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REMEDIAL ACTION WORK PLAN

28-12 41ST AVENUE SITE
28-12 41ST AVENUE
QUEENS COUNTY
LONG ISLAND CITY, NEW YORK 11101
NYSDEC BCP SITE NO. C241300

Prepared by
H & A of New York Engineering and Geology, LLP
New York, New York

Prepared for
28 12 41ST AVE LLC
Queens Village, New York

File No. 0214374
May 2026



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May 22, 2026
File No. 0214374

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233

Attention: Mr. Shawn Roberts

Subject: Revised Remedial Action Work Plan
28-12 41st Avenue Site – NYSDEC BCP Site No. C241300
28-12 41st Avenue
Long Island City, New York

Dear Mr. Roberts:

On behalf of 28 12 41ST AVE LLC, H & A of New York Engineering and Geology, LLP (Haley & Aldrich of New York) is submitting for review of the New York State Department of Environmental Conservation (NYSDEC) this revised Remedial Action Work Plan (RAWP) for the 28-12 41st Avenue Site, located at 28-12 41st Avenue in the Long Island City neighborhood of Queens, New York (Site). This RAWP was developed in accordance with the NYSDEC (Title 6 of the New York Codes, Rules, and Regulations) Part 375 Brownfield Cleanup Regulations dated December 2006, the "Technical Guidance for Site Investigation and Remediation" (Division of Environmental Remediation-10 dated May 2010) and other relevant NYSDEC technical and administrative guidance.

Please do not hesitate to contact us if there are any questions regarding this submittal.

Sincerely yours,
H & A OF NEW YORK ENGINEERING AND GEOLOGY, LLP

Luke J. McCartney, P.G.
Senior Project Manager

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PREPARED FOR
28 12 41ST AVE LLC
QUEENS VILLAGE, NEW YORK

PREPARED BY:



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James M. Bellew
Principal
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Certification

I, Zhan Shu, certify that I am currently a New York State-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 Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation (DER-10) and Green Remediation (DER-31).



	5/22/2026	Zhan Shu
NYS Professional Engineer 112052	*Date*	*Signature*

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H	Quality Assurance Project Plan
I	Proposed Remedial Action Project Schedule
J	NYSDEC Special Community Air Monitoring Program
K	Odor Control Suppressant Safety Data Sheet

List of Acronyms and Abbreviations

Acronym	Definition
#	
2025 RI	Remedial Investigation performed by H & A of New York Engineering and Geology, LLP in July and October2025
Symbol	
µg/L	micrograms per liter
µg/m^3	micrograms per cubic meter
A	
ACM	asbestos-containing material
amsl	above mean sea level
AOC	Area of Concern
ASP	Analytical Services Protocol
AST	aboveground storage tank
AWQS	Ambient Water Quality Standards
B	
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bgs	below grade surface
BTEX	benzene, toluene, ethylbenzene, xylenes
btoc	below top of casing
C	
C&D	construction and demolition
CAMP	Community Air Monitoring Plan
CFR	Code of Federal Regulations
CHASP	Construction Health and Safety Plan
COC	contaminant of concern
CP	Commissioners Policy
CPP	Citizen Participation Plan
CQAP	Construction Quality Assurance Plan
CSM	Conceptual Site Model
cu yd	cubic yard
CVOC	chlorinated volatile organic compound

List of Acronyms and Abbreviations (continued)

Acronym	Definition
D	
DER	Division of Environmental Remediation
DER-10	Division of Environmental Remediation-10 *(specifically "May 2010 NYSDEC Technical Guidance for Site Investigation and Remediation")*
DMM	Division of Materials Management
DUSR	Data Usability Summary Report
DustTrak	TSI DustTrak® Environmental Monitor
E	
EC	Engineering Control
ECL	Environmental Conservation Law
EDD	Electronic Data Deliverable
EE	Environmental Easement
El.	elevation
ELAP	Environmental Laboratory Accreditation Program
ESA	Environmental Site Assessment
F	
FER	Final Engineering Report
ft	foot/feet
FWRIA	Fish and Wildlife Resource Impact Analysis
G	
GEI	GEI Consultants, Inc., P.C.
GPR	ground-penetrating radar
GV	Guidance Value
H	
Haley & Aldrich of New York	H & A of New York Engineering and Geology, LLP
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HVAC	heating, ventilation, and air conditioning
I	
IC	Institutional Control

List of Acronyms and Abbreviations (continued)

