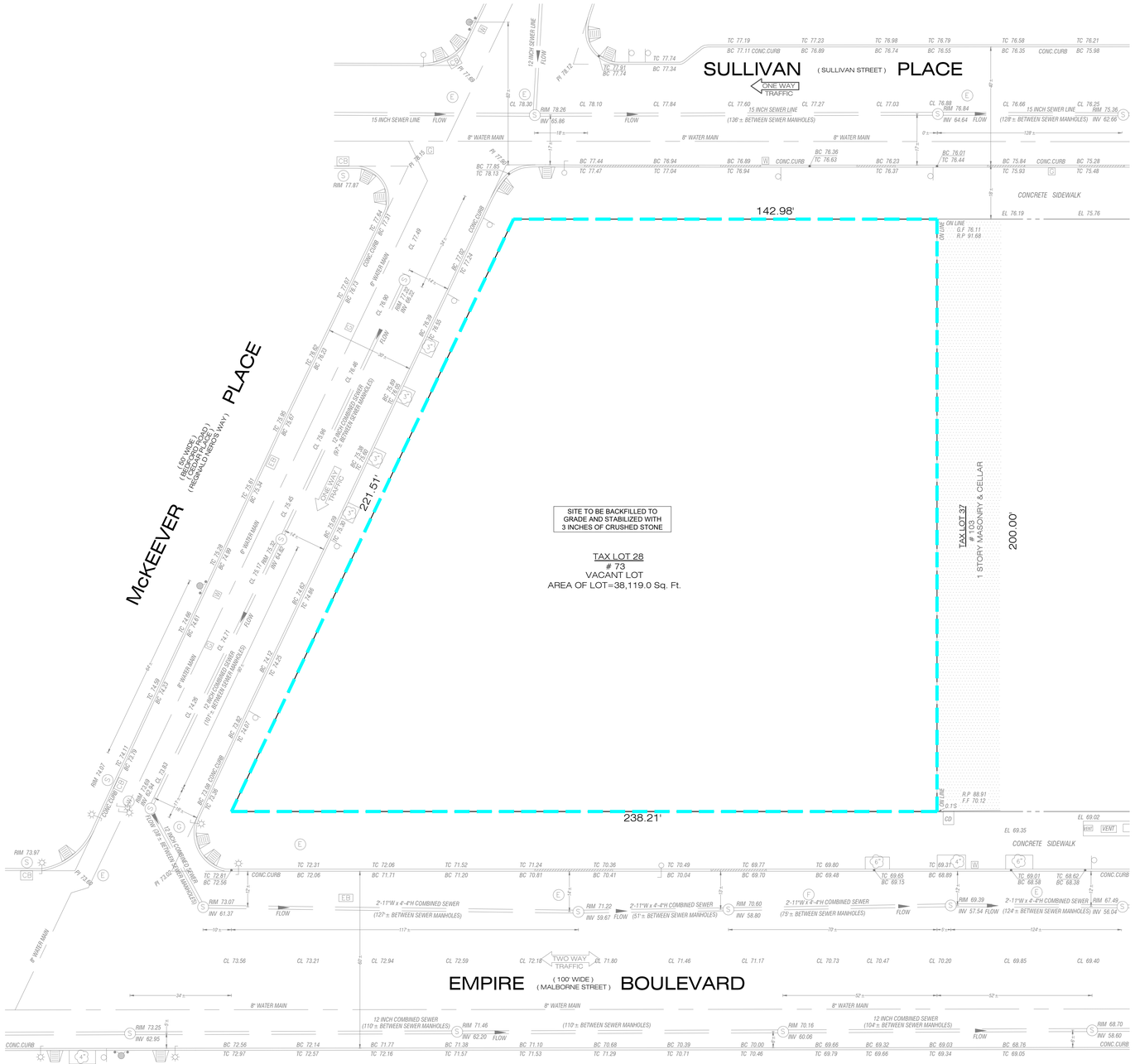
EXISTING SITE PLAN & DRAINAGE AREA MAP

SEAL & SIGNATURE

STATE OF NEW YORK · JEFFREY ALAN DEROSIER · 083791 · LICENSED PROFESSIONAL ENGINEER

DATE: 03/27/2026
PROJECT No: 25023
DRAWING BY: JAD
CHK BY: JAD
DWG No: SWM-101.00
CADD FILE No:
1 of 2

DEP ID# S307226



GRAPHIC SCALES

1" = 20' 20' 10' 0' 20' 40'

1 PROPOSED SITE PLAN & DRAINAGE AREA MAP
SCALE: 1" = 20'

LEGEND

- ROOF
- PAVEMENT
- GREEN ROOF
- POROUS PAVEMENT
- SYNTHETIC TURF
- STONE / GRAVEL
- UNDEVELOPED
- GRASS, BIO & LANDSCAPE
- DRAINAGE AREA BOUNDARY
- LIMIT OF DISTURBANCE

AREA SUMMARY - LOT 20

DISTURBED AREA (Entire Project):	Ad	=	X,XXX s.f. (1.101 Acre)
SITE AREA (Excludes ROW):	As	=	11,527 s.f. (0.265 Acre)
LAND COVER			PROPOSED (*p)
ROOF (C = 0.95)	Ar	=	11,257 s.f.
PAVEMENT (C = 0.85)	Ap	=	0 s.f.
GREEN ROOF (C = 0.70)	Agr	=	0 s.f.
POROUS PAVEMENT (C=0.70)	App	=	0 s.f.
SYN. TURF FIELD (C=0.70)	Atf	=	0 s.f.
GRAVEL PARKING LOT (C=0.65)	Agp	=	0 s.f.
UNDEVELOPED AREA (C=0.30)	Au	=	0 s.f.
GRASS, BIO OR LAND. (C = 0.20)	Ag	=	0 s.f.
TOTAL		=	11,527 s.f.
WEIGHTED C	Cw	=	0.950
IMPERVIOUS COVER	Ai	=	11,527 s.f.
PERCENT IMPERVIOUS	I	=	100%

AREA SUMMARY - LOT 30

DISTURBED AREA (Entire Project):	Ad	=	XXXX s.f. (X.XXX Acre)
SITE AREA (Excludes ROW):	As	=	8,937 s.f. (0.205 Acre)
LAND COVER			PROPOSED (*p)
ROOF (C = 0.95)	Ar	=	8,937 s.f.
PAVEMENT (C = 0.85)	Ap	=	0 s.f.
GREEN ROOF (C = 0.70)	Agr	=	0 s.f.
POROUS PAVEMENT (C=0.70)	App	=	0 s.f.
SYN. TURF FIELD (C=0.70)	Atf	=	0 s.f.
GRAVEL PARKING LOT (C=0.65)	Agp	=	0 s.f.
UNDEVELOPED AREA (C=0.30)	Au	=	0 s.f.
GRASS, BIO OR LAND. (C = 0.20)	Ag	=	0 s.f.
TOTAL		=	8,937 s.f.
WEIGHTED C	Cw	=	0.950
IMPERVIOUS COVER	Ai	=	8,937 s.f.
PERCENT IMPERVIOUS	I	=	100%

AREA SUMMARY - LOT 25

DISTURBED AREA (Entire Project):	Ad	=	XXX s.f. (X.XXX Acre)
SITE AREA (Excludes ROW):	As	=	9,027s.f. (0.207 Acre)
LAND COVER			PROPOSED (*p)
ROOF (C = 0.95)	Ar	=	9,027 s.f.
PAVEMENT (C = 0.85)	Ap	=	0 s.f.
GREEN ROOF (C = 0.70)	Agr	=	0 s.f.
POROUS PAVEMENT (C=0.70)	App	=	0 s.f.
SYN. TURF FIELD (C=0.70)	Atf	=	0 s.f.
GRAVEL PARKING LOT (C=0.65)	Agp	=	0 s.f.
UNDEVELOPED AREA (C=0.30)	Au	=	0 s.f.
GRASS, BIO OR LAND. (C = 0.20)	Ag	=	0 s.f.
TOTAL		=	9,027 s.f.
WEIGHTED C	Cw	=	0.950
IMPERVIOUS COVER	Ai	=	9,027 s.f.
PERCENT IMPERVIOUS	I	=	100%

AREA SUMMARY - LOT 28

DISTURBED AREA (Entire Project):	Ad	=	XXX s.f. (X.XXX Acre)
SITE AREA (Excludes ROW):	As	=	8,636 s.f. (0.198 Acre)
LAND COVER			PROPOSED (*p)
ROOF (C = 0.95)	Ar	=	8,636 s.f.
PAVEMENT (C = 0.85)	Ap	=	0 s.f.
GREEN ROOF (C = 0.70)	Agr	=	0 s.f.
POROUS PAVEMENT (C=0.70)	App	=	0 s.f.
SYN. TURF FIELD (C=0.70)	Atf	=	0 s.f.
GRAVEL PARKING LOT (C=0.65)	Agp	=	0 s.f.
UNDEVELOPED AREA (C=0.30)	Au	=	0 s.f.
GRASS, BIO OR LAND. (C = 0.20)	Ag	=	0 s.f.
TOTAL		=	8,636 s.f.
WEIGHTED C	Cw	=	0.950
IMPERVIOUS COVER	Ai	=	8,636 s.f.
PERCENT IMPERVIOUS	I	=	100%

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NO.	REVISION / ISSUED TO	DATE
1	SWPPP RESUBMISSION	04/22/2026

PROJECT

73 EMPIRE BLVD.
DEMOLITION & REMEDIATION
73 EMPIRE BLVD.

BROOKLYN, NEW YORK

DRAWING TITLE

PROPOSED SITE PLAN & DRAINAGE AREA MAP

SEAL & SIGNATURE

STATE OF NEW YORK · JEFFREY ALAN DEROSIER · 083791 · LICENSED PROFESSIONAL ENGINEER

DATE:	03/27/2026
PROJECT No:	25023
DRAWING BY:	JAD
CHK BY:	JAD
DWG No:	SWM-102.00
CADD FILE No:	2 of 2

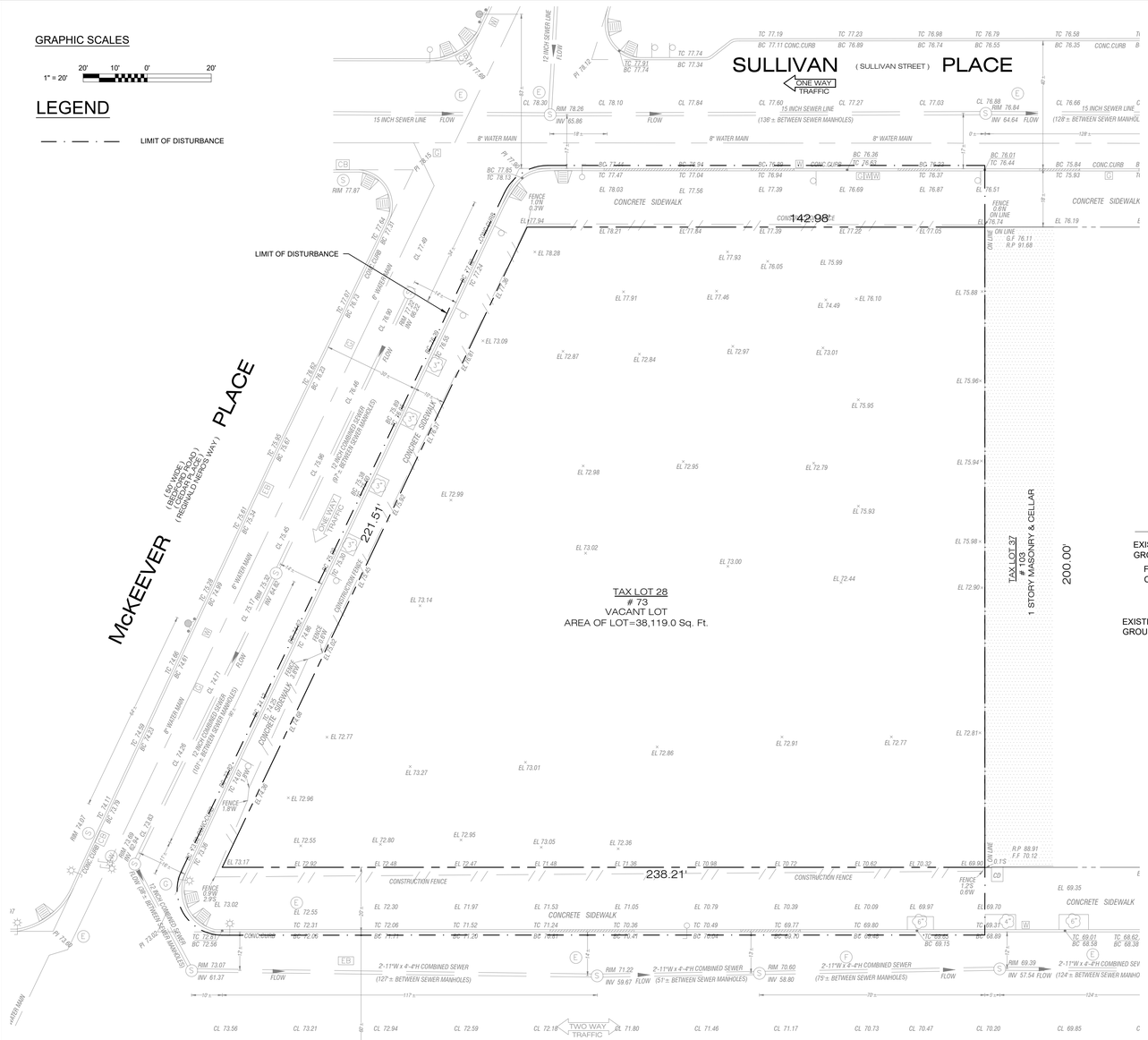
DEP ID# S307226

GRAPHIC SCALES

1" = 20' 20' 10' 0' 20'

LEGEND

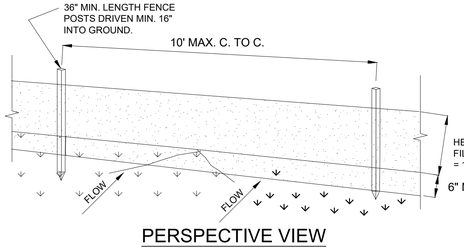
LIMIT OF DISTURBANCE



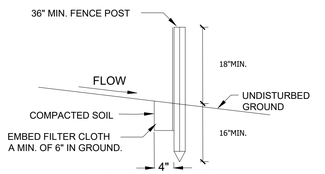
1 EXISTING CONDITIONS PLAN
SCALE: 1" = 20'

GENERAL SEQUENCE OF CONSTRUCTION

1.	PHASE 1 - DEMOLITION	1 MONTHS
2.	PHASE 2 - EXCAVATION	4 MONTHS



PERSPECTIVE VIEW

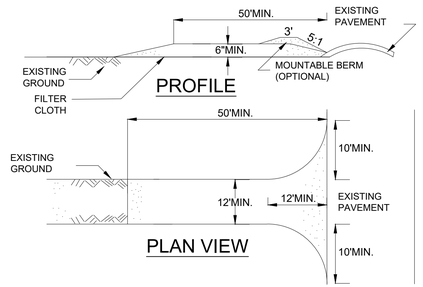


SECTION VIEW

CONSTRUCTION SPECIFICATIONS

1. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER- LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL MEET THE MINIMUM REQUIREMENTS SHOWN.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

2 SILT FENCE DETAIL
NOT TO SCALE



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ACCESS SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.
10. FLAGGER'S SHALL BE PROVIDED WHEN ACCESS IS LESS THAN 24 FEET WIDE.
11. PROVIDE DUST CONTROL AT ACCESS POINTS.

3 STABILIZED CONSTRUCTION ACCESS DETAIL
NOT TO SCALE

NOTES:
1. CONCRETE WASHOUT TO BE PRE-FABRICATED, WATERTIGHT AND PORTABLE WASHOUT BIN TO CONTAIN CONCRETE WASTE AND CONCRETE WASH WATER. THE QUANTITY OF THE BIN(S) SHALL ACCOMMODATE ALL RINSING OPERATIONS REQUIRED ON-SITE AND BE PROTECTED FROM BREACH OR OVERFLOW AT ALL TIMES. PROVIDE MINIMUM DIMENSION OF 8 FT X 8 FTX. X 2 FT.
2. MANUFACTURED BY CONCRETE WASHOUT SYSTEMS OR APPROVED EQUAL.
3. MAINTENANCE OF TEMPORARY WASHOUT FACILITIES SHALL INCLUDE REMOVING AND DISPOSING OF HARDENED CONCRETE AND RETURNING THE FACILITY TO A FUNCTIONING CONDITION. EXCESS WATER SHALL BE PUMPED INTO A CONTAINMENT VESSEL AND PROPERLY DISPOSED OF OFF-SITE.
4. ACCUMULATED HARDENED MATERIAL SHALL BE REMOVED WHEN 75% OF THE STORAGE CAPACITY OF THE STRUCTURE IS FILLED.
5. WASH WATER SHALL BE ESTIMATED AT 7 GALLONS PER CHUTE AND 50 GALLONS PER HOPPER OF THE CONCRETE PUMP TRUCK AND/OR DISCHARGING DRUM.
6. ALL CONCRETE WASHOUT FACILITIES SHALL BE INSPECTED DAILY. DAMAGED OR LEAKING FACILITIES SHALL BE DEACTIVATED AND REPAIRED OR REPLACED IMMEDIATELY.
7. FACILITY SHALL BE LOCATED A MIN. 100 FEET FROM ANY STREAM OR RECEIVING WATER.

5 CONCRETE WASHOUT DETAIL
NOT TO SCALE

PLANS PREPARED BY:
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NO.	REVISION	DATE
ISSUED TO	DESCRIPTION	
1	SWPPP RESUBMISSION	04/22/2026

PROJECT

73 EMPIRE BLVD.
DEMOLITION & REMEDIATION
73 EMPIRE BLVD.

BROOKLYN, NEW YORK

DRAWING TITLE

EROSION & SEDIMENT CONTROL PLAN GENERAL NOTES & DETAILS

SEAL & SIGNATURE

STATE OF NEW YORK · JEFFREY ALAN DEROSIER · 083791 · LICENSED PROFESSIONAL ENGINEER

DATE: 03/27/2026
PROJECT No: 25023
DRAWING BY: JAD
CHK BY: JAD
DWG No: ESC-100.00
CADD FILE No:

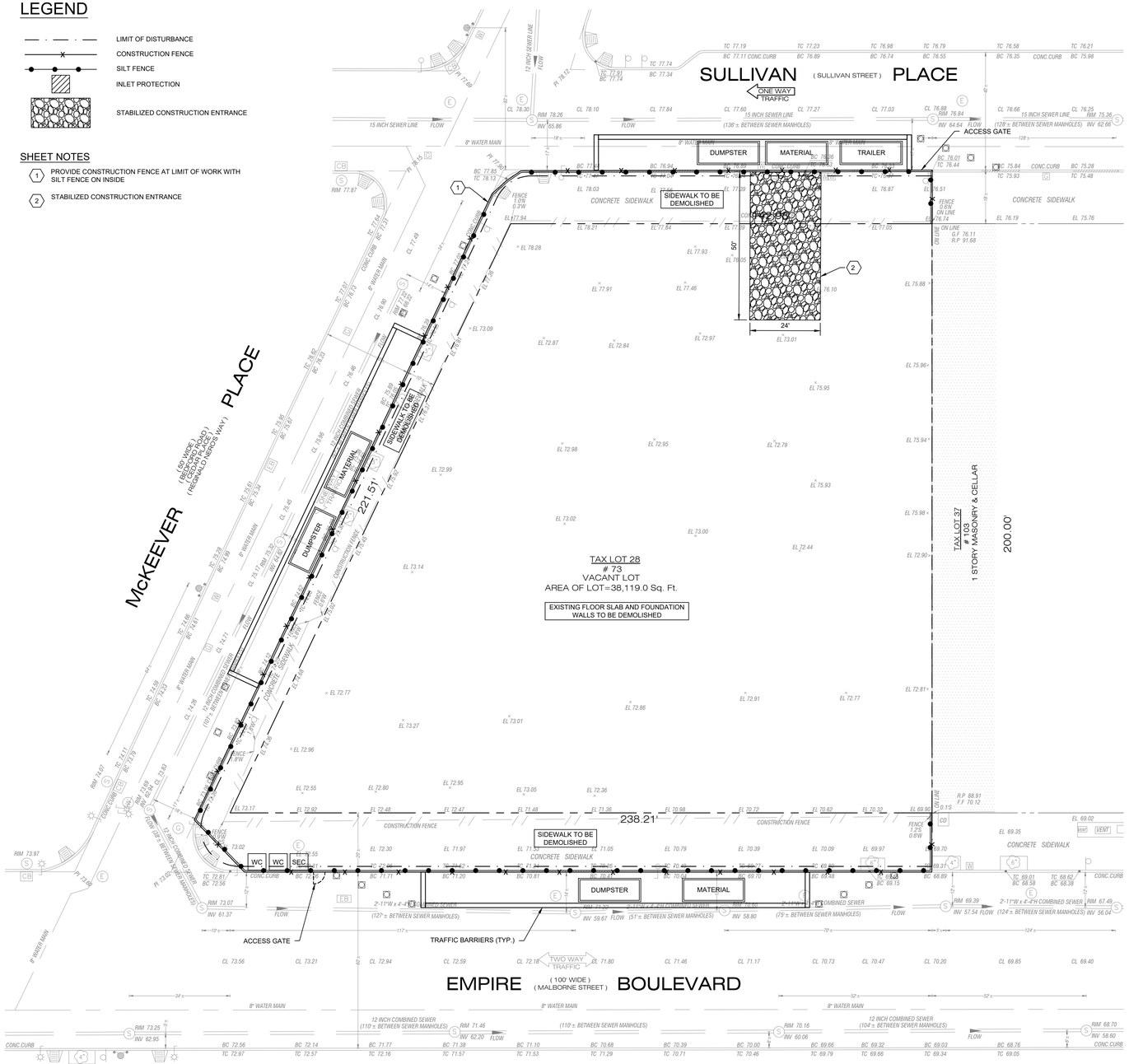
DEP ID# S307226

LEGEND

- LIMIT OF DISTURBANCE
- CONSTRUCTION FENCE
- SILT FENCE
- INLET PROTECTION
- STABILIZED CONSTRUCTION ENTRANCE

SHEET NOTES

1. PROVIDE CONSTRUCTION FENCE AT LIMIT OF WORK WITH SILT FENCE ON INSIDE
2. STABILIZED CONSTRUCTION ENTRANCE



GRAPHIC SCALES

1" = 20' — 20' 10' 0' 20'

1 ESC PLAN - PHASE 1 DEMOLITION
SCALE: 1" = 20'

TABLE 4.6(a) – CONSTRUCTION SEQUENCING

PHASE # 1: Demolition

CONSTRUCTION ACTIVITY (in sequential order)	PRACTICE(S) INSTALLED PRIOR TO ACTIVTY[1]	PRACTICE(S) INSTALLED DURING ACTIVTY[1]	PRACTICE(S) INSTALLED WITHIN ONE BUSINESS DAY OF COMPLETING ACTIVTY[1]
Secure the site.	None	None	None
Identify and establish limits of disturbance.	None	None	None
Install Construction Fence, Stabilized Construction Entrance and Silt Fence	None	Silt Fence Stabilized Construction Entrance	None
Establish construction field office, sanitary facilities and staging areas	None	None	None
Demolish Existing Improvements	Silt Fence Stabilized Construction Entrance	None	None

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NO.	REVISION	DATE
1	SWPPP RESUBMISSION	04/22/2026

ISSUED TO

PROJECT

73 EMPIRE BLVD.
DEMOLITION & REMEDIATION
73 EMPIRE BLVD.

BROOKLYN, NEW YORK

DRAWING TITLE

ESC PLAN - PHASE 1 DEMOLITION

SEAL & SIGNATURE

JEFFREY ALAN DEROSIER — STATE OF NEW YORK — 089791 — LICENSED PROFESSIONAL ENGINEER

DATE:	03/27/2026
PROJECT No:	25023
DRAWING BY:	JAD
CHK BY:	JAD
DWG No:	ESC-101.00
CADD FILE No:	

DEP ID# S307226

LEGEND

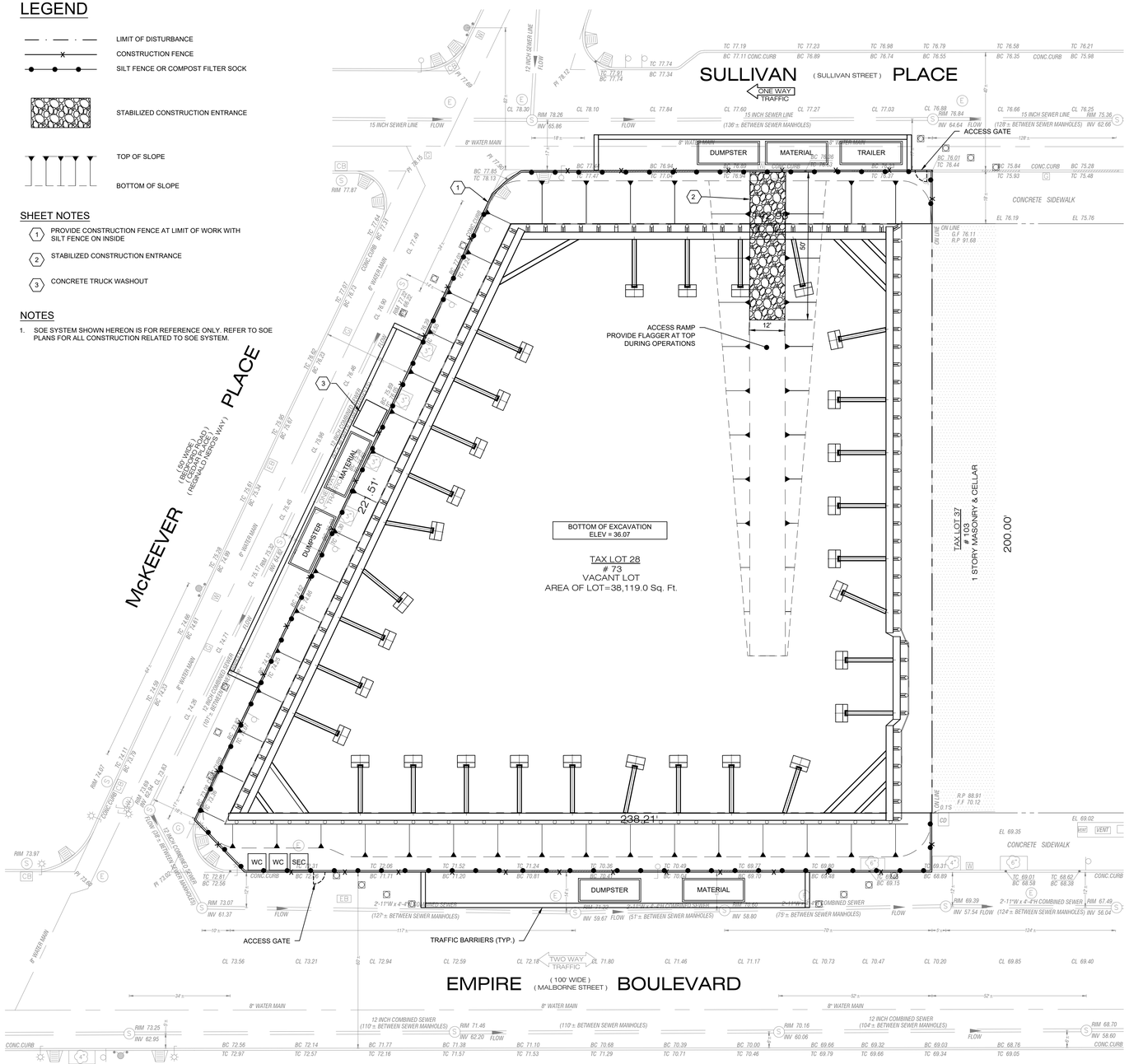
- LIMIT OF DISTURBANCE
- CONSTRUCTION FENCE
- SILT FENCE OR COMPOST FILTER SOCK
- STABILIZED CONSTRUCTION ENTRANCE
- TOP OF SLOPE
- BOTTOM OF SLOPE

SHEET NOTES

1. PROVIDE CONSTRUCTION FENCE AT LIMIT OF WORK WITH SILT FENCE ON INSIDE
2. STABILIZED CONSTRUCTION ENTRANCE
3. CONCRETE TRUCK WASHOUT

NOTES

1. SOE SYSTEM SHOWN HEREON IS FOR REFERENCE ONLY. REFER TO SOE PLANS FOR ALL CONSTRUCTION RELATED TO SOE SYSTEM.



GRAPHIC SCALES

1" = 20' 20' 10' 0' 20'

1 ESC PLAN - PHASE 2 SOE & ENVIRONMENTAL REMEDIATION

SCALE: 1" = 20'

TABLE 4.6(B) – CONSTRUCTION SEQUENCING

PHASE # 2: Excavation

CONSTRUCTION ACTIVITY (in sequential order)	PRACTICE(S) INSTALLED PRIOR TO ACTIVTY[1]	PRACTICE(S) INSTALLED DURING ACTIVTY[1]	PRACTICE(S) INSTALLED WITHIN ONE BUSINESS DAY OF COMPLETING ACTIVTY[1]
Install SOE	Silt fence Stabilized construction entrance	Concrete Truck Washout, Dust Control	None
Excavate and remove excess material	Silt Fence Stabilized Construction Entrance	Dust Control	None
Backfill and Remove SOE	Silt Fence Stabilized Construction Entrance	Dust Control	
Stabilize Site			None

PLANS PREPARED BY:
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NO.	REVISION / ISSUED TO	DATE / DESCRIPTION
1	SWPPP RESUBMISSION	04/22/2026

PROJECT

73 EMPIRE BLVD.
DEMOLITION & REMEDIATION
73 EMPIRE BLVD.

BROOKLYN, NEW YORK

DRAWING TITLE
ESC PLAN - PHASE 2 SOE & ENVIRONMENTAL REMEDIATION

SEAL & SIGNATURE

STATE OF NEW YORK · JEFFREY ALAN DEROSIER · 083791 · LICENSED PROFESSIONAL ENGINEER

DATE: 03/27/2026
PROJECT No: 25023
DRAWING BY: JAD
CHK BY: JAD
DWG No: ESC-102.00
CADD FILE No:

DEP ID# S307226

Appendix B: Calculations

Documents included:

☐ Erosion and Sediment Control Practice Calculations – Not Applicable

☐ Design Calculation Sheet:

☐ NYC MS4 No-Net-Increase Calculator for Nitrogen (NYC SWM Appendix B), if applicable.

☐ Detention in Series Workbook (NYC SWM Appendix G), if applicable.

☐ Hydrologic and hydraulic analyses

If any of the above documents are not included, explain why below:

Project is listed in Table 2.2 and only requires ESC components.

Appendix C: Technical Documentation

Documents included:

☐ Manufacturer Product Data

☐ Material specifications

☐ Installation details

If any of the above documents are not included, explain why below:

Project is listed in Table 2.2 and only requires ESC components.

Appendix D: Geotechnical Investigation Reports

Documents included:

☒ Custom Soils Report

☒ Geotechnical Investigation Report

☒ Geotechnical Investigation Data Summary

If any of the above documents are not included, explain why below:

Click or tap here to enter text.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Kings County, New York

25023-73 Empire Blvd

January 7, 2026

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:900 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 40 80 160 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Kings County, New York
Survey Area Data: Version 16, Aug 28, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
UoA	Urban land, outwash substratum, 0 to 3 percent slopes	0.6	23.9%
UtB	Urban land, till substratum, 3 to 8 percent slopes	1.9	76.1%
Totals for Area of Interest		**2.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the

development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Kings County, New York

UoA—Urban land, outwash substratum, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2pbdp
Elevation: 0 to 160 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land, outwash substratum: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land, Outwash Substratum

Setting

Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Asphalt over human-transported material

Typical profile

M1 - 0 to 6 inches: cemented material
M2 - 6 to 20 inches: cemented material
2^C - 20 to 72 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 0 inches to manufactured layer
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Greenbelt

Percent of map unit: 3 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, base slope, crest, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

Flatbush

Percent of map unit: 2 percent
Landform position (two-dimensional): Summit, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, base slope, crest, rise, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

Centralpark

Percent of map unit: 1 percent
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ebbets

Percent of map unit: 1 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, base slope, crest, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

Laguardia

Percent of map unit: 1 percent
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, base slope, crest, dip, rise, talf
Down-slope shape: Concave, convex, linear
Across-slope shape: Concave, linear, convex
Hydric soil rating: No

UtB—Urban land, till substratum, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2pbc7
Elevation: 0 to 370 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land, till substratum: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land, Till Substratum

Setting

Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Asphalt over human-transported material

Typical profile

M - 0 to 15 inches: cemented material
2^C - 15 to 79 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: 0 inches to manufactured layer
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Greenbelt

Percent of map unit: 3 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, base slope, crest, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

Ebbets

Percent of map unit: 2 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, base slope, crest, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

Laguardia

Percent of map unit: 2 percent
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, base slope, crest, dip, rise, talf
Down-slope shape: Concave, convex, linear
Across-slope shape: Concave, linear, convex
Hydric soil rating: No

Centralpark

Percent of map unit: 1 percent
Landform position (two-dimensional): Summit

Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

STRUCTURAL
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GEOTECHNICAL REPORT

73 EMPIRE BLVD.
BROOKLYN, N.Y. 11225

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PREPARED BY:

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1.0 Introduction

This report presents the results of the geotechnical investigations for the proposed development at 73 Empire Boulevard, Brooklyn, New York. The purposes of this study were to investigate subsurface conditions and develop recommendations for feasible foundation systems based on the subsurface investigations described herein by us and by others. Our findings and recommendations are presented below.

1.1 Executive Summary

We understand that the current development plan will include a 14-story building with three below grade levels extending to about 37 to 40 feet deep. Based on the data from initial (Phase 1) subsurface investigations performed by Epic Testing Services, Inc. (Epic) and supplemental (Phase 2) subsurface investigations by Structural Engineering Technologies (S.E.T.), the foundations for the proposed new building can bear on dense sand and gravel (Class 3a, 2a) with an allowable bearing pressure of 4 tsf at 37 feet to 40 feet below grade. Therefore, we recommend supporting the building on shallow foundations. Groundwater was recorded at about 52 feet below grade within boring B-6 performed by Epic. Therefore, liquefaction is not a design concern for the proposed development. The site may be assigned to Site Class D (Stiff soil profile).

2.0 Project Description

2.1 Site Description

The about 38,000-square foot site in Brooklyn, New York is on the western portion of the block bound by Sullivan Place on the north, Bedford Avenue on the east, Empire Boulevard on the south and McKeever Place on the west. The site includes NYC Tax Lots 28 of Block 1306 and was occupied by a 1-story stucco building which has been demolished. No additional information regarding this site was available at the time of this report.

2.2 Adjacent Conditions

The site is directly bordered by Sullivan Place on the north, a 1-story brick building (lot 37) on the east, Empire Boulevard on the south and by McKeever Place on the west.

Based on, publicly available information, test pit findings, and general observations, the existing and adjacent structure conditions are as follows:

North Exposure

- Sullivan Place: Sullivan Place is directly adjacent to the site's full north exposure (about 143 feet). Sidewalk grade varies between El 76 and El 78.

East Exposure

- Lot 37: A 1-story brick building with a reported cellar level is directly adjacent to the site's east exposure (about 200 feet). Based on test pits TP-1 to TP-3, the full depth of the adjacent building's brick foundation wall was not observed because of an adjacent remnant rubble foundation wall from the demolished building on our site. The rubble wall on our site extends between about 4.9 feet to 6.4 feet below site grade. Probes underneath the rubble wall did not encounter the adjacent foundation wall. We assume the adjacent foundation wall (on lot 37) matches the depth of the remnant foundation wall of the demolished building.

South Exposure

- Empire Boulevard: Empire Boulevard is directly adjacent to the site's full south exposure (about 232 feet). Sidewalk grade varies between El 69 and El 73.

West Exposure

- McKeever Place: McKeever Place is directly adjacent to the site's full west exposure (about 221 feet). Sidewalk grade varies between El 73 and El 78.

All depths reported herein are taken from existing sidewalk grade unless otherwise noted. Based on the site survey by Statewide Land Surveying P.C., (dated July 2nd, 2025), we understand that the sidewalk grade fronting the site varies from about El. 68 (NAVD88)[1] to El 75; for the purposes of this report, we consider site/sidewalk grade to be about El. 73.

[1] All elevations herein are provided in the North American Vertical Datum of 1988 (NAVD88) unless otherwise noted.

2.3 Proposed Construction

We understand that the proposed development will consist of a 14-story building with three cellar levels extending about 37 to 40 feet below grade.