Acronym	Definition
L	
L/min	liters per minute
LSDF	low-sulfur diesel fuel
M	
mg/kg	milligrams per kilogram
MP	monitoring point
MW	monitoring well
N	
NAVD	North American Vertical Datum
ng/L	nanograms per liter
NTU	nephelometric turbidity unit
NYCDEP	New York City Department of Environmental Protection
NYCDOB	New York City Department of Buildings
NYCDOT	New York City Department of Transportation
NYCOER	New York City Office of Environmental Remediation
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	
OSHA	Occupational Health and Safety Administration
P	
Pace	Pace Analytical Services, LLC of Westborough, Massachusetts
PAH	polycyclic aromatic hydrocarbon
PBS	Petroleum Bulk Storage
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PGWSCO	Protection of Groundwater Soil Cleanup Objective
PID	photoionization detector
PM-10	particles with diameters generally less than 10 micrometers and smaller
PPE	personal protective equipment
ppm	parts per million
ppt	parts per trillion
PVC	polyvinyl chloride
PWGC	P.W. Grosser Consulting, Inc.

List of Acronyms and Abbreviations (continued)

Acronym	Definition
Q	
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
R	
RA	Remedial Action
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCA	recycled concrete aggregate
RCRA	Resource Conservation and Recovery Act
RE	Remedial Engineer
REC	Recognized Environmental Condition
Requestor	28 12 41ST AVE LLC
RI	Remedial Investigation
RIR	Remedial Investigation Report
RIWP	Remedial Investigation Work Plan
RRSCO	Restricted Residential Soil Cleanup Objective
S	
S/MMP	Soil/Materials Management Plan
SCG	Standards, Criteria, and Guidance
SCO	Soil Cleanup Objective
SDS	Safety Data Sheet
SEFA	Spreadsheets for Environmental Footprint Analysis
Site	28-12 41st Avenue, Queens, New York
SIM	Selective Ion Monitoring
SMP	Site Management Plan
SOE	support of excavation
SPDES	State Pollutant Discharge Elimination System
sq ft	square feet
SSDS	sub-slab depressurization system
SVE	soil vapor extraction
SVI	soil vapor intrusion
SVOC	semi-volatile organic compound
SWPPP	Stormwater Pollution Prevention Plan
T	
TAL	Total Analyte List
TCE	trichloroethylene
TCL	Target Compound List
TOGS	Technical and Operational Guidance Series

List of Acronyms and Abbreviations (continued)

Acronym	Definition
U	
USEPA	United States Environmental Protection Agency
USGS	U.S. Geological Survey
UST	underground storage tank
UUSCO	Unrestricted Use Soil Cleanup Objective
V	
VOC	volatile organic compound

Executive Summary

This Remedial Action Work Plan (RAWP) was developed by H & A of New York Engineering and Geology, LLP (Haley & Aldrich of New York) on behalf of 28 12 41ST AVE LLC (the "Requestor") for the proposed development of the property located at 28-12 41st Avenue, Long Island City, New York (the "Site"). The Requestor is seeking entry into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) as a Volunteer. The Requestor seeks entry into the NYSDEC BCP at the construction stage with a Brownfield Cleanup Agreement (BCA) to be executed prior to the start of construction activities.

This RAWP summarizes the nature and extent of contamination on the Site as determined from data gathered during the Phase I Environmental Site Assessment (ESA) completed by P.W. Grosser Consulting, Inc. (PWGC) in April 2021, the Phase II Environmental Site Assessment (ESA) performed by PWGC in May 2021, the Remedial Investigation Report (RIR) prepared by GEI Consultants, Inc., P.C. (GEI) in July 2025, and the Remedial Investigation (RI) performed by Haley & Aldrich of New York in October 2025 (2025 RI).

This RAWP provides an evaluation of a Track 2 cleanup and other applicable Remedial Action (RA) alternatives, their associated costs, and the recommended and preferred remedy. The remedies described in this document are consistent with the procedures defined in the NYSDEC Division of Environmental Remediation (DER) Program Policy: Technical Guidance for Site Investigation and Remediation (DER-10) and comply with applicable federal, state, and local laws, regulations, and requirements.

Site Description/Physical Setting/Site History

The Site is identified as Block 417, Lot 20 on the New York City tax map. The Site is approximately 5,000 square feet (sq ft) (0.115 acres) and is currently improved with a vacant one-story, slab-on-grade warehouse. The Site is located in an urban area characterized by low-rise commercial and residential buildings and multi-family high-rise buildings. The Site is bounded to the north by 41st Avenue followed by the ATLAS High School; to the east by a two-story mixed-use residential and commercial building; to the south by a two-story commercial building and a two-story mixed-use residential and commercial building; and to the west by a commercial parking lot followed by Gotham Tech High School (Q417).

The Site is located within an M1-5/R7-3 light manufacturing and residential zoning district, within the Special Long Island City Mixed Use District. The Requestor plans to redevelop the Site for residential purposes, which is consistent with current zoning. The Site has been assigned an E-Designation (E-104, City Environmental Quality Review [CEQR] 00DCP055Q) for hazardous materials as part of the Long Island City Rezoning.

Based on the findings of the April 2021 Phase I Environmental Site Assessment (ESA) prepared by P.W. Grosser Consulting, Inc. (PWGC), the Site was first developed as early as 1898 and used for residential purposes through 1970. Around 1971, the present-day commercial warehouse was constructed, and the Site has been utilized for commercial uses including metal works, dry cleaning, a laundry facility with two storage tanks, printing, and auto repair. In October 2025, the Requestor purchased the Site from

the previous property owner, Realty 41, LLC, which had owned the property since June 2021. The Site is currently vacant.

There are five sensitive receptors within a 500-foot (ft) radius of the Site listed below:

1. Gotham Tech High School (Q417) – 53-16 Northern Boulevard, Queens, New York 11377, listed as a public high school.
2. ATLAS High School – 28-01 41st Avenue, Long Island City, New York 11101, listed as a high school.
3. Sven Park – 29-59 Northern Boulevard, Long Island City, New York 11101, listed as a park and plaza.
4. Q575 Academy of American Studies – 40-02 29th Street, Long Island City, New York 11101, listed as a public elementary, junior, or senior high school.
5. Dutch Kills Green – Queens Plaza, Queensboro Bridge Greenway, Long Island City, New York 11101, listed as a park and plaza.

A Site location map is provided as **Figure 1**, and a Site plan showing the property boundaries and adjacent properties is provided as **Figure 2**.

Summary of the Remedial Investigation

The 2025 RI was completed in accordance with Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR) Part 375, DER-10, the New York State Department of Health (NYSDOH) "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" (October 2006 and subsequent updates), and the October 2025 Remedial Investigation Work Plan (RIWP), prepared by Haley & Aldrich of New York. The objective of the 2025 RI was to determine the nature and extent of contamination in soil, groundwater, and soil vapor. The 2025 RI was performed from October 14 through October 31 and November 25 and 26, 2025. Air monitoring was conducted during ground-intrusive activities. The draft RIR was submitted concurrently with this draft RAWP and BCP Application.

The 2025 RI consisted of the following:

1. Advancement of nine soil borings to a maximum depth of 30 ft below grade surface (bgs). Four samples were collected at each boring, including from surface grade (or immediately below the concrete cover) at specific intervals, including 0 to 2 ft, the bottom of fill between approximately 4 to 8 ft bgs, the development depth of approximately 12 to 14 ft bgs, and the 2-ft interval above the groundwater interface at 22 to 24 ft bgs. A total of 36 soil samples were collected (plus quality assurance/quality control [QA/QC] samples) for laboratory analysis.
2. Installation of five permanent groundwater monitoring wells to 30 ft bgs, with monitoring well screens installed to straddle the water table. One groundwater sample was collected from each well (plus QA/QC samples) for laboratory analysis.
3. Installation of seven soil vapor probes to a depth of approximately 20 ft bgs, targeting the 2-ft interval above the groundwater interface. Seven soil vapor samples were collected for laboratory analysis.

The ground-level elevation on the Site is approximately 37 ft above mean sea level (amsl). The topography of the Site slopes gently downward towards the west, consistent with the surrounding area. The Site is underlain by a layer of urban fill consisting of brown to dark brown to black fine to medium sand with varying amounts of silt, fine gravel, brick, concrete, and asphalt observed from surface grade up to approximately 7 ft bgs. The urban fill layer was underlain by a potential native layer consisting of brown fine to medium sand with varying amounts of clay, silt, and fine to coarse gravel.

According to the U.S. Geological Survey (USGS) Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, New Jersey (dated 1994), the uppermost geologic formation underlying the soils at the Site is the Hartland Formation. Bedrock was not encountered during the RI; however, depth to bedrock in this region of Queens is estimated to be about 105 ft bgs.