3.0 Geotechnical Study

3.1 Subsurface Investigation

The Phase 1 subsurface investigation for 73 Empire Boulevard was performed and documented by Epic. The Phase 2 subsurface investigation was performed and documented by S.E.T to verify the subsurface conditions observed during the Phase 1 investigation.

- Phase 1: This Phase consisted of 10 borings (identified as ET-1 to ET-10) performed by Epic Testing Services Inc. (Epic) in January 2015. All borings were advanced from the existing grade to depths varying between 52 feet to 97 feet below grade. Standard Penetration Testing (SPT) was generally performed at 5-foot intervals.
- Phase 2: This Phase consisted of 1 boring (identified as S.E.T.-1) performed by PG Environmental Services (PGES) in August 2025 and monitored by S.E.T. Standard Penetration Testing (SPT) was generally performed continuously for the top 14 feet and at 5-foot intervals thereafter. This phase also included three test pits (identified as TP-1, TP-2, TP-3) along the east exposure.

See Appendix A for boring logs performed at each Phase of investigation. See Appendix B for laboratory test results on select soil samples taken by S.E.T.

The descriptions and our summary of the reported subsurface strata are as follows:

3.2 Subsurface Conditions

Uncontrolled Fill/Loose Sand [Class 7, 6]

Surficial uncontrolled fill and loose sand was observed and documented immediately below the ground surface and was reported to depths up to 8 feet below grade within the borings. This fill and loose sand are described as granular (sand and gravel) with pieces of bricks and concrete. Typical N-values varied from 3 to 29 blows per foot (bpf) and the material is considered Class 7 in accordance with 2022 New York City Building Code (NYCBC).

Medium Dense to Dense Sand and Gravel [Class 3b, 3a, 2a]

Medium dense to dense sand and gravel was generally observed starting between 6 to 10 feet below grade and extended to the termination depth of all borings. The N-values for the layer varied significantly from 17 bpf to split spoon refusal (over 100 blows per foot), averaging about 54 bpf. The layer is considered Class 3b, 3a and 2a per NYCBC.

3.3 Groundwater

Groundwater was documented and observed at about 52 feet below grade (El. 21) in the borings performed by Epic during the Phase 1 subsurface explorations. The groundwater level may vary with weather conditions, seasonal factors, utility breaks, or other unknown factors.

3.4 Test Pits Results

Three test pits (identified as TP-1, TP-2 and TP-3) were coordinated by S.E.T. and performed by P.G. Environmental Services (PGES) in August 2025. The test pits were performed at the face of the adjacent building on the eastern side of the site. Based on the observations made during test pit excavation, the full depth of the adjacent building's brick foundation wall was not observed because of a remnant rubble foundation wall from the demolished building on our site. The rubble foundation wall from the demolished building extends between about 4.9 feet to 6.4 feet below site grade. Probes underneath the rubble foundation wall from our site did not encounter any adjacent foundation walls. The test pit logs are provided on sketches in Appendix C.

4.0 Design Recommendations

4.1 Seismic Site Class

The NYCBC assigns a seismic site class based on the type, thickness, and average soil properties in the top 100 feet of bearing stratum. Based on the soil profile, and in accordance with Table 1613.3.4.1 of the NYCBC (2022), the site may be assigned to Site Class D (stiff soil profile), and the corresponding site coefficients for short periods (F_a) and 1-second period (F_v) are 1.57 and 2.4, respectively. Design spectral accelerations were determined in accordance with Section 1613.3 of the NYCBC. The maximum considered earthquake spectral accelerations at short periods (S_{MS}) and 1-second period (S_{M1}) are 0.465g and 0.146g, respectively. Assuming the development falls under Risk Category I, II, or III (to be confirmed by the project architect), the project should be designed based on a Seismic Design Category of B according to Table 1613.3.5.

4.2 Liquefaction Potential

The NYCBC requires evaluation of the liquefaction potential of non-cohesive soil below groundwater table and less than 50-ft below the ground surface. Since groundwater was not encountered within 50 feet below grade, liquefaction is not a design concern for the proposed development.

4.3 Foundation Recommendations

We understand that the current development plan includes below grade levels extending about 37 to 40 feet deep. We recommend shallow foundations bearing on the dense sand and gravel (Class 3a and Class 2a) generally encountered at foundation grade.

4.3.1 Shallow Foundation

We recommend supporting new foundations on spread footings or mats extending about 37 to 40 feet below sidewalk grade. New foundations should also match adjacent foundation levels whenever possible, to avoid loading or underpinning adjacent foundations. Dense sand and gravel was generally encountered at foundation level. Therefore, the foundations should bear on this native material with an allowable bearing capacity of 4 tsf at 37 feet or greater below grade. The coefficient of subgrade reaction of 180-tons/ ft^3 can be considered for spread footings bearing at 37 ft or greater below grade, respectively. Total settlement for the shallow foundation could be on the order of ½-inch for spread footings on this sand; this Settlement would mainly occur during construction; differential Settlement could be about 50% of total settlement. Settlement estimates are based on assumed maximum load of 2100 psf across the building footprint (150 psf/story x 14 stories). Our load assumptions should be confirmed by the project structural engineer.

In accordance with the NYCBC requirements for controlled inspection, a professional geotechnical engineer should inspect and approve the foundation subgrade ("Subgrade Inspection – BC1704.7.1") to ensure the material is adequate to provide the recommended allowable bearing pressure. Foundation bearing surfaces should be level and free and clear of debris, standing or frozen water, and other deleterious materials.

4.3.2 Slab-On Grade

We recommend that any slab-on-grade be installed on compacted native soil or compacted controlled fill. Fill should be placed in uniform lifts not exceeding 12 inches when compacted using a 2-ton smooth drum vibratory roller. Lift thickness should not exceed 6 inches when

compacted using hand-operated vibratory plate equipment. The slab subgrade (and all fill lifts) should be compacted to at least 92% of its maximum dry density as determined by ASTM D1557 (Modified Proctor Test). The water content at the time of compaction should be within 2% of the optimum value determined according to ASTM D 1557.

We also recommend installing 6 inches of free-draining gravel or crushed stone directly below the concrete slab to enhance water drainage and reduce capillary action.

We recommend using a subgrade modulus of 80-tons/ft^3 for subgrade soils that have been compacted with at least four (4) passes of a walk-behind vibratory plate or drum roller prior to placing fill or concrete. DOB-required special inspections may include "Subsurface Conditions – BC 1705.6.2 & 1705.6.3" and "Subgrade Inspection – BC 1705.6.4."

4.4 Soil Parameters

We estimated the engineering properties of the subsoils based on our experience and evaluation of N-values shown on the boring logs. Values shown in the table below represent the probable range of the soil parameters and are not necessarily representative of differing values across the site.

Stratigraphy	Unsaturated unit weight, γ (pcf)	Friction angle, φ (°)	At-Rest Coefficient, K_o	Cohesion, c (psf)
Fill & Loose Sand [0-6 ft]	115	26	0.56	0
Medium-Dense Sand/Gravel [Beyond 6 ft]	125	32-34	0.47-0.44	0

Foundation walls should be designed to resist lateral earth pressures from each layer equal to the vertical surcharge load plus the vertical earth pressure load (unit weight x depth) multiplied by the at-rest coefficient of lateral earth pressure provided for each layer as described above.

4.5 Groundwater Control

Groundwater was encountered about 52 feet below grade in boring B-6 performed by Epic during the time of the subsurface explorations. For the proposed construction, we do not expect excavation to extend below groundwater level; we expect that any perched water encountered during foundation excavation (from precipitation or surface run-off) can likely be controlled with traditional sumps and pumps. Local water control should not induce groundwater draw-down at adjacent properties.

5.0 Construction Considerations

5.1 Pre-construction conditions and Temporary Support of Excavation

During cellar and foundation excavation, lateral support of excavation sides will be required. The potential movement of adjacent structures, sidewalks and courtyards must be avoided.

We note that there are no New York City Transit (NYCT) or New York City Landmark Preservation Commission (NYCLPC) landmark structures within 200 feet of the development. Therefore, interaction with NYCT and NYCLPC are not expected.

General excavation for the cellar level is expected to extend about 37 to 40 feet below sidewalk grade. Lateral support of excavation against sidewalks and courtyards could likely be provided using a combination of stable slopes and soldier piles with timber lagging, and multiple levels of lateral bracing. Since the adjacent building foundations on lot 37 along the east exposure are above the proposed cellar levels, multiple tiers of underpinning of adjacent building foundations will be required.

If underpinning is undesirable, a 3-foot-wide horizontal bench must be maintained from the bottom of adjacent foundations, with excavation below the bench following a 1V:1.5H slope. Alternative support systems such as braced secant piles, tangent piles, or bracket piles can also be used to support the adjacent building during the proposed excavation. Temporary excavation side slopes above the groundwater table and with no surcharge on top of the slope should not be steeper than 1V:1H. In addition, concrete spray should be used on top of soil slope to stabilize the slope and minimize erosion due to rain or other construction activities.

Support of excavation design must be prepared by a licensed engineer in the state of New York and filed with the DOB prior to commencement of construction activities. DOB-required special inspections should be specified based on the SOE design but will likely include “Excavations – BC 1705.25.3” and “Underpinning and Alternate Methods of Support of Buildings and Adjacent Property – BC 1705.25.4”.

5.2 Fill Material, Placement and Compaction Criteria

Fill material to be placed should be Controlled Fill as defined by the NYCBC. Controlled Fill should consist of sand, gravel, crushed stone, crushed gravel, or a mixture of these having not more than 10% by dry weight passing the No. 200 sieve. The maximum particle size should be 4-in.

The Controlled Fill must be free of organic, frozen, and other deleterious materials. The use of recycled concrete aggregate (RCA) or the byproduct of blasting-tunneling (commercially known as mole rock) for backfill behind the foundation walls, or below the slab on grade, is not recommended.

We recommend that the foundation subgrade (prior to fill placement) be compacted with at least four (4) passes of a walk-behind vibratory plate or drum roller prior to placing fill or concrete. DOB-required special inspections will likely include "Subsurface Conditions – BC 1704.7.2 & 1704.7.3" and "Subgrade Inspection – BC 1704.7.1."

5.3 Potential Effects on Adjacent Structures

We expect no significant effects on adjacent structures and facilities with properly designed and constructed excavation support. However, excavation in granular fill or sands/gravel could result in slight Settlement of adjacent ground or structures. Typically, these settlements adjacent to the basement walls may be about 0.25% to 0.5% of the depth of excavation. The settlements usually diminish over a distance of about 1.5 times the excavation depth.

Underpinning can also result in Settlement of the structure being underpinned. Properly designed and constructed underpinning can limit Settlement to about 0.5 inches. This could result in cosmetic cracking of the adjacent and existing structures to remain.

5.4 Monitoring Program

5.4.1 Optical Surveying

Before and during soldier pile installation and foundation construction, a precise optical survey program should be implemented to monitor for vertical and horizontal movements of adjacent structures. Survey control points should also be established to monitor lateral movement of the excavation bracing system (if/where applicable). Excavation should be temporarily stopped if movements (vertical or horizontal) exceed established limits. Criteria for allowable movements of structures should be finalized after a pre-construction survey is completed.

As outlined in the 2022 NYC Building Code, we recommend verticality surveys to be performed on adjacent building walls along our lot lines to identify existing deficiencies and potential bulging or leaning of the walls next to our construction site.

5.4.2 Vibration Monitoring

Adjacent buildings may experience slight vibrations during pile drilling and foundation construction. The vibrations should be monitored during construction. Monitoring data should be reviewed daily during construction by a qualified engineer to verify that no unforeseen problems are developing. Baseline vibration levels should be established at least one week before start of demolition or construction.

5.4.3 Crack Monitoring

Visual observations should be taken periodically for cracks in adjacent buildings, pavements, sidewalks, local settlements, etc. The information should be provided to the contractor who may modify the means and methods of construction in response to the information.

6.0 Special Inspections

While the project design is currently ongoing, we expect the following special inspections may be required during excavation and foundation construction:

- Subgrade Inspection – BC 1705.6.4
- Subsurface Conditions-Fill Placement & In-Place Density – BC 1705.6.2 & 1705.6.3
- Excavations – BC 1705.25.3
- Underpinning and Alternative Methods of Support of Buildings and Adjacent Property – BC 1705.25.4 & BC 1817
- Concrete Cast-in-Place – BC 1705.3
- Concrete Design Mix – BC 1905.3
- Concrete Sampling and Testing – BC 1905.6

7.0 Limitations

This report is intended for use in the site located at 73 Empire Boulevard, Brooklyn NY. Structural Engineering Technologies, P.C. cannot take responsibility for the use of this report at any other site. The conclusions and recommendations provided herein are based on subsurface conditions inferred from borings at specific site areas, and from limited verbal description of the proposed project. Recommendations given are contingent upon one another and no recommendation should be followed independent of the others. This report has been prepared to assist the Architect and Structural Engineer in the design. It is intended for use based on the provided information. Any changes in structures or locations should be brought to our attention so that we may review the impact such changes may affect our conclusions and recommendations.

Respectfully Yours,
STRUCTURAL ENGINEERING TECHNOLOGIES, P.C.

Miguel G. Matos, P.E.
Co-Geotechnical Department Director

Deosarran Persaud, P.E.
Co-Geotechnical Department Director

George J. Cambourakis, P.E., C. Eng
President

APPENDIX A

BORING LOGS (BY S.E.T., AND EPIC)

JOB # CM 5022 | ADDRESS: 73 EMPIRE BOULEVARD

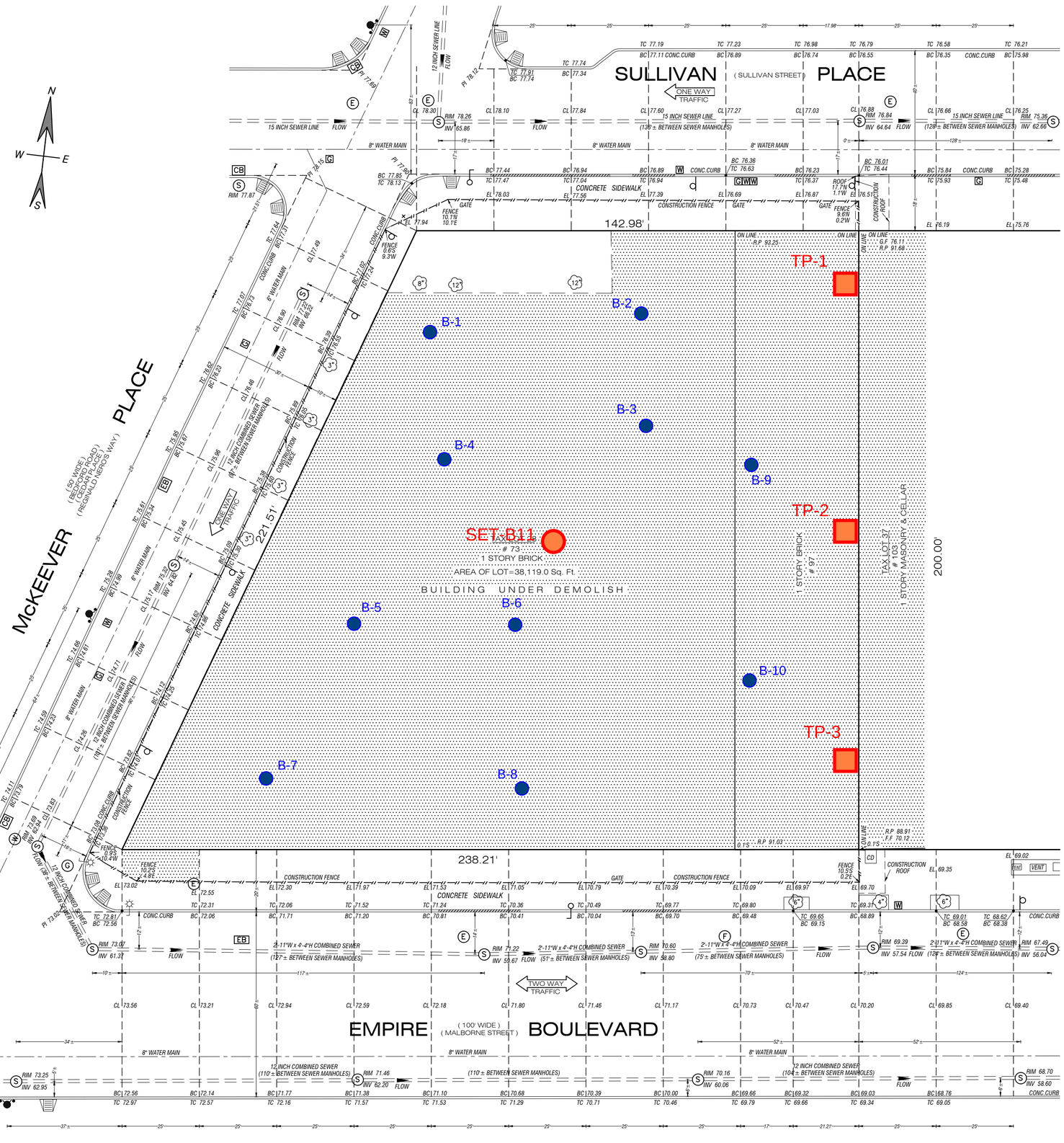
GENERAL NOTES:

1. This survey was prepared only for the party (parties) and purpose indicated hereon.
2. Property corner monuments or markers were (not) placed as part of this survey.
3. Certifications on this survey map signify that the map was prepared in accordance with the current existing Code of Practice for Land Surveys adopted by the New York State Association of Professional Land Surveyors, Inc. Said certifications are limited to the party (parties) for whom the survey is prepared and are not transferable.
4. The location and nature of underground structures, internal walls and improvements or encroachments not visible to the surveyor are not covered under this certification.
5. Easements of record are only guaranteed if an Abstract of Title is furnished to the surveyor.
6. This is to certify that there are no streams nor natural water courses on the property except as shown on this survey.
7. Elevations refer to NAVD 1988 datum.

CAPTION	ARCHITECTURAL SURVEY				
DATE	REVISIONS				
07-02-2025	ARCHITECTURAL SURVEY				
	DATE	BY		DATE	BY
SURVEYED	07-02-2025	V.B,V.J,P.J	DRAWN	07-05-2025	A.K

LEGEND

- F.F . . . FIRST FLOOR ELEVATION
- R.P . . . ROOF PARAPET ELEVATION
- G.F . . . GARAGE FLOOR ELEVATION
- TC . . . TOP OF CURB
- BC . . . BOTTOM OF CURB
- CL . . . CENTERLINE
- EL . . . SPOT ELEVATION
- INV . . . INVERT ELEVATION
- CD . . . CELLAR DOOR
- CONC. . . . CONCRETE
- (G) . . . GAS MANHOLE
- (W) . . . WATER MANHOLE
- (E) . . . ELECTRIC MANHOLE
- (S) . . . SEWER MANHOLE
- (F) . . . FIRE DEPARTMENT MANHOLE
- W . . . WATER VALVE
- G . . . GAS VALVE
- CB . . . CATCH BASIN
- EB . . . ELECTRIC BOX
- TRAFFIC LIGHT
- LIGHT POLE
- STREET SIGN
- HYDRANT
- CHAIN LINK FENCE
- CONSTRUCTION FENCE
- DROP CURB
- PEDESTRIAN RAMP
- TREE & SIZE



SCALE: 1 INCH = 25 FEET

VINCENT TEUTONICO, L.S.
NEW YORK LICENSE 050307

MAP OF SURVEY OF PROPERTY

BOROUGH AND COUNTY OF BROOKLYN
CITY AND STATE OF NEW YORK
TAX MAP: BLOCK 1306, LOT 28

STATEWIDE LAND SURVEYING P.C.

16 FLAGG PLACE
STATEN ISLAND
NY 10304
TEL: 718-751-6871
email: citymapping@yahoo.com

BORING B-1

DEPTH FT.	SPOON BLOWS PER 1/2 FT.		HOLLOW STEM AUGER	MATERIAL
GROUND SURFACE				
5.0	8 16	13 16		Uncontrolled Fill. Class 7
10.0	12 14	10 11		Uncontrolled Fill. Class 7
15.0	8 10	10 14		Granular Soils. SM Class 3b
20.0	11 12	16 15		Granular Soils. SP Class 3b
25.0	16 19	16 23		Granular Soils. SM Class 3a
30.0	31 49	36 50		Sandy Gravel & Gravel. GP Class 2a
35.0	42 40	39 47		Sandy Gravel & Gravel. GP Class 2a
40.0	38 49	44 63		Sandy Gravel & Gravel. GP Class 2a
45.0	26 31	20 28		Granular Soils. SW Class 3a
50.0	22 29	25 36		Granular Soils. SW Class 3a
GWT-55'. 55.0	19 25	23 21		Granular Soils. SP Class 3a
60.0	11 19	19 26		Granular Soils. SP Class 3a
65.0	25 37	31 33		Granular Soils. SP Class 3a

BORING B-1

DEPTH FT.	SPOON BLOWS PER 1/2 FT.		HOLLOW STEM AUGER	MATERIAL
70.0	39 28	42 36		Granular Soils. SP Class 3a
75.0	33 28	30 41		Granular Soils. SP Class 3a
80.0	31 39	22 39		Granular Soils. SW Class 3a
85.0	33 41	35 26		Granular Soils. SW Class 3a
90.0	20 28	33 24		Granular Soils. SW Class 3a
95.0	43 56	49 41		Sandy Gravel & Gravel. GP Class 2a
100.0	58 80	63 24		Sandy Gravel & Gravel. GP Class 2a End of Hole 97'.

BORING B-2

DEPTH FT.	SPOON BLOWS PER 1/2 FT.		HOLLOW STEM AUGER	MATERIAL
GROUND SURFACE				
5.0	12 5	16 13		Uncontrolled Fill. Class 7
10.0	10 14	10 11		Granular Soils. SM Class 3b
15.0	12 11	16 13		Granular Soils. SM Class 3b
20.0	15 18	18 23		Granular Soils. SM Class 3a
25.0	17 27	21 29		Granular Soils. SM Class 3a
30.0	24 26	31 25		Granular Soils. SM Class 3a
35.0	33 39	37 30		Sandy Gravel & Gravel. GP Class 2a
40.0	28 26	43 29		Sandy Gravel & Gravel. GP Class 2a
45.0	28 24	37 27		Sandy Gravel & Gravel. GP Class 2a
50.0	31 25	26 33		Granular Soils. SW Class 3a
55.0	30 24	28 29		Granular Soils. SW Class 3a End of Hole 52'.

BORING B-3

DEPTH FT.	SPOON BLOWS PER 1/2 FT.		HOLLOW STEM AUGER	MATERIAL
GROUND SURFACE				
5.0	6 11	13 15		Uncontrolled Fill. Class 7
10.0	8 12	10 17		Granular Soils. SM Class 3b
15.0	14 19	19 16		Granular Soils. SM Class 3a
20.0	17 20	21 23		Granular Soils. SM Class 3a
25.0	31 28	26 25		Granular Soils. SW Class 3a
30.0	29 36	31 30		Granular Soils. SW Class 3a
35.0	24 23	27 29		Granular Soils. SW Class 3a
40.0	28 36	36 31		Sandy Gravel & Gravel. GP Class 2a
45.0	42 36	40 30		Sandy Gravel & Gravel. GP Class 2a
50.0	39 31	28 35		Sandy Gravel & Gravel. GP Class 2a
55.0	33 36	37 31		Sandy Gravel & Gravel. GP Class 2a End of Hole 52'.

TABLE 1804.2 UNIFIED SOIL CLASSIFICATION (Including Identification And Description)

GROUP SYMBOLS	TYPICAL NAMES
GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
GM	Silty gravels, gravel-sand-silt mixtures.
GC	Clayey gravels, gravel-sand-clay mixtures.
SW	Well-graded sands, gravelly sands, little or no fines.
SP	Poorly graded sands or gravelly sands, little or no fines.
SM	Silty sands, sand-silt mixtures.
SC	Clayey sands, sand-clay mixtures.
ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
OL	Organic silts and organic silty clays of low plasticity.
MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
CH	Inorganic clays of high plasticity, fat clays.
OH	Organic clays of medium to high plasticity, organic silts.
Pt	Peat and other highly organic soils.

PLASTICITY CHART

ALLOWABLE BEARING PRESSURES, N.Y.C. BLDG. CODE BC-1804

CLASS OF MATERIALS (NOTES 1 AND 3)	MAXIMUM ALLOWABLE FOUNDATION PRESSURE (TSF)	MAXIMUM ALLOWABLE FOUNDATION PRESSURE (kPa)
1. BEDROCK (NOTES 2 & 7)		
1a Hard sound rock—gneiss, diabase, schist	60	5,746
1b Medium hard rock—marble, serpentine	40	3,830
1c Intermediate rock—shale, sandstone	20	1,915
1d Soft rock—weathered rock	8	766
2. SANDY GRAVEL AND GRAVEL (GW, GP) (Notes 3, 4, 8 & 9)		
2a Dense	10	958
2b Medium	6	575
3. GRANULAR SOILS (GC, GM, SW, SP, SM & SC) (Notes 4, 5, 8 & 9)		
3a Dense	6	575
3b Medium	3	287
4. CLAYS (SC, CL & CH) (Notes 4, 6, 8 & 9)		
4a Hard	5	479
4b Stiff	3	287
4c Medium	2	192
5. SILTS AND SILTY SOILS (ML & MH) (Notes 4, 8 & 9)		
5a Dense	3	287
5b Medium	1.5	144
6. ORGANIC SILTS, ORGANIC CLAYS, PEATS, SOFT CLAYS, LOOSE GRANULAR SOILS AND VARVED SILTS.	See 1804.2.1	See 1804.2.1
7. CONTROLLED AND UNCONTROLLED FILLS.	See 1804.2.2 OR 1804.2.3	See 1804.2.2 OR 1804.2.3

Notes:

1. WHERE THERE IS DOUBT AS TO THE APPLICABLE CLASSIFICATION OF A SOIL STRATUM, THE ALLOWABLE BEARING PRESSURE APPLICABLE TO THE LOWER CLASS OF MATERIAL TO WHICH THE GIVEN STRATUM MIGHT CONFORM SHALL APPLY.
2. THE TABULATED VALUES OF ALLOWABLE BEARING PRESSURES APPLY ONLY FOR MASSIVE ROCKS OR FOR SEDIMENTARY OR FOLIATED ROCKS, WHERE THE STRATA ARE LEVEL OR NEARLY SO, AND THEN ONLY IF THE AREA HAS AMPLE LATERAL SUPPORT. TILTED STRATA AND THEIR RELATION TO NEARBY SLOPES OR EXCAVATIONS SHALL RECEIVE SPECIAL CONSIDERATION. THE TABULATED VALUES FOR CLASS 1a MATERIALS (HARD SOUND ROCK) MAY BE INCREASED BY 25 PERCENT PROVIDED THE GEOTECHNICAL ENGINEER PERFORMS ADDITIONAL TESTS AND/OR ANALYSIS SUBSTANTIATING THE INCREASE.
3. FOR INTERMEDIATE CONDITIONS, VALUES OF ALLOWABLE BEARING PRESSURE SHALL BE ESTIMATED BY INTERPOLATION BETWEEN INDICATED EXTREMES.
4. FOOTING EMBEDMENT IN SOILS SHALL BE IN ACCORDANCE WITH SECTION 1805.2 AND THE WIDTH OF THE LOADED AREA NOT LESS THAN 2 FEET (610MM), UNLESS ANALYSIS DEMONSTRATES THAT THE PROPOSED CONSTRUCTION WILL HAVE A MINIMUM FACTOR OF SAFETY OF 2.0 AGAINST SHEAR FAILURE OF THE SOIL.
5. ESTIMATES OF SETTLEMENTS SHALL GOVERN THE ALLOWABLE BEARING VALUE, SUBJECT TO THE MAXIMUMS GIVEN IN THIS TABLE, AND AS PROVIDED IN SECTION 1804.2.
6. THE BEARING CAPACITY OF CLAY SOILS SHALL BE ESTABLISHED ON THE BASIS OF THE STRENGTH OF SUCH SOILS AS DETERMINED BY FIELD OR LABORATORY TESTS AND SHALL PROVIDE A FACTOR OF SAFETY AGAINST FAILURE OF THE SOIL OF NOT LESS THAN 2.0 COMPUTED ON THE BASIS OF A RECOGNIZED PROCEDURE OF SOILS ANALYSIS, SHALL ACCOUNT FOR PROBABLE SETTLEMENTS OF THE BUILDING AND SHALL NOT EXCEED THE TABULATED MAXIMUM VALUES.
7. INCREASES IN ALLOWABLE BEARING PRESSURE DUE TO EMBEDMENT OF THE FOUNDATION. THE ALLOWABLE BEARING VALUES FOR INTERMEDIATE TO HARD ROCK SHALL APPLY WHERE THE LOADED AREA IS ON THE SURFACE OF SOUND ROCK. WHERE THE LOADED AREA IS BELOW THE ADJACENT ROCK SURFACE AND IS FULLY CONFINED BY THE ADJACENT ROCK MASS AND PROVIDED THAT THE ROCK MASS HAS NOT BEEN SHATTERED BY BLASTING OR OTHERWISE IS OR HAS BEEN RENDERED UNSOUND, THESE VALUES MAY BE INCREASED 10 PERCENT OF THE BASE VALUE FOR EACH 1 FOOT (0.3 METERS) OF EMBEDMENT BELOW THE SURFACE OF THE ADJACENT ROCK SURFACE IN EXCESS OF 1 FOOT (0.3 METERS), BUT SHALL NOT EXCEED 200 PERCENT OF THE VALUES.
8. THE ALLOWABLE BEARING VALUES FOR SOILS OF CLASSES 2, 3, 4, AND 5 DETERMINED IN ACCORDANCE WITH NOTES THREE, FOUR AND FIVE ABOVE, SHALL APPLY WHERE THE LOADED AREA IS EMBEDDED 4 FEET (1219 MM) OR LESS IN THE BEARING STRATUM. WHERE THE LOADED AREA IS EMBEDDED MORE THAN 4 FEET (1219 MM) BELOW THE ADJACENT SURFACE OF THE BEARING STRATUM, AND IS FULLY CONFINED BY THE WEIGHT OF THE ADJACENT SOIL, THESE VALUES MAY BE INCREASED 5 PERCENT OF THE BASE VALUE FOR EACH 1-FOOT (305 MM) ADDITIONAL EMBEDMENT, BUT SHALL NOT EXCEED TWICE THE VALUES. INCREASES IN ALLOWABLE BEARING PRESSURE DUE TO EMBEDMENT SHALL NOT APPLY TO SOFT ROCK, CLAYS, SILTS AND SOILS OF CLASSES 6 AND 7.
9. THE ALLOWABLE BEARING VALUES FOR SOILS OF CLASSES 2, 3, 4, AND 5 DETERMINED IN ACCORDANCE WITH THIS TABLE AND THE NOTES THERETO, MAY BE INCREASED UP TO ONE-THIRD WHERE THE DENSITY OF THE BEARING STRATUM BELOW THE BOTTOM OF THE FOOTINGS INCREASES WITH DEPTH AND IS NOT UNDERLAIN BY MATERIALS OF A LOWER ALLOWABLE BEARING PRESSURE. SUCH ALLOWABLE BEARING VALUES SHALL BE DEMONSTRATED BY A RECOGNIZED MEANS OF ANALYSIS THAT THE PROBABLE SETTLEMENT OF THE FOUNDATION DUE TO COMPRESSION, AND/OR CONSOLIDATION DOES NOT EXCEED ACCEPTABLE LIMITS FOR THE PROPOSED BUILDING.
10. THE MAXIMUM TOE PRESSURE FOR ECCENTRICALLY LOADED FOOTINGS MAY EXCEED THE ALLOWABLE BEARING VALUE BY UP TO 25 PERCENT IF IT IS DEMONSTRATED THAT THE HEEL OF THE FOOTING IS NOT SUBJECTED TO TENSION.

SOIL DESCRIPTIONS ARE BY VISUAL EXAMINATION OF SOIL SAMPLES RECOVERED DURING DRILLING OPERATIONS.
SOIL DESCRIPTIONS ARE IN ACCORD WITH THE UNIFIED SOILS CLASSIFICATION SYSTEM AND N.Y.C. BUILDING CODE BC-1804.
GROUND WATER WAS MEASURED INSIDE THE DRILL CASING OR HOLLOW AUGER AT THE COMPLETION OF EACH BOREHOLE.
ALL BORING ELEVATIONS ARE REFERENCED TO EXISTING GROUND LEVEL AS ZERO ELEVATION.

"N"	STANDARD PENETRATION TEST (2" SPOON, 140LB HAMMER, 30" FALL)
6 / 8 / 9 / 12 — N= 17 BLOWS PER FOOT	SPOON BLOW COUNT IS GENERALLY SHOWN IN 6" INCREMENTS FOR 2' DRIVE TO OBTAIN BLOWS PER FOOT (N) USE THE 2ND & 3RD 6" INCREMENT

THIS REPORT IS SUBMITTED WITH THE SPECIFIC UNDERSTANDING THAT THE SOLE LIABILITY OF EPIC TESTING SERVICES, INC., IT'S ENGINEERS AND EMPLOYEES FOR ERRORS AND OMISSIONS IS LIMITED TO THE AMOUNT OF THE FEE PAID FOR THIS REPORT. THE USE OF THIS REPORT WILL CONSTITUTE AN ACCEPTANCE BY THE CLIENT OF THIS DISCLAIMER. THE FEE CHARGED FOR THIS REPORT IS PREDICATED UPON THIS LIMITATION OF LIABILITY WHICH IS THE ESSENCE OF THIS AGREEMENT. IF THESE TERMS ARE NOT ACCEPTABLE, CLIENT MUST NOTIFY EPIC TESTING SERVICES, INC. IN WRITING BY CERTIFIED MAIL, RETURN RECEIPT REQUESTED, WITHIN FIVE (5) DAYS. EPIC TESTING SERVICES, INC., IT'S ENGINEERS AND EMPLOYEES DO NOT ACCEPT ANY LIABILITY OR RESPONSIBILITY FOR PERSONS OTHER THAN THE CLIENT FOR WHOM THIS WORK WAS DIRECTLY PREPARED AND ANY SUCH PERSON, FIRM OR CORPORATION RELIES ON THIS REPORT AT HIS OWN RISK.
NOTE: ALL THE FIELD SAMPLES WILL BE HELD 30 DAYS FROM THE DATE OF THIS REPORT IN OUR LABORATORY UNLESS OTHERWISE DIRECTED BY THE CLIENT IN WRITING.

TYPE OF CORE BARRELS AND DIAMOND BITS:

SIZE	O.D.	CORE DIAMETERS
AX	1- 7/8"	1-1/8"
BX	2-3/8"	1-5/8"
NX	2-15/16"	2-1/8"
AXM	1-7/8"	1-1/8"
NXM	2-15/16"	2-1/8"
B	2"	1-3/8"

WEIGHT OF HAMMERS:
300 LBS. ON 2 ½" CASING – 18" DROP
140 LBS. ON 2" SPOON – 30" DROP
SPOON – SPLIT SAMPLER – 2" O.D. – 1 3/8" I.D. (24" LONG)

GROUND WATER TABLE (G.W.T.) AS NOTED ON BORING LOGS, IS ONLY THE FIRST INDICATION OF WATER ENCOUNTERED BY OUR DRILLERS.

EPIC TESTING SERVICES, INC.
SUBSOIL INVESTIGATION
259 HEMPSTEAD TURNPIKE. PHONE (516) 668-6739 ELMONT, NY 11003

TITLE:

APPLICANT SEAL

DRAWN BY:	Rishidat Umrao
CHECKED BY:	Jahmal Sabaha, P.E.
DATE DRAWN:	01-30-15
DATE REVISED:	
PROJECT:	73 Empire Boulevard Brooklyn.
CLIENT:	Matt Katz.
B– 708 .00	
DRAWING REF.:	SB-608
SHEET NO.:	1 OF 3

DEPARTMENT OF BUILDINGS

SELF CERTIFICATION

BORING B-4

DEPTH FT.	SPOON BLOWS PER 1/2 FT.		HOLLOW STEM AUGER	MATERIAL
GROUND SURFACE				
5.0	12 6	6 14		Uncontrolled Fill. Class 7
10.0	13 17	19 23		Granular Soils. SM Class 3a
15.0	21 20	26 24		Granular Soils. SM Class 3a
20.0	18 23	19 23		Granular Soils. SM Class 3a
25.0	21 20	25 27		Granular Soils. SM Class 3a
30.0	36 30	31 35		Sandy Gravel & Gravel. GP Class 2a
35.0	28 39	33 35		Sandy Gravel & Gravel. GP Class 2a
40.0	27 26	33 42		Sandy Gravel & Gravel. GP Class 2a
45.0	20 26	20 25		Granular Soils. SW Class 3a
50.0	21 24	27 23		Granular Soils. SW Class 3a
55.0	28 29	22 31		Granular Soils. SW Class 3a End of Hole 52'.