A summary of the Areas of Concern (AOCs) identified from the 2025 RI findings is provided below:

- AOC 1 – Site-Wide Contaminated Fill in Subsurface Soils: Shallow subsurface soils throughout the Site are impacted with elevated concentrations of semi-volatile organic compounds (SVOCs; specifically polycyclic aromatic hydrocarbons [PAHs]), metals (including arsenic, barium, copper, lead, mercury, selenium, and zinc), and, in some areas, pesticides and polychlorinated biphenyls (PCBs) up to 8 ft bgs. Deeper soils are impacted with elevated concentrations of metals with localized detections of lead, mercury, and zinc at RI-SB-07 up to 23 ft bgs and zinc at RI-SB-05 up to 14 ft bgs. These findings are consistent with characteristics of contaminated fill found throughout the New York City area. Contaminated fill material varies in depth throughout the Site, generally extending from surface grade up to about 7 ft bgs.
- AOC 2 – Localized Tetrachloroethene (PCE) Impacted Shallow Soils: Shallow soils are impacted with elevated concentrations of PCE with localized detections at RIB-05_0-2, RIB-08_0-2, and RIB-08_6-8. Shallow PCE contaminated soils likely resulted from historical uses at the Site.
- AOC 3 – Groundwater Impacts: SVOCs (specifically PAHs), lead, and per- and polyfluoroalkyl substances (PFAS) were detected above Ambient Water Quality Standards (AWQS) and Guidance Values (GVs) in Site groundwater. PAH contamination and lead in groundwater appears to be limited to the southeast corner of the Site. PFAS impacts in groundwater were encountered only within the central and southern portion of the Site. Naturally occurring metals, including iron, magnesium, manganese, and sodium, were also identified in groundwater but not as contaminants of concern (COCs). Groundwater contamination likely resulted from Site-wide contaminated fill and historical uses at the Site and/or nearby properties.
- AOC 4 – Soil Vapor Impacts: Volatile organic compounds (VOCs), primarily PCE, are present in the vapor phase at elevated concentrations Site-wide in shallow soil (0-2 ft bgs), intermediate soil (10 ft bgs), and soil above the groundwater (20 ft bgs) table. The highest concentrations of PCE appear to be present in the central and southern portions of the Site. Soil vapor contamination likely resulted from historical uses at the Site and/or nearby upgradient properties.

Qualitative Human Health Exposure Assessment

A qualitative human health exposure assessment (QHHEA) consists of characterizing the exposure setting (including the physical environment and potentially exposed human populations), identifying exposure pathways, and evaluating chemical fate and transport. An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has the following five elements:

1. Receptor population;
2. Contaminant source;
3. Contaminant release and transport mechanism;
4. Point of exposure; and
5. Route of exposure.

An exposure pathway is complete when all five elements of an exposure pathway are documented; a potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway is not documented but could reasonably occur. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway does not exist in the present and will not exist in the future. A qualitative human health exposure assessment was performed to evaluate the exposure pathways, and the following conclusions were developed:

- Site contamination includes VOCs, primarily the chlorinated VOC (CVOC) PCE, metals, SVOCs (specifically PAHs), pesticides, and PCBs in soil; SVOCs (PAHs), metals, and PFAS in groundwater; and CVOCs, specifically PCE, in soil vapor. Under current conditions, the likelihood of exposure to soil or groundwater is limited, as the Site building is vacant and secured, and the remainder of the Site is affixed with a perimeter fence secured with a lock. Site access is only granted to personnel associated with the planned development. Potable water for Queens County will continue to be sourced from reservoirs in the Catskill and Delaware watersheds. All intrusive work on the Site is performed in accordance with a Site-Specific Health and Safety Plan (HASP), Community Air Monitoring Plan (CAMP), and donning of appropriate personal protective equipment (PPE).
- During future construction/remediation, the exposure element exists for all elements during this phase. The primary exposure pathways include dermal contact, ingestion, and/or inhalation of contaminated soil, groundwater, and/or soil vapor by construction workers or dermal contact via inhalation of soil dust by the community in the vicinity of the Site. The overall risk will be minimized by the implementation of a Site-Specific Construction Health and Safety Plan (CHASP), localized monitoring of organic vapors, community air monitoring on the Site perimeter for particulates and VOCs, vapor and dust suppression techniques, installation of a stabilized entrance, cleaning truck tires and undercarriages, and donning of appropriate PPE. Additionally, the Site will be under this RAWP, which includes a Soil Materials Management Plan that highlights measures for PPE, covering of stockpiles, housekeeping, suppression techniques (particulates and vapor), and measures to prevent off-Site migration of contaminants. In addition, the Site will be secured and inaccessible to the public during remedial construction.