BORING B-5

DEPTH FT.	SPOON BLOWS PER 1/2 FT.		HOLLOW STEM AUGER	MATERIAL
GROUND SURFACE				
5.0	7 19	11 5		Uncontrolled Fill. Class 7
10.0	6 10	13 15		Granular Soils. SM Class 3b
15.0	8 16	15 15		Granular Soils. SM Class 3a
20.0	13 19	14 22		Granular Soils. SM Class 3a
25.0	16 16	16 19		Granular Soils. SM Class 3a
30.0	18 26	23 20		Granular Soils. SW Class 3a
35.0	24 20	27 29		Granular Soils. SW Class 3a
40.0	31 25	26 34		Granular Soils. SW Class 3a
45.0	33 27	38 31		Granular Soils. SW Class 3a
50.0	40 36	43 44		Sandy Gravel & Gravel. GP Class 2a
55.0	33 46	39 40		Sandy Gravel & Gravel. GP Class 2a End of Hole 52'.

BORING B-6

DEPTH FT.	SPOON BLOWS PER 1/2 FT.		HOLLOW STEM AUGER	MATERIAL
GROUND SURFACE				
5.0	6 12	12 14		Uncontrolled Fill. Class 7
10.0	10 15	17 16		Granular Soils. SM Class 3a
15.0	13 14	18 19		Granular Soils. SM Class 3a
20.0	16 20	22 23		Granular Soils. SM Class 3a
25.0	39 33	42 25		Sandy Gravel & Gravel. GP Class 2a
30.0	52 34	29 39		Sandy Gravel & Gravel. GP Class 2a
35.0	41 36	40 39		Sandy Gravel & Gravel. GP Class 2a
40.0	38 44	43 26		Sandy Gravel & Gravel. GP Class 2a
45.0	20 30	33 41		Granular Soils. SW Class 3a
50.0	47 39	36 40		Granular Soils. SW Class 3a
GWT-52'. 55.0	38 49	43 40		Granular Soils. SW Class 3a End of Hole 52'.

BORING B-7

DEPTH FT.	SPOON BLOWS PER 1/2 FT.		HOLLOW STEM AUGER	MATERIAL
GROUND SURFACE				
5.0	8 12	12 13		Uncontrolled Fill. Class 7
10.0	10 16	10 11		Granular Soils. SM Class 3b
15.0	14 21	19 17		Granular Soils. SM Class 3a
20.0	23 20	25 26		Granular Soils. SM Class 3a
25.0	17 19	21 23		Granular Soils. SM Class 3a
30.0	31 39	35 36		Granular Soils. SW Class 3a
35.0	34 39	30 24		Granular Soils. SW Class 3a
40.0	31 25	22 37		Granular Soils. SW Class 3a
45.0	35 30	37 39		Granular Soils. SW Class 3a
50.0	36 55	49 60/ 0		Granular Soils. SW Class 3a End of Hole 47'.

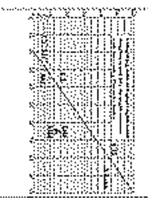
TABLE 1804.2 UNIFIED SOIL CLASSIFICATION (Including Identification And Description)

MAJOR DIVISIONS		GROUP SYMBOLS	TYPICAL NAMES
Coarse-grained Soils. More than half of material is larger than No. 200 sieve size.	Gravels. More than half of coarse fraction is larger than No. 4 sieve size. Clean Gravels (little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
	Gravels with Fines (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures.
		GC	Clayey gravels, gravel-sand-clay mixtures.
	Sands. More than half of coarse fraction is smaller than No. 4 sieve size. Clean Sands (little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines.
		SP	Poorly graded sands or gravelly sands, little or no fines.
	Sands with Fines (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures.
		SC	Clayey sands, sand-clay mixtures.
Fine-grained Soils. More than half of material is smaller than No. 200 sieve size.	Silts and Clays Liquid limit is less than 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		OL	Organic silts and organic silty clays of low plasticity.
	Silts and Clays Liquid limit is greater than 50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		CH	Inorganic clays of high plasticity, fat clays.
		OH	Organic clays of medium to high plasticity, organic silts.
Highly Organic Soils		Pt	Peat and other highly organic soils.

The No. 200 sieve size is about the smallest visible to the naked eye.

Use grain-size curve in identifying the fractions as given under field identification.

Determine percentage of gravel and sand from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size) coarse-grained soils are classified as follows:
Less than 5% GW, GP, SW, SP.
More than 12% GM, GC, SM, SC.
5% to 12% Borderline cases requiring use of dual symbols.



PLASTICITY CHART For laboratory classification of fine-grained soils

ALLOWABLE BEARING PRESSURES, N.Y.C. BLDG. CODE BC-1804

CLASS OF MATERIALS (NOTES 1 AND 3)	MAXIMUM ALLOWABLE FOUNDATION PRESSURE (TSF)	MAXIMUM ALLOWABLE FOUNDATION PRESSURE (kPa)
1. BEDROCK (NOTES 2 & 7)		
1a Hard sound rock—gneiss, diabase, schist	60	5,746
1b Medium hard rock—marble, serpentine	40	3,830
1c Intermediate rock—shale, sandstone	20	1,915
1d Soft rock—weathered rock	8	766
2. SANDY GRAVEL AND GRAVEL (GW, GP) (Notes 3, 4, 8 & 9)		
2a Dense	10	958
2b Medium	6	575
3. GRANULAR SOILS (GC, GM, SW, SP, SM & SC) (Notes 4, 5, 8 & 9)		
3a Dense	6	575
3b Medium	3	287
4. CLAYS (SC, CL & CH) (Notes 4, 6, 8 & 9)		
4a Hard	5	479
4b Stiff	3	287
4c Medium	2	192
5. SILTS AND SILTY SOILS (ML & MH) (Notes 4, 8 & 9)		
5a Dense	3	287
5b Medium	1.5	144
6. ORGANIC SILTS, ORGANIC CLAYS, PEATS, SOFT CLAYS, LOOSE GRANULAR SOILS AND VARVED SILTS.	See 1804.2.1	See 1804.2.1
7. CONTROLLED AND UNCONTROLLED FILLS.	See 1804.2.2 OR 1804.2.3	See 1804.2.2 OR 1804.2.3

Notes:

1. WHERE THERE IS DOUBT AS TO THE APPLICABLE CLASSIFICATION OF A SOIL STRATUM, THE ALLOWABLE BEARING PRESSURE APPLICABLE TO THE LOWER CLASS OF MATERIAL TO WHICH THE GIVEN STRATUM MIGHT CONFORM SHALL APPLY.
2. THE TABULATED VALUES OF ALLOWABLE BEARING PRESSURES APPLY ONLY FOR MASSIVE ROCKS OR FOR SEDIMENTARY OR FOLIATED ROCKS, WHERE THE STRATA ARE LEVEL OR NEARLY SO, AND THEN ONLY IF THE AREA HAS AMPLE LATERAL SUPPORT. TILTED STRATA AND THEIR RELATION TO NEARBY SLOPES OR EXCAVATIONS SHALL RECEIVE SPECIAL CONSIDERATION. THE TABULATED VALUES FOR CLASS 1a MATERIALS (HARD SOUND ROCK) MAY BE INCREASED BY 25 PERCENT PROVIDED THE GEOTECHNICAL ENGINEER PERFORMS ADDITIONAL TESTS AND/OR ANALYSIS SUBSTANTIATING THE INCREASE.
3. FOR INTERMEDIATE CONDITIONS, VALUES OF ALLOWABLE BEARING PRESSURE SHALL BE ESTIMATED BY INTERPOLATION BETWEEN INDICATED EXTREMES.
4. FOOTING EMBEDMENT IN SOILS SHALL BE IN ACCORDANCE WITH SECTION 1805.2 AND THE WIDTH OF THE LOADED AREA NOT LESS THAN 2 FEET (610MM), UNLESS ANALYSIS DEMONSTRATES THAT THE PROPOSED CONSTRUCTION WILL HAVE A MINIMUM FACTOR OF SAFETY OF 2.0 AGAINST SHEAR FAILURE OF THE SOIL.
5. ESTIMATES OF SETTLEMENTS SHALL GOVERN THE ALLOWABLE BEARING VALUE, SUBJECT TO THE MAXIMUMS GIVEN IN THIS TABLE, AND AS PROVIDED IN SECTION 1804.2.
6. THE BEARING CAPACITY OF CLAY SOILS SHALL BE ESTABLISHED ON THE BASIS OF THE STRENGTH OF SUCH SOILS AS DETERMINED BY FIELD OR LABORATORY TESTS AND SHALL PROVIDE A FACTOR OF SAFETY AGAINST FAILURE OF THE SOIL OF NOT LESS THAN 2.0 COMPUTED ON THE BASIS OF A RECOGNIZED PROCEDURE OF SOILS ANALYSIS, SHALL ACCOUNT FOR PROBABLE SETTLEMENTS OF THE BUILDING AND SHALL NOT EXCEED THE TABULATED MAXIMUM VALUES.
7. INCREASES IN ALLOWABLE BEARING PRESSURE DUE TO EMBEDMENT OF THE FOUNDATION. THE ALLOWABLE BEARING VALUES FOR INTERMEDIATE TO HARD ROCK SHALL APPLY WHERE THE LOADED AREA IS ON THE SURFACE OF SOUND ROCK. WHERE THE LOADED AREA IS BELOW THE ADJACENT ROCK SURFACE AND IS FULLY CONFINED BY THE ADJACENT ROCK MASS AND PROVIDED THAT THE ROCK MASS HAS NOT BEEN SHATTERED BY BLASTING OR OTHERWISE IS OR HAS BEEN RENDERED UNSOUND, THESE VALUES MAY BE INCREASED 10 PERCENT OF THE BASE VALUE FOR EACH 1 FOOT (0.3 METERS) OF EMBEDMENT BELOW THE SURFACE OF THE ADJACENT ROCK SURFACE IN EXCESS OF 1 FOOT (0.3 METERS), BUT SHALL NOT EXCEED 200 PERCENT OF THE VALUES.
8. THE ALLOWABLE BEARING VALUES FOR SOILS OF CLASSES 2, 3, 4, AND 5 DETERMINED IN ACCORDANCE WITH NOTES THREE, FOUR AND FIVE ABOVE, SHALL APPLY WHERE THE LOADED AREA IS EMBEDDED 4 FEET (1219 MM) OR LESS IN THE BEARING STRATUM. WHERE THE LOADED AREA IS EMBEDDED MORE THAN 4 FEET (1219 MM) BELOW THE ADJACENT SURFACE OF THE BEARING STRATUM, AND IS FULLY CONFINED BY THE WEIGHT OF THE ADJACENT SOIL, THESE VALUES MAY BE INCREASED 5 PERCENT OF THE BASE VALUE FOR EACH 1-FOOT (305 MM) ADDITIONAL EMBEDMENT, BUT SHALL NOT EXCEED TWICE THE VALUES. INCREASES IN ALLOWABLE BEARING PRESSURE DUE TO EMBEDMENT SHALL NOT APPLY TO SOFT ROCK, CLAYS, SILTS AND SOILS OF CLASSES 6 AND 7.
9. THE ALLOWABLE BEARING VALUES FOR SOILS OF CLASSES 2, 3, 4, AND 5 DETERMINED IN ACCORDANCE WITH THIS TABLE AND THE NOTES THERETO, MAY BE INCREASED UP TO ONE-THIRD WHERE THE DENSITY OF THE BEARING STRATUM BELOW THE BOTTOM OF THE FOOTINGS INCREASES WITH DEPTH AND IS NOT UNDERLAIN BY MATERIALS OF A LOWER ALLOWABLE BEARING PRESSURE. SUCH ALLOWABLE BEARING VALUES SHALL BE DEMONSTRATED BY A RECOGNIZED MEANS OF ANALYSIS THAT THE PROBABLE SETTLEMENT OF THE FOUNDATION DUE TO COMPRESSION, AND/OR CONSOLIDATION DOES NOT EXCEED ACCEPTABLE LIMITS FOR THE PROPOSED BUILDING.
10. THE MAXIMUM TOE PRESSURE FOR ECCENTRICALLY LOADED FOOTINGS MAY EXCEED THE ALLOWABLE BEARING VALUE BY UP TO 25 PERCENT IF IT IS DEMONSTRATED THAT THE HEEL OF THE FOOTING IS NOT SUBJECTED TO TENSION.

SOIL DESCRIPTIONS ARE BY VISUAL EXAMINATION OF SOIL SAMPLES RECOVERED DURING DRILLING OPERATIONS.
SOIL DESCRIPTIONS ARE IN ACCORD WITH THE UNIFIED SOILS CLASSIFICATION SYSTEM AND N.Y.C. BUILDING CODE BC-1804.
GROUND WATER WAS MEASURED INSIDE THE DRILL CASING OR HOLLOW AUGER AT THE COMPLETION OF EACH BOREHOLE.
ALL BORING ELEVATIONS ARE REFERENCED TO EXISTING GROUND LEVEL AS ZERO ELEVATION.

"N"	STANDARD PENETRATION TEST (2" SPOON, 140LB HAMMER, 30" FALL)
6 / 8 / 9 / 12 — N= 17 BLOWS PER FOOT	SPOON BLOW COUNT IS GENERALLY SHOWN IN 6" INCREMENTS FOR 2' DRIVE TO OBTAIN BLOWS PER FOOT (N) USE THE 2ND & 3RD 6" INCREMENT

THIS REPORT IS SUBMITTED WITH THE SPECIFIC UNDERSTANDING THAT THE SOLE LIABILITY OF EPIC TESTING SERVICES, INC., IT'S ENGINEERS AND EMPLOYEES FOR ERRORS AND OMISSIONS IS LIMITED TO THE AMOUNT OF THE FEE PAID FOR THIS REPORT. THE USE OF THIS REPORT WILL CONSTITUTE AN ACCEPTANCE BY THE CLIENT OF THIS DISCLAIMER. THE FEE CHARGED FOR THIS REPORT IS PREDICATED UPON THIS LIMITATION OF LIABILITY WHICH IS THE ESSENCE OF THIS AGREEMENT. IF THESE TERMS ARE NOT ACCEPTABLE, CLIENT MUST NOTIFY EPIC TESTING SERVICES, INC. IN WRITING BY CERTIFIED MAIL, RETURN RECEIPT REQUESTED, WITHIN FIVE (5) DAYS. EPIC TESTING SERVICES, INC., IT'S ENGINEERS AND EMPLOYEES DO NOT ACCEPT ANY LIABILITY OR RESPONSIBILITY FOR PERSONS OTHER THAN THE CLIENT FOR WHOM THIS WORK WAS DIRECTLY PREPARED AND ANY SUCH PERSON, FIRM OR CORPORATION RELIES ON THIS REPORT AT HIS OWN RISK.
NOTE: ALL THE FIELD SAMPLES WILL BE HELD 30 DAYS FROM THE DATE OF THIS REPORT IN OUR LABORATORY UNLESS OTHERWISE DIRECTED BY THE CLIENT IN WRITING.

TYPE OF CORE BARRELS AND DIAMOND BITS:

SIZE	O.D.	CORE DIAMETERS
AX	1- 7/8"	1-1/8"
BX	2-3/8"	1-5/8"
NX	2-15/16"	2-1/8"
AXM	1-7/8"	1-1/8"
NXM	2-15/16"	2-1/8"
B	2"	1-3/8"

WEIGHT OF HAMMERS:
300 LBS. ON 2 ½" CASING – 18" DROP
140 LBS. ON 2" SPOON – 30" DROP
SPOON – SPLIT SAMPLER – 2" O.D. – 1 3/8" I.D. (24" LONG)

GROUND WATER TABLE (G.W.T.) AS NOTED ON BORING LOGS, IS ONLY THE FIRST INDICATION OF WATER ENCOUNTERED BY OUR DRILLERS.

EPIC TESTING SERVICES, INC.
SUBSOIL INVESTIGATION
259 HEMPSTEAD TURNPIKE. PHONE (516) 668-6739 ELMONT, NY 11003

TITLE:

APPLICANT SEAL

DRAWN BY: Rishidat Umrao
CHECKED BY: Jahmal Sabaha, P.E.
DATE DRAWN: 01-30-15
DATE REVISED:
PROJECT: 73 Empire Boulevard Brooklyn.
CLIENT: Matt Katz.
B– 708 .00
DRAWING REF.: SB-608
SHEET NO.: 2 OF 3

DEPARTMENT OF BUILDINGS

SELF CERTIFICATION

BORING B-8			
DEPTH FT.	SPOON BLOWS PER 1/2 FT.		MATERIAL
GROUND SURFACE			
5.0	6 / 9	15 / 13	Uncontrolled Fill. Class 7
10.0	14 / 17	17 / 16	Granular Soils. SM Class 3a
15.0	18 / 20	21 / 23	Granular Soils. SM Class 3a
20.0	22 / 21	24 / 27	Granular Soils. SM Class 3a
25.0	39 / 40	42 / 40	Sandy Gravel & Gravel. GP Class 2a
30.0	38 / 42	38 / 36	Sandy Gravel & Gravel. GP Class 2a
35.0	28 / 23	41 / 30	Sandy Gravel & Gravel. GP Class 2a
40.0	36 / 29	27 / 25	Sandy Gravel & Gravel. GP Class 2a
45.0	31 / 37	37 / 30	Sandy Gravel & Gravel. GP Class 2a
50.0	22 / 27	25 / 23	Granular Soils. SW Class 3a
55.0	22 / 27	27 / 27	Granular Soils. SW Class 3a End of Hole 52'.

BORING B-9			
DEPTH FT.	SPOON BLOWS PER 1/2 FT.		MATERIAL
GROUND SURFACE			
5.0	17 / 11	4 / 13	Uncontrolled Fill. Class 7
10.0	5 / 10	7 / 13	Granular Soils. SM Class 3b
15.0	12 / 11	16 / 14	Granular Soils. SM Class 3b
20.0	15 / 18	18 / 20	Granular Soils. SM Class 3a
25.0	13 / 16	16 / 11	Granular Soils. SM Class 3a
30.0	21 / 25	26 / 23	Granular Soils. SW Class 3a
35.0	20 / 29	27 / 35	Granular Soils. SW Class 3a
40.0	33 / 31	28 / 27	Granular Soils. SW Class 3a
45.0	34 / 28	36 / 20	Granular Soils. SW Class 3a
50.0	33 / 29	37 / 31	Granular Soils. SW Class 3a
GWT-52'. 55.0	36 / 35	28 / 35	Granular Soils. SW Class 3a End of Hole 52'.

BORING B-10			
DEPTH FT.	SPOON BLOWS PER 1/2 FT.		MATERIAL
GROUND SURFACE			
5.0	7 / 10	12 / 10	Uncontrolled Fill. Class 7
10.0	16 / 15	16 / 21	Granular Soils. SM Class 3a
15.0	18 / 20	23 / 26	Granular Soils. SM Class 3a
20.0	37 / 35	31 / 39	Granular Soils. SW Class 3a
25.0	26 / 40	41 / 37	Granular Soils. SW Class 3a
30.0	33 / 36	39 / 31	Granular Soils. SW Class 3a
35.0	41 / 28	40 / 31	Sandy Gravel & Gravel. GP Class 2a
40.0	33 / 39	36 / 35	Sandy Gravel & Gravel. GP Class 2a
45.0	38 / 31	36 / 33	Sandy Gravel & Gravel. GP Class 2a
50.0	39 / 42	36 / 40	Sandy Gravel & Gravel. GP Class 2a
GWT-52'. 55.0	51 / 36	50 / 39	Sandy Gravel & Gravel. GP Class 2a End of Hole 52'.

SB-608

B-1 PERCOLATION TEST RESULTS

TIME (MINUTES)	DROP IN WATER LEVEL (INCHES)
1	7.0
5	19.0
10	35.0
15	60.0
30	77.0
45	93.0
60	115.0

SB-608

B-6 PERCOLATION TEST RESULTS

TIME (MINUTES)	DROP IN WATER LEVEL (INCHES)
1	10.0
5	25.0
10	38.0
15	55.0
30	76.0
45	90.0
60	104.0

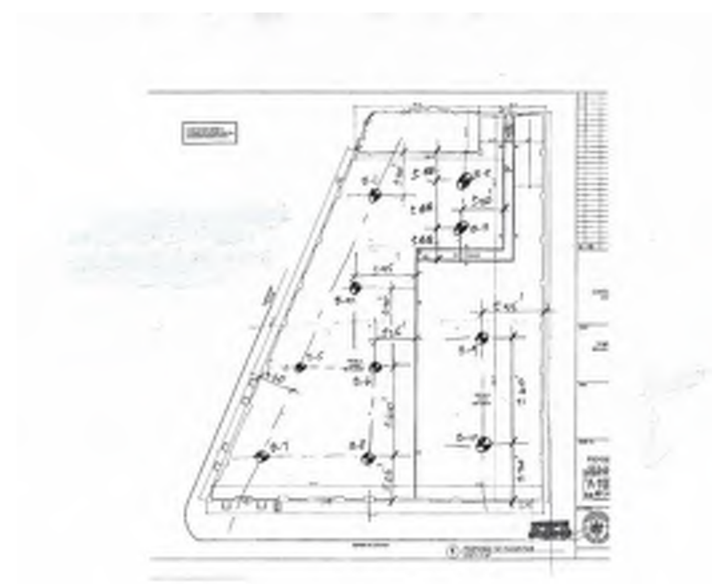
SB-608

B-10 PERCOLATION TEST RESULTS

TIME (MINUTES)	DROP IN WATER LEVEL (INCHES)
1	13.0
5	42.0
10	63.0
15	81.0
30	94.0
45	115.0
60	121.0

TABLE 1804.2 UNIFIED SOIL CLASSIFICATION (Including Identification And Description)

MAJOR DIVISIONS	GROUP SYMBOLS	TYPICAL NAMES
Coarse-grained Soils. More than half of material is larger than No. 200 sieve size. Gravels: Clean Gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixture, little or no fines.
	GP	Poorly graded gravels or gravel-sand mixture, little or no fines.
Gravels with Fines (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures.
	GC	Clayey gravels, gravel-sand-clay mixtures.
Sands: Clean Sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines.
	SP	Poorly graded sands or gravelly sands, little or no fines.
Sands with Fines (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures.
	SC	Clayey sands, sand-clay mixtures.
Fine-grained Soils. More than half of material is smaller than No. 200 sieve size. Silts and Clays Liquid limit is less than 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
	OL	Organic silts and organic silty clays of low plasticity.
Silts and Clays Liquid limit is greater than 50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
	CH	Inorganic clays of high plasticity, fat clays.
	OH	Organic clays of medium to high plasticity, organic silts.
Highly Organic Soils	Pt	Peat and other highly organic soils.



ALLOWABLE BEARING PRESSURES, N.Y.C. BLDG. CODE BC-1804

CLASS OF MATERIALS (NOTES 1 AND 3)	MAXIMUM ALLOWABLE FOUNDATION PRESSURE (TSF)	MAXIMUM ALLOWABLE FOUNDATION PRESSURE (kPa)
1. BEDROCK (NOTES 2 & 7)		
1a Hard sound rock—gneiss, diabase, schist	60	5,746
1b Medium hard rock—marble, serpentine	40	3,830
1c Intermediate rock—shale, sandstone	20	1,915
1d Soft rock—weathered rock	8	766
2. SANDY GRAVEL AND GRAVEL (GW, GP) (Notes 3, 4, 8 & 9)		
2a Dense	10	958
2b Medium	6	575
3. GRANULAR SOILS (GC, GM, SW, SP, SM & SC) (Notes 4, 5, 8 & 9)		
3a Dense	6	575
3b Medium	3	287
4. CLAYS (SC, CL & CH) (Notes 4, 6, 8 & 9)		
4a Hard	5	479
4b Stiff	3	287
4c Medium	2	192
5. SILTS AND SILTY SOILS (ML & MH) (Notes 4, 8 & 9)		
5a Dense	3	287
5b Medium	1.5	144
6. ORGANIC SILTS, ORGANIC CLAYS, PEATS, SOFT CLAYS, LOOSE GRANULAR SOILS AND VARVED SILTS.	See 1804.2.1	See 1804.2.1
7. CONTROLLED AND UNCONTROLLED FILLS.	See 1804.2.2 OR 1804.2.3	See 1804.2.2 OR 1804.2.3

Notes:

1. WHERE THERE IS DOUBT AS TO THE APPLICABLE CLASSIFICATION OF A SOIL STRATUM, THE ALLOWABLE BEARING PRESSURE APPLICABLE TO THE LOWER CLASS OF MATERIAL TO WHICH THE GIVEN STRATUM MIGHT CONFORM SHALL APPLY.
2. THE TABULATED VALUES OF ALLOWABLE BEARING PRESSURES APPLY ONLY FOR MASSIVE ROCKS OR FOR SEDIMENTARY OR FOLIATED ROCKS, WHERE THE STRATA ARE LEVEL OR NEARLY SO, AND THEN ONLY IF THE AREA HAS AMPLE LATERAL SUPPORT. TILTED STRATA AND THEIR RELATION TO NEARBY SLOPES OR EXCAVATIONS SHALL RECEIVE SPECIAL CONSIDERATION. THE TABULATED VALUES FOR CLASS 1a MATERIALS (HARD SOUND ROCK) MAY BE INCREASED BY 25 PERCENT PROVIDED THE GEOTECHNICAL ENGINEER PERFORMS ADDITIONAL TESTS AND/OR ANALYSIS SUBSTANTIATING THE INCREASE.
3. FOR INTERMEDIATE CONDITIONS, VALUES OF ALLOWABLE BEARING PRESSURE SHALL BE ESTIMATED BY INTERPOLATION BETWEEN INDICATED EXTREMES.
4. FOOTING EMBEDMENT IN SOILS SHALL BE IN ACCORDANCE WITH SECTION 1805.2 AND THE WIDTH OF THE LOADED AREA NOT LESS THAN 2 FEET (610MM), UNLESS ANALYSIS DEMONSTRATES THAT THE PROPOSED CONSTRUCTION WILL HAVE A MINIMUM FACTOR OF SAFETY OF 2.0 AGAINST SHEAR FAILURE OF THE SOIL.
5. ESTIMATES OF SETTLEMENTS SHALL GOVERN THE ALLOWABLE BEARING VALUE, SUBJECT TO THE MAXIMUMS GIVEN IN THIS TABLE, AND AS PROVIDED IN SECTION 1804.2.
6. THE BEARING CAPACITY OF CLAY SOILS SHALL BE ESTABLISHED ON THE BASIS OF THE STRENGTH OF SUCH SOILS AS DETERMINED BY FIELD OR LABORATORY TESTS AND SHALL PROVIDE A FACTOR OF SAFETY AGAINST FAILURE OF THE SOIL OF NOT LESS THAN 2.0 COMPUTED ON THE BASIS OF A RECOGNIZED PROCEDURE OF SOILS ANALYSIS, SHALL ACCOUNT FOR PROBABLE SETTLEMENTS OF THE BUILDING AND SHALL NOT EXCEED THE TABULATED MAXIMUM VALUES.
7. INCREASES IN ALLOWABLE BEARING PRESSURE DUE TO EMBEDMENT OF THE FOUNDATION. THE ALLOWABLE BEARING VALUES FOR INTERMEDIATE TO HARD ROCK SHALL APPLY WHERE THE LOADED AREA IS ON THE SURFACE OF SOUND ROCK. WHERE THE LOADED AREA IS BELOW THE ADJACENT ROCK SURFACE AND IS FULLY CONFINED BY THE ADJACENT ROCK MASS AND PROVIDED THAT THE ROCK MASS HAS NOT BEEN SHATTERED BY BLASTING OR OTHERWISE IS OR HAS BEEN RENDERED UNSOUND, THESE VALUES MAY BE INCREASED 10 PERCENT OF THE BASE VALUE FOR EACH 1 FOOT (0.3 METERS) OF EMBEDMENT BELOW THE SURFACE OF THE ADJACENT ROCK SURFACE IN EXCESS OF 1 FOOT (0.3 METERS), BUT SHALL NOT EXCEED 200 PERCENT OF THE VALUES.
8. THE ALLOWABLE BEARING VALUES FOR SOILS OF CLASSES 2, 3, 4, AND 5 DETERMINED IN ACCORDANCE WITH NOTES THREE, FOUR AND FIVE ABOVE, SHALL APPLY WHERE THE LOADED AREA IS EMBEDDED 4 FEET (1219 MM) OR LESS IN THE BEARING STRATUM. WHERE THE LOADED AREA IS EMBEDDED MORE THAN 4 FEET (1219 MM) BELOW THE ADJACENT SURFACE OF THE BEARING STRATUM, AND IS FULLY CONFINED BY THE WEIGHT OF THE ADJACENT SOIL, THESE VALUES MAY BE INCREASED 5 PERCENT OF THE BASE VALUE FOR EACH 1-FOOT (305 MM) ADDITIONAL EMBEDMENT, BUT SHALL NOT EXCEED TWICE THE VALUES. INCREASES IN ALLOWABLE BEARING PRESSURE DUE TO EMBEDMENT SHALL NOT APPLY TO SOFT ROCK, CLAYS, SILTS AND SOILS OF CLASSES 6 AND 7.
9. THE ALLOWABLE BEARING VALUES FOR SOILS OF CLASSES 2, 3, 4, AND 5 DETERMINED IN ACCORDANCE WITH THIS TABLE AND THE NOTES THERETO, MAY BE INCREASED UP TO ONE-THIRD WHERE THE DENSITY OF THE BEARING STRATUM BELOW THE BOTTOM OF THE FOOTINGS INCREASES WITH DEPTH AND IS NOT UNDERLAIN BY MATERIALS OF A LOWER ALLOWABLE BEARING PRESSURE. SUCH ALLOWABLE BEARING VALUES SHALL BE DEMONSTRATED BY A RECOGNIZED MEANS OF ANALYSIS THAT THE PROBABLE SETTLEMENT OF THE FOUNDATION DUE TO COMPRESSION, AND/OR CONSOLIDATION DOES NOT EXCEED ACCEPTABLE LIMITS FOR THE PROPOSED BUILDING.
10. THE MAXIMUM TOE PRESSURE FOR ECCENTRICALLY LOADED FOOTINGS MAY EXCEED THE ALLOWABLE BEARING VALUE BY UP TO 25 PERCENT IF IT IS DEMONSTRATED THAT THE HEEL OF THE FOOTING IS NOT SUBJECTED TO TENSION.

SOIL DESCRIPTIONS ARE BY VISUAL EXAMINATION OF SOIL SAMPLES RECOVERED DURING DRILLING OPERATIONS.
SOIL DESCRIPTIONS ARE IN ACCORD WITH THE UNIFIED SOILS CLASSIFICATION SYSTEM AND N.Y.C. BUILDING CODE BC-1804.
GROUND WATER WAS MEASURED INSIDE THE DRILL CASING OR HOLLOW AUGER AT THE COMPLETION OF EACH BOREHOLE.
ALL BORING ELEVATIONS ARE REFERENCED TO EXISTING GROUND LEVEL AS ZERO ELEVATION.

"N"	STANDARD PENETRATION TEST (2" SPOON, 140LB HAMMER, 30" FALL)
6 8 / 9 12 — N = 17 BLOWS PER FOOT	SPOON BLOW COUNT IS GENERALLY SHOWN IN 6" INCREMENTS FOR 2' DRIVE TO OBTAIN BLOWS PER FOOT (N) USE THE 2ND & 3RD 6" INCREMENT

THIS REPORT IS SUBMITTED WITH THE SPECIFIC UNDERSTANDING THAT THE SOLE LIABILITY OF EPIC TESTING SERVICES, INC., IT'S ENGINEERS AND EMPLOYEES FOR ERRORS AND OMISSIONS IS LIMITED TO THE AMOUNT OF THE FEE PAID FOR THIS REPORT. THE USE OF THIS REPORT WILL CONSTITUTE AN ACCEPTANCE BY THE CLIENT OF THIS DISCLAIMER. THE FEE CHARGED FOR THIS REPORT IS PREDICATED UPON THIS LIMITATION OF LIABILITY WHICH IS THE ESSENCE OF THIS AGREEMENT. IF THESE TERMS ARE NOT ACCEPTABLE, CLIENT MUST NOTIFY EPIC TESTING SERVICES, INC. IN WRITING BY CERTIFIED MAIL, RETURN RECEIPT REQUESTED, WITHIN FIVE (5) DAYS. EPIC TESTING SERVICES, INC., IT'S ENGINEERS AND EMPLOYEES DO NOT ACCEPT ANY LIABILITY OR RESPONSIBILITY FOR PERSONS OTHER THAN THE CLIENT FOR WHOM THIS WORK WAS DIRECTLY PREPARED AND ANY SUCH PERSON, FIRM OR CORPORATION RELIES ON THIS REPORT AT HIS OWN RISK.
NOTE: ALL THE FIELD SAMPLES WILL BE HELD 30 DAYS FROM THE DATE OF THIS REPORT IN OUR LABORATORY UNLESS OTHERWISE DIRECTED BY THE CLIENT IN WRITING.

TYPE OF CORE BARRELS AND DIAMOND BITS:

SIZE	O.D.	CORE DIAMETERS
AX	1- 7/8"	1-1/8"
BX	2-3/8"	1-5/8"
NX	2-15/16"	2-1/8"
AXM	1-7/8"	1-1/8"
NXM	2-15/16"	2-1/8"
B	2"	1-3/8"

WEIGHT OF HAMMERS:
300 LBS. ON 2 ½" CASING – 18" DROP
140 LBS. ON 2" SPOON – 30" DROP
SPOON – SPLIT SAMPLER – 2" O.D. – 1 3/8" I.D. (24" LONG)

GROUND WATER TABLE (G.W.T.) AS NOTED ON BORING LOGS, IS ONLY THE FIRST INDICATION OF WATER ENCOUNTERED BY OUR DRILLERS.

EPIC TESTING SERVICES, INC.
SUBSOIL INVESTIGATION
259 HEMPSTEAD TURNPIKE. PHONE (516) 668-6739 ELMONT, NY 11003

TITLE:

APPLICANT SEAL	
	DRAWN BY: Rishidat Umrao
	CHECKED BY: Jahmal Sabaha, P.E.
	DATE DRAWN: 01-30-15
	DATE REVISED:
	PROJECT: 73 Empire Boulevard Brooklyn.
	CLIENT: Matt Katz.
	B– 708 .00
	DRAWING REF.: SB-608
	SHEET NO.: 3 OF 3

DEPARTMENT OF BUILDINGS

SELF CERTIFICATION

STRUCTURAL ENGINEERING TECHNOLOGIES, P.C.
40-12 28th Street, Long Island City, NY 11101
Tel: 718.706.7196 E-mail: info@set-ny.com
www.set-ny.com

GEOTECHNICAL BORING LOG

Boring #: B-11

Client: MR. ZELIG WEISS
Date Start: 08-12-2025
Date Finish: 08-12-2025
Project: 73 EMPIRE BOULEVARDE, BROOKLYN NY
Block: 1306
Lot(s): 28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Reuben
Helper: Lucas
Elevation & Datum: About Sidewalk grade
Groundwater Depth: N/A
Rock Depth: N/A

DEPTH	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
0.0'	S-1 (0.0'-2.0')	Dark brown fm SAND, some mc gravel, SM (dry)	9"	8	5	FILL (7)
				10	10	
	S-2 (2.0'-4.0')	Dark brown fm SAND, some mc gravel, SM (dry)	7"	10	7	FILL (7)
				4	3	
	S-3 (4.0'-6.0')	Brown fm SAND, some silt, bricks, SM (moist)	12"	7	9	FILL (7)
5.0'				10	6	
	S-4 (6.0'-8.0')	Brown mc SAND, some mc gravel, bricks, SM (dry)	4"	9	6	FILL (7)
				5	6	
	S-5 (8.0'-10.0')	Brown f silty SAND, SM-ML (dry)	9"	4	2	SAND (6)
				1	2	
10.0'	S-6 (10.0'-12.0')	Brown f silty SAND, SM-ML (dry)	10"	2	4	SAND (6)
				3	5	
	S-7 (12.0'-14.0')	Brown f silty SAND, some mc gravel, SM-GP (dry)	10"	5	7	SAND (3b)
				11	16	
15.0'	S-8 (15.0'-17.0')	Brown f SAND, some f gravel, trace silt, SM (dry)	12"	9	11	SAND (3b)
				11	12	
20.0'	S-9 (20.0'-22.0')	Gray to brown fm GRAVEL and c sand, GP-SM (dry)	14"	20	17	GRAVEL (2a)
				26	35	

Drilling Equipment:
Year: 2024
Make: GEOPROBE
Model: 7822DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-11

Client: MR. ZELIG WEISS
Date Start: 08-12-2025
Date Finish: 08-12-2025
Project: 73 EMPIRE BOULEVARDE, BROOKLYN NY
Block: 1306
Lot(s): 28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Reuben
Helper: Lucas
Elevation & Datum: About Sidewalk grade
Groundwater Depth: N/A
Rock Depth: N/A

DEPTH	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
25.0'	S-10 (25.0'-27.0')	Brown to gray f GRAVEL, some c sand, GP-SM (dry)	12"	24	27	GRAVEL (2a)
				29	38	
30.0'	S-11 (30.0'-32.0')	Brown to gray m GRAVEL, some c sand, GP-SM (dry)	10"	21	18	GRAVEL (2a)
				17	31	
35.0'	S-12 (35.0'-37.0')	Brown to gray f GRAVEL, some c sand, GP-SP (wet)	16"	17	15	GRAVEL (2a)
				18	16	
40.0'	S-13 (40.0'-42.0')	Brown mc SAND, some f gravel, SM (moist)	14"	14	15	SAND (3a)
				16	14	

Drilling Equipment:
Year: 2024
Make: GEOPROBE
Model: 7822DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-11

Client: MR. ZELIG WEISS
Date Start: 08-12-2025
Date Finish: 08-12-2025
Project: 73 EMPIRE BOULEVARDE, BROOKLYN NY
Block: 1306
Lot(s): 28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Reuben
Helper: Lucas
Elevation & Datum: About Sidewalk grade
Groundwater Depth: N/A
Rock Depth: N/A

DEPTH	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
45.0'	S-14 (45.0'-47.0')	Brown m SAND, trace f gravel, SP (wet)	12"	13	16	SAND (3a)
				18	20	
50.0'	S-15 (50.0'-52.0')	Brown fm SAND, some f gravel, SP (dry)	15"	15	14	SAND (3a)
				19	22	
55.0'	S-16 (55.0'-57.0')	Brown fm SAND, SM (moist)	11"	16	19	SAND (3a)
				15	18	
60.0'	S-17 (60.0'-62.0')	Brown fm SAND, SM (dry)	10"	20	19	SAND (3a)
				16	21	
65.0'						

Drilling Equipment:
Year: 2024
Make: GEOPROBE
Model: 7822DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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GEOTECHNICAL BORING LOG

Boring #: B-11

Client: MR. ZELIG WEISS
Date Start: 08-12-2025
Date Finish: 08-12-2025
Project: 73 EMPIRE BOULEVARDE, BROOKLYN NY
Block: 1306
Lot(s): 28
Drilling Agency: PG ENVIRONMENTAL SERVICES, INC.
Driller: Reuben
Helper: Lucas
Elevation & Datum: About Sidewalk grade
Groundwater Depth: N/A
Rock Depth: N/A

DEPTH 65.0'	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
	S-18 (65.0'-67.0')	Brown fm SAND, SM (moist)	19"	15	17	SAND (3a)
				20	24	
70.0'	S-19 (70.0'-72.0')	Brown fm SAND, some silt, SM (moist)	16"	17	22	SAND (3a)
				27	26	
75.0'	S-20 (75.0'-77.0')	Brown fm SAND, SM (moist)	16"	12	14	SAND (3a)
				20	19	
80.0'	S-21 (80.0'-82.0')	Brown fm SAND, trace silt, SM (moist)	15"	11	12	SAND (3a)
				22	24	
85.0'	S-22 (85.0'-87.0')	Brown f SAND, SM (dry)	17"	25	41	SAND (3a)
				37	45	

Drilling Equipment:
Year: 2020
Make: GEOPROBE
Model: 7822DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

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40-12 28th Street, Long Island City, NY 11101
Tel: 718.706.7196 E-mail: info@set-ny.com
www.set-ny.com

GEOTECHNICAL BORING LOG

Boring #: B-11

Client: MR. ZELIG WEISS | Date Start: 08-12-2025 | Date Finish: 08-12-2025

Project: 73 EMPIRE BOULEVARDE, BROOKLYN NY | Block: 1306 | Lot(s): 28

Drilling Agency: PG ENVIRONMENTAL SERVICES, INC. | Driller: Reuben | Helper: Lucas

Elevation & Datum: About Sidewalk grade | Groundwater Depth: N/A | Rock Depth: N/A

DEPTH	SAMPLES	MATERIAL DESCRIPTION	REC. IN SOIL	SPOON BLOWS PER 6" INTERVAL		REMARKS
90.0'	S-23 (90.0'-92.0')	Brown silty SAND, SM (moist)	14"	27	50	SAND (3a)
				60	55	
95.0'	S-24 (95.0'-97.0')	Brown fm SAND, trace silt, SM (moist)	14"	12	11	SAND (3b)
				14	16	
100.0'	S-25 (100.0'-102.0')	Brown fm SAND, trace silt, SM (moist)	12"	14	13	SAND (3b)
				15	18	
						End of boring @ 102-feet Below Grade
105.0'						

Drilling Equipment:
Year: 2020
Make: GEOPROBE
Model: 7822DT
Mounting: TRACK

Spoon Hammer Type: Automatic Trip Hammer
Spoon Hammer Drop: 30 INCH.
Spoon Hammer Weight: 140 LBS.
Spoon Size: 24 INCH
Rock Core Barrel Size: N/A

APPENDIX B

LABORATORY TEST RESULTS (TERRASENSE)

APPENDIX C

TEST PIT LOGS (BY GZA)

STRUCTURAL
ENGINEERING
TECHNOLOGIES, P.C.

46-12 28th Street, Long Island City, N.Y. 11101
(P) 718-706-7196 · info@SET-NY.com

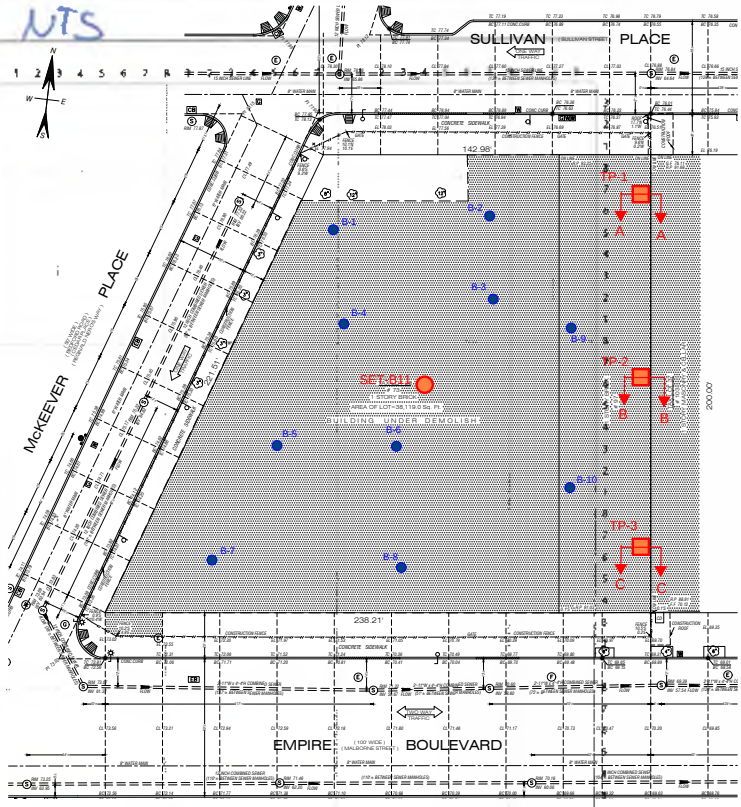
Job 73 EMPIRE BLVD, BROOKLYN NY

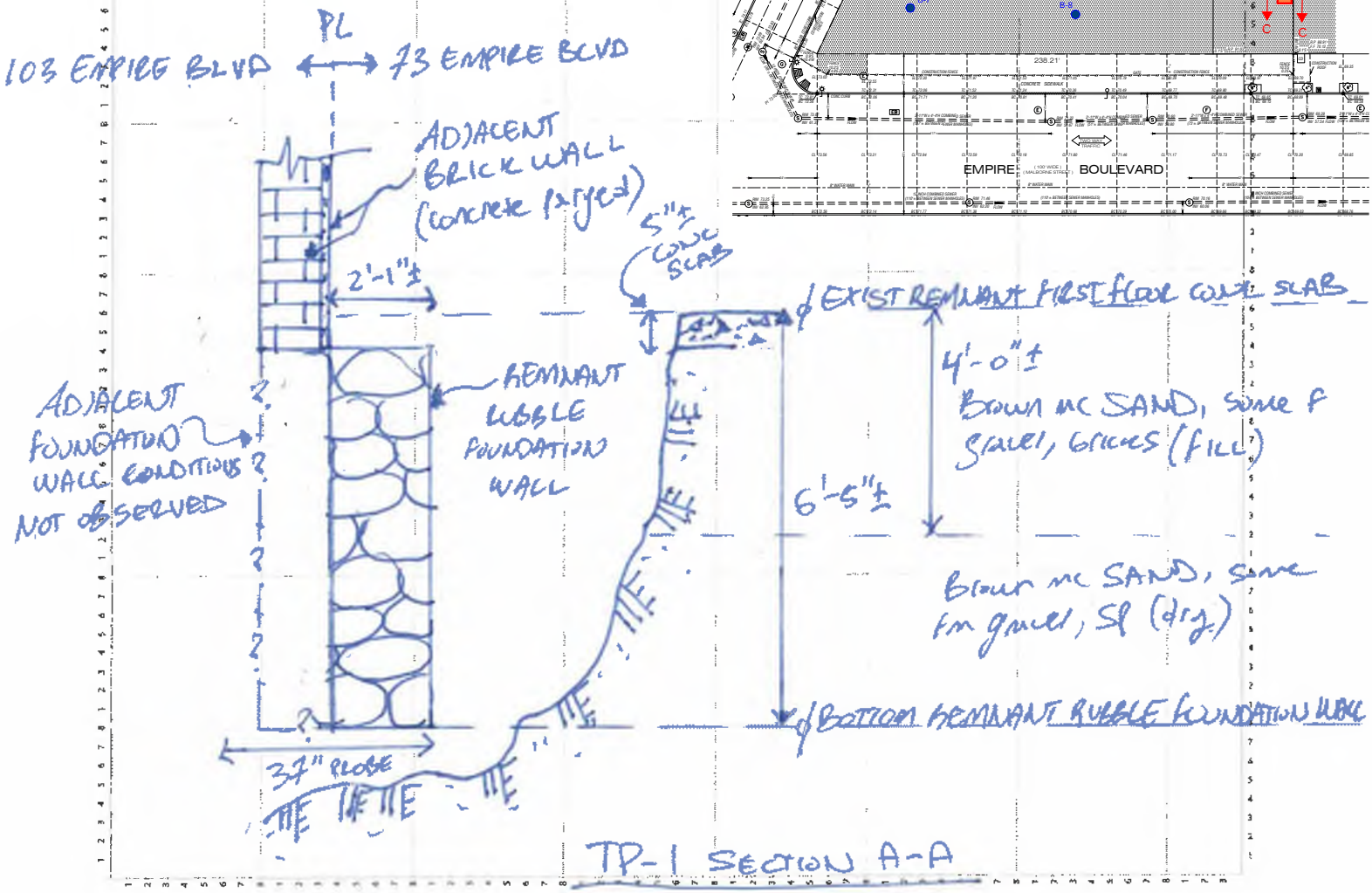
Sheet No. 1 of 1

Calculated By NF Date 08/12/25

Checked By Date

Scale NTS





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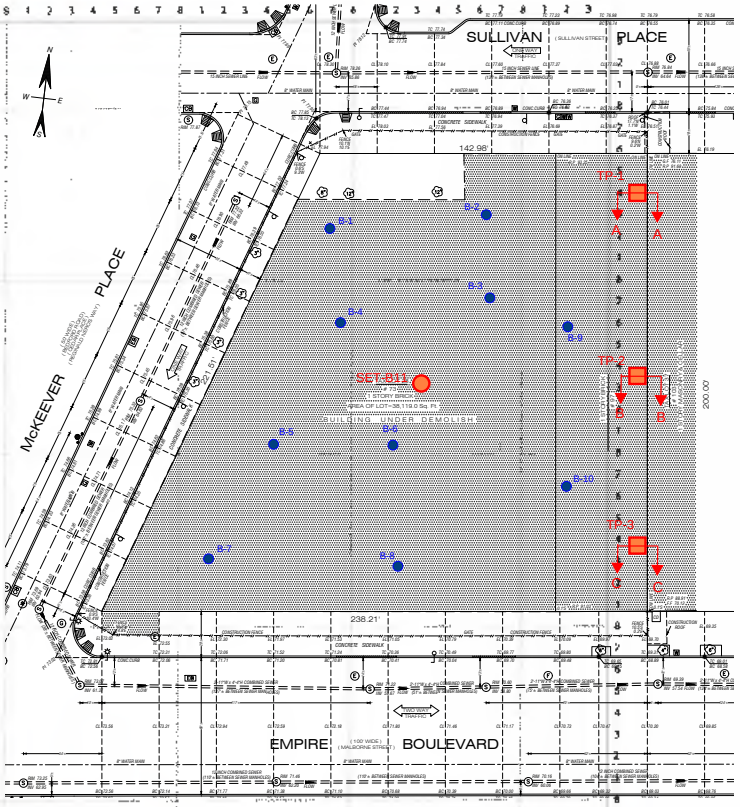
Job 73 EMPIRE BLVD, BROOKLYN NY

Sheet No. 1 of 1

Calculated By NF Date 08/12/25

Checked By Date

Scale NTS



105 EMPIRE BLVD ↔ PL ↔ 73 EMPIRE BLVD

ADJACENT BRICK WALL/CONCRETE (ARGE)

8"± CONC SLAB

EXIST REMNANT FIRST FLOOR CONC SLAB

1'-6"±

REMNANT RUBBLE FOUNDATION WALL

ADJACENT FOUNDATION WALL CONDITIONS NOT OBSERVED

4'-0"±
BROWN MC SAND, SOME FM GRAVEL, CONCRETE/BRICKS (FILL)

5'-8"±

BROWN MC SAND, SOME FM GRAVEL, SP (DRY)

BOTTOM REMNANT RUBBLE FOUNDATION WALL

3'-6"± RUBBLE

TP-2 SECTION B-B

STRUCTURAL
ENGINEERING
TECHNOLOGIES, P.C.

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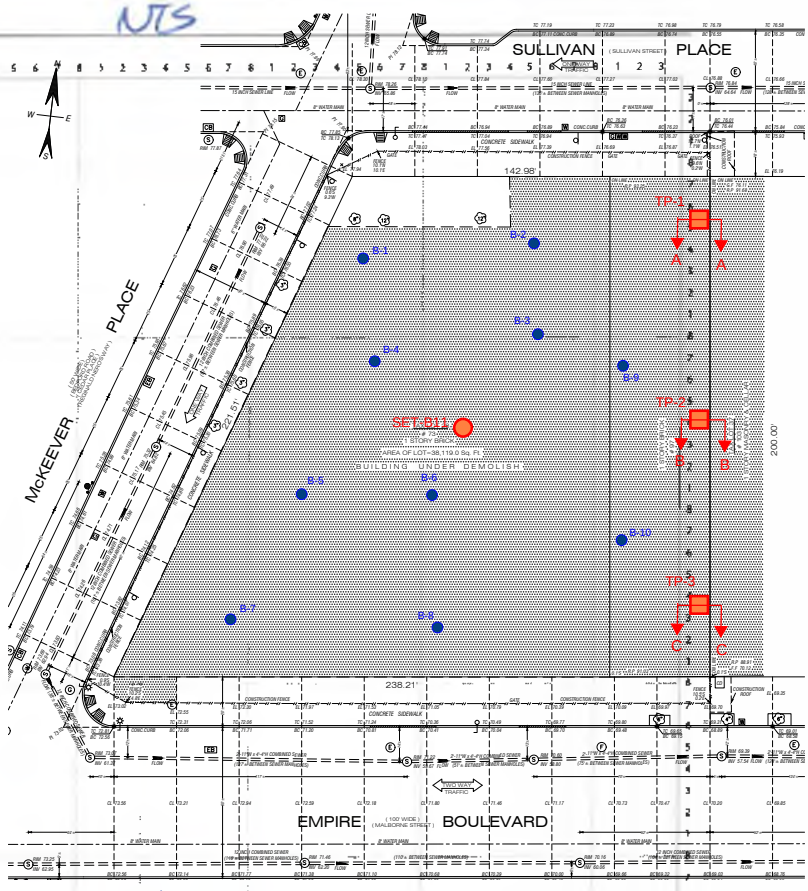
Job 73 EMPIRE BLVD, BROOKLYN NY

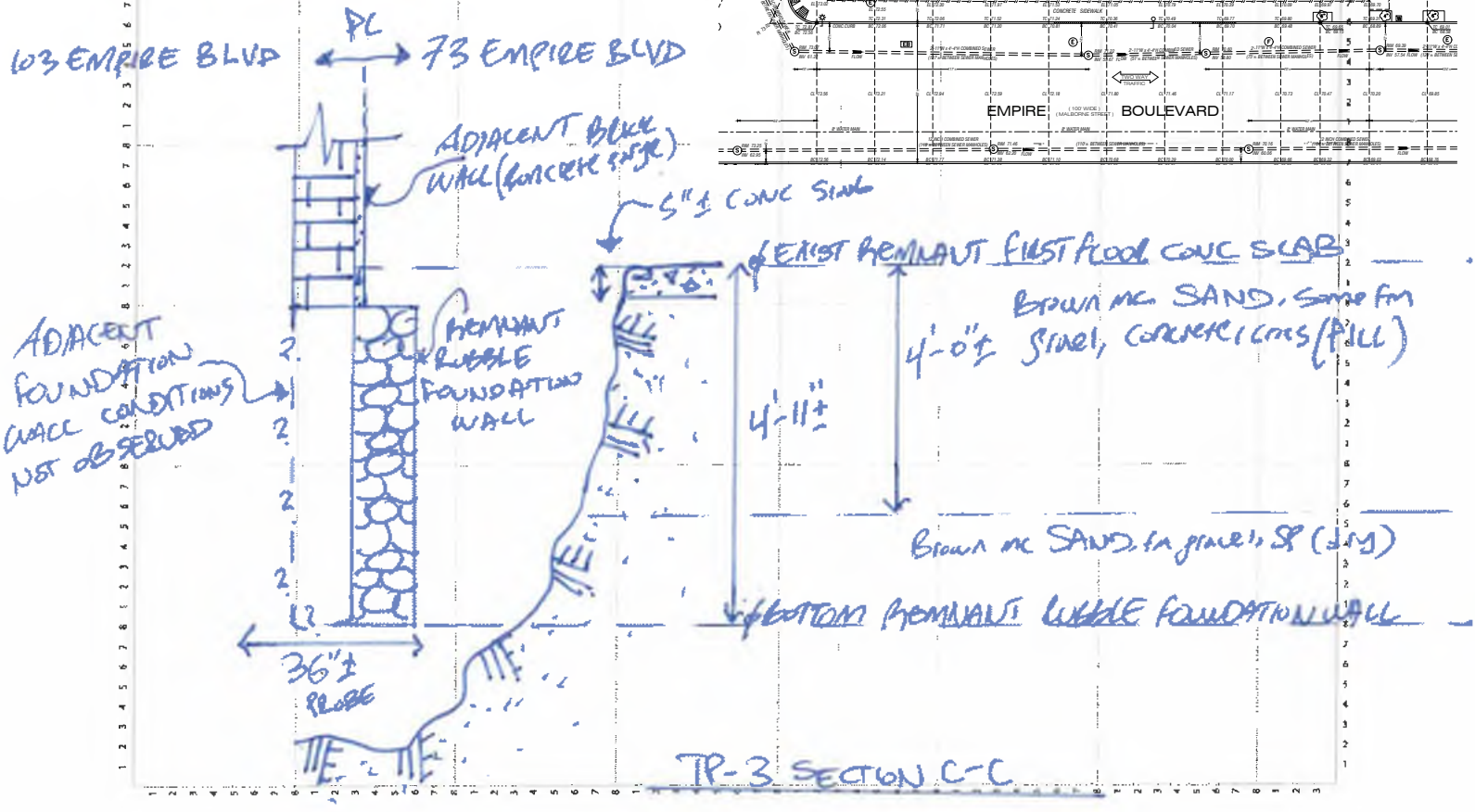
Sheet No. 1 of 1

Calculated By NF Date 08/12/25

Checked By Date

Scale NTS





Appendix E: Certifications

☒ **Error! Reference source not found. (must be completed, signed and submitted with the SWPPP in the SWPTS Application)**

- Owner
- Developer
- SWPPP Preparer

☐ Contractor's Certification **(must be submitted with the SWPPP in the SWPTS Application. To be completed, signed and attached to the SWPPP on-site after SWPPP Approval, but before the start of construction)**

☐ Sub-Contractor's Certification **(must be submitted with the SWPPP in the SWPTS Application. To be completed, signed and attached to the SWPPP on-site after SWPPP Approval, but before the start of construction)**

If any of the above documents are not included, explain why below:

Contractor Certification will be provided upon selection of a Contractor.

E.1 – Stakeholders' Certification

PROJECT
73 Empire Blvd

SWPTS Application ID
Click or tap here to enter text.

OWNER'S CERTIFICATION:
"I certify that I am aware of the proposed development activity and that the application for the above-listed project is being submitted on my behalf. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the laws of the City of New York and could subject me to criminal or civil penalties and/or administrative proceedings."

X Rafael Rabitsky, Member
Empire McKeever Heights, LLC

Owner
Print Name, Title, and Company

X 2/27/26

Owner
Sign and Date

DEVELOPER'S CERTIFICATION:
"I have read or been advised of the applicable sections of RCNY Title 15 Chapter 19.1 and believe that I understand them. I also understand that, under the RCNY I am responsible for submitting a fee to initiate review of this application. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I understand that certifying false, incorrect or inaccurate information is a violation of the laws of the City of New York and could subject me to criminal or civil penalties and/or administrative proceedings. I also understand that, by submitting this application, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction."

X Rafael Rabitsky, Member
Galaxy Developers, LLC

Developer
Print Name, Title, and Company

X 2/27/26

Developer
Sign and Date

SWPPP PREPARER'S CERTIFICATION:
"I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project was prepared by me or under my direct supervision in accordance with the RCNY Title 15 Chapter 19.1 and terms and conditions of the most recent NYSDEC SPDES General Permit for Stormwater Discharges from Construction Sites. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the City New York and could subject me to criminal, civil and/or administrative proceedings."

X Jeffrey A. Derosier, PE
Member
Derosier Engineering, LLC

SWPPP Preparer
Print Name, Title, and Company

X 2/27/2026

SWPPP Preparer
Sign and Date

E.2 – Contractor's Certification

PROJECT
73 Empire Blvd – Demo and Excavation

SWPTS Application ID
Click or tap here to enter text.

CONTRACTING FIRM NAME
Click or tap here to enter text.

CONTRACTING FIRM ADDRESS
Click or tap here to enter text.

SITE CONTRACTOR

Name and Title: Click or tap here to enter text.
Contact Information: Click or tap here to enter text.

TRAINED CONTRACTOR(S) WITH SWPPP RESPONSIBILITIES

1) **Name and Title:** Click or tap here to enter text.
   Contact Information:
   NYS DEC ESC Training Certificate Number and Expiration Date:
2) **Name and Title:**
   Contact Information:
   NYS DEC ESC Training Certificate Number and Expiration Date:

STORMWATER MEASURES

Contractor is responsible for all stormwater pollution prevention measures described withing the SWPPP, and relisted below:

1) **Pollution Prevention Measures and Spill Reporting:**
   a. Click or tap here to enter text.
   b. Click or tap here to enter text.
   c. Click or tap here to enter text.
2) **Erosion and Sediment Control Practice:**
   a. Click or tap here to enter text.
   b. Click or tap here to enter text.
   c. Click or tap here to enter text.
3) **Stormwater Management Practices:**
   a. Click or tap here to enter text.
   b. Click or tap here to enter text.
   c. Click or tap here to enter text.

E.2 – Contractor's Certification

PROJECT
73 Empire Blvd – Demo and Excavation

SWPTS Application ID
Click or tap here to enter text.

CERTIFICATION
"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the developer must comply with the terms and conditions of the NYC Stormwater Construction Permit, the most current version of the New York State Pollutant Discharge Elimination System (SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations."

X	**X**
Site Contractor *Print Name, Title, and Company*	*Site Contractor* *Sign and Date*
X	**X**
Trained Contractor *Print Name, Title, and Company*	*Trained Contractor* *Sign and Date*

E.3 – Sub-Contractor's Certification

PROJECT
73 Empire Blvd – Demo and Excavation

SWPTS Application ID
Click or tap here to enter text.

CONTRACTING FIRM NAME
Click or tap here to enter text.

CONTRACTING FIRM ADDRESS
Click or tap here to enter text.

SUB-CONTRACTOR REPRESENTATIVE

Name and Title: Click or tap here to enter text.
Contact Information: Click or tap here to enter text.

TRAINED CONTRACTOR(S) WITH SWPPP RESPONSIBILITIES

1) **Name and Title:** Click or tap here to enter text.
   Contact Information:
   NYS DEC ESC Training Certificate Number and Expiration Date:
2) **Name and Title:**
   Contact Information:
   NYS DEC ESC Training Certificate Number and Expiration Date:

STORMWATER MEASURES

Contractor is responsible for all stormwater pollution prevention measures described withing the SWPPP, and relisted below:

1) **Pollution Prevention Measures and Spill Reporting:**
   a. Click or tap here to enter text.
   b. Click or tap here to enter text.
   c. Click or tap here to enter text.
2) **Erosion and Sediment Control Practice:**
   a. Click or tap here to enter text.
   b. Click or tap here to enter text.
   c. Click or tap here to enter text.
3) **Stormwater Management Practices:**
   a. Click or tap here to enter text.
   b. Click or tap here to enter text.
   c. Click or tap here to enter text.

E.3 – Sub-Contractor's Certification

PROJECT
73 Empire Blvd – Demo and Excavation

SWPTS Application ID
Click or tap here to enter text.

CERTIFICATION
"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the developer must comply with the terms and conditions of the NYC Stormwater Construction Permit, the most current version of the New York State Pollutant Discharge Elimination System (SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations."

X	**X**
Sub-Contractor Representative *Print Name, Title, and Company*	*Sub-Contractor Representative* *Sign and Date*
X	**X**
Trained Contractor *Print Name, Title, and Company*	*Trained Contractor* *Sign and Date*

Appendix F: Inspections

Documents included:

☒ Site-Specific Template for **Error! Reference source not found.**

☒ Site-Specific Template for Qualified Inspector Report,

☒ Template of Monthly Inspection Summary Report by the Qualified Inspector, including:

☐ Certificates of Completion of NYSDEC 4-Hour Erosion and Sediment Control Training

If any of the above documents are not included, explain why below:

Contractors Certification to be provided upon selection of a Contractor.

PRE-CONSTRUCTION MEETING DOCUMENTATION

INSPECTOR: _____ **DATE:** _____

PROJECT / SITE NAME:	**73 Empire Blvd Demolition & Excavation**
PROJECT SITE ADDRESS:	**73 Empire Blvd, Brooklyn, NY 11255**
SWPTS App Number:	
Other SPDES Permits:	

EROSION AND WATER QUALITY CONTROL IDENTIFICATION

The contractor and/or subcontractors that will implement each erosion control measure must be identified:

IDENTIFICATION

Measure to be Implemented	Name of Contractor and/or Subcontractor
Site Pollution Prevention (aka Housekeeping)	
Stabilized Construction Entrance	
Silt Fence	
Dust Control	
Concrete Truck Washout	

DAILY INSPECTION REPORT (TRAINED CONTRACTOR)

TRAINED CONTRACTOR:_____ **DATE:** _____

PROJECT / SITE NAME:	**73 Empire Blvd Demolition & Excavation**
PROJECT SITE ADDRESS:	**73 Empire Blvd, Brooklyn, NY 11255**
SWPTS App Number:	
Other SPDES Permits:	

TIME OF INSPECTION:

WEATHER & TEMP:

SOIL CONDITIONS:

Site Pollution Prevention (aka Housekeeping)

Yes	No	N/A	
☐	☐	☐	Is the construction site litter, debris and spoils appropriately managed?
☐	☐	☐	Are facilities and equipment necessary for the implementation of erosion & sediment control in working order and / or properly maintained?
☐	☐	☐	Are staging areas organized?
☐	☐	☐	Are raw materials covered or sealed in stored container?

Sediment Control Practices

Stabilized Construction Entrance

Yes	No	N/A	
☐	☐	☐	Stone is clean enough to effectively remove mud from vehicles.
☐	☐	☐	Installed per standards and specifications?
☐	☐	☐	Does all traffic use the stabilized entrance to enter and leave site?
☐	☐	☐	Is adequate drainage provided to prevent ponding at entrance?
☐	☐	☐	Sediment tracked onto public streets is removed or cleaned on a regular basis?

Dust Control

Yes	No	N/A	
☐	☐	☐	Are dust mitigation practices present onsite?
☐	☐	☐	Is dust adequately controlled?

Silt Fence and Reinforced Silt Fence

Yes	No	N/A	
☐	☐	☐	Installed at perimeter of disturbance and/or per plan.
☐	☐	☐	Joints constructed by wrapping the two ends together for continuous support.
☐	☐	☐	Fabric buried 6 inches minimum.
☐	☐	☐	Posts are stable, fabric is tight and without rips or frayed areas. Sediment accumulation is ___% of design capacity.

Concrete Truck Washout

Yes	No	N/A	
☐	☐	☐	Present on-site during concrete operations.
☐	☐	☐	No damage or leaking.
☐	☐	☐	Hardened concrete removed when at 75% capacity.
☐	☐	☐	Concrete and water accumulations is at _____% capacity.

Trained Contractor's Certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I understand that certifying false, incorrect, or inaccurate information is a violation of the laws of the City of New York and could subject me to criminal or civil penalties and/or administrative proceedings.

_____ _____

Trained Contractor (print name) Trained Contractor Signature

QUALIFIED INSPECTOR REPORT

INSPECTOR: _____ **DATE:** _____

PROJECT / SITE NAME:	**73 Empire Blvd Demolition & Excavation**
PROJECT SITE ADDRESS:	**73 Empire Blvd, Brooklyn, NY 11255**
SWPTS App Number:	
Other SPDES Permits:	

TIME OF INSPECTION:

WEATHER & TEMP:

SOIL CONDITIONS:

REASON FOR INSPECTION: ☐ 2x 7-day ☐ 7-day/Weekly ☐ 30-day ☐ Rainfall ☐ Other_____

SITE PLAN / SKETCH

Indicate the areas of active soil disturbance activity, areas that have been disturbed but are inactive at the time of the inspection, and areas that have been stabilized (temporary and/or final) since the last inspection.

Qualified Inspector's Certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I understand that certifying false, incorrect, or inaccurate information is a violation of the laws of the City of New York and could subject me to criminal or civil penalties and/or administrative proceedings.

_____ _____

Qualified Professional (print name) Qualified Professional Signature

General

Yes No N/A

☐ ☐ ☐ Are all disturbances within the limits of the approved plans?

☐ ☐ ☐ Are all erosion & sediment control measures installed / constructed?

☐ ☐ ☐ Are all erosion & sediment control measures properly maintained?

☐ ☐ ☐ Are stabilization measures initiated in inactive areas?

☐ ☐ ☐ Are permanent stormwater control measures implemented?

☐ ☐ ☐ Are receiving waters free of the evidence of turbidity, sedimentation or oil?

☐ ☐ ☐ Was there a runoff at points of discharge since the last inspection?

If Yes, describe the condition:_____

_____

☐ ☐ ☐ Is there any runoff at the points of discharge at the time of the inspection?

If Yes, describe the condition:_____

_____

☐ ☐ ☐ Is construction impacting the adjacent property?

If Yes, describe the condition:_____

_____

Site Pollution Prevention (aka Housekeeping)

Yes No N/A

☐ ☐ ☐ Is the construction site litter, debris and spoils appropriately managed?

☐ ☐ ☐ Are facilities and equipment necessary for the implementation of erosion & sediment control in working order and / or properly maintained?

☐ ☐ ☐ Are staging areas organized?

☐ ☐ ☐ Are raw materials covered or sealed in stored container?

Sediment Control Practices

Stabilized Construction Entrance

Yes No N/A

☐ ☐ ☐ Stone is clean enough to effectively remove mud from vehicles.

☐ ☐ ☐ Installed per standards and specifications?

☐ ☐ ☐ Does all traffic use the stabilized entrance to enter and leave site?

☐ ☐ ☐ Is adequate drainage provided to prevent ponding at entrance?

☐ ☐ ☐ Sediment tracked onto public streets is removed or cleaned on a regular basis?

Dust Control

Yes No N/A

☐ ☐ ☐ Are dust mitigation practices present onsite?

☐ ☐ ☐ Is dust adequately controlled?

Silt Fence and Reinforced Silt Fence

Yes No N/A

☐ ☐ ☐ Installed at perimeter of disturbance and/or per plan.

☐ ☐ ☐ Joints constructed by wrapping the two ends together for continuous support.

☐ ☐ ☐ Fabric buried 6 inches minimum.

☐ ☐ ☐ Posts are stable, fabric is tight and without rips or frayed areas. Sediment accumulation is ___% of design capacity.

Concrete Truck Washout

Yes	No	N/A	
☐	☐	☐	Present on-site during concrete operations.
☐	☐	☐	No damage or leaking.
☐	☐	☐	Hardened concrete removed when at 75% capacity.
☐	☐	☐	Concrete and water accumulations is at _____% capacity.

Revegetation

Yes	No	N/A	
☐	☐	☐	Temporary seeding and mulch have been applied to idle areas.
☐	☐	☐	6 inches minimum of topsoil has been applied under permanent seeding.

Erosion and Sediment Control Narrative Questions

1. Were all erosion and sediment control practices and/or pollution prevention measures installed properly and functioned as designed? ☐ Yes ☐ No
   If No, describe the required reinstallation and replacement required (including identifying which practices/measures require reinstallation/replacement: _____
   _____
   _____

2. Do any erosion and sediment control practices and/or pollution prevention measures require repair or maintenance? ☐ Yes ☐ No
   If Yes, describe the required repair and/or maintenance (including identifying which practices/measures require repair/maintenance: _____
   _____

3. Is any of the construction not in conformance with the SWPPP and technical standards?
   ☐ Yes ☐ No
   If Yes, identify the construction that is not in conformance below: _____
   _____
   _____

4. Are any corrective actions necessary to install, repair, replace, and/or maintain temporary erosion control practices, sediment control practices and/or pollution prevention measures (during practices/measures)?
   ☐ Yes ☐ No

   Are deficiencies present with the post-construction stormwater practices (after practices) that require correction?
   ☐ Yes ☐ No
   If Yes to either question, identify the erosion control practice, sediment control practice, and/or pollution prevention measures (including whether practices/measures are during practice/measure or after practice) requiring correctio and describe the correction necessary below: _____
   _____
   _____

5. Were any corrective actions required in the previous inspection report? ☐ Yes ☐ No

If Yes, provide a status of any corrective actions required below: _____
_____
_____

6. Additional Comments

_____
_____
_____

Modifications to the SWPPP (to be completed as described below)

The Operator shall amend the SWPPP whenever:

1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
2. The SWPPP proves to be ineffective in:
    a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
    b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason

_____
_____
_____
_____
_____

Detailed Description of Consistent Issues in the Construction and Technical Standards of SMP's

_____
_____
_____
_____
_____

Summary of Deficiencies Observed on _____and Other Remarks

_____
_____
_____
_____

Comments from previous inspection on_____and Other Remarks

_____
_____
_____
_____

Post Construction SMP Facilities

Final Stabilization

Practice ID and Name _____
Practice Location _____
Construction Status & Compliance _____

PHOTOS (TAKEN DURING CONSTRUCTION)

MONTHLY SUMMARY OF INSPECTION ACTIVITIES

PROJECT / SITE NAME:	**73 Empire Blvd Demolition & Excavation**
PROJECT SITE ADDRESS:	**73 Empire Blvd, Brooklyn, NY 11255**
SWPTS App Number:	
Other SPDES Permits:	

DATE:

REPORTING MONTH:

Date of Inspection	Regular/Rainfall Based Inspection	Name of Inspector	Items of Concern

Qualified Inspector's Certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I understand that certifying false, incorrect, or inaccurate information is a violation of the laws of the City of New York and could subject me to criminal or civil penalties and/or administrative proceedings.

_____ _____

Qualified Professional (print name) Qualified Professional Signature

Appendix G: Construction Amendment Forms

Documents included:

☐ Amendment Cover Letter, including
- SWPPP Revision Number
- Amendment type (major/minor)
- Reason(s) for amendment request
- Proposed changes
- If the amendment was based on DEP comments, a table including reference to comment, explanation of comment, responses, and location of change in document.

Appendix H: Draft Stormwater Maintenance Easement

Documents included:

☐ Draft Construction Maintenance Easement, including

- Cover Letter
- Easement Document (Exhibit A)
- Metes & Bounds Description
    - Note: A Survey Map of Project Lot may be used as an acceptable substitute to Metes & Bounds Description only if it is signed and sealed by a licensed surveyor.
- City/State Transfer Tax Forms

If any of the above documents are not included, explain why below:

Project is listed in Table 2.2 and only requires ESC components.