- Under the proposed future condition (after construction/remediation), residual contaminants may remain on Site depending on the remedy achieved. The residual contaminants would include those listed in the current conditions. If contaminants remain on Site after construction/remediation, the route of exposure will be mitigated by proper installation of Engineering Controls (ECs), such as a Site capping system foundation and sub-slab depressurization system; implementation of institutional controls, such as land use and groundwater use restrictions; and implementation of a Site Management Plan (SMP) to manage referenced controls. For petroleum-related VOCs and CVOCs present in soil vapor, the potential exists for exposure through pathways associated with soil vapor intrusion. Routes of exposure include cracks in the foundation or slab, or emergency repairs to the foundation walls or slab.

Fish and Wildlife Assessment

NYSDEC DER-10 requires an on-Site and off-Site Fish and Wildlife Resource Impact Analysis (FWRIA) if certain criteria are met. The Site was developed as early as the late 1800s for residential use until the early 1970s, when a commercial warehouse was constructed and utilized for metal works, dry cleaning, printing, a laundry facility with two storage tanks, and auto repair until the present day. The Site is located in the Long Island City neighborhood of Queens, New York. The Site provides little or no wildlife habitat or food value and/or access to the detected subsurface contamination. No natural waterways are present on or adjacent to the Site. The proposed future use of the Site is residential. As such, no unacceptable ecological risks are expected under the current and future use scenarios.

Summary of the Remedy

The selected Track 2 (Alternative II) remedy will include the following tasks:

1. Development and implementation of a CHASP and CAMP for the protection of on-Site workers, the community, residents, and the environment during remediation and construction activities.
2. Design and construction of a support-of-excavation (SOE) system to facilitate the Track 2 remediation.
3. Implementation of soil erosion, pollution, and sediment control measures in compliance with applicable laws and regulations.
4. Demolition of the warehouse building and removal of the existing concrete cover and miscellaneous debris on the Site.
5. Decommissioning of on-Site monitoring wells, as necessary, in accordance with NYSDEC Commissioner Policy (CP)-43: Groundwater Monitoring Well Decommissioning Policy.
6. Excavation, stockpiling, off-Site transport, and disposal of contaminated soil/fill material Site-wide that exceeds Restricted Residential Soil Cleanup Objectives (RRSCOs) as defined by 6 NYCRR Part 375-6.8. Site-wide excavation will extend to 7 ft bgs with hotspot excavations to at least 9 ft bgs centered on RI-SB-02, where PAHs exceeded RRSCOs to a depth of 8 ft bgs, 9 ft bgs centered on RI-SB-04, where mercury exceeded its RRSCO to a depth of 8 ft bgs, and 15 ft bgs centered on RI-SB-07, where metals exceeded RRSCOs to a depth of 14 ft bgs. An estimated 1,342 cubic yards (cu yd) of soil/fill will be removed for Track 2 excavation.

7. Removal, decommissioning, and off-Site disposal of any unknown USTs, if encountered, and/or associated appurtenances (e.g., fill lines, vent lines, and electrical conduit) during redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.
8. Screening for indications of contamination (by visual means, odor, and monitoring with photoionization detectors [PIDs]) of excavated material during intrusive Site work.
9. Implementation of a preliminary waste characterization to facilitate off-Site disposal of excavated soil/fill.
10. Appropriate off-Site disposal of material removed from the Site in accordance with federal, state, and local rules and regulations for handling, transport, and disposal.
11. Backfilling of excavated areas, as necessary for development, with certified-clean material (i.e., meeting UUSCOs), recycled concrete aggregate (RCA), and/or virgin, native crushed stone.
12. Collection and analysis of Site-wide excavation confirmation soil samples and hotspot post - excavation confirmation soil samples from the excavation base and sidewalls of the hotspot excavation areas, in accordance with DER-10, to document post-excavation conditions to confirm a Track 2 remedy was achieved. If the proposed confirmation endpoint sample exceeds the Track 2 RRSCOs, over-excavation and resampling may be performed, as necessary, to meet Track 2 standards.
13. Installation of a Soil Vapor Extraction (SVE) system to address elevated petroleum-related VOCs in soil vapor from the proposed cellar development depth of 14 ft bgs to 24 ft bgs, terminating slightly above the observed groundwater depth, in the central portion of the Site beneath the building footprint and an active SSDS beneath the building footprint.
14. Operation of an active sub-slab depressurization system (SSDS) as an engineering control in the building. The active SSDS will consist of a horizontal perforated polyvinyl chloride (PVC) pipeline within a permeable layer immediately beneath the building foundation slab and a vapor barrier system connecting to steel risers penetrating through the building to the roof. A blower fan will be installed on the roof and connected to the SSDS piping.
15. Completion of post-mitigation sampling conducted concurrently with performance testing of the active SSDS and no sooner than 30 days after installation Details of the SSDS operation, maintenance, and monitoring will be provided in the Site Management Plan (SMP).
16. Establishment of use restrictions including prohibitions on the use of groundwater from the Site and prohibitions on sensitive Site uses, such as farming or vegetable gardening in residual Site soil, to significantly reduce the potential for future exposure pathways.
17. Recording of an Environmental Easement (EE), including ICs, to prevent future exposure to any residual contamination remaining at the Site;
18. Publication of a Site Management Plan (SMP) for long-term management of residual contamination as required by the EE, including plans for: (1) ICs and ECs, (2) monitoring, (3) operation and maintenance, and (4) reporting;
19. All responsibilities associated with the RA, including permitting requirements will be addressed in accordance with all applicable federal, state, and local rules and regulations.