Appendix I: Draft Post-Construction Operation and Maintenance Manual

Documents included:

☐ Draft Post-Construction Operation and Maintenance Manual

If any of the above documents are not included, explain why below:

Project is listed in Table 2.2 and only requires ESC components.

Appendix J: NYSDEC General Permit for Stormwater Discharges from Construction Sites

Documents included:

☒ New York State Department of Environmental Conservation SPDES General Permit for Stormwater Discharges for Construction Activity

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL
CONSERVATION (NYSDEC)

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

From

CONSTRUCTION ACTIVITY

Permit No. GP-0-25-001

Construction General Permit (CGP)

Issued Pursuant to Article 17, Titles 7, 8 and Article 70

of the Environmental Conservation Law

Effective Date: January 29, 2025 Expiration Date: January 28, 2030

Scott E. Sheeley

Chief Permit Administrator

Scott E. Sheeley JAN. 29, 2025

Authorized Signature Date

Address: NYSDEC
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act (CWA), and 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), *stormwater discharges* from certain *construction activities* are unlawful unless they are authorized by a National Pollutant Discharge Elimination System (NPDES) permit or by a state permit program. New York State administers the approved State Pollutant Discharge Elimination System (SPDES) program with permits issued in accordance with the New York State Environmental Conservation Law (ECL) Article 17, Titles 7 and 8, and Article 70, as well as 6 NYCRR Parts 621 and 750.

C*onstruction activities* constitute construction of a *point source* and, therefore, pursuant to ECL sections 17-0505, 17-0701, and 17-0803, the *owner or operator* must have coverage under a SPDES permit prior to *commencement of construction activities*. The *owner or operator* cannot wait until there is an actual *discharge* from the *construction site* to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES CONSTRUCTION GENERAL PERMIT (CGP) GP-0-25-001
FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

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Part I. How to Obtain Coverage and General Requirements

To be covered under this permit, the *owner or operator* must meet all eligibility requirements in Part I.A. and follow the requirements for obtaining permit coverage in Part I.D., F., or G.

A. Eligibility Requirements

For a *common plan of development or sale*, the *phase(s)* that meet the eligibility requirements in Part I.A. may obtain coverage under this permit even if other *phase(s)* of the same *common plan of development or sale* do not meet the eligibility requirements and require an individual SPDES permit.

1. The *owner's or operator's construction activities* involve soil disturbances of:

    a. one or more acres; or

    b. less than one acre which are part of a *common plan of development or sale* that will ultimately disturb one or more acres; or

    c. less than one acre where NYSDEC has determined that a SPDES permit is required for *stormwater discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of pollutants to *surface waters of the State*.

        i. 5,000 square feet or more, but less than one acre, and are in the New York City Watershed located east of the Hudson River, Appendix C Figure 1; or

        ii. 20,000 square feet or more, but less than one acre, within the municipal boundaries of the City of New York (NYC); or

        iii. less than 20,000 square feet which are part of a *common plan of development or sale* that will ultimately disturb 20,000 square feet or more, but less than one acre, within the municipal boundaries of NYC; or

        iv. that creates 5,000 square feet or more of *impervious area* within the municipal boundaries of NYC.

2. *Discharges* from the *owner's or operator's construction activities* are/were not:

    a. already covered by a different SPDES permit; or

    b. covered under a different SPDES permit that was denied, terminated, or revoked; or

    c. identified in an expired individual SPDES permit that was not renewed; or

    d. required to obtain an individual SPDES permit or another general SPDES permit in accordance with Part VII.K.

3. If *construction activities* may adversely affect a species that is endangered or threatened, the *owner or operator* must obtain a:

    a. permit issued pursuant to 6 NYCRR Part 182 for the project; or

    b. letter issued by NYSDEC of non-jurisdiction pursuant to 6 NYCRR Part 182 for the project.

4. If *construction activities* have the potential to affect an *historic property*, the *owner or operator* must obtain one of the following:

    a. documentation that the *construction activity* is not within an archeological buffer area indicated on the sensitivity map, and that the *construction activity* is not located on or immediately adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places, and that there is no new permanent building on the *construction site* within the following distances from a building, structure, or object that is more than 50 years old, or if there is such a new permanent building on the *construction site* within those parameters that NYS Office of Parks, Recreation and Historic Preservation (OPRHP), a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined that the building, structure, or object more than 50 years old is not historically/archeologically significant:

        i. 1-5 acres of disturbance - 20 feet; or

        ii. 5-20 acres of disturbance - 50 feet; or

iii. 20+ acres of disturbance - 100 feet.

b. NYSDEC consultation form sent to OPRHP,[1] and copied to NYSDEC's Agency Historic Preservation Officer (APO), and

i. the State Environmental Quality Review Act (SEQR) Environmental Assessment Form (EAF) with a negative declaration or the Findings Statement, with documentation of OPRHP's agreement with the resolution; or

ii. documentation from OPRHP that the *construction activity* will result in No Impact; or

iii. documentation from OPRHP providing a determination of No Adverse Impact; or

iv. a Letter of Resolution signed by the *owner or operator*, OPRHP and the DEC APO which allows for this *construction activity* to be eligible for coverage under the general permit in terms of the State Historic Preservation Act (SHPA).

c. documentation of satisfactory compliance with Section 106 of the National Historic Preservation Act for a coterminous project area:

i. No Affect; or

ii. No Adverse Affect; or

iii. Executed Memorandum of Agreement.

d. documentation that SHPA Section 14.09 has been completed by NYSDEC or another state agency.

5. If *construction activities* are subject to SEQR, the *owner or operator* must obtain documentation that SEQR has been satisfied.

6. If *construction activities* are not subject to SEQR, but subject to the equivalent environmental review from another New York State or federal agency, the

[1] The consultation form can be submitted, along with other project information, through OPRHP's Cultural Resource Information System (CRIS) portal. If submitted through CRIS, paper copies of the consultation form need not be mailed.

owner or operator must obtain documentation that project review, pursuant to a process equivalent to SEQR from another New York State or federal agency, has been satisfied.

7. If *construction activities* require Uniform Procedures Act (UPA) Permits (see 6 NYCRR Part 621) from NYSDEC, or the equivalent from another New York State or federal agency, the *owner or operator* must:

    a. obtain all such necessary permits; or

    b. receive notification from NYSDEC pursuant to 6 NYCRR 621.3(a)(4) excepting Part I.A.7.a.

8. *Construction activities* are not eligible if they meet the following criteria in Part I.A.8.a. or b.:

    a. For linear transportation and linear utility project types, the *construction activities*:

        i. are within the watershed of *surface waters of the State* classified as AA or AA-S identified utilizing the Stormwater Interactive Map on NYSDEC's website; and

        ii. are undertaken on land with no existing *impervious cover*; and

        iii. disturb two or more acres of *steep slope*.

    b. For all other project types, the *construction activities*:

        i. are within the watershed of *surface waters of the State* classified as AA or AA-S identified utilizing the Stormwater Interactive Map on NYSDEC's website; and

        ii. are undertaken on land with no existing *impervious cover*; and

        iii. disturb one or more acres of *steep slope*.

B. Types of *Discharges* Authorized

1. The following *stormwater discharges* are authorized under this permit:

   a. *Stormwater discharges*, including *stormwater* runoff, snowmelt runoff, and surface runoff and drainage, associated with *construction activity*, are authorized under this permit provided that appropriate *stormwater* controls are designed, installed, and maintained in accordance with Part II. and Part III.

   b. *Stormwater discharges* from construction support activities at the *construction site* (including concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, and borrow areas) if the following requirements are met:

      i. The support activity is directly related to the *construction site* required to have permit coverage for *stormwater discharges*; and

      ii. The support activity is not a commercial operation, nor does it serve multiple unrelated *construction sites*; and

      iii. The support activity does not continue to operate beyond the completion of the *construction activity* at the site it supports; and

      iv. *Stormwater* controls are implemented in accordance with Part II. and Part III. for *discharges* from the support activity areas.

2. The following non-*stormwater discharges* associated with *construction activity* are authorized under this permit:

   a. Non-*stormwater discharges* listed in 6 NYCRR 750-1.2(a)(29)(vi), with the following exception: "*Discharges* from firefighting activities are authorized only when the firefighting activities are emergencies/unplanned"; and

   b. Non-*stormwater discharges* of waters to which other components have not been added that are used in accordance with the *SWPPP* to control dust or irrigate vegetation in stabilized areas; and

   c. Uncontaminated *discharges* from *dewatering* operations

3. Authorized *discharges* of *stormwater* or authorized *discharges* of non-*stormwater*, commingled with a *discharge* authorized by a different SPDES permit and/or a *discharge* that does not require SPDES permit authorization, are also authorized under this permit.

C. Prohibited *Discharges*

1. Non-*stormwater discharges* prohibited under this permit include but are not limited to:

    a. Wastewater from washout of concrete; and

    b. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials; and

    c. Fuels, oils, or other *pollutants* used in vehicle and equipment operation and maintenance; and

    d. Soaps, solvents, or detergents used in vehicle and equipment washing or external building washdown; and

    e. Toxic or hazardous substances from a spill or other release.

D. Electronic Notice of Intent (eNOI) Submittal

To receive authorization in accordance with Part I.D.3.b., the *owner or operator* must submit a complete eNOI in accordance with the requirements in Part I.D. The eNOI contains questions to: ensure eligibility requirements in Part I.A. have been met; obtain *owner or operator* contact information; obtain the total area to be disturbed and the existing/future *impervious areas* (rounded to the nearest tenth of an acre); confirm *Traditional Land Use Control MS4 Operator* jurisdiction over construction projects; satisfy the EPA eRule requirements; confirm that the Water Quality-Based Effluent Limitations in Part II. have been met; demonstrate consideration of the future risks due to climate change in accordance with Part III.A.2.; and confirm that the other *Stormwater Pollution Prevention Plan (SWPPP)* requirements in Part III. have been met.

1. An eNOI may be submitted for:

    a. *construction activities* that are not part of a *common plan of development or sale*; or

b. an entire *common plan of development or sale*; or

c. separate *phase(s)* of a *common plan of development or sale* if the following requirements are met:

    i. the *common plan of development or sale* meets the eligibility requirements of Part I.A.5. or 6.; and

    ii. the *phase(s)* meet(s) all other eligibility requirements of Part I.A.; and

    iii. Part III.C. Required *SWPPP* Components by Project Type is based on the *common plan of development or sale*, not the *phase(s)*; or

d. *tree clearing* that is associated with, or will support, a *renewable energy* generation, transmission, or storage project that meets Part I.A.5. and 6., if the *tree clearing*:

    i. meets all other eligibility requirements of Part I.A.; and

    ii. will occur in NYSDEC's Regions 3-9; and

    iii. is not within ¼ mile of a bat hibernaculum protected pursuant to 6 NYCRR Part 182; and

    iv. will occur between November 1st and March 31st.

2. As prerequisites for submitting an eNOI, the *owner or operator* must:

    a. prepare a *SWPPP* for Part I.D.1.a., b., c., or d. in accordance with Part III.; and

    b. based on the following criteria, upload the following signature forms signed in accordance with Part VII.J. to the eNOI prior to submission:

        i. for all eNOIs:

            1. the SWPPP Preparer Certification Form, Appendix F, signed by the *SWPPP* preparer; and

2. the Owner/Operator Certification Form, Appendix J, signed by the *owner or operator*; and

ii. if an eNOI includes *construction activities* within the municipal boundary(ies) of *Traditional Land Use Control MS4 Operator(s)* that will *discharge* to the *MS4(s)*:

1. determine if the *Traditional Land Use Control MS4 Operator(s)* have review authority. A *Traditional Land Use Control MS4 Operator* does not have review authority where:

a. the *owner or operator* of the *construction activities* in Part I.D.2.b.ii. is the same entity as the *Traditional Land Use Control MS4 Operator* identified in Part I.D.2.b.ii.; or

b. there is a statute exempting the *owner or operator* from zoning review by the *Traditional Land Use Control MS4 Operator*; or

c. there is no such statute per Part I.D.2.b.ii.1.b., the *Traditional Land Use Control MS4 Operator* concludes, after public hearing, that it does not have zoning review authority in accordance with Legal Memorandum LU14 Updated January 2020 “Governmental Immunity from Zoning and Other Legislation”; and

2. if the *Traditional Land Use Control MS4 Operator(s)* have review authority, submit the *SWPPP* to the *Traditional Land Use Control MS4 Operator(s)* for review and have:

a. if outside the municipal boundaries of NYC: the MS4 SWPPP Acceptance Form, Appendix G, signed by the principal executive officer or ranking elected official from the *Traditional Land Use Control MS4 Operator,* or by a duly authorized representative of that person in accordance with Part VII.J.2.; or

b. if within the municipal boundaries of NYC: The City of New York Department of Environmental Protection (NYCDEP) SWPPP Acceptance/Approval Form, Appendix H, signed by the principal executive officer or ranking elected official from the Traditional Land Use Control MS4 Operator, or by a duly authorized representative of that person in accordance with Part VII.J.2.; and

3. if the *Traditional Land Use Control MS4 Operator* does not have review authority, have the MS4 No Jurisdiction Form, Appendix I, signed by the principal executive officer or ranking elected official from the *Traditional Land Use Control MS4 Operator,* or by a duly authorized representative of that person in accordance with Part VII.J.2.

3. Submitting an eNOI:

a. The *owner or operator* must submit a complete Notice of Intent electronically using a NYSDEC approved form.[2]

b. The *owner or operator* is authorized to *commence construction activity* as of the authorization date indicated in the Letter of Authorization (LOA), which is sent by NYSDEC after a complete eNOI is submitted.

i. If an eNOI is received for a *SWPPP* that deviates from one of the technical standards but demonstrates *equivalence* in accordance with Part III.B.1.a.ii. or Part III.B.2.b.ii., if the *SWPPP* includes *construction activities* that are not within the municipal boundary(ies) of *Traditional Land Use Control MS4 Operator(s)*, and/or if the *SWPPP* includes *construction activities* within the municipal boundary(ies) of *Traditional Land Use Control MS4 Operator(s)* that do not have review authority in accordance with Part I.D.2.b.ii.1., the authorization date indicated in the LOA will be 60 business days after the eNOI submission date.

[2] Unless NYSDEC grants a waiver in accordance with 40 CFR 127.15(c) or (d). All waiver requests must be submitted to Stormwater_info@dec.ny.gov or NYSDEC, Bureau of Water Permits, 625 Broadway, 4th Floor, Albany, New York 12233-3505.

c. If *Traditional Land Use Control MS4 Operator(s)* have review authority in accordance with Part I.D.2.b.ii.2., the *owner or operator* must, within five business days of receipt of the LOA, send an electronic copy of the LOA to the *Traditional Land Use Control MS4 Operator(s)* with review authority.

E. General Requirements for *Owners or Operators* with Permit Coverage

1. As of the date the LOA is received, the *owner or operator* must make the eNOI, *SWPPP*, and LOA available for review and copying in accordance with the requirements in Part VII.H. When applicable, as of the date an updated LOA is received, the *owner or operator* must make the updated LOA available for review and copying in accordance with the requirements in Part VII.H.

2. The *owner or operator* must ensure compliance with all requirements of this permit and that the provisions of the *SWPPP*, including any changes made to the *SWPPP* in accordance with Part III.A.5., are properly implemented and maintained from the *commencement of construction activity* until:

   a. all areas of disturbance have achieved *final stabilization;* and

   b. the owner's or operator's coverage under this permit is terminated in accordance with Part V.A.5.a.

3. As of the date of the *commencement of construction activities* until Part I.E.2.a. and b. have been met, the *owner or operator* must maintain at the *construction site*, a copy of:

   a. all documentation necessary to demonstrate eligibility with this permit; and

   b. this permit; and

   c. the *SWPPP*; and

   d. the signed SWPPP Preparer Certification Form; and

   e. the signed MS4 SWPPP Acceptance Form or signed NYCDEP SWPPP Acceptance/Approval Form or signed MS4 No Jurisdiction Form (when applicable); and

   f. the signed Owner/Operator Certification Form; and

g. the eNOI; and

h. the LOA; and

i. the LOA transmittal to the Traditional Land Use Control MS4 Operator in accordance with Part I.D.3.c. (when applicable).

4. The *owner or operator* must maintain at the *construction site*, until Part I.E.2.a. and b. have been met, as of the date the documents become final or are received, a copy of the:

   a. responsible contractor's or subcontractor's certification statement(s) in accordance with Part III.A.7.; and

   b. inspection reports in accordance with Part IV.C.4. and 6.; and

   c. Request to Disturb Greater Than Five Acres and the Authorization Letter to Disturb Greater Than Five Acres in accordance with Part I.E.6. (when applicable); and

   d. Request to Continue Coverage and the Letter of Continued Coverage (LOCC) in accordance with Part I.F.2. and 4. (when applicable); and

   e. The updated LOA(s) in accordance with Part I.E.9. (when applicable).

5. The *owner or operator* must maintain the documents in Part I.E.3. and 4. in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection. The documents must be paper documents unless electronic documents are accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be. If electronic documents are kept on site, the *owner or operator* must maintain functional equipment on site available to an inspector during normal hours of operation such that an inspector may view the electronic documents in a format that can be read in a similar manner as a paper record and in a legally dependable format with no less evidentiary value than their paper equivalent.

6. The *owner or operator* must meet the following requirements prior to disturbing greater than five acres of soil at any one time:

   a. The *owner or operator* must submit a written Request to Disturb Greater Than Five Acres to:

i. NYSDEC's Regional Office Division of Water staff based on the project location, Appendix E, if a *Traditional Land Use Control MS4 Operator* does not have review authority in accordance with Part I.D.2.b.ii.1.; or

ii. the *Traditional Land Use Control MS4 Operator*, if a *Traditional Land Use Control MS4 Operator* has review authority in accordance with Part I.D.2.b.ii.1.; or

iii. NYSDEC's Regional Office Division of Water staff based on the project location, Appendix E, and each involved *Traditional Land Use Control MS4 Operator*, if the project spans multiple municipalities with more than one *Traditional Land Use Control MS4 Operator* involved with review authority in accordance with Part I.D.2.b.ii.1.

b. The written Request to Disturb Greater Than Five Acres must include:

i. The SPDES permit identification number (Permit ID); and

ii. Full technical justification demonstrating why alternative methods of construction that would result in five acres of soil disturbance or less at any one time are not feasible; and

iii. The phasing plan for the project and sequencing plans for all *phases* from the *SWPPP* in accordance with Part III.B.1.d.; and

iv. Plans with locations and details of erosion and sediment control practices such that the heightened concern for erosion when disturbing greater than five acres at one time has been addressed; and

v. Acknowledgment that "the *owner or operator* will comply with the requirements in Part IV.C.2.b."; and

vi. Acknowledgment that "the *owner or operator* will comply with the requirements in Part II.B.1.b."

c. The *owner or operator* must be in receipt of an Authorization Letter to Disturb Greater Than Five Acres, which will include when the

authorization begins and ends and indicate a maximum area (acres) of soil disturbance allowed at any one time, from:

i. NYSDEC, if Part I.E.6.a.i. or iii. apply; or

ii. the *Traditional Land Use Control MS4 Operator*, if Part I.E.6.a.ii. applies.

7. Upon a finding of significant non-compliance with the practices described in the *SWPPP* or violation of this permit, NYSDEC may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied. The stop work order must be in writing, describe the non-compliance in detail, and be sent to the *owner or operator*.

8. If any human remains or archaeological remains are encountered during excavation, the *owner or operator* must immediately cease, or cause to cease, all *construction activity* in the area of the remains and notify the appropriate Regional Water Engineer (RWE).[3] *Construction activity* shall not resume until written permission to do so has been received from the RWE.

9. To be authorized to implement modifications to the information previously submitted in the eNOI, the *owner or operator* must:

   a. notify NYSDEC via email at Stormwater_info@dec.ny.gov requesting access to update the eNOI; and

   b. update the eNOI to reflect the modifications and resubmit the eNOI in accordance with Part I.D.; and

   c. receive an updated LOA.

10. The eNOI, *SWPPP*, LOA, updated LOAs (when applicable), and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five business days of the *owner or operator* receiving a written request by any such person to review these documents. Copying of documents will be done at the requester's expense.

[3] The Regional Water Manager where a DEC Region does not have a RWE.

F. Permit Coverage for *Discharges* Authorized Under GP-0-20-001

When applicable:

1. Upon the effective date of this permit, an *owner or operator* of *a construction activity*, with coverage under GP-0-20-001, will have interim coverage under GP-0-25-001 for 45 calendar days starting on the effective date of GP-0-25-001 so long as the *owner or operator* maintains compliance with all applicable requirements of this permit.

2. Within 30 calendar days of the effective date of this permit, the *owner or operator*, with coverage under GP-0-20-001, must submit a complete Request to Continue Coverage electronically using a NYSDEC approved form,[4] which contains the information identified in Part I.F.3. below, if:

   a. the *owner or operator* continues to implement the SMP component in conformance with the technical standards in place at the time of initial project authorization; and

   b. the *owner or operator* will comply with all non-design requirements of GP-0-25-001.

3. The Request to Continue Coverage form contains questions to: ensure eligibility requirements in Part I.A. have been met; verify *owner or operator* contact information; verify the permit identification number; verify the original eNOI submission ID, if applicable; verify Part I.F.2.a. and b.; verify the version of the Design Manual that the technical/design components conform to; and receive an updated Owner/Operator Certification Form, Appendix I.

4. The *owner or operator* has obtained continued coverage under GP-0-25-001 as of the date indicated in the LOCC, which is sent by NYSDEC after a complete Request to Continue Coverage form is submitted.

5. If the owner or operator does not submit the Request to Continue Coverage form in accordance with Part I.F.2. and 3., coverage under this permit is automatically terminated after interim coverage expires.

[4] Unless NYSDEC grants a waiver in accordance with 40 CFR 127.15(c) or (d). All waiver requests must be submitted to Stormwater_info@dec.ny.gov or NYSDEC, Bureau of Water Permits, 625 Broadway, 4th Floor, Albany, New York 12233-3505.

G. Change of *Owner or Operator*

When applicable:

1. When property ownership changes, or when there is a change in operational control over the construction plans and specifications, the following process applies:

    a. The new *owner or operator* must meet the applicable prerequisites for submitting an eNOI in accordance with Part I.D.2.; and

    b. The new *owner or operator* must submit an eNOI in accordance with Part I.D.3.; and

    c. Permit coverage for the new *owner or operator* will be effective upon receipt of the LOA in accordance with Part I.D.3.b.; and

    d. The new *owner or operator*, upon receipt of their LOA, must provide their Permit ID to the original *owner or operator*; and

    e. If the original *owner or operator* will no longer be the *owner or operator* of the *construction activity* identified in the original *owner's or operator's* eNOI, the original *owner or operator*, upon receipt of the new *owner's or operator's* Permit ID in accordance with Part I.G.1.d., must submit to NYSDEC a completed eNOT in accordance with Part V. that includes the name and Permit ID of the new *owner or operator*; or

    f. If the original *owner or operator* maintains ownership of a portion of the *construction activity*, the original *owner or operator* must maintain their coverage under the permit by modifying their eNOI; modifications to the eNOI must include:

        i. the revised area of disturbance and/or *impervious area(s)*; and

        ii. the revised SMP information, if applicable; and

        iii. a narrative description of what has changed; and

        iv. the new *owner's or operator's* Permit ID for the portion of the project removed from the eNOI.

    Owners or operators must follow Part I.E.9. to modify the eNOI.

Part II. Water Quality-Based Effluent Limitations

A. Maintaining Water Quality

NYSDEC expects that compliance with the requirements of this permit will control *discharge*s necessary to meet applicable *water quality standards*. It shall be a violation of the *ECL* for any *discharge* to either cause or contribute to a violation of the following *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York:

1. There must be no increase in turbidity that will cause a substantial visible contrast to natural conditions; and

2. There must be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and

3. There must be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

If there is evidence indicating that the *stormwater discharge*s authorized by this permit are causing, have the reasonable potential to cause, or are contributing to a violation of the *water quality standard,* the *owner or operator* must take appropriate corrective action in accordance with Part IV.C.5. of this permit and document in accordance with Part IV.C.4. of this permit. To address the *water quality standard* violation the *owner or operator* must include and implement appropriate controls in the *SWPPP* to correct the problem or obtain an individual SPDES permit.

If, despite compliance with the requirements of this permit, it is demonstrated that the *stormwater discharge*s authorized by this permit are causing or contributing to a violation of *water quality standards*, or if NYSDEC determines that a modification of this permit is necessary to prevent a violation of *water quality standards*, the authorized *discharge*s will no longer be eligible for coverage under this permit, and the *owner or operator* must obtain an individual SPDES permit prior to further *discharges* from the *construction site*.

B. Effluent Limitations Applicable to *Discharges* from *Construction Activities*

*Discharge*s authorized by this permit must achieve, at a minimum, the effluent limitations in Part II.B.1.a., b., c., d., and e. These limitations represent the

degree of effluent reduction attainable by the application of best practicable technology currently available.

1. Erosion and Sediment Control Requirements - The *owner or operator* must select, design, install, implement, and maintain control measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. The selection, design, installation, implementation, and maintenance of these control measures must meet the non-numeric effluent limitations in Part II.B.1.a., b., c., d., and e. and be in accordance with the New York State Standards and Specifications for Erosion and Sediment Control (BB), dated November 2016, using sound engineering judgment. Where control measures are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must include in *SWPPP* the reason(s) for the deviation, or alternative design, and provide information in the *SWPPP* demonstrating that the deviation or alternative design is *equivalent* to the technical standard.

    a. **Erosion and Sediment Controls.** At a minimum, erosion and sediment controls must be selected, designed, installed, implemented, and maintained to:

        i. *Minimize* soil erosion through application of runoff control and soil stabilization control measure to *minimize pollutant discharge*s; and

        ii. Control *stormwater discharge*s, including both peak flow rates and total *stormwater* volume, to *minimize* channel and *streambank* erosion and scour in the immediate vicinity of the *discharge* points; and

        iii. *Minimize* the amount of soil exposed during *construction activity*; and

        iv. *Minimize* the disturbance of *steep slope*; and

        v. *Minimize* sediment *discharge*s from the site; and

        vi. Provide and maintain *natural buffers* around surface waters, direct *stormwater* to vegetated areas and maximize *stormwater* infiltration to reduce *pollutant discharge*s, unless *infeasible*; and

        vii. *Minimize* soil compaction. *Minimizing* soil compaction is not required

where the intended function of a specific area of the site dictates that it be compacted; and

viii. Unless *infeasible*, preserve a sufficient amount of topsoil to complete soil restoration and establish a uniform, dense vegetative cover; and

ix. *Minimize* dust. On areas of exposed soil, *minimize* dust through the appropriate application of water or other dust suppression techniques to control the generation of *pollutants* that could be discharged from the site.

b. **Soil Stabilization**. In areas where soil disturbance activity has ceased, whether permanently or *temporarily ceased*, the application of soil stabilization measures must be initiated by the end of the next business day and completed within 14 calendar days from the date the current soil disturbance activity ceased. For *construction sites* that *directly discharge* to one of the 303(d) segments listed in Appendix D, or are located in one of the watersheds listed in Appendix C, or are authorized to disturb greater than five acres in accordance with Part I.E.5.a.viii., the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven calendar days from the date the soil disturbance activity ceased.

c. **Dewatering**. *Discharge*s from *dewatering* activities, including *discharge*s from *dewatering* of trenches and excavations, must be managed by appropriate control measures.

d. **Pollution Prevention Measures**. Select, design, install, implement, and maintain effective pollution prevention measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such measures must be selected, designed, installed, implemented, and maintained to:

i. *Minimize* the *discharge* of *pollutants* from equipment and vehicle washing, wheel wash water, and other wash waters. Soaps, detergents and solvents cannot be used; and

ii. *Minimize* the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, hazardous and toxic waste, and other materials present on the site to precipitation

and to *stormwater*. *Minimization* of exposure is not required in cases where the exposure to precipitation and to *stormwater* will not result in a *discharge* of *pollutants*, or where exposure of a specific material or product poses little risk of *stormwater* contamination (such as final products and materials intended for outdoor use); and

iii. Prevent the *discharge* of *pollutants* from spills and leaks and implement chemical spill and leak prevention and response procedures.

e. **Surface Outlets.** When discharging from basins and impoundments, the surface outlets must be designed, constructed, and maintained in such a manner that sediment does not leave the basin or impoundment and that erosion at or below the outlet does not occur.

C. Post-Construction Stormwater Management Practice (SMP) Requirements

1. The *owner or operator* of a *construction activity* that requires post-construction SMPs, in accordance with Part III.C., must select, design, install, implement, and maintain the SMPs to meet the *performance criteria* in the New York State Stormwater Management Design Manual, dated July 31, 2024 (DM), using sound engineering judgment. Where SMPs are not designed in conformance with the *performance criteria* in the DM, the *owner or operator* must include in the *SWPPP* the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. The *owner or operator* of a *construction activity*, that requires SMPs in accordance with Part III.C., must design the practices to meet the applicable *sizing criteria* in Part II.C.2.a., b., c., or d.

a. Sizing Criteria for *New Development*

i. Runoff Reduction Volume (RRv) and Water Quality Volume (WQv):

1. Reduce the total WQv by application of RR techniques and standard SMPs with RRv capacity. The total WQv must be calculated in accordance with the criteria in Section 4.2 of the DM; or

2. Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the requirements in Part II.C.2.a.i.1. due to *site limitations* must direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv must be documented in the *SWPPP*. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the *SWPPP* must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible*.

   In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 4.4 of the DM. The remaining portion of the total WQv that cannot be reduced must be treated by application of standard SMPs.

ii. Channel Protection Volume (CPv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event, remaining after runoff reduction. Where a CPv control orifice is provided, the minimum orifice size must be 3 inches, with acceptable external trash rack or orifice protection. The CPv requirement does not apply when:

   1. Reduction of the entire CPv is achieved by application of runoff reduction techniques or infiltration systems; or

   2. The 1-year post-development peak *discharge* is less than or equal to 2.0 cfs without detention or velocity controls; or

   3. The site *directly discharges* into a fifth order or larger water body (stream, river, or lake), or tidal waters, where the increase in smaller flows will not impact the stream bank or channel integrity. However, the point of *discharge* must be adequately protected against scour and erosion by the increased peak *discharge*.

iii. *Overbank* Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:

1. the site *directly discharges* to tidal waters or fifth order or larger streams, or

2. A downstream analysis reveals that *overbank* control is not required.

iv. Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:

1. the site *directly discharges* to tidal waters or fifth order or larger streams, or

2. A downstream analysis reveals that *overbank* control is not required.

b. *Sizing Criteria* for *New Development* in Enhanced Phosphorus Removal Watersheds

i. Runoff Reduction Volume (RRv) and Water Quality Volume (WQv):

1. Reduce the WQv by application of RR techniques and standard SMPs with RRv capacity. The total WQv is the runoff volume from the 1-year, 24-hour design storm over the post-developed watershed and must be calculated in accordance with the criteria in Section 4.3 of the DM; or

2. Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part II.C.2.b.i.1. due to *site limitations* must direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv must be documented in the *SWPPP*. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the *SWPPP* must include

documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible.*

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 4.5 of the DM. The remaining portion of the total WQv that cannot be reduced must be treated by application of standard SMPs.

ii. Channel Protection Volume (CPv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event, remaining after runoff reduction. Where a CPv control orifice is provided, the minimum orifice size must be 3 inches, with acceptable external trash rack or orifice protection. The CPv requirement does not apply when:

1. Reduction of the entire CPv is achieved by application of runoff reduction techniques or infiltration systems; or

2. The 1-year post-development peak *discharge* is less than or equal to 2.0 cfs; or

3. The site *directly discharges* to tidal waters, or a fifth order or larger water body (stream, river, or lake) where the increase in smaller flows will not impact the stream bank or channel integrity. However, the point of *discharge* must be adequately protected against scour and erosion by the increased peak *discharge*.

iii. *Overbank* Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:

1. the site *directly discharges* to tidal waters or fifth order or larger streams; or

2. A downstream analysis reveals that *overbank* control is not required.

iv. Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:

1. the site *directly discharges* to tidal waters or fifth order or larger streams; or

2. A downstream analysis reveals that *overbank* control is not required.

c. *Sizing Criteria* for *Redevelopment Activity*

i. Water Quality Volume (WQv): The WQv treatment objective for *redevelopment activity* must be addressed by one of the following options, as outlined in Section 9.2.1. *Redevelopment activities* located in an Enhanced Phosphorus Removal Watershed (see Part III.B.3. and Appendix C) must calculate the WQv in accordance with Section 4.3 of the DM. All other *redevelopment activities* must calculate the WQv in accordance with Section 4.2 of the DM.

1. Reduce the existing *impervious cover* by a minimum of 25% of the total disturbed, *impervious area*. The Soil Restoration criteria in Section 5.1.6 of the DM must be applied to all newly created pervious areas; or

2. Capture and treat 100% of the required WQv, for a minimum of 25% of the disturbed redevelopment *impervious area*, by implementation of standard SMPs or reduced by application of runoff reduction techniques; or

3. Capture and treat 100% of the required WQv, for a minimum of 75% of the disturbed redevelopment *impervious area*, by implementation of a volume-based alternative SMP, as defined in Section 9.4 of the DM; or

4. Capture and treat 100% of the required WQv, for a minimum of 75% of the disturbed redevelopment *impervious area*, by implementation of a flow-through alternative SMP sized to treat the peak rate of runoff from the WQv design storm; or

5. Application of a combination of 1 through 4 above that provide a weighted average of at least two of the above methods. Application of this method must be in accordance with the criteria in Section 9.2.1(A)(V) of the DM; or

6. If there is an existing SMP located on the site that captures and treats runoff from the *impervious area* that is being disturbed, the WQv treatment option selected must, at a minimum, provide treatment equal to the treatment that was being provided by the existing practice(s) if that treatment is greater than the treatment required by options 1 through 5 above.

ii. Channel Protection Volume (CPv) is not required if there is 0% change to hydrology that increases the *discharge* rate and volume from the project site.

iii. *Overbank* Flood Control (Qp) is not required if there is 0% change to hydrology that increases the *discharge* rate from the project site.

iv. Extreme Flood Control (Qf) is not required if there is 0% change to hydrology that increases the *discharge* rate from the project site.

d. *Sizing Criteria* for Combination of *Redevelopment Activity* and *New Development*

Construction projects, that include both *new development* and *redevelopment activity*, must use SMPs that meet the *sizing criteria* calculated as an aggregate of the *sizing criteria* in Part II.C.2.a. or b. for the *new development* portion of the project and Part II.C.2.c. for the *redevelopment activity* portion of the project.

Part III. Stormwater Pollution Prevention Plan (SWPPP)

A. General *SWPPP* Requirements

1. A *SWPPP* must be prepared and implemented by the *owner or operator* of all *construction activity* covered by this permit. All authorized *discharges* must be identified in the *SWPPP*. The *SWPPP* must document the selection, design, installation, implementation and maintenance of the control measures and

practices that will be used to meet the effluent limitations in Part II.B. and, where applicable, the SMP requirements in Part II.C.

2. The *SWPPP* must demonstrate consideration in narrative format of the future physical risks due to climate change pursuant to the Community Risk and Resiliency Act (CRRA), 6 NYCRR Part 490, and associated guidance.

    a. The owner or operator must consider:

        i. the following physical risks due to climate change:

            (i) increasing temperature; and

            (ii) increasing precipitation; and

            (iii) increasing variability in precipitation, including chance of drought; and

            (iv) increasing frequency and severity of flooding; and

            (v) rising sea level; and

            (vi) increasing storm surge; and

            (vii) shifting ecology.

        ii. for each of the following:

            (i) overall site planning; and

            (ii) location, elevation, and sizing of:

                a. control measures and practices; and

                b. conveyance system(s); and

                c. detention system(s).

3. The *SWPPP* must describe the erosion and sediment control practices and where required, SMPs that will be used and/or constructed to reduce the *pollutants* in *stormwater discharges* and to assure compliance with the

requirements of this permit. In addition, the *SWPPP* must identify potential sources of pollution which may reasonably be expected to affect the quality of *stormwater discharges*.

4. All *SWPPPs*, that require the SMP component in accordance with Part III.B.2., must be prepared by a *qualified professional*.

5. The *owner or operator* must keep the *SWPPP* current so that, at all times, it accurately documents the erosion and sediment control practices that are being used or will be used during construction, and all SMPs that will be constructed on the site. At a minimum, the *owner or operator* must modify the *SWPPP*, including construction drawings:

   a. whenever the current provisions prove to be ineffective in *minimizing pollutants* in *stormwater discharges* from the site; and

   b. whenever there is a change in design, construction, or operation at the *construction site* that has or could have an effect on the *discharge* of *pollutants*; and

   c. to address issues or deficiencies identified during an inspection by the *qualified inspector,* NYSDEC, or other regulatory authority; and

   d. to document the final construction conditions in an as-built drawing.