1. Introduction

28 12 41ST AVE LLC (the "Requestor") submitted a Brownfield Cleanup Program (BCP) Application to the New York State Department of Environmental Conservation (NYSDEC) concurrently with a draft Remedial Investigation Report (RIR) and this draft Remedial Action Work Plan (RAWP) summarizing the investigation and proposed remediation of a 5,000 square feet (sq ft) (0.115-acre) property located at 28-12 41st Avenue in Queens County, Queens, New York (the "Site"). 28 12 41ST AVE LLC is applying to be a Volunteer in the BCP, and residential use is proposed for the property. The Site will be redeveloped with a ten-story residential building with a full cellar encompassing a majority of the Site footprint and an approximate 1,800 sq ft courtyard in the southern portion of the Site. Refer to the BCP Application for additional details.

This RAWP summarizes the nature and extent of contamination as determined from data gathered during the Remedial Investigation (RI), performed between October 14 and 31, 2025. It provides an evaluation of a Track 2 cleanup and other applicable Remedial Action (RA) alternatives, their associated costs, and the recommended and preferred remedy. The remedy described in this document is consistent with the procedures defined in the NYSDEC Division of Environmental Remediation (DER)-10, DER-31, and complies with all applicable standards, criteria, and guidance (SCG). The remedy described in this document also complies with all applicable federal, state, and local laws, regulations, and requirements. A formal Remedial Design document will not be prepared.

The NYSDEC and New York State Department of Health (NYSDOH) have determined that this Site poses a significant threat to human health and the environment. The RI for this Site did not identify fish and wildlife resources.

1.1 SITE LOCATION AND DESCRIPTION

The Site is identified as Block 417, Lot 20 on the New York City tax map. The Site is approximately 5,000 sq ft (0.115 acres) and is currently improved with a vacant one-story, slab-on-grade warehouse. The Site is located in an urban area characterized by low-rise commercial and residential buildings and multi-family high-rise buildings. The Site is bounded to the north by 41st Avenue followed by the ATLAS High School; to the east by a two-story mixed-use residential and commercial building; to the south by a two-story commercial building and a two-story mixed-use residential and commercial building; and to the west by a commercial parking lot followed by Gotham Tech High School (Q417).

The Site is located within an M1-5/R7-3 light manufacturing and residential zoning district, within the Special Long Island City Mixed Use District. The Requestor plans to redevelop the Site for residential purposes, which is consistent with current zoning. The Site has been assigned an E-Designation (E-104, City Environmental Quality Review [CEQR] 00DCP055Q) for hazardous materials as part of the Long Island City Rezoning.

A boundary map is attached to the BCA as required by Environmental Conservation Law (ECL) Title 14 Section 27-1419. A Project Locus showing the Site location is provided as **Figure 1**, and a Site Plan showing the property boundaries and adjacent properties is provided as **Figure 2**. The Site is fully

described with Metes and Bounds and global positioning system coordinates for the starting point, as included in **Appendix A**. The zoning map is included in **Appendix B**.

1.2 REDEVELOPMENT PLAN

The RA 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 RA contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

The planned project will consist of the construction of a ten-story residential building with a full cellar encompassing a majority of the Site footprint (approximately 64%) and an approximate 1,800 square-foot (sq ft) courtyard in the southern portion of the Site, requiring excavation up to approximately 14 feet (ft) below grade surface (bgs). Proposed development plans are provided in **Appendix C**.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The Site is located on 41st Avenue in an urban area identified as the Long Island City neighborhood in the borough of Queens. There are five sensitive receptors within a 500-ft radius of the Site listed below:

1) Gotham Tech High School (Q417) – 53-16 Northern Boulevard, Queens, New York 11377, listed as a public high school.
2) ATLAS High School – 28-01 41st Avenue, Long Island City, New York 11101, listed as a high school.
3) Sven Park – 29-59 Northern Boulevard, Long Island City, New York 11101, listed as a park and plaza.
4) Q575 Academy of American Studies –40-02 29th Street, Long Island City, New York 11101, listed as a public elementary, junior, or senior high school.
5) Dutch Kills Green – Queens Plaza, Queensboro Bridge Greenway, Long Island City, New York 11101, listed as a park and plaza.

Properties immediately surrounding the Site consist of residential uses as described in the table below:

Direction	Owner/Entity Name	Property Address	Adjoining Property Use	Surrounding Property Use
North Adjacent	New York City Dept. of Education	28-01 41st Avenue, Long Island City, Queens, New York 11101	ATLAS Public High School	Residential and commercial
East Adjacent	Don's Corporation	28-14 41st Avenue, Long Island City, Queens, New York 11101	Mixed Residential & Commercial Buildings	Residential
Southeast Adjacent	41-14 29th Street, LLC	41-14 29th Street, Long Island City, Queens, New York 11101	Industrial & Manufacturing	Residential and commercial
Southwest Adjacent	H & L 41-11 Realty INC	41-11 28th Street, Long Island City, Queens, New York 11101	Industrial & Manufacturing	Residential and commercial
West Adjacent	H & L 28-08 Holding Corp	28-08 41st Avenue, Long Island City, Queens, New York 11101	Parking Facilities	Residential and commercial

2. Description of Remedial Investigation Findings

The Site was investigated in accordance with the scope of work presented in the Remedial Investigation Work Plan (RIWP) dated October 2025. The investigation was conducted between October 14 and 31 and November 25 and 26, 2025. The draft RIR was submitted to NYSDEC concurrently with the BCP Application and this draft RAWP.

2.1 SUMMARY OF REMEDIAL INVESTIGATION

The 2025 RI consisted of the following:

1. Advancement of nine soil borings to a maximum depth of 30 ft bgs. Four samples were collected at each boring, including from surface grade (or immediately below the concrete cover) at specific intervals, including 0 to 2 ft, the bottom of fill between approximately 4 to 8 ft bgs, the development depth of approximately 12 to 14 ft bgs, and the 2-ft interval above the groundwater interface at 22 to 24 ft bgs. A total of 36 soil samples were collected (plus quality assurance/quality control [QA/QC] samples) for laboratory analysis.
2. Installation of five permanent groundwater monitoring wells to 30 ft bgs, with monitoring well screens installed to straddle the water table. One groundwater sample was collected from each well (plus QA/QC samples) for laboratory analysis.
3. Installation of seven soil vapor probes to a depth of approximately 20 ft bgs, targeting the 2-ft interval above the groundwater interface. Seven soil vapor samples were collected for laboratory analysis.

Sample locations are shown on **Figure 3**.

Soil, groundwater, and soil vapor samples were relinquished under standard chain of custody protocol and delivered via courier to Pace Analytical Laboratories, LLC (Pace) of Westborough, Massachusetts (Certification No. 11148), for analysis. Air monitoring was conducted during all ground-intrusive activities.

2.1.1 Soil Borings and Monitoring Wells

Nine soil borings were advanced throughout the Site to a maximum depth of 30 ft bgs, using Geoprobe® model 6610DT and 7822DT drill rigs operated by a licensed operator provided by Lakewood Environmental Services Corp., the drilling subcontractor. Soils were logged continuously by a geologist using the Modified Burmister Soil Classification System. The presence of staining, odors, and photoionization detector (PID) responses was noted.

Five, 2-inch permanent monitoring wells were installed to 30 ft bgs. Each monitoring well was constructed using a 2-inch diameter polyvinyl chloride (PVC) riser pipe with 10-ft-long, 10-slot (0.010-inch) slotted screens. Each monitoring well was constructed within a 2-inch annular space backfilled with #0 certified clean sand fill, followed by bentonite plugs. All the monitoring wells were sealed at grade with steel flush-mount covers. Monitoring well screens were installed to straddle the

water table. During a monitoring well gauging event on October 31, 2025, groundwater was encountered at depths ranging from approximately 25.78 to 26.06 ft bgs.