6. NYSDEC may notify the *owner or operator* at any time that the *SWPPP* does not meet one or more of the minimum requirements of this permit. The notification must be in writing and identify the provisions of the *SWPPP* that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by NYSDEC, the *owner or operator* must make the required changes to the *SWPPP* and submit written notification to NYSDEC that the changes have been made. If the *owner or operator* does not respond to NYSDEC's comments in the specified time frame, NYSDEC may suspend the *owner's or operator's* coverage under this permit or require the *owner or operator* to obtain coverage under an individual SPDES permit in accordance with Part II.D.4.

7. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting, and maintaining the erosion and sediment control practices included in the *SWPPP* and the

contractor(s) and subcontractor(s) that will be responsible for constructing the SMPs included in the *SWPPP*. The *owner or operator* must have each of the contractors and subcontractors identify at least one person from their company to be *trained contractor* that will be responsible for implementation of the *SWPPP*. The *owner or operator* must ensure that at least one *trained contractor* is on site daily when soil disturbance activities are being performed.

The *owner or operator* must have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before the *commencement of construction activities*:

> "I hereby certify under penalty of law that I understand and agree to comply with the requirements of the *SWPPP* and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with the requirements of the most current version of the New York State Pollutant Discharge Elimination System (SPDES) Construction General Permit (CGP) for Stormwater Discharges from Construction Activities and that it is unlawful for any person to cause or contribute to a violation of *water quality standards*. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

In addition to providing the certification statement above, the certification page must also identify the specific elements of the *SWPPP* that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the *trained contractor* responsible for *SWPPP* implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* must attach the certification statement(s) to the copy of the *SWPPP* that is maintained at the *construction site*. If new or additional contractors are hired to implement measures identified in the *SWPPP* after the *commencement of construction activities*, they must also sign the certification statement and provide the information listed above prior to performing *construction activities*.

B. Required *SWPPP* Contents

1. Erosion and sediment control component - The *owner or operator* must prepare a *SWPPP* that includes erosion and sediment control practices.

    a. Erosion and sediment control practices must be designed:

        i. in conformance with the BB; or

        ii. *equivalent* to the BB if deviating from Part III.B.1.a.i.

    b. If the erosion and sediment control practices are designed in conformance with Part III.B.1.a.ii., the *SWPPP* must include a demonstration of *equivalence* to the BB.

    c. At a minimum, the erosion and sediment control component of the *SWPPP* must include the following:

        i. Background information about the scope of the project, including the location, type and size of project; and

        ii. A site map/construction drawing(s) with north arrows for the project, including a general location map. At a minimum, the site map must show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); floodplain/floodway boundaries; wetlands and drainage patterns that could be affected by the *construction activity*; existing and final contours; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the *stormwater discharge*(s) and receiving surface water(s); and

        iii. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG); and

        iv. A phasing plan for the project and sequencing plans for all *phases*, both of which must address clearing and grubbing, excavation and grading, utility and infrastructure installation, *final stabilization*,

and any other *construction activity* at the site that will result in soil disturbance.

1. The phasing plan must include:

    a. a map delineating and labeling the limits of soil disturbance for all *phases* of a project; and

    b. a table identifying the order and intended schedule of when each *phase* will begin and end its sequencing plan. The table must identify the total disturbed area for each *phase* at any one time and the total disturbed area for the overall project at any one time all on one timeline showing all overlapping quantities of disturbed area at any one time; and

2. A sequencing plan for a specific *phase* must include:

    a. a table indicating the order and intended schedule of *construction activities* within a *phase*, and corresponding construction drawings with a description of the work to be performed; and

    b. all permanent and *temporary stabilization* measures; and

v. A description of the minimum erosion and sediment control practices to be installed or implemented for each *construction activity* that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented; and

vi. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice; and

vii. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any

temporary sediment basins and structural practices that will be used to divert flows from exposed soils; and

viii. A maintenance inspection schedule for the contractor(s) and subcontractor(s) identified in Part III.A.7. to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection schedule must be in accordance with the requirements in the BB technical standard; and

ix. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a *pollutant* source in the *stormwater discharges*; and

x. A description and location of any *stormwater discharges* associated with industrial activity other than construction at the site, including, but not limited to, *stormwater discharges* from asphalt plants and concrete plants located on the *construction site*; and

xi. Identification of any elements of the design that are not in conformance with the design criteria in the BB technical standard. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. SMP component – The *owner or operator* of *construction activity* identified in Table 2 of Appendix B must prepare a *SWPPP* that includes SMPs.

   a. SMPs must be designed in conformance with the applicable *sizing criteria* in Part II.C.2.a., c., or d.; and

   b. SMPs must be designed in conformance with the *performance criteria*:

      i. in the DM; or

      ii. *equivalent* to the DM if deviating from Part III.B.2.b.i.; or

      iii. in the New York State Stormwater Management Design Manual, dated January 2015 (2015 Design Manual), or *equivalent* to it, if the following criteria are met:

1. The eNOI is submitted in accordance with Part I.D. before January 29, 2027 for *construction activities* that are either:

    a. subject to governmental review and approval:

        i. where the *owner or operator* made any application to that governmental entity prior to the effective date of this permit; and

        ii. such application included a *SWPPP* developed using the 2015 Design Manual or *equivalent* to it; or

    b. not subject to governmental review and approval:

        i. where a fiscal allocation for the *construction activities* has been developed and approved by a governmental entity; and

        ii. the *SWPPP* was developed using the 2015 Design Manual or *equivalent* to it; and

c. If SMPs are designed in conformance with Part III.B.2.b.ii., the *SWPPP* must include the reason(s) for the deviation or alternative design and a demonstration of *equivalence* to the DM; and

d. If SMPs are designed in conformance with Part III.B.2.b.iii., the *SWPPP* must include supporting information or documentation demonstrating that Part III.B.2.b.iii.1.a. or b. apply; and

e. The SMP component of the *SWPPP* must include the following:

    i. Identification of all SMPs to be constructed as part of the project, including which option the SMP designs conform to, either Part III.B.2.b.i., ii., or iii. Include the dimensions, material specifications and installation details for each SMP; and

    ii. A site map/construction drawing(s) showing the specific location and size of each SMP; and

iii. A Stormwater Modeling and Analysis Report that includes:

(i) Map(s) showing pre-development conditions, including watershed/subcatchments boundaries, flow paths/routing, and design points; and

(ii) Map(s) showing post-development conditions, including watershed/subcatchments boundaries, flow paths/routing, design points and SMPs; and

(iii) Results of *stormwater* modeling (i.e. hydrology and hydraulic analysis) for the required storm events. Include supporting calculations (model runs), methodology, and a summary table that compares pre- and post-development runoff rates and volumes for the different storm events; and

(iv) Summary table, with supporting calculations, which demonstrates that each SMP has been designed in conformance with the *sizing criteria* included in the DM; and

(v) Identification of any *sizing criteria* that is not required based on the requirements included in Part II.C.; and

(vi) Identification of any elements of the design that are not in conformance with the *performance criteria* in the DM. Include the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the DM.

iv. Soil testing results and locations (test pits, borings); and

v. Infiltration test results, when required in accordance with Part III.B.2.a.; and

vi. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each SMP. The plan must identify the entity

that will be responsible for the long-term operation and maintenance of each practice; and

3. Enhanced Phosphorus Removal Standards - The *owner or operator* of *construction activity* identified in Table 2 of Appendix B that is located in a watershed identified in Appendix C must prepare a *SWPPP* that includes SMPs designed in conformance with the applicable *sizing criteria* in Part II.C.2.b., c., or d. and the *performance criteria* Enhanced Phosphorus Removal Standards included in the DM. At a minimum, the SMP component of the *SWPPP* must meet the requirements of Part III.B.2.

C. Required *SWPPP* Components by Project Type

Owners or operators of *construction activities*, identified in Table 1 of Appendix B, are required to prepare a *SWPPP* that only includes erosion and sediment control practices designed in accordance with Part III.B.1. *Owners or operators* of the *construction activities*, identified in Table 2 of Appendix B, must prepare a *SWPPP* that also includes SMPs designed in accordance with Part III.B.2 or 3.

For the entire area of disturbance, including the entire *common plan of development or sale* if applicable, the owner or operator must evaluate every bullet from Appendix B Table 1 and Table 2 separately. If bullets from both Table 1 and Table 2 apply, the *SWPPP* must include erosion and sediment control practices for all *construction activities* but SMPs for only those portions of the *construction activities* that fall under Table 2 bullet(s).

Part IV. Inspection and Maintenance Requirements

A. General Construction Site Inspection and Maintenance Requirements

1. The *owner or operator* must ensure that all erosion and sediment control practices (including pollution prevention measures), and all SMPs identified in the *SWPPP*, are inspected and maintained in accordance with Part IV.B. and C.

B. Contractor Maintenance Inspection Requirements

1. The *owner or operator* of each *construction activity*, identified in Tables 1 and 2 of Appendix B, must have a *trained contractor* inspect the erosion and sediment control practices and pollution prevention measures being

implemented within the active work area daily to ensure that they are being maintained in effective operating condition at all times. If deficiencies are identified, the contractor must:

a. if the corrective action does not require engineering design:

    i. begin implementing corrective actions within one business day; and

    ii. complete the corrective actions within five business days; or

b. if the corrective action requires engineering design:

    i. begin the engineering design process within five business days; and

    ii. complete the corrective action in a reasonable time frame but no later than within 60 calendar days.

2. For *construction sites* where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *trained contractor* can stop conducting the maintenance inspections in accordance with Part IV.B.1. The *trained contractor* must begin conducting the maintenance inspections in accordance with Part IV.B.1. as soon as soil disturbance activities resume.

3. For *construction sites* where soil disturbance activities have been shut down with partial project completion, the *trained contractor* can stop conducting the maintenance inspections in accordance with Part IV.B.1. if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all SMPs required for the completed portion of the project have been constructed in conformance with the *SWPPP* and are operational.

C. *Qualified Inspector* Inspection Requirements

1. With the exception of the following *construction activities* identified in Tables 1 and 2 of Appendix B, a *qualified inspector* must conduct site inspections for all other *construction activities* identified in Tables 1 and 2 of Appendix B:

    a. the construction of a single-family residential subdivision with 25% or less *impervious cover* at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than or equal to five (5) acres and is

not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix D; and

b. the construction of a single-family home that involves soil disturbances of one (1) or more acres but less than or equal to five (5) acres and is not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix D; and

c. construction on *agricultural property* that involves soil disturbances of one (1) or more acres but less than five (5) acres; and

d. *construction activities* located in the New York City Watershed located east of the Hudson River, see Appendix C Figure 1, that involve soil disturbances of 5,000 square feet or more, but less than one acre.

2. The *qualified inspector* must conduct site inspections in accordance with the following timetable:

a. For *construction sites* where soil disturbance activities are on-going, the *qualified inspector* must conduct a site inspection at least once every seven (7) calendar days; or

b. For *construction sites* where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part I.E.6. to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* must conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections must be separated by a minimum of two (2) full calendar days; or

c. For *construction sites* where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *qualified inspector* must conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* must notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix E) or, in areas under the jurisdiction of a *Traditional Land Use Control MS4 Operator,* the *Traditional Land Use Control MS4 Operator* (provided the *Traditional Land Use Control MS4 Operator* is not the *owner or operator* of the *construction activity*) by hard copy or email prior to reducing the inspections to this frequency and again by hard copy or email prior to re-commencing construction; or

d. For *construction sites* where soil disturbance activities have been shut down with partial project completion, the requirement to have the *qualified inspector* conduct inspections ceases if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all SMPs required for the completed portion of the project have been constructed in conformance with the *SWPPP* and are operational. The *owner or operator* must notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix E) or, in areas subject to the review authority of *Traditional Land Use Control MS4 Operator(s)* in accordance with Part I.D.2.b.ii.1., the *Traditional Land Use Control MS4 Operator(s)* (provided the *Traditional Land Use Control MS4 Operator(s)* are not the *owners or operators* of the *construction activity*) in writing prior to the shutdown and again in writing prior to resuming *construction activity*. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* must terminate coverage by meeting the requirements of Part V; or

e. For *construction sites* involving soil disturbance of one (1) or more acres that *directly discharge* to one of the 303(d) segments listed in Appendix D or is located in one of the watersheds listed in Appendix C, the *qualified inspector* must conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections must be separated by a minimum of two (2) full calendar days.

3. At a minimum, the *qualified inspector* must inspect:

   a. all erosion and sediment control practices and pollution prevention measures to ensure integrity and effectiveness; and

   b. all SMPs under construction to ensure that they are constructed in conformance with the *SWPPP*; and

   c. all areas of disturbance that have not achieved *final stabilization*; and

   d. all points of *discharge* to *surface waters of the State* located within, or immediately adjacent to, the property boundaries of the *construction site*; and

   e. all points of *discharge* from the *construction site*.

4. The *qualified inspector* must prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report must include and/or address all of the following, for all *construction activities* except those listed in Part IV.C.1.:

   a. Permit identification number; and

   b. Date and time of inspection; and

   c. Name and title of person(s) performing inspection; and

   d. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection, including the temperature at the time of the inspection; and

   e. A description of the condition of the runoff at all points of *discharge* from the *construction site*. This must include identification of any *discharges* of sediment from the *construction site*. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow; and

   f. A description of the condition of all *surface waters of the State* located within, or immediately adjacent to, the property boundaries of the *construction site* which receive runoff from disturbed areas. This must include identification of any *discharges* of sediment to the *surface waters of the State*; and

   g. Identification of all erosion and sediment control practices and pollution prevention measures that need repair or maintenance; and

   h. Identification of all erosion and sediment control practices and pollution prevention measures that were not installed properly or are not functioning as designed and need to be reinstalled or replaced; and

   i. Description and sketch (map) of areas with active soil disturbance activity, areas that have been disturbed but are inactive at the time of the inspection, and areas that have been stabilized (temporary and/or final) since the last inspection; and

   j. Estimates, in square feet or acres, of the following areas:

i. Total area with active soil disturbance (not requiring either *temporary stabilization* or *final stabilization*); and

ii. Total area with inactive soil disturbance (requiring either *temporary stabilization* or *final stabilization*); and

iii. Total area that has achieved *temporary stabilization*; and

iv. Total area that has achieved *final stabilization*; and

k. Current stage of construction of all SMPs and identification of all *construction activity* on site that is not in conformance with the *SWPPP* and technical standards; and

l. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices and pollution prevention measures; and to correct deficiencies identified with the construction of the SMP(s); and

m. Identification and status of all corrective actions that were required by previous inspection; and

n. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* must attach color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* must also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* must attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the *qualified inspector* must notify the *owner or operator*, and appropriate contractor or subcontractor identified in Part III.A.7., of any corrective actions that need to be taken. The contractor or subcontractor must:

a. if the corrective action does not require engineering design:

i. begin implementing corrective actions within one business day; and

ii. complete the corrective actions within five business days; or

b. if the corrective action requires engineering design:

i. begin the engineering design process within five business days; and

ii. complete the corrective action in a reasonable time frame but no later than within 60 calendar days.

6. All inspection reports must be signed by the *qualified inspector.* In accordance with Part I.E.3., the inspection reports must be maintained on site with the *SWPPP*.

Part V. How to Terminate CGP Coverage

A. Electronic Notice of Termination (eNOT) Submittal

The eNOT contains questions to ensure requirements in Part V.A. have been met.

1. An *owner or operator* must terminate coverage when one or more of the following requirements have been met:

a. Total project completion:

i. all *construction activity* identified in the *SWPPP* has been completed; and

ii. all areas of disturbance have achieved *final stabilization*; and

iii. all temporary, structural erosion and sediment control measures have been removed; and

iv. all SMPs have been constructed in conformance with the *SWPPP* and are operational; and

v. an as-built drawing has been prepared; or

b. Planned shutdown with partial project completion:

   i. all soil disturbance activities have ceased; and

   ii. all areas disturbed as of the project shutdown date have achieved *final stabilization*; and

   iii. all temporary, structural erosion and sediment control measures have been removed; and

   iv. all SMPs required for the completed portion of the project have been constructed in conformance with the *SWPPP* and are operational; and

   v. an as-built drawing has been prepared; or

c. In accordance with Part I.G. Change of Owner or Operator; or

d. The *owner or operator* has obtained coverage under an alternative general SPDES permit or an individual SPDES permit.

2. For *construction activities* that require *qualified inspector* inspections in accordance with Part IV.C.1. and have met Part V.A.1.a. or b., the *owner or operator* must have the *qualified inspector* perform a final site inspection prior to submitting the eNOT. The *qualified inspector* must, by signing the "Final Stabilization" and "Post-Construction Stormwater Management Practice(s)" certification statements on the eNOT, certify that all the requirements in Part V.A.1.a. or b. have been achieved.

3. For *construction activities* that are subject to the review authority of *Traditional Land Use Control MS4 Operator(s)* in accordance with Part I.D.2.b.ii.1. and meet Part V.A.1.a. or b., the *owner or operator* must have the *Traditional Land Use Control MS4 Operator(s)* sign the "MS4 Acceptance" statement on the eNOT in accordance with the requirements in Part VII.J. A *Traditional Land Use Control MS4 Operator* official, by signing this statement, determined that it is acceptable for the *owner or operator* to submit the eNOT in accordance with the requirements of this Part. A *Traditional Land Use Control MS4 Operator* can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector*'s final site inspection certification(s) when required in Part V.A.2.

4. For *construction activities* that require SMPs and meet Part V.A.1.a. or b., the *owner or operator* must, prior to submitting the eNOT, ensure one of the following:

    a. for SMP(s) that were constructed by a private entity, but will be owned, operated, and maintained by a public entity, the SMP(s) and any right-of-way(s) needed to operate and maintain such practice(s) have been deeded to the municipality in which the practice(s) is located; or

    b. for SMP(s) that are privately owned, but will be operated and maintained by a public entity, an executed operation and maintenance agreement is in place with the municipality that will operate and maintain the SMP(s); or

    c. for SMP(s) that are privately owned, the *owner or operator* has a mechanism in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the *owner or operator's* deed of record; or

    d. for SMP(s) that are owned by a public or private institution (e.g. school, university, hospital), government agency or authority, or public utility, the *owner or operator* has policies and procedures in place that ensure operation and maintenance of the practices in accordance with the operation and maintenance plan.

5. An *owner or operator* that has met the requirements of Part V.A.1., 2., 3., and 4. must request termination of coverage under this permit by submitting a complete Notice of Termination form electronically using a NYSDEC approved form.[5]

    a. The owner's or operator's coverage is terminated as of the termination date indicated in the Letter of Termination (LOT), which is sent by NYSDEC after a complete eNOT is submitted.

[5] Unless NYSDEC grants a waiver in accordance with 40 CFR 127.15(c) or (d). All waiver requests must be submitted to Stormwater_info@dec.ny.gov or NYSDEC, Bureau of Water Permits, 625 Broadway, 4th Floor, Albany, New York 12233-3505.

Part VI. Record Retention and Reporting

A. Record Retention

The *owner or operator* must retain a copy of the documents listed in Part I.E.3. and a copy of the LOT for a period of at least five years from the date that NYSDEC accepts a complete NOT submitted in accordance with Part V.

B. Reporting

Except for the eNOI, the signature forms associated with the eNOI, and the eNOT, all other written correspondence requested by NYSDEC, including individual permit applications, must be sent to the address of the appropriate DOW (SPDES) Program contact at the Regional Office listed in Appendix E.

Part VII. Standard Permit Requirements

For the purposes of this permit, examples of contractors and subcontractors include: third-party maintenance and construction contractors.

A. Duty to Comply

The *owner or operator*, and all contractors or subcontractors, must comply with all requirements of this permit. Any non-compliance with the requirements of this permit constitutes a violation of the New York State Environmental Conservation Law (ECL), and its implementing regulations, and is grounds for enforcement action. Filing of a request for termination of coverage under this permit, or a notification of planned changes or anticipated non-compliance, does not limit, diminish or stay compliance with any requirements of this permit.

B. Need to Halt or Reduce Activity Not a Defense

The necessity to halt or reduce the *construction activity* regulated by this permit, in order to maintain compliance with the requirements of this permit, must not be a defense in an enforcement action.

C. Penalties

There are substantial criminal, civil, and administrative penalties associated with violating the requirements of this permit. Fines of up to $37,500 per day for each

violation and imprisonment for up to 15 years may be assessed depending upon the nature and degree of the offense.

D. False Statements

Any person who knowingly makes any false material statement, representation, or certification in any application, record, report, or other document filed or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance must, upon conviction, be punished in accordance with ECL §71-1933 and or New York State Penal Law Articles 175 and 210.

E. Re-Opener Clause

Upon issuance of this permit, a determination has been made on the basis of a submitted Notice of Intent, plans, or other available information, that compliance with the specified permit requirements will reasonably protect classified water use and assure compliance with applicable *water quality standards*. Satisfaction of the requirements of this permit notwithstanding, if operation pursuant to this permit causes or contributes to a condition in contravention of State *water quality standards* or guidance values, or if NYSDEC determines that a modification is necessary to prevent impairment of the best use of the waters or to assure maintenance of *water quality standards* or compliance with other provisions of ECL Article 17 or the Clean Water Act (CWA), or any regulations adopted pursuant thereto, NYSDEC may require such modification and the Commissioner may require abatement action to be taken by the *owner or operator* and may also prohibit such operation until the modification has been implemented.

F. Duty to Mitigate

The *owner or operator*, and its contractors and subcontractors, must take all reasonable steps to *minimize* or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

G. Requiring Another General Permit or Individual SPDES Permit

NYSDEC may require any *owner or operator* authorized to *discharge* in accordance with this permit to apply for and obtain an individual SPDES permit or apply for authorization to *discharge* in accordance with another general SPDES permit.

1. Cases where an individual SPDES permit or authorization to discharge in accordance with another general SPDES permit may be required include, but is not limited to the following:

a. the *owner or operator* is not in compliance with the conditions of this permit or does not meet the requirements for coverage under this permit; and

b. a change has occurred in the availability of demonstrated technology or practices for the control or abatement of *pollutants* applicable to the *point source*; and

c. new effluent limitation guidelines or new source performance standards are promulgated that are applicable to *point sources* authorized to *discharge* in accordance with this permit; and

d. existing effluent limitation guidelines or new source performance standards that are applicable to *point sources* authorized to *discharge* in accordance with this permit are modified; and

e. a water quality management plan containing requirements applicable to such *point sources* is approved by NYSDEC; and

f. circumstances have changed since the time of the request to be covered so that the *owner or operator* is no longer appropriately controlled under this permit, or either a temporary or permanent reduction or elimination of the authorized *discharge* is necessary; and

g. the *discharge* is in violation of section 17-0501 of the ECL; and

h. the *discharge(s)* is a significant contributor of *pollutants*. In making this determination, NYSDEC may consider the following factors:

   i. the location of the *discharge(s)* with respect to *surface waters of the State*; and

   ii. the size of the *discharge(s)*; and

   iii. the quantity and nature of the *pollutants discharged* to *surface waters of the State*; and

   iv. other relevant factors including compliance with other provisions of ECL Article 17, or the CWA.

2. When NYSDEC requires any *owner or operator* authorized by this permit to apply for an individual SPDES permit as provided for in this subdivision, it must notify the *owner or operator* in writing that a permit application is required. This notice must include a brief statement of the reasons for this decision, an application

form, a statement setting a time for the *owner or operator* to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from the *owner's or operator's* receipt of the notification letter, whereby the authorization to *discharge* under this permit must be terminated. NYSDEC may grant additional time upon demonstration, to the satisfaction of the RWE,[6] that additional time to apply for an alternative authorization is necessary or where NYSDEC has not provided a permit determination in accordance with 6 NYCRR Part 621.

3. When an individual SPDES permit is issued to an *owner or operator* authorized to *discharge* under this permit for the same *discharge(s)*, this permit authorization for *construction activities* authorized under the individual SPDES permit is automatically terminated on the effective date of the individual SPDES permit unless termination is earlier in accordance with 6 NYCRR Part 750.

H. Duty to Provide Information

The *owner or operator* must furnish to NYSDEC, within five business days, unless otherwise set forth by NYSDEC, any information that NYSDEC may request to determine whether cause exists to determine compliance with this permit or to determine whether cause exists for requiring an individual SPDES permit in accordance with 6 NYCRR 750-1.21(e) (see Part VII.G. Requiring Another General Permit or Individual Permit).

The *owner or operator* must make available to NYSDEC, for inspection and copying, or furnish to NYSDEC within 25 business days of receipt of a NYSDEC request for such information, any information retained in accordance with this permit.

Except for Part I.D.4. and 5. and Part I.G., the following applies: where the *owner or operator* becomes aware that it failed to submit any relevant facts on the Notice of Intent, or submitted incorrect information in a Notice of Intent or in any report to NYSDEC, the *owner or operator* must submit such facts or corrected information to NYSDEC within five business days.

I. Extension

In the event a new permit is not issued and effective prior to the expiration of this permit, and this permit is extended pursuant to the State Administrative Procedure Act and 6 NYCRR Part 621, then the *owner or operator* with coverage under this permit may continue to operate and *discharge* in accordance with the requirements of this permit until a new permit is issued and effective.

[6] The Regional Water Manager where a DEC Region does not have a RWE.

J. Signatories and Certification

The Notice of Intent, Notice of Termination, and reports required by this permit must be signed as provided in 40 CFR §122.22.

1. All Notices of Intent and Notices of Termination must be signed as follows:

    a. For a corporation. By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

        (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation; or

        (ii) the manager of one or more manufacturing, production or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for Notice of Intent or Notice of Termination requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

        Note: NYSDEC does not require specific assignments or delegations of authority to responsible corporate officers identified in 40 CFR §122.22(a)(1)(i). NYSDEC will presume that these responsible corporate officers have the requisite authority to sign the Notice of Intent or Notice of Termination unless the corporation has notified NYSDEC to the contrary. Corporate procedures governing authority to sign a Notice of Intent or Notice of Termination may provide for assignment or delegation to applicable corporate positions under 40 CFR §122.22(a)(1)(ii) rather than to specific individuals.

    b. For a partnership or sole proprietorship. By a general partner or the proprietor, respectively.

c. For a municipality, State, Federal, or other public agency. By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

    1. the chief executive officer of the agency; or

    2. a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. All reports required by this permit, and other information requested by NYSDEC, must be signed by a person described in Part VII.J.1., or by a duly authorized representative of that person. A person is a duly authorized representative only if:

    a. The authorization is made in writing by a person described in Part VII.J.1. or using the Duly Authorized Form, found on the DEC website; and

    b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

    c. The written authorization is submitted to NYSDEC.

3. Changes to authorization. If an authorization under Part VII.J.2. is no longer accurate because a different individual or position has responsibility for the overall operation of the *construction activity*, a new authorization satisfying the requirements of Part VII.J.2. must be submitted to NYSDEC prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under Part VII.J.1. or 2. must make the following certification:

    I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who

manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

5. Electronic reporting. If documents described in Part VII.J.1. or 2. are submitted electronically by or on behalf of the *construction activity* with coverage under this permit, any person providing the electronic signature for such documents must meet all relevant requirements of this section, and must ensure that all of the relevant requirements of 40 CFR Part 3 (including, in all cases, subpart D to Part 3) (Cross-Media Electronic Reporting) and 40 CFR Part 127 (NPDES Electronic Reporting Requirements) are met for that submission.

K. Inspection and Entry

The *owner or operator* must allow NYSDEC, the USEPA Regional Administrator, the applicable county health department, or any authorized representatives of those entities, or, in the case of a *construction site* which *discharges* through an *MS4*, an authorized representative of the *MS4* receiving the *discharge*, upon the presentation of credentials and other documents as may be required by law, to:

1. enter upon the *owner's or operator's* premises where a regulated facility or activity is located or conducted or where records must be kept under the requirements of this permit; and

2. have access to and copy at reasonable times, any records that must be kept under the requirements of this permit, including records required to be maintained for purposes of operation and maintenance; and

3. inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and

4. sample or monitor at reasonable times, for the purposes of assuring general SPDES permit compliance or as otherwise authorized by the CWA or ECL, any substances or parameters at any location; and

5. enter upon the property of any contributor to the regulated facility or activity under authority of the *owner or operator*.

L. Confidentiality of Information

The following must not be held confidential: this permit, the fact sheet for this permit, the name and address of any *owner or operator*, effluent data, the Notice of Intent, and information regarding the need to obtain an individual permit or an alternative general SPDES permit. This includes information submitted on forms themselves and any attachments used to supply information required by the forms (except information submitted on usage of substances). Upon the request of the *owner or operator*, NYSDEC must make determinations of confidentiality in accordance with 6 NYCRR Part 616, except as set forth in the previous sentence. Any information accorded confidential status must be disclosed to the Regional Administrator upon his or her written request. Prior to disclosing such information to the Regional Administrator, NYSDEC will notify the Regional Administrator of the confidential status of such information.

M. Other Permits May Be Required

Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

N. NYSDEC Orders or Civil Decrees/Judgments

The issuance of this permit by the NYSDEC, and the coverage under this permit by the *owner or operator*, does not supersede, revoke, or rescind any existing order on consent or civil Decree/Judgment, or modification to any such documents or to any order issued by the Commissioner, or any of the terms, conditions, or requirements contained in such order or modification therefore, unless expressly noted.

O. Property Rights

Coverage under this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State, or local laws or regulations, nor does it obviate the necessity of obtaining the assent of any other jurisdiction as required by law for the *discharge* authorized.

P. Compliance with Interstate Standards

If the *construction activity* covered by this permit originates within the jurisdiction of an interstate water pollution control agency, then the *construction activity* must also comply with any applicable effluent standards or *water quality standards* promulgated by that interstate agency and as set forth in this permit for such *construction activities*.

Q. Oil and Hazardous Substance Liability

Coverage under this permit does not affect the imposition of responsibilities upon, or the institution of any legal action against, the *owner or operator* under section 311 of the CWA, which must be in conformance with regulations promulgated pursuant to section 311 governing the applicability of section 311 of the CWA to *discharges* from facilities with *NPDES* permits, nor must such issuance preclude the institution of any legal action or relieve the *owner or operator* from any responsibilities, liabilities, or penalties to which the *owner or operator* is or may be subject pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. section 9601 et seq. (CERCLA).

R. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, must not be affected thereby.

S. NYSDEC Approved Forms

The *owner or operator* must provide all relevant information that is requested by NYSDEC, and required by this permit, on all NYSDEC approved forms.

APPENDIX A – Abbreviations and Definitions

Abbreviations

APO – Agency Preservation Officer
BB – New York State Standards and Specifications for Erosion and Sediment Control (Blue Book), dated November 2016
BMP – Best Management Practice
CPESC – Certified Professional in Erosion and Sediment Control
CPv – Channel Protection Volume
CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)
DM – New York State Stormwater Management Design Manual (Design Manual), dated July 31, 2024
DOW – Division of Water
EAF – Environmental Assessment Form
ECL – chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law
EPA – U.S. Environmental Protection Agency
HSG – Hydrologic Soil Group
MS4 – Municipal Separate Storm Sewer System
NOI – Notice of Intent
NOT – Notice of Termination
NPDES – National Pollutant Discharge Elimination System
NYC – The City of New York
NYCDEP – The City of New York Department of Environmental Protection
NYSDEC – The New York State Department of Environmental Conservation
OPRHP – Office of Parks, Recreation and Historic Places
Qf – Extreme Flood
Qp – Overbank Flood
RR – Runoff Reduction
RRv – Runoff Reduction Volume
RWE – Regional Water Engineer
SEQR – State Environmental Quality Review Act
SHPA – State Historic Preservation Act
SMP – Post-Construction Stormwater Management Practice
SPDES – State Pollutant Discharge Elimination System
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total Maximum Daily Load
UPA – Uniform Procedures Act
USDA – United States Department of Agriculture
WQv – Water Quality Volume

Definitions

All definitions in this section are solely for the purposes of this permit. If a word is not italicized in the permit, use its common definition.

Agricultural Building – a structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products; excluding any structure designed, constructed or used, in whole or in part, for human habitation, as a place of employment where agricultural products are processed, treated or packaged, or as a place used by the public.

Agricultural Property – the land for construction of a barn, *agricultural building*, silo, stockyard, pen or other structural practices identified in Table II in the "Agricultural Best Management Practice Systems Catalogue" (dated June 2023).

Alter Hydrology from Pre- to Post-Development Conditions – the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer System – a sewer system which conveys sewage and *stormwater* through a single pipe system to a publicly owned treatment works.

Commence (Commencement of) Construction Activities – the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the *SWPPP*. See definition for "*Construction Activity(ies)*" also.

Common Plan of Development or Sale – a contiguous area where multiple separate and distinct *construction activities* are occurring, or may occur, under one plan. The "common plan" of development or sale is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQR) environmental assessment form or other documents, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating *construction activities* may occur on a specific plot. A *common plan of development or sale* is comprised of two or more *phases*.

Common plan of development or sale does not include separate and distinct *construction activities* that are occurring, or may occur, under one plan that are at least 1/4 mile apart provided any interconnecting road, pipeline or utility project that is part of the same "common plan" is not concurrently being disturbed.

Construction Activity(ies) – identified within 40 CFR 122.26(b)(14)(x), 122.26(b)(15)(i), and 122.26(b)(15)(ii), any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, mechanized logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal.

Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, which is excluded from the calculation of the soil disturbance for a project. Routine maintenance includes, but is not limited to:

- Re-grading of gravel roads or parking lots; and
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and maintains or improves the hydraulic capacity of the ditch; and
- Replacement of existing culverts that maintains the approximate original line and grade, and maintains or improves the hydraulic capacity of a ditch; and
- Replacement of existing bridges that maintains the approximate original line and grade, and maintains or improves the hydraulic capacity beneath the bridges; and
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch); and
- Placement of aggregate shoulder backing that stabilizes the transition between the road shoulder and the ditch or *embankment*; and
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material; and
- Long-term use of equipment storage areas at or near highway maintenance facilities; and
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or *embankment*; and
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts; and
- Maintenance of ski trails including brush hog use and mowing; and
- Above ground snowmaking pipe replacement; and
- Replacement of existing utility poles; etc.

Construction Site – the land area where *construction activity(ies)* will occur. See also the definitions for "*Commence (Commencement of) Construction Activities"* and "*Common Plan of Development or Sale."*

Dewatering – the act of draining rainwater and/or groundwater from building foundations, vaults or excavations/trenches.

Directly Discharge(s)(ing) (to a specific surface waterbody) – runoff flows from a *construction site* by overland flow and the first point of *discharge* is the specific surface waterbody, or runoff flows from a *construction site* to a separate storm sewer system and the first point of *discharge* from the separate storm sewer system is the specific surface waterbody.

Discharge(s)(d) – any addition of any *pollutant* to waters of the State through an outlet or *point source*.

Embankment – an earthen or rock slope that supports a road/highway.

Equivalent (Equivalence) – the practice or measure meets all the performance, longevity, maintenance, and safety objectives of the technical standard and will provide an equal or greater degree of water quality protection.

Final Stabilization – all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other *equivalent* stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

Historic Property – any building, structure, site, object or district that is listed on the State or National Registers of Historic Places or is determined to be eligible for listing on the State or National Registers of Historic Places.

Impervious Area (Cover) – all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and compacted gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Infeasible – not technologically possible, or not economically practicable and achievable considering best industry practices.

Minimize(ing)(ation) – reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer System (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

1. owned or operated by a State, city, town, village, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, *stormwater*, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA, that *discharges* to *surface waters of the State*; and

2. designed or used for collecting or conveying *stormwater*; and

3. which is not a *combined sewer system*; and

4. which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

Natural Buffer(s) – an undisturbed area with natural cover running along a surface water (e.g. wetland, stream, river, lake, etc.).

New Development – any land disturbance that does not meet the definition of *Redevelopment Activity* included in this appendix.

New York State Erosion and Sediment Control Certificate Program – a certificate program that establishes and maintains a process to identify and recognize individuals who are capable of developing, designing, inspecting and maintaining erosion and sediment control plans on projects that disturb soils in New York State. The certificate program is administered by the New York State Conservation District Employees Association.

Nonpoint Source(s) – any source of water pollution or *pollutants* which is not a discrete conveyance or *point source* permitted pursuant to Title 7 or 8 of Article 17 of the Environmental Conservation Law (see ECL Section 17-1403).

Overbank – flow events that exceed the capacity of the stream channel and spill out into the adjacent floodplain.

Owner or Operator – the person, persons, or legal entity which owns or leases the property on which the *construction activity* is occurring; an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications; and/or an entity that has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit requirements.

Performance Criteria – the six performance criteria for each group of SMPs in Chapters 5 and 6 of the technical standard, New York State Stormwater Management Design Manual (DM), dated July 31, 2024. These include feasibility, conveyance, pretreatment, treatment, landscaping, and maintenance. It does not include the *Sizing Criteria* (i.e. WQv, RRv, CPv, Qp and Qf) in Part I.C.2. of the permit.

Phase – a defined area in which *construction activities* are occurring or will occur separate from other defined area(s).

Point Source – any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel or other floating craft, or landfill leachate collection system from which *pollutants* are or may be *discharged*.

Pollutant(s) – dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast *discharged* into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in 6 NYCRR Parts 700 et seq.

Qualified Inspector – a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, *New York State Erosion and Sediment Control Certificate Program* holder or other NYSDEC endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of NYSDEC endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other NYSDEC endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any SMPs that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

Qualified Professional – a person that is knowledgeable in the principles and practices of *stormwater* management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other NYSDEC endorsed individual(s). Individuals preparing *SWPPPs* that require the SMP component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics. All components of the *SWPPP* that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

Redevelopment Activity(ies) – the disturbance and reconstruction of existing *impervious area*, including *impervious areas* that were removed from a project site within five (5) years of preliminary project plan submission to the local government (i.e. site plan, subdivision, etc.).

Renewable Energy – electricity or thermal energy generated by renewable energy systems through use of the following technologies: solar thermal, photovoltaics, on land and offshore wind, hydroelectric, geothermal electric, geothermal ground source heat, tidal energy, wave energy, ocean thermal, and fuel cells which do not utilize a fossil fuel resource in the process of generating electricity.

Site Limitations – site conditions that prevent the use of an infiltration technique and or infiltration of the total WQv. Typical *site limitations* include: seasonal high groundwater, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 inches/hour. The existence of *site limitations* shall be confirmed and documented using actual field testing (i.e. test pits, soil borings, and infiltration test) or using information from the most current United States Department of Agriculture (USDA) Soil Survey for the County where the project is located.

Sizing Criteria – the criteria included in Part I.C.2 of the permit that are used to size SMPs. The criteria include; Water Quality Volume (WQv), Runoff Reduction Volume (RRv), Channel Protection Volume (Cpv), *Overbank* Flood (Qp), and Extreme Flood (Qf).

Steep Slope – land area designated on the current United States Department of Agriculture (USDA) Soil Survey as Soil Slope Phase D, (provided the map unit name or description is inclusive of slopes greater than 25%), or Soil Slope Phase E or F, (regardless of the map unit name), or a combination of the three designations.

Stormwater – that portion of precipitation that, once having fallen to the ground, is in excess of the evaporative or infiltrative capacity of soils, or the retentive capacity of surface features, which flows or will flow off the land by surface runoff to waters of the State.

Streambank – the terrain alongside the bed of a creek or stream. The bank consists of the sides of the channel, between which the flow is confined.

Stormwater Pollution Prevention Plan (SWPPP) – a project specific report, including construction drawings, that among other things: describes the *construction activity(ies)*, identifies the potential sources of pollution at the *construction site*; describes and shows the *stormwater* controls that will be used to control the *pollutants* (i.e. erosion and sediment controls; for many projects, includes SMPs); and identifies procedures the *owner or operator* will implement to comply with the requirements of the permit. See Part III of the permit for a complete description of the information that must be included in the *SWPPP*.

Surface Waters of the State – shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporarily Ceased – an existing disturbed area will not be disturbed again within 14 calendar days of the previous soil disturbance.

Temporary Stabilization – exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Load (TMDL) – the sum of the allowable loads of a single *pollutant* from all contributing point and *nonpoint source*s. It is a calculation of the maximum amount of a *pollutant* that a waterbody can receive and still meet *water quality standards*, and an allocation of that amount to the *pollutant's* sources. A TMDL stipulates Waste Load Allocations (WLA) for *point source discharges*, Load Allocations (LA) for *nonpoint source*s, and a margin of safety (MOS).

Traditional Land Use Control MS4 Operator – a city, town, or village with land use control authority that is authorized to *discharge* under New York State DEC's SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s) or the City of New York's Individual SPDES Permit for their Municipal Separate Storm Sewer Systems (NY-0287890).

Trained Contractor – an employee from the contracting (construction) company, identified in Part III.A.7., that has received four (4) hours of NYSDEC endorsed training

in proper erosion and sediment control principles from a Soil and Water Conservation District, or other NYSDEC endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.7., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, *New York State Erosion and Sediment Control Certificate Program* holder, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of NYSDEC endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other NYSDEC endorsed entity).

The *trained contractor* is responsible for the day-to-day implementation of the *SWPPP*.

Tree Clearing – *construction activities* limited to felling and removal of trees.

Tree clearing does not include hand felling and leaving the trees in place with no support from mechanized equipment, which is not considered *construction activity* requiring coverage under this permit.

Water Quality Standard – such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

APPENDIX B – Required SWPPP Components by Project Type

Table 1
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A *SWPPP* THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following *construction activities* that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres:

- Single-family home not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix D
- Single-family residential subdivisions with 25% or less *impervious cover* at total site build-out and not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix D
- Construction of a barn or other *agricultural building*, silo, stock yard or pen.
- Structural agricultural conservation practices as identified in Table II in the "Agricultural Best Management Practice Systems Catalogue" (dated June 2023) that include construction or reconstruction of *impervious area* or *alter hydrology from pre- to post-development* conditions.

The following *construction activities* that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land:

- All construction activities located in the New York City Watershed located east of the Hudson River, see Appendix C Figure 1, that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

Within the municipal boundaries of NYC:

- Stand-alone road reconstruction, where the total soil disturbance from only that road construction, is less than one (1) acre of land.

The following *construction activities*:

- Installation of underground linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains
- Environmental enhancement projects, such as wetland mitigation, *stormwater* retrofits, stream restoration, and resiliency projects that reconstruct shoreline areas to address sea level rise
- Pond construction
- Linear bike paths running through areas with vegetative cover, including bike paths surfaced with an *impervious cover*
- Cross-country ski trails, walking/hiking trails, and mountain biking trails, including a de minimis parking lot (maximum 10 spaces total, sized for passenger cars) with 35 feet minimum preservation of undisturbed area downgradient from the parking lot
- Dam rehabilitation (the structure of the dam itself)
- Sidewalks, bike paths, or walking paths, surfaced with an *impervious cover*, that are not part of residential, commercial, or institutional development;
- Sidewalks, bike paths, or walking paths, surfaced with an *impervious cover*, that include incidental shoulder or curb work along an existing highway to support construction of the sidewalk, bike path, or walking path.

Table 1 (Continued)
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A *SWPPP* THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following *construction activities*:

- Slope stabilization
- Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics
- Spoil areas that will be covered with vegetation
- Vegetated open space (i.e. recreational parks, lawns, meadows, fields, downhill ski trails) that do not *alter hydrology from pre- to post-development* conditions
- Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre- to post-development* conditions
- Demolition where vegetation will be established, and no *redevelopment activity* is planned[1]
- Installation or replacement of either an overhead electric transmission line or a ski lift tower that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover*.
- Solar array field areas that have tables elevated off the ground, spaced one table width apart, do not *alter hydrology from pre- to post-development conditions*, and address water quality volume and runoff reduction volume by maintaining sheet flow on slopes less than 8%.
- Structural agricultural conservation practices as identified in Table II in the "Agricultural Best Management Practice Systems Catalogue" (dated June 2023) that do not include construction or reconstruction of *impervious area* and do not *alter hydrology from pre- to post-development* conditions.
- Temporary access roads, median crossovers, detour roads, lanes, or other temporary *impervious areas* that will be restored to pre-construction conditions once the *construction activity* is complete (in this context, "temporary" means the *impervious area* will be in place for two years or less)
- Other *construction activities* that do not include the construction or reconstruction of *impervious area*, and do not *alter hydrology from pre- to post-development* conditions, and are not listed in Table 2.

1. If the site is redeveloped in the future, a new eNOI must be submitted.

Table 2
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A *SWPPP* THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES (SMPS)

The following *construction activities*:

- Single-family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix D
- Single-family home that disturbs five (5) or more acres of land
- Single-family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix D
- Single-family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% *impervious cover* at total site build-out
- Single-family residential subdivisions that involve soil disturbances of between 20,000 square feet and one (1) acre of land within the municipal boundaries of NYC with greater than 25% *impervious cover* at total site build-out
- Single-family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single-family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a *common plan of development or sale* that will ultimately disturb five (5) or more acres of land
- Multi-family residential developments; includes duplexes, townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Creation of 5,000 square feet or more of *impervious area* in the municipal boundaries of NYC
- Airports
- Amusement parks
- Breweries, cideries, and wineries, including establishments constructed on agricultural land
- Campgrounds
- Cemeteries that include the construction or reconstruction of *impervious area* (>5% of disturbed area) or *alter the hydrology from pre- to post-development* conditions
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other *agricultural building* (e.g. silo) that involves soil disturbance greater than five acres.
- Structural agricultural conservation practices as identified in Table II in the “Agricultural Best Management Practice Systems Catalogue” (dated June 2023) that involves soil disturbance greater than five acres and include the construction or reconstruction of *impervious area* or *alter hydrology from pre- to post-development* conditions.
- Facility buildings, including ski lodges, restroom buildings, pumphouses, ski lift terminals, and maintenance and groomer garages
- Institutional development; includes hospitals, prisons, schools and colleges
- Industrial facilities; includes industrial parks
- Landfills; including creation of landfills or capping landfills.
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTWs, water treatment plants, and water storage tanks
- Golf courses
- Office complexes

Table 2 (Continued)

CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A *SWPPP* THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES (SMPS)

The following *construction activities*:

- Permanent laydown yards and equipment storage lots
- Playgrounds that include the construction or reconstruction of *impervious area*
- Sports complexes
- Racetracks; includes racetracks with earthen (dirt) surfaces
- Road construction or reconstruction, outside the municipal boundaries of NYC
- Road construction within the municipal boundaries of NYC
- Stand-alone road reconstruction, within the municipal boundaries of NYC where the total soil disturbance from that road reconstruction involves soil disturbance of one (1) acre or more of land
- Parking lot construction or reconstruction (as with all Table 2 bullets, this includes parking lots constructed as part of the *construction activities* listed in Table 1, unless a Table 1 bullet specifies otherwise)
- Athletic fields (natural grass) that include the construction or reconstruction of *impervious area* (>5% of disturbed area) or *alter the hydrology from pre- to post-development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations, and well drilling pads, surfaced with *impervious cover,* and constructed as part of an overhead electric transmission line, wind-power, cell tower, oil or gas well drilling, sewer or water main, ski lift, or other linear utility project
- Sidewalks, bike paths, or walking paths, surfaced with an *impervious cover*, that are part of a residential, commercial or institutional development
- Sidewalks, bike paths, or walking paths, surfaced with an *impervious cover*, that are part of highway construction or reconstruction
- Solar array field areas on slopes greater than 8% that cannot maintain sheet flow using management practices identified in the BB or the DM
- Solar array field areas on slopes less than 8% that will *alter the hydrology from pre- to post-development* conditions
- Solar array field areas with tables that are not elevated high enough to achieve *final stabilization* beneath the tables
- Traditional *impervious areas* associated with solar development (e.g. roads, buildings, transformers)
- Utility pads surfaced with *impervious cover*, including electric vehicle charging stations
- All other *construction activities* that include the construction or reconstruction of *impervious area* or *alter the hydrology from pre- to post-development* conditions, and are not listed in Table 1

APPENDIX C – Watersheds Requiring Enhanced Phosphorus Removal

Watersheds where *owners or operators* of *construction activities* identified in Table 2 of Appendix B must prepare a *SWPPP* that includes SMPs designed in conformance with the Enhanced Phosphorus Removal Standards included in the DM technical standard.

- Entire New York City Watershed located east of the Hudson River – Figure 1
- Onondaga Lake Watershed – Figure 2
- Greenwood Lake Watershed – Figure 3
- Oscawana Lake Watershed – Figure 4
- Kinderhook Lake Watershed – Figure 5

Figure 1 - New York City Watershed East of the Hudson

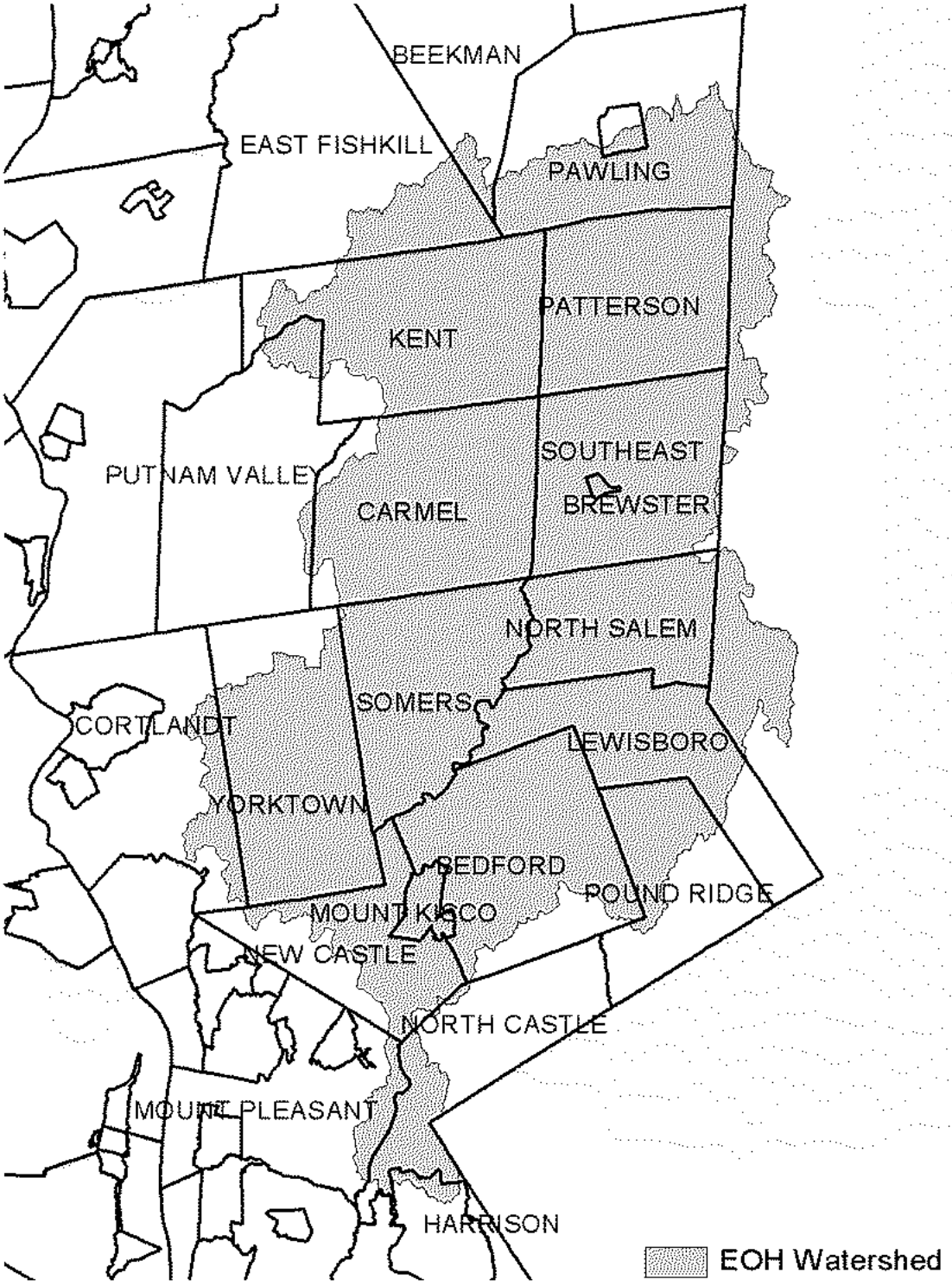


Figure 2 - Onondaga Lake Watershed

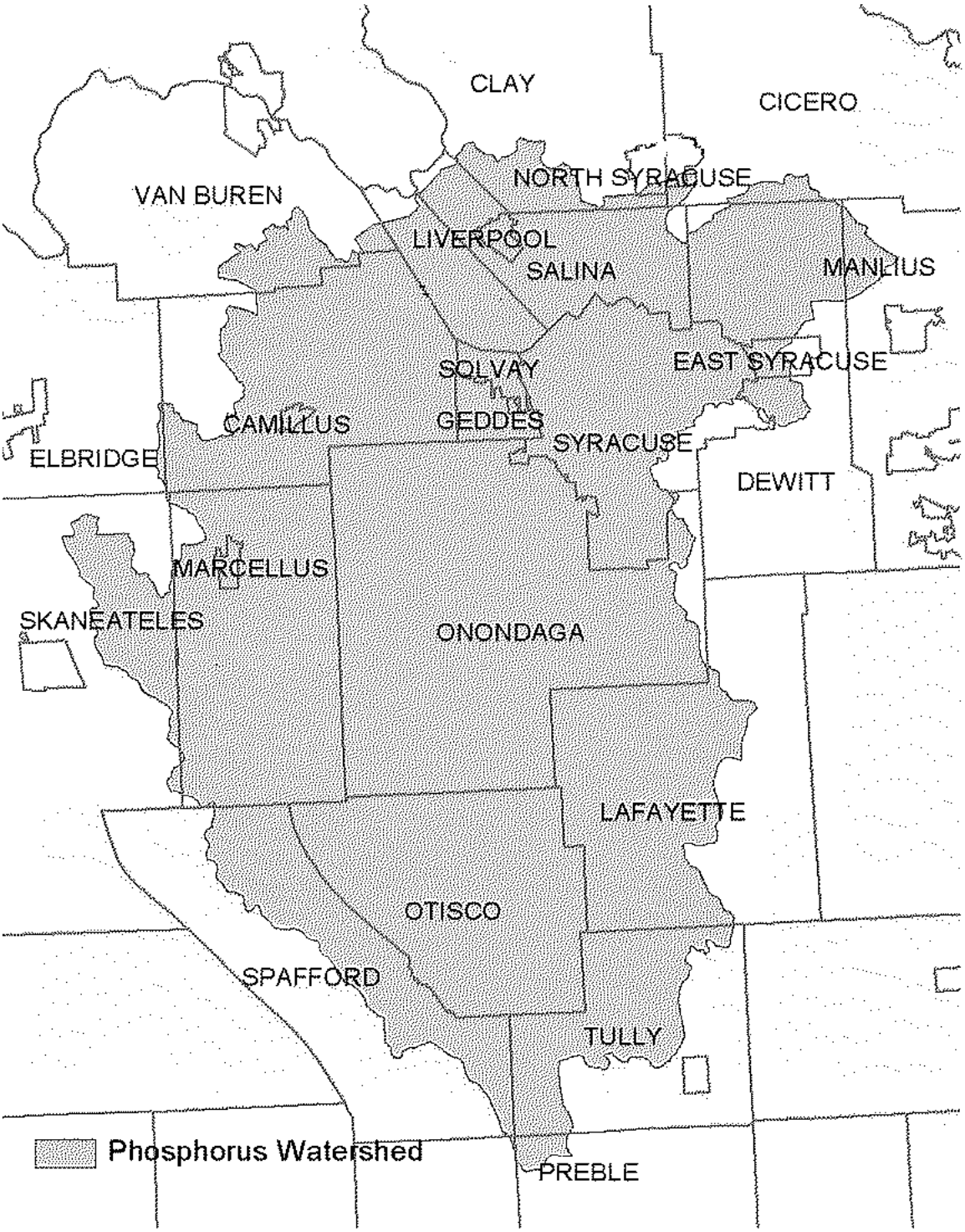


Figure 3 - Greenwood Lake Watershed

Figure 4 - Oscawana Lake Watershed

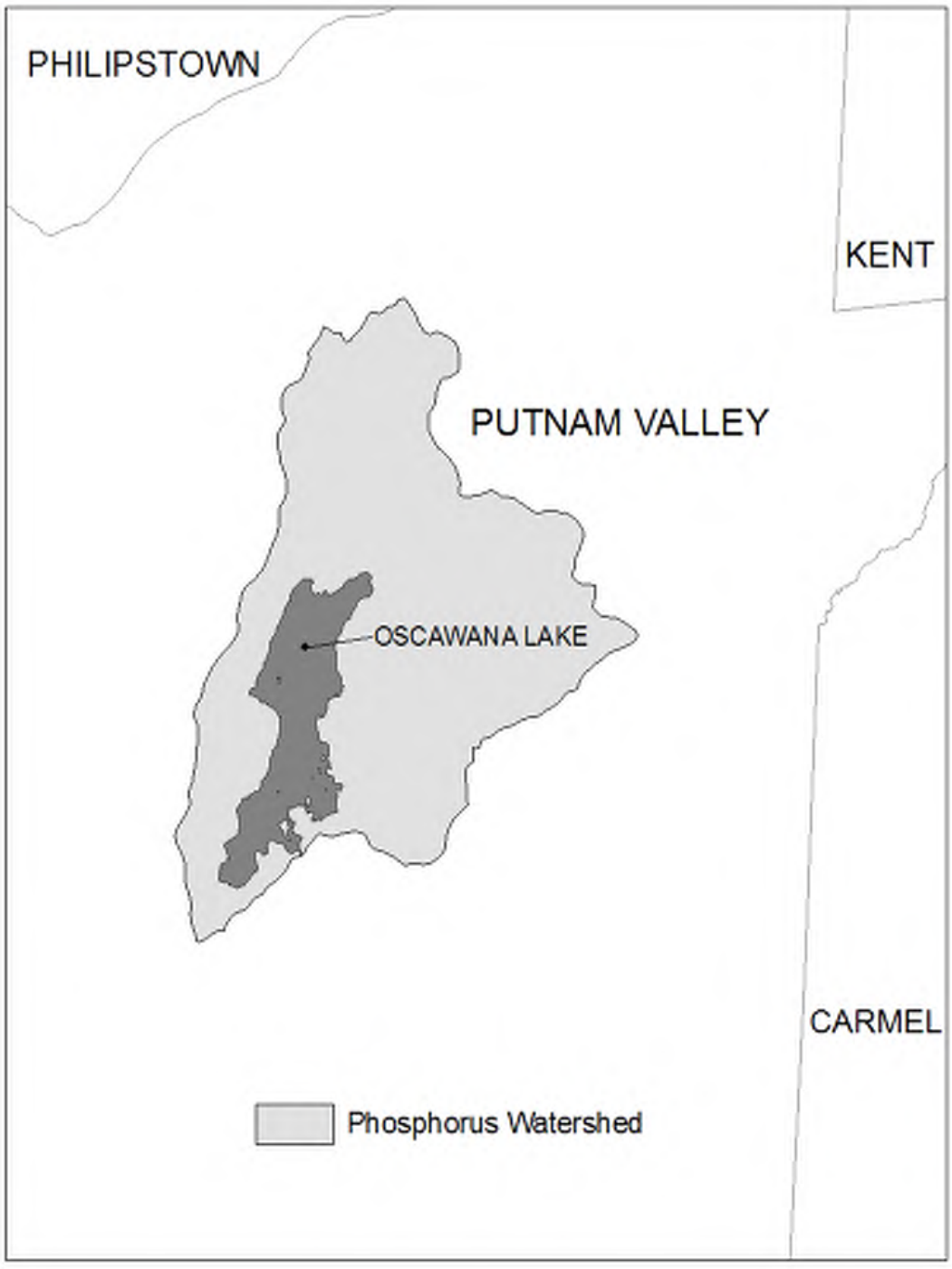
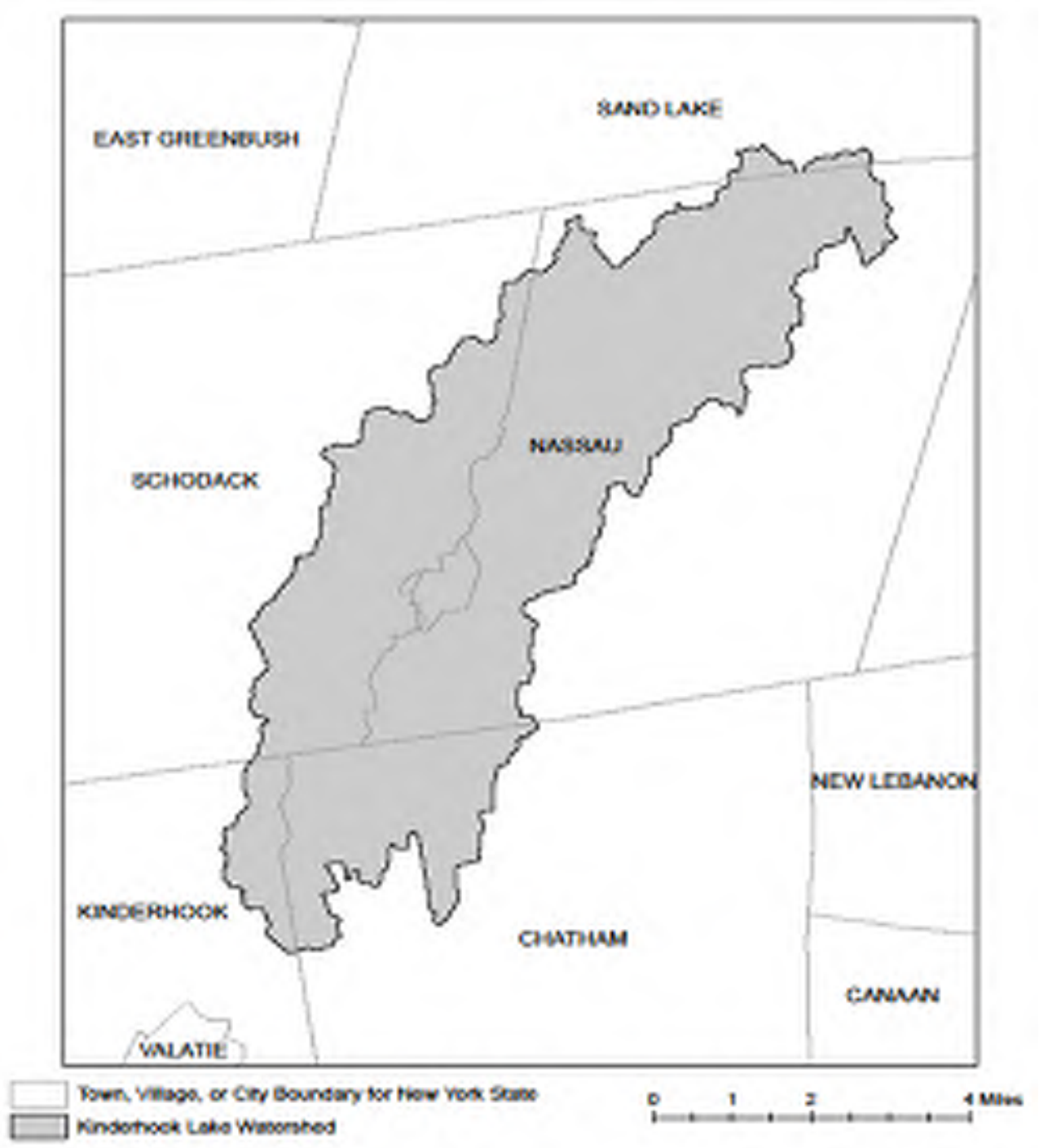


Figure 5 - Kinderhook Lake Watershed



APPENDIX D – Impaired Waterbodies (by Construction Related Pollutants)

List of waterbodies impaired by *pollutants* related to *construction activity*, including turbidity, silt/sediment, and nutrients (e.g. nitrogen, phosphorus). This list is a subset of "The Final New York State 2018 Section 303(d) List of Impaired Waters Requiring a TMDL" dated June 2020.

County	Waterbody	Pollutant
Albany	Ann Lee (Shakers) Pond, Stump Pond (1201-0096)	Phosphorus
Albany	Lawsons Lake (1301-0235)	Phosphorus
Allegany	Amity Lake, Saunders Pond (0403-0054)	Phosphorus
Allegany	Andover Pond (0403-0056)	Phosphorus
Bronx	Reservoir No.1/Lake Isle (1702-0075)	Phosphorus
Bronx	Van Cortlandt Lake (1702-0008)	Phosphorus
Broome	Blueberry, Laurel Lakes (1404-0033)	Phosphorus
Broome	Fly Pond, Deer Lake (1404-0038)	Phosphorus
Broome	Minor Tribs to Lower Susquehanna (0603-0044)	Phosphorus
Broome	Whitney Point Lake/Reservoir (0602-0004)	Phosphorus
Cattaraugus	Allegheny River/Reservoir (0201-0023)	Phosphorus
Cattaraugus	Beaver Lake/Alma Pond (0201-0073)	Phosphorus
Cattaraugus	Case Lake (0201-0020)	Phosphorus
Cattaraugus	Linlyco/Club Pond (0201-0035)	Phosphorus
Cayuga	Duck Lake (0704-0025)	Phosphorus
Cayuga	Owasco Inlet, Upper, and tribs (0706-0014)	Nutrients
Chautauqua	Chadakoin River and tribs (0202-0018)	Phosphorus
Chautauqua	Hulburt/Clymer Pond (0202-0079)	Phosphorus
Chautauqua	Middle Cassadaga Lake (0202-0002)	Phosphorus
Clinton	Great Chazy River, Lower, Main Stem (1002-0001)	Silt/Sediment
Columbia	Robinson Pond (1308-0003)	Phosphorus
Cortland	Dean Pond (0602-0077)	Phosphorus
Dutchess	Fallkill Creek (1301-0087)	Phosphorus
Dutchess	Hillside Lake (1304-0001)	Phosphorus
Dutchess	Wappingers Lake (1305-0001)	Phosphorus
Dutchess	Wappingers Lake (1305-0001)	Silt/Sediment
Erie	Beeman Creek and tribs (0102-0030)	Phosphorus
Erie	Delaware Park Pond (0101-0026)	Phosphorus
Erie	Ellicott Creek, Lower, and tribs (0102-0018)	Phosphorus
Erie	Ellicott Creek, Lower, and tribs (0102-0018)	Silt/Sediment
Erie	Green Lake (0101-0038)	Phosphorus
Erie	Little Sister Creek, Lower, and tribs (0104-0045)	Phosphorus
Erie	Murder Creek, Lower, and tribs (0102-0031)	Phosphorus

Erie	Rush Creek and tribs (0104-0018)	Phosphorus
Erie	Scajaquada Creek, Lower, and tribs (0101-0023)	Phosphorus
Erie	Scajaquada Creek, Middle, and tribs (0101-0033)	Phosphorus
Erie	Scajaquada Creek, Upper, and tribs (0101-0034)	Phosphorus
Erie	South Branch Smoke Cr, Lower, and tribs (0101-0036)	Phosphorus
Erie	South Branch Smoke Cr, Lower, and tribs (0101-0036)	Silt/Sediment
Genesee	Bigelow Creek and tribs (0402-0016)	Phosphorus
Genesee	Black Creek, Middle, and minor tribs (0402 0028)	Phosphorus
Genesee	Black Creek, Upper, and minor tribs (0402-0048)	Phosphorus
Genesee	Bowen Brook and tribs (0102-0036)	Phosphorus
Genesee	LeRoy Reservoir (0402-0003)	Phosphorus
Genesee	Mill Pond (0402-0050)	Phosphorus
Genesee	Oak Orchard Cr, Upper, and tribs (0301-0014)	Phosphorus
Genesee	Oatka Creek, Middle, and minor tribs (0402-0031)	Phosphorus
Genessee	Tonawanda Cr, Middle, Main Stem (0102-0002)	Phosphorus
Greene	Schoharie Reservoir (1202-0012)	Silt/Sediment
Greene	Sleepy Hollow Lake (1301-0059)	Silt/Sediment
Herkimer	Steele Creek tribs (1201-0197)	Phosphorus
Herkimer	Steele Creek tribs (1201-0197)	Silt/Sediment
Kings	Hendrix Creek (1701-0006) 18	Nitrogen
Kings	Prospect Park Lake (1701-0196)	Phosphorus
Lewis	Mill Creek/South Branch, and tribs (0801-0200)	Nutrients
Livingston	Christie Creek and tribs (0402-0060)	Phosphorus
Livingston	Conesus Lake (0402-0004)	Phosphorus
Livingston	Mill Creek and minor tribs (0404-0011)	Silt/Sediment
Monroe	Black Creek, Lower, and minor tribs (0402-0033)	Phosphorus
Monroe	Buck Pond (0301-0017)	Phosphorus
Monroe	Cranberry Pond (0301-0016)	Phosphorus
Monroe	Durand, Eastman Lakes (0302-0037)	Phosphorus
Monroe	Lake Ontario Shoreline, Western (0301-0069) 9	Phosphorus
Monroe	Long Pond (0301-0015)	Phosphorus
Monroe	Mill Creek and tribs (0302-0025)	Phosphorus 2
Monroe	Mill Creek/Blue Pond Outlet and tribs (0402-0049)	Phosphorus
Monroe	Minor Tribs to Irondequoit Bay (0302-0038)	Phosphorus
Monroe	Rochester Embayment - East (0302-0002) [9]	Phosphorus
Monroe	Rochester Embayment - West (0301-0068) 9	Phosphorus
Monroe	Shipbuilders Creek and tribs (0302-0026)	Phosphorus 2
Monroe	Thomas Creek/White Brook and tribs (0302-0023)	Phosphorus

Nassau	Bannister Creek/Bay (1701-0380)	Nitrogen
Nassau	Beaver Lake (1702-0152)	Phosphorus
Nassau	Browswere Bay (1701-0383)	Nitrogen
Nassau	Camaans Pond (1701-0052)	Phosphorus
Nassau	East Meadow Brook, Upper, and tribs (1701-0211)	Silt/Sediment
Nassau	East Rockaway Channel (1701-0381)	Nitrogen
Nassau	Glen Cove Creek, Lower, and tribs (1702-0146)	Silt/Sediment
Nassau	Grant Park Pond (1701-0054)	Phosphorus
Nassau	Hempstead Bay, Broad Channel (1701-0032)	Nitrogen
Nassau	Hempstead Lake (1701-0015)	Phosphorus
Nassau	Hewlett Bay (1701-0382)	Nitrogen
Nassau	Hog Island Channel (1701-0220)	Nitrogen
Nassau	Massapequa Creek, Upper, and tribs (1701-0174)	Phosphorus
Nassau	Milburn/Parsonage Creeks, Upp, and tribs (1701-0212)	Phosphorus
Nassau	Reynolds Channel, East (1701-0215) [12]	Nitrogen
Nassau	Reynolds Channel, West (1701-0216) 12	Nitrogen
Nassau	Tidal Tribs to Hempstead Bay (1701-0218)	Nitrogen
Nassau	Tribs (fresh) to East Bay (1701-0204)	Silt/Sediment
Nassau	Tribs (fresh) to East Bay (1701-0204)	Phosphorus
Nassau	Tribs to Smith Pond/Halls Pond (1701-0221)	Phosphorus
Nassau	Woodmere Channel (1701-0219)	Nitrogen
New York	Harlem Meer (1702-0103)	Phosphorus
New York	The Lake in Central Park (1702-0105)	Phosphorus
Niagara	Bergholtz Creek and tribs (0101-0004)	Phosphorus
Niagara	Hyde Park Lake (0101-0030)	Phosphorus
Niagara	Lake Ontario Shoreline, Western (0301-0053) 9	Phosphorus
Niagara	Lake Ontario Shoreline, Western (0301-0072) 9	Phosphorus
Oneida	Ballou, Nail Creeks (1201-0203)	Phosphorus
Onondaga	Ley Creek and tribs (0702-0001) 10	Nutrients (phosphorus)
Onondaga	Minor Tribs to Onondaga Lake (0702-0022) 10	Nutrients (phosphorus)
Onondaga	Minor Tribs to Onondaga Lake (0702-0022) 10	Nitrogen (NH3, NO2)
Onondaga	Onondaga Creek, Lower (0702-0023) 10	Nutrients (phosphorus)
Onondaga	Onondaga Creek, Lower, and tribs (0702-0023)	Turbidity
Onondaga	Onondaga Creek, Middle, and tribs (0702-0004)	Turbidity
Onondaga	Onondaga Creek, Upper, and tribs (0702-0024)	Turbidity
Ontario	Great Brook and minor tribs (0704-0034)	Phosphorus 2
Ontario	Great Brook and minor tribs (0704-0034)	Silt/Sediment

Ontario	Hemlock Lake Outlet and minor tribs (0402-0013)	Phosphorus
Ontario	Honeoye Lake (0402-0032)	Phosphorus
Orange	Brown Pond Reservoir (1303-0013)	Phosphorus
Orange	Lake Washington (1303-0012)	Phosphorus
Orange	Minor Tribs to Middle Wallkill (1306-0061)	Phosphorus
Orange	Monhagen Brook and tribs (1306-0074)	Phosphorus
Orange	Orange Lake (1301-0008) [16]	Phosphorus
Orange	Quaker Creek and tribs (1306-0025)	Phosphorus
Orange	Wallkill River, Middle, Main Stem (1306-0038)	Phosphorus
Orange	Wallkill River, Upper, and Minor tribs (1306-0017)	Phosphorus
Orleans	Glenvwood Lake (0301-0041)	Phosphorus
Orleans	Lake Ontario Shoreline, Western (0301-0070) 9	Phosphorus
Orleans	Lake Ontario Shoreline, Western (0301-0071) 9	Phosphorus
Oswego	Lake Neatahwanta (0701-0018)	Nutrients (phosphorus)
Oswego	Pleasant Lake (0703-0047)	Phosphorus
Putnam	Lost Lake, Putnam Lake (1302-0053)	Phosphorus
Putnam	Minor Tribs to Croton Falls Reservoir (1302-0001)	Phosphorus
Queens	Bergen Basin (1701-0009) 18	Nitrogen
Queens	Jamaica Bay, Eastern, and tribs, Queens (1701-0005) 18	Nitrogen
Queens	Kissena Lake (1702-0258)	Phosphorus
Queens	Meadow Lake (1702-0030)	Phosphorus
Queens	Shellbank Basin (1701-0001) 18	Nitrogen
Queens	Willow Lake (1702-0031)	Phosphorus
Rensselaer	Nassau Lake (1310-0001)	Phosphorus
Rensselaer	Snyders Lake (1301-0043)	Phosphorus
Richmond	Grassmere Lake/Bradys Pond (1701-0357)	Phosphorus
Rockland	Congers Lake, Swartout Lake (1501-0019)	Phosphorus
Rockland	Rockland Lake (1501-0021)	Phosphorus
Saratoga	Ballston Lake (1101-0036)	Phosphorus
Saratoga	Dwaas Kill and tribs (1101-0007)	Phosphorus
Saratoga	Dwaas Kill and tribs (1101-0007)	Silt/Sediment
Saratoga	Lake Lonely (1101-0034)	Phosphorus
Saratoga	Round Lake (1101-0060)	Phosphorus
Saratoga	Tribs to Lake Lonely (1101-0001)	Phosphorus
Schenectady	Collins Lake (1201-0077)	Phosphorus
Schenectady	Duane Lake (1311-0006)	Phosphorus
Schenectady Lake	Mariaville Lake (1201-0113)	Phosphorus
Schuyler	Cayuta Lake (0603-0005)	Phosphorus

Seneca	Reeder Creek and tribs (0705-0074)	Phosphorus
St.Lawrence	Black Lake Outlet, Black Lake (0906-0001)	Phosphorus
St.Lawrence	Fish Creek and minor tribs (0906-0026)	Phosphorus
Steuben	Smith Pond (0502-0012)	Phosphorus
Suffolk	Agawam Lake (1701-0117)	Phosphorus
Suffolk	Big/Little Fresh Ponds (1701-0125)	Phosphorus
Suffolk	Canaan Lake (1701-0018)	Phosphorus
Suffolk	Canaan Lake (1701-0018)	Silt/Sediment
Suffolk	Fresh Pond (1701-0241)	Phosphorus
Suffolk	Great South Bay, East (1701-0039)	Nitrogen
Suffolk	Great South Bay, Middle (1701-0040)	Nitrogen
Suffolk	Great South Bay, West (1701-0173)	Nitrogen
Suffolk	Lake Ronkonkoma (1701-0020)	Phosphorus
Suffolk	Mattituck/Marratooka Pond (1701-0129)	Phosphorus
Suffolk	Mill and Seven Ponds (1701-0113)	Phosphorus
Suffolk	Millers Pond (1702-0013)	Phosphorus
Suffolk	Moriches Bay, East (1701-0305)	Nitrogen
Suffolk	Moriches Bay, West (1701-0038)	Nitrogen
Suffolk	Quantuck Bay (1701-0042)	Nitrogen
Suffolk	Shinnecock Bay and Inlet (1701-0033)	Nitrogen
Suffolk	Tidal Tribs to West Moriches Bay (1701-0312)	Nitrogen
Sullivan	Bodine, Mongomery Lakes (1401-0091)	Phosphorus
Sullivan	Davies Lake (1402-0047)	Phosphorus
Sullivan	Evens Lake (1402-0004)	Phosphorus
Sullivan	Pleasure Lake (1402-0055)	Phosphorus
Sullivan	Swan Lake (1401-0063)	Phosphorus
Tompkins	Cayuga Lake, Southern End (0705-0040)	Phosphorus
Tompkins	Cayuga Lake, Southern End (0705-0040)	Silt/Sediment
Ulster	Ashokan Reservoir (1307-0004)	Silt/Sediment
Ulster	Esopus Creek, Lower, Main Stem (1307-0010) [17]	Turbidity
Ulster	Esopus Creek, Middle, Main Stem (1307-0003) 17	Turbidity
Ulster	Esopus Creek, Upper, and minor tribs (1307-0007)[3]	Silt/Sediment
Ulster	Wallkill River, Lower, Main Stem (1306-0027)	Phosphorus
Warren	Hague Brook and tribs (1006-0006)	Silt/Sediment
Warren	Huddle/Finkle Brooks and tribs (1006-0003)	Silt/Sediment
Warren	Indian Brook and tribs (1006-0002)	Silt/Sediment
Warren	Lake George (1006-0016) and tribs	Silt/Sediment
Warren	Tribs to Lake George, East Shore (1006-0020)	Silt/Sediment
Warren	Tribs to Lake George, Lk.George Village (1006-0008)	Silt/Sediment

Washington	Wood Cr/Champlain Canal and tribs (1005-0036)	Phosphorus
Westchester	Lake Katonah (1302-0136)	Phosphorus
Westchester	Lake Lincolndale (1302-0089)	Phosphorus
Westchester	Lake Meahagh (1301-0053)	Phosphorus
Westchester	Lake Mohegan (1301-0149)	Phosphorus
Westchester	Lake Shenorock (1302-0083)	Phosphorus
Westchester	Mamaroneck River, Lower (1702-0071)	Silt/Sediment
Westchester	Mamaroneck River, Upp, & minor tribs (1702-0123)	Silt/Sediment
Westchester	Saw Mill River (1301-0007)	Phosphorus
Westchester	Saw Mill River, Middle, and tribs (1301-0100)	Phosphorus
Westchester	Sheldrake River (1702-0069)	Phosphorus
Westchester	Sheldrake River (1702-0069)	Silt/Sedimnt
Westchester	Silver Lake (1702-0040)	Phosphorus
Westchester	Teatown Lake (1302-0150)	Phosphorus
Westchester	Truesdale Lake (1302-0054)	Phosphorus
Westchester	Wallace Pond (1301-0140)	Phosphorus

APPENDIX E – List of NYSDEC Regional Offices

Region	Covering the following counties:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) Permit Administrators	DIVISION OF WATER (DOW) Water (SPDES) Program
1	Nassau and Suffolk	50 Circle Road Stony Brook, NY 11790 Tel. (631) 444-0365	50 Circle Road Stony Brook, NY 11790-3409 Tel. (631) 444-0405
2	Bronx, Kings, New York, Queens and Richmond	1 Hunters Point Plaza, 47-40 21st St. Long Island City, NY 11101-5407 Tel. (718) 482-4997	1 Hunters Point Plaza, 47-40 21st St. Long Island City, NY 11101-5407 Tel. (718) 482-4933
3	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster and Westchester	21 South Putt Corners Road New Paltz, NY 12561-1696 Tel. (845) 256-3059	220 White Plains Road, Suite 110 Tel. (914) 428 - 2505
4	Albany, Columbia, Delaware, Greene, Montgomery, Otsego, Rensselaer, Schenectady and Schoharie	1130 North Westcott Road Schenectady, NY 12306-2014 Tel. (518) 357-2069	1130 North Westcott Road Schenectady, NY 12306-2014 Tel. (518) 357-2045
5	Clinton, Essex, Franklin, Fulton, Hamilton, Saratoga, Warren and Washington	1115 State Route 86, Po Box 296 Ray Brook, NY 12977-0296 Tel. (518) 897-1234	232 Golf Course Road Warrensburg, NY 12885-1172 Tel. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	5786 WIDEWATERS PARKWAY SYRACUSE, NY 13214-1867 TEL. (315) 426-7438	5786 WIDEWATERS PARKWAY SYRACUSE, NY 13214-1867 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROADAVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	700 DELAWARE AVENUE BUFFALO, NY 14209-2999 TEL. (716) 851-7165	700 DELAWARE AVENUE BUFFALO, NY 14209-2999 TEL. (716) 851-7070

APPENDIX F – SWPPP Preparer Certification Form

The SWPPP Preparer Certification Form required by this permit begins on the following page.

SWPPP Preparer Certification Form

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b., the completed form must be attached to the eNOI and submitted to NYSDEC electronically.)

Project/Site Name:

eNOI Submission ID:

Owner/Operator Name:

Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) has been prepared in accordance with the requirements of GP-0-25-001. I certify under penalty of law that the SWPPP and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SWPPP Preparer First Name | MI | SWPPP Preparer Last Name

Signature | Date

Revised: January 2025

APPENDIX G – MS4 SWPPP Acceptance Form

The MS4 SWPPP Acceptance Form required by this permit begins on the following page.

MS4 SWPPP Acceptance Form

for construction activities seeking authorization under the

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b., the completed form must be attached to the eNOI and submitted to NYSDEC electronically.)

I. Project Owner/Operator Information
1. Owner/Operator Name:
2. Contact Person:
3. Street Address:
4. City/State/Zip:
II. Project Site Information
5. Project/Site Name:
6. Street Address:
7. City/State/Zip:
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information
8. SWPPP Reviewed by:
9. Title/Position:
10. Date Final SWPPP Reviewed and Accepted:
IV. Regulated MS4 Information
11. Name of MS4 Operator:
12. MS4 SPDES Permit Identification Number: NYR20A
13. Street Address:
14. City/State/Zip:
15. Telephone Number:

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in section II. of this form has been reviewed and meets the substantive requirements in the SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP). Note: The MS4 Operator, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 Operator does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name[1]:

Title/Position:

Signature:

Date:

VI. Additional Information

[1] Printed name of the principal executive officer or ranking elected official for the MS4 Operator or their duly authorized representative in accordance with CGP Part VII.J.2.

APPENDIX H – NYCDEP SWPPP Acceptance/Approval Form

The City of New York Department of Environmental Protection (NYCDEP) SWPPP Acceptance/Approval form required by this permit begins on the following page.

THE CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Environmental Planning and Analysis
59-17 Junction Blvd., 9th Floor; Flushing, NY 11373

SWPPP Acceptance/Approval

Application Number:

I. Project Owner/Operator Information

1. Owner/Operator Name:
2. Contact Person:
3. Street Address:
4. City/State/Zip:

II. Project Site Information

5. Project/Site Name:
6. Street Address:
7. City/State/Zip:

III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance/Approval

8. SWPPP Reviewed by:
9. Title/Position: /
10. Date Final SWPPP Reviewed and Accepted:
11. Acceptance/Approval Expiration Date:

IV. Regulated MS4 Information for projects that require coverage under the NY State Pollution Discharge Elimination System General Permit for Stormwater Discharges from Construction Activity

12. Name of MS4: *CITY OF NEW YORK*
13. MS4 SPDES Permit Identification Number: *NY-0287890*
14. Contact Person:
15. Street Address: *59-17 Junction Blvd. 9th Floor*
16. City/State/Zip: *Flushing, NY 11373*
17. Telephone Number:

Projects in the MS4 area must submit a copy of this SWPPP Acceptance with a Notice of Intent for coverage under the NY SPDES General Permit for Stormwater Discharges from Construction Activity to: NYS Department of Environmental Conservation, Division of Water; 625 Broadway, 4th Floor; Albany, New York 12233-3505.

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s).

Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Conditions of Acceptance/Approval and Additional Information

Projects in the MS4 area must submit a copy of this SWPPP Acceptance with a Notice of Intent for coverage under the NY SPDES General Permit for Stormwater Discharges from Construction Activity to: NYS Department of Environmental Conservation, Division of Water; 625 Broadway, 4th Floor; Albany, New York 12233-3505.

APPENDIX I – MS4 No Jurisdiction Form

The MS4 No Jurisdiction Form required by this permit begins on the following page.

MS4 No Jurisdiction Form

for construction activities seeking authorization under the

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b., the completed form must be attached to the eNOI and submitted to NYSDEC electronically.)

I. Project Owner/Operator Information

a. Owner/Operator Name:

b. Contact Person:

c. Street Address:

d. City/State/Zip:

II. Project Site Information

a. Project/Site Name:

b. Street Address:

c. City/State/Zip:

d. eNOI Submission ID:

III. Traditional Land Use Control MS4 Operator Information

a. Name of MS4 Operator:

b. MS4 SPDES Permit ID Number: NYR20A

c. Street Address:

d. City/State/Zip:

e. Telephone Number:

IV. Certification Statement

In accordance with CGP Part I.D.2.b.ii.3., I hereby certify that the Traditional Land Use Control MS4 Operator identified in section III. of this form does not have review authority over the construction project identified in section II. of this form, which is owned/operated by the entity identified in section I. of this form. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

a. Printed name of the principal executive officer or ranking elected official for the MS4 Operator or their duly authorized representative in accordance with CGP Part VII.J.2.:

b. Title/Position:

c. Signature:

d. Date:

APPENDIX J – Owner/Operator Certification Form

The Owner/Operator Certification Form required by this permit begins on the following page.

Owner/Operator Certification Form

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b. or Part I.F.2. and 3., the completed form must be attached to the eNOI or the Request to Continue Coverage, and submitted to NYSDEC electronically.

Project/Site Name: _____

eNOI Submission ID: _____

eNOI Submitted by: ☐ **Owner/Operator** ☐ **SWPPP Preparer** ☐ **Other**

Certification Statement - Owner/Operator

I hereby certify that I read, and will comply with, the GP-0-25-001 permit requirements. I understand that authorization to discharge under the permit for the project/site named above is dependent on receipt of a Letter of Authorization (LOA) or a Letter of Continued Coverage (LOCC) from the New York State Department of Environmental Conservation (NYSDEC) in accordance with CGP Part I.D.3.b. or Part I.F.4. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner/Operator First Name MI Owner/Operator Last Name

_____

Signature

_____

Date

Revised: January 2025

Appendix L: Underground Injection Well Documentation

Documents included:

☐ Copy of EPA 7520-16 Online Form
☐ Relevant communication with EPA Region 2 Office indicating compliance with UIC Rule:
- Insert list of correspondence included in this appendix
- Add rows as needed

☐ Relevant technical documentation demonstrating use of BMPs and compliance with UIC Rule
- Insert list of technical documents included in this appendix
- Add rows as needed

If any of the above documents are not included, explain why below:

Not Applicable

Appendix Z: Additional Documentation

Documents included:

- Site Survey
- RAWP

JOB # CM 5022 | ADDRESS: 73 EMPIRE BOULEVARD

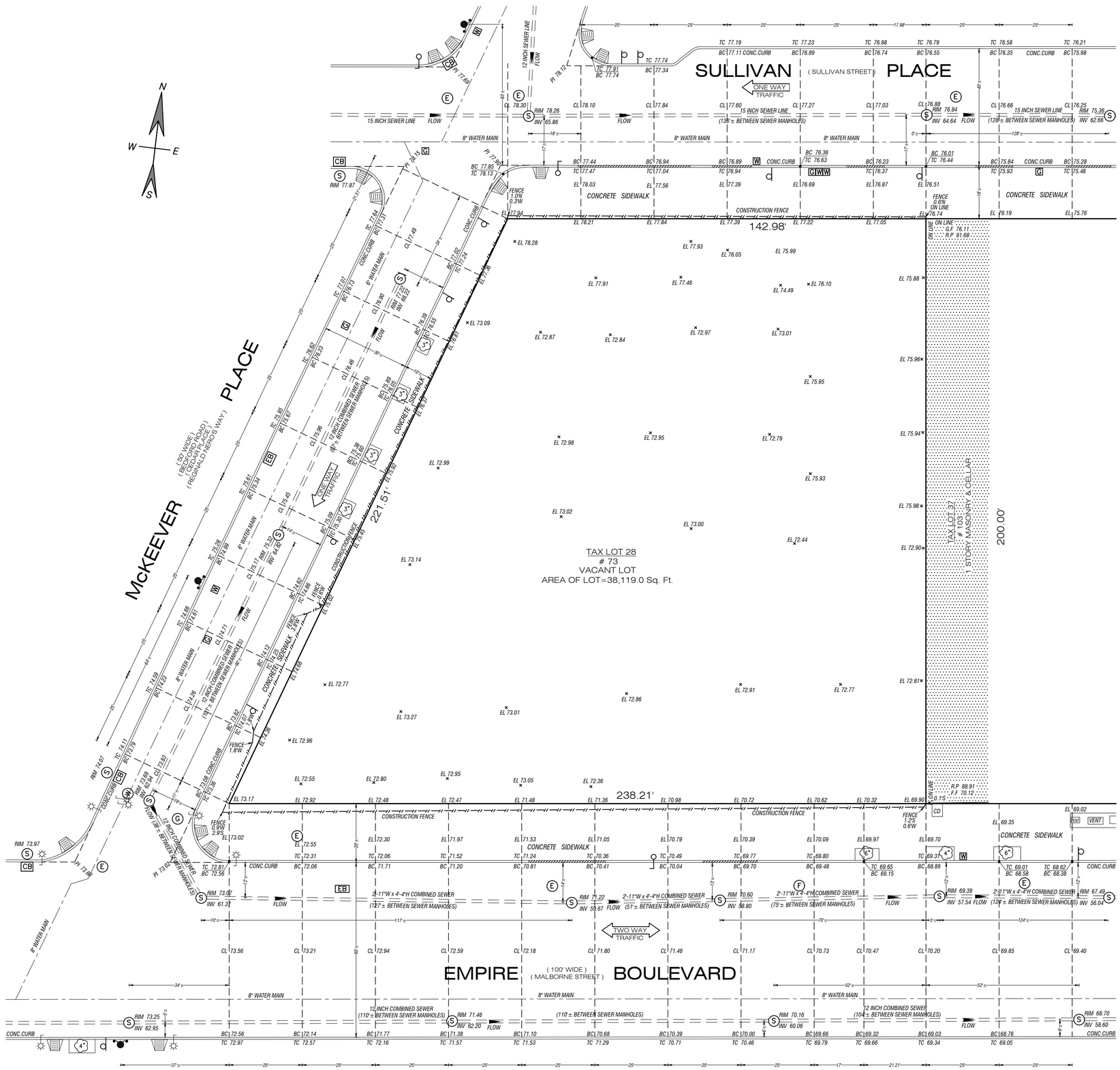
GENERAL NOTES:

1. This survey was prepared only for the party (parties) and purpose indicated hereon.
2. Property corner monuments or markers were (not) placed as part of this survey.
3. Certifications on this survey map signify that the map was prepared in accordance with the current existing Code of Practice for Land Surveys adopted by the New York State Association of Professional Land Surveyors, Inc. Said certifications are limited to the party (parties) for whom the survey is prepared and are not transferable.
4. The location and nature of underground structures, internal walls and improvements or encroachments not visible to the surveyor are not covered under this certification.
5. Easements of record are only guaranteed if an Abstract of Title is furnished to the surveyor.
6. This is to certify that there are no streams nor natural water courses on the property except as shown on this survey.
7. Elevations refer to NAVD 1988 datum.

CAPTION	ARCHITECTURAL SURVEY				
DATE	REVISIONS				
10-20-2025	ARCHITECTURAL SURVEY UPDATE				
07-02-2025	ARCHITECTURAL SURVEY				
	DATE	BY		DATE	BY
SURVEYED	07-02-2025	V.B,V.J,P.J	DRAWN	07-05-2025	V.B

LEGEND

- F.F . . . FIRST FLOOR ELEVATION
- R.P . . . ROOF PARAPET ELEVATION
- G.F . . . GARAGE FLOOR ELEVATION
- TC . . . TOP OF CURB
- BC . . . BOTTOM OF CURB
- CL . . . CENTERLINE
- EL . . . SPOT ELEVATION
- INV . . . INVERT ELEVATION
- CD . . . CELLAR DOOR
- CONC. . . . CONCRETE
- (G) . . . GAS MANHOLE
- (W) . . . WATER MANHOLE
- (E) . . . ELECTRIC MANHOLE
- (S) . . . SEWER MANHOLE
- (F) . . . FIRE DEPARTMENT MANHOLE
- W . . . WATER VALVE
- G . . . GAS VALVE
- CB . . . CATCH BASIN
- EB . . . ELECTRIC BOX
- TRAFFIC LIGHT
- LIGHT POLE
- STREET SIGN
- HYDRANT
- CHAIN LINK FENCE
- CONSTRUCTION FENCE
- DROP CURB
- PEDESTRIAN RAMP
- TREE & SIZE



SCALE: 1 INCH = 25 FEET

VINCENT TEUTONICO, L.S.
NEW YORK LICENSE 050307

MAP OF SURVEY OF PROPERTY

BOROUGH AND COUNTY OF BROOKLYN
CITY AND STATE OF NEW YORK
TAX MAP: BLOCK 1306, LOT 28

STATEWIDE LAND SURVEYING P.C.

16 FLAGG PLACE
STATEN ISLAND
NY 10304
TEL: 718-751-6871
email: citymapping@yahoo.com

Stormwater Construction Permit Application

Project Location:

Construction Project Address, Coordinates and NYC Borough-Block-Lot

Request ID: 0004590

Application ID: S307226

1.01 Identify the project location and verify if it's in an MS4 region of NYC

Project/Site Name

73 Empire Blvd - Demolition & Remediation

Is your project located on a tax lot (Does your projects site have a BBL)?	Yes

House No.

73-97

Street (Not P.O. Box)

Empire Blvd

Borough

Brooklyn

City

New York

Zip Code

11225

State

New York

Side of Street

North

NYC BIN Number

Name of the Nearest Cross Street

McKeever Place

Distance to the Nearest Cross Street (feet)

0.00

Project in relation to Cross Street

Within MS4?

Latitude

40.66380

Longitude

-73.95910

Please Identify End Points of the Project (To Latitude)

Please Identify End Points of the Project (To Longitude)

BBL and associated NYC zoning:

BBL ID	NYC Zoning	Latitude	Longitude	Placeholder?	Created On
3013060028	C4-4D	40.66380	-73.95910	No	4/22/2026 1:26 PM

Please enter additional Borough-Block-Lot and associated NYC zoning separated by comma ",".

Project Information:

Detailed Construction Project Information

2.01 What is the nature of this Construction Project?

Development with no increase in imperviousness

2.02 Select the predominant land use for both pre and post development conditions.

Pre-Development Existing Land Use

Commercial

If the predominant land use for pre-development is not listed above, please specify it here.

Post-Development Future Land Use

Demolition, No Redevelopment

If the predominant land use for post-development is not listed above, please specify it here.

Number of Lots

2.03 Planned Start Date of Construction Activities

6/1/2026

2.04 Planned End Date of Construction Activities

10/30/2026

2.05 Is This a Phased Project?	Yes
2.05a. Is this the first application?	384860001
2.05b. Primary application number	

2.06 Total Site Area (Acres)

2.07 Total Area to be Disturbed (Acres)

0.88	1.12

2.08 Existing Impervious Area to be Disturbed (Acres)	2.09 Future Impervious Area Within Disturbed Area (Acres)
1.06	0.00

2.10 Do you plan to disturb more than 5 acres of soil at any one time?	No

2.11 Indicate the percentage of each Hydrological Soil Group (HSG) at the site

HSG A (in %): 0	**HSG B (in %):** 100	**HSG C (in %):** 0	**HSG D (in %):** 0

2.12 Indicate USDA Soil Slope Phase in percentage value for each Soil Group at the site

Soil Slope A 0% - 3%	0	**Soil Slope B 3% - 8%**	100	**Soil Slope C 8% - 15%**	0
Soil Slope D 15% - 25%		0	**Soil Slope E, F > 25%**		0

2.13 Where Does Site Runoff Go?	Combined Sewer

2.14 If the site drains into the NYC MS4 via another separate sewer system, enter the name of the owner or operator for that system.

2.15 Is the project required to meet the no net increase requirements?	No
2.16 Is the project located in one of the watershed areas associated with AA and AA-S classified waters?	No
2.16.1 Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as E or F on the USDA Soil Survey?	
2.16.2 If Yes, What is the Acreage to be Disturbed?	

2.17 Identify the nearest surface waterbodies to which construction site runoff will discharge.

Receiving Waterbody (#1)	Receiving Waterbody (#2)
Combined Sewer Service Area	
Waterbody Name (#1)	**Waterbody Name (#2)**
Combined Sewer Service Area	
Type of Waterbody (#1)	**Type of Waterbody (#2)**
Other Type Off Site	
Water Body Type Other (#1)	**Water Body Type Other (#2)**
Combined Sewer	

Impaired For (Pollutant Name) (#1)	Impaired For (Pollutant Name) (#2)
None	

Is Surface Waterbody in 303(d) Seg? (#1)	Is Surface Waterbody in 303(d) Seg? (#2)
No	

If Wetland selected, how was it identified? (#1)	If Wetland selected, how was it identified? (#2)

Wetland Identification Other (#1)	Wetland Identification Other (#2)

2.18 Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area?	No
2.19 Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law?	No
2.20 Is this property owned by a state authority, state agency, federal government or local government?	No
2.20.1 Please select the Government Agency	
Please specify the name of the Government Agency	
2.21 Is this a remediation project being done under NYS DEC approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.)?	Yes
2.22 Is this a flood management project?	No
2.22.1 Is The Project:	

Erosion Sediment Control Criteria:

Erosion and Sediment Control Practices

3.01 Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)?	Yes
3.02 Has a construction sequence schedule for the planned management practices been prepared?	Yes

3.03 Select all of the erosion and sediment control practices that will be employed on the project

Runoff Control

- ☐ Check Dam
- ☐ Construction Ditch
- ☐ Dewatering Sump Pit
- ☐ Diversion
- ☐ Earth Dike
- ☐ Flow Diffuser
- ☐ Flow Spreader
- ☐ Grade Stabilization Structure
- ☐ Grassed Waterway
- ☐ Lined Waterway
- ☐ Paved Flume
- ☐ Perimeter Dike/Swale
- ☐ Pipe Slope Drain
- ☐ Rock Outlet Protection
- ☐ Storm Drain Diversion
- ☐ Subsurface Drain
- ☐ Water Bar

Soil Stabilization

- ☐ Anchored Stabilization Matting
- ☐ Armored Slope and Channel Stabilization
- ☐ Branch Packing
- ☐ Brush Layer
- ☐ Brush Mattress
- ☐ Fertilizer Application
- ☐ Fiber Roll
- ☐ Landgrading
- ☐ Lime Application
- ☐ Live Crib Wall
- ☐ Live Fascines
- ☐ Live Stakes
- ☐ Loose Stabilization Blankets
- ☐ Mulching
- ☐ Permanent Construction Area Planting
- ☐ Recreation Area Seeding
- ☐ Retaining Walls
- ☐ Soil Restoration
- ☐ Stabilization With Sod
- ☐ Surface Roughening
- ☐ Temporary Construction Area Seeding
- ☐ Topsoiling
- ☐ Tree Revetment
- ☐ Trees, Shrubs, and Vines
- ☐ Vegetated Rock Gabions
- ☐ Vegetating Sand and Gravel Borrow Areas
- ☐ Vegetating Sand Dunes and Tidal Banks
- ☐ Vegetating Waterways

Sediment Control

- ☐ Buffer Filter Strip
- ☐ Sediment Dike

☐	Cofferdam Structure	☐	Sediment Tank - Portable
☐	Compost Filter Sock	☐	Sediment Trap
☐	Dewatering Device	☑	Silt Fence
☐	Geotextile Filter Bag	☐	Storm Drain Inlet Protection
☐	Rock Dam	☐	Straw Bale Dike
☐	Sediment Basin	☐	Turbidity Curtain

Erosion Control Planning and Site Management

☑	Construction Road Stabilization	☑	Site Pollution Prevention
☑	Concrete Truck Washout	☑	Stabilized Construction Access
☑	Dust Control	☐	Temporary Access Waterway Crossing
☐	Protecting Vegetation During Construction	☐	Winter Stabilization

Other Erosion and Sediment Control Practice(s)

If using other Erosion & Sediment Control Practices that are not listed above, please enter them here separated by comma ",".

Post Construction Criteria:

Stormwater Management Practice Component Requirement	
4.01 Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)?	No
4.02 Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual?	

Table 1 - Site Planning Practices:

Site Planning Practices

4.03 Identify all the site planning practices that were used to prepare the final site plan/layout for the project

☐	Preservation of undisturbed area	☐	Sidewalk Reduction
☐	Preservation of Buffers	☐	Driveway Reduction

- ☐ Reduction of Clearing and Grading
- ☐ Cul-de-sac Reduction
- ☐ Locating Development in Less Sensitive Area
- ☐ Building Footprint Reduction
- ☐ Roadway Reduction
- ☐ Parking Reduction
- ☐ None (Please explain the reason in SWPPP)

Does the SWPPP include a description for each of the practices selected above including, but not limited to: a delineation for the area in question, a justification describing how and why the area/practice qualifies as its labeled practice type, etc.?

4.04 Indicate which of the following soil restoration criteria was used to address the requirements in section 5.1.6 (“Soil Restoration”) of the Design Manual (2015 Version).

SMPs Information

SMP Table Summary

SMP ID	SMP Type	SMP Classification	Impervious Area	Contributing Area	Technique Name	Manufacturer Name

Post Construction Summary:

Table Summary

	Total (Acres)	Total Impervious (Acres)
Runoff Reduction		
Standard SMPs		
Alternative SMPs		

4.05 Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).	
4.06 Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) & Standard SMPs with RRv capacity identified in Table 2,3, & 4.	
4.07 Provide the minimum RRv required in acre-feet based on HSG.	
4.08 WQv Provided(Acre-feet)	

4.09 Summarize the specific site limitations and justify not reducing 100% of WQv required (#4.05)

N/A

Channel Protection & Flood Control:

Units	BBL Number

Additional Post Construction Criteria

4.10 The need to provide Channel Protection Storage volume is waived because

Site discharges directly to tidal waters or a fifth order or larger stream or CSS

4.11 Provide the total Channel Protection Storage Volume (CPv) required

CPv Required (acre-feet)	
CPv Provided (acre-feet)	

4.12 The need to provide Overbank flood (Qp) and Extreme flood (Qf) control is waived because

Site discharges directly to tidal waters or a fifth order or larger stream or CSS

4.13 Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria

Qp Pre-Devlopment (CFS)	
Qp Post-Development (CFS)	
Qf Pre-Development (CFS)	
Qf Post-Development (CFS)	

4.14 Has a long term Operation and Maintenance Plan for the post-construction stormwater management practices(s) been developed?

4.15 Identify the entity responsible for the long-term operation and Maintenance.

Other Permits:

Other New York State or New York City Permits

4.16 Identify other NYC permits or approvals that are required for this project.
Note: Include appropriate documentation with SWPPP

- ☐ **BWSO Site Connection**
- ☐ **DOB Private on-site drainage**
- ☑ **None**
- ☐ **Lot Line Adjustment**
- ☐ **Zoning Change**

4.17 Identify other DEC permits, existing and new, that are required for this project/facility

- ☐ **Air Pollution Control**
- ☐ **Coastal Erosion**
- ☐ **Freshwater Wetlands/ Article 24**
- ☐ **Tidal Wetlands**

☐	**Hazardous Waste**	☐	**Wild, Scenic and Recreational River**
☐	**Long Island Wells**	☐	**Stream Bed or Bank Protection/ Article 15**
☐	**Mined Land Reclamation**	☐	**Endangered or Threatened Species (Incidental Take Permit)**
☐	**Solid Waste**	☐	**Individual SPDES**
☐	**Navigable Waters Protection/ Article 15**	☐	**SPDES Multi-Sector General Permit**
☐	**Water Quality Certificate**	☐	**None**
☐	**Dam Safety**	☑	**Other**
☐	**Water Supply**		

Please Specify (Other)

BCP

SPDES Multi Sector General Permit

4.18 Does this project require a US Army Corps of Engineers Wetland Permit?	No

4.18.1 Indicate the Size of Impact (to nearest tenth of an acre).

4.19 Former SPDES # if Continuing Coverage

NA

4.20 Have you complied with CEQR (City Environment Quality Review)?	Yes

4.21 This space can be used for other pertinent project information.

Development will be filed under a separate Application.

Stakeholders:

All the stakeholders will need to register in the system before the application can be submitted. If a stakeholder is already registered in the system, his/her information will be prefilled below.

Enter Owner's Email Address	rafael@rabskygroup.com
Owner Type	Company
Is Owner Same as Developer?	No
Will Owner or Developer be Applicant for NYS NOI?	Developer

Enter Developer's Email Address	rafael@galaxycm.com
Enter SWPPP Preparer's Email Address Must be a Qualified Professional as defined in RCNY Title 15, Chapter 19.1	jeff.derosier@derosierengineering.com

Stakeholders' Information:

Construction Project Stakeholders' Information

Owner information:

Name (Company / Private / Agency)	Empire McKeever heights LLC
Mailing Address	505 Flushing Ave
First Name	Rafael
Middle Initial	
Last Name	Rabinowitz
City	Brooklyn
State	New York
Zipcode	11205
Federal Tax ID	
Phone	(718) 246-4762
Alternate Email	

Developer information:

Name (Company / Private / Agency)	Galaxy Developers LLC
Mailing Address	505 flushing ave
First Name	Rafael
Middle Initial	
Last Name	Rabinowitz
City	brooklyn
State	New York
Zipcode	11249
Federal Tax ID	
Phone	(718) 246-4762

Alternate Email	

SWPPP Preparer:

Mailing Address	35 Gates Avenue
First Name	Jeffrey
Middle Initial	A.
Last Name	Derosier
City	Warren
State	NJ
Zipcode	07059
Phone	(201) 993-0665
Alternate Email	

Applicant:

Mailing Address	35 Gates Avenue
First Name	Jeffrey
Middle Initial	A.
Last Name	Derosier
City	Warren
State	NJ
Zipcode	07059
Phone	(201) 993-0665
Alternate Email	

********** END **********

THE CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Environmental Planning and Analysis
59-17 Junction Blvd., 9th Floor; Flushing, NY 11373

SWPPP Acceptance/Approval

Application Number: S307226

I. Project Owner/Operator Information

1. Owner/Operator Name: *Galaxy Developers LLC*
2. Contact Person: *Rafael Rabinowitz*
3. Street Address: *505 flushing ave*
4. City/State/Zip: *brooklyn New York 11249*

II. Project Site Information

5. Project/Site Name: *73 Empire Blvd - Demolition & Remediation*
6. Street Address: *73-97 Empire Blvd*
7. City/State/Zip: *New York New York 11225*

III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance/Approval

8. SWPPP Reviewed by: *Evy Rahmey*
9. Title/Position: */*
10. Date Final SWPPP Reviewed and Accepted: *4/30/2026*
11. Acceptance/Approval Expiration Date: 4/30/2028

IV. Regulated MS4 Information for projects that require coverage under the NY State Pollution Discharge Elimination System General Permit for Stormwater Discharges from Construction Activity

12. Name of MS4: *CITY OF NEW YORK*
13. MS4 SPDES Permit Identification Number: *NY-0287890*
14. Contact Person: *Christine Ng*
15. Street Address: *59-17 Junction Blvd. 9th Floor*
16. City/State/Zip: *Flushing, NY 11373*
17. Telephone Number: *(718) 595-3855*

Projects in the MS4 area must submit a copy of this SWPPP Acceptance with a Notice of Intent for coverage under the NY SPDES General Permit for Stormwater Discharges from Construction Activity to: NYS Department of Environmental Conservation, Division of Water; 625 Broadway, 4th Floor; Albany, New York 12233-3505.

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s).

Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name: *Christine Ng*

Title/Position: *Director Stormwater Permitting*

Signature: Christine Ng

Date: *4/30/2026*

VI. Conditions of Acceptance/Approval and Additional Information

This project is approved for DEMOLITION with site restoration to PERVIOUS cover. No other work is permitted under this approval.

This project is in the Combined Sewer Service area, do not file for coverage under the NYSDEC General Permit for Stormwater Discharges from Construction Sites.

The OWNER or DEVELOPER must complete the Permit Initiation form in the SWPTS Portal. The following items are required to complete the Permit Initiation form:

1- Enter N/A in the space provided for SPDES General Permit Identification #

2-A Contractor email that is registered in the SWPTS Portal.

3- A Qualified Inspector email that is registered as a qualified professional in the SWPTS Portal.

Note: The final site condition must be pervious cover per the approved plan SWM-102.0.

Projects in the MS4 area must submit a copy of this SWPPP Acceptance with a Notice of Intent for coverage under the NY SPDES General Permit for Stormwater Discharges from Construction Activity to: NYS Department of Environmental Conservation, Division of Water; 625 Broadway, 4th Floor; Albany, New York 12233-3505.