Following installation, monitoring wells were developed by surging a pump in the well several times to pull fine-grained material from the well. Development was completed until the water turbidity was 50 nephelometric turbidity units (NTUs) or less, or 10 well volumes were purged.

2.1.2 Soil Vapor Points

Soil vapor samples were collected in accordance with the "Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York" (NYSDOH, 2006). Seven soil vapor probes were installed in the 2-ft interval directly above the observed groundwater interface (to a depth of approximately 20 ft bgs). Soil vapor implants were installed with a Geoprobe® drill rig to advance a stainless-steel probe to the desired sample depth.

To ensure the stainless-steel soil vapor probe was sealed completely to the surface using bentonite, a tracer gas was used in accordance with NYSDOH protocols to serve as a QA/QC device to verify the integrity of the soil vapor probe seal. In addition, one to three implant volumes were purged prior to the collection of the soil vapor samples. At the conclusion of the sampling round, tracer monitoring was performed a second time to confirm the continued integrity of the probe seals.

2.1.3 Samples Collected

Soil samples were collected from surface grade (or immediately below the concrete cover) at specific intervals, including 0 to 2 ft, the bottom of fill between approximately 4 to 8 ft bgs, the development depth of approximately 12 to 14 ft bgs, and the approximate 2-ft interval above the groundwater interface at 22 to 24 ft bgs. Soil samples were collected from acetate liners using a stainless-steel trowel or sampling spoon. Samples were collected using laboratory-provided clean bottle ware. Volatile organic compound (VOC) grab samples were collected using Terra Cores®.

Groundwater monitoring wells were sampled utilizing low-flow sampling procedures. Prior to sampling, the water level was measured from each monitoring well using an electronic water level meter. Groundwater from each well was purged using low pumping rates (less than 500 milliliters per minute) to limit drawdown of the water level. Dedicated disposable field equipment used at each well included high-density polyethylene and silicon tubing. Wells were purged until turbidity, pH, temperature, dissolved oxygen, and specific conductivity stabilized.

Soil vapor samples were collected in appropriately sized Summa canisters that were certified clean by the laboratory. Flow rate for both purging and sampling did not exceed 0.2 liters per minute (L/min), and sampling occurred for the duration of approximately two hours.

2.1.4 Chemical Analytical Work Performed

All samples were collected in laboratory-supplied containers, which were relinquished under standard chain of custody protocol and delivered via courier to Pace for analysis.

H & A of New York Engineering and Geology, LLP (Haley & Aldrich of New York) collected twenty-seven RI soil samples (plus QA/QC samples) for laboratory analysis.

RI soil samples were analyzed for the following:

- Target Compound List (TCL) VOCs using the U.S. Environmental Protection Agency (USEPA) Method 8260B;
- TCL semi-volatile organic compounds (SVOCs) using USEPA Method 8270C;
- Total Analyte List (TAL) metals (including hexavalent and trivalent chromium and cyanide) using USEPA Method 6010;
- Polychlorinated biphenyls (PCBs) using USEPA Method 8082;
- TCL pesticides using USEPA Method 8081B;
- Per- and polyfluoroalkyl substances (PFAS) by USEPA Method 1633A; and
- 1,4-dioxane by USEPA Method 8270 Selective Ion Monitoring (SIM).

Haley & Aldrich of New York collected five RI groundwater samples (plus QA/QC samples) for laboratory analysis. RI groundwater samples were analyzed for the following:

- TCL VOCs using USEPA Method 8260B;
- TCL SVOCs using USEPA Method 8270C;
- Total metals (including hexavalent and trivalent chromium and cyanide) using USEPA Methods 6010/7471;
- Dissolved metals (including hexavalent and trivalent chromium and cyanide) using USEPA Methods 6020/7471;
- TCL pesticides using USEPA Method 8081B;
- PCBs using USEPA Method 8082;
- PFAS using USEPA Method 1633A; and
- 1,4-dioxane using USEPA Method 8270 SIM.

Groundwater samples analyzed for PFAS and 1,4-dioxane were collected and analyzed in accordance with the protocols established in the April 2023 PFAS Guidance.

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

2.1.5 Best Management Practices

DER-31 provides examples of best practices and techniques that could be applied during all phases of remediation (Attachment 1 of the DER-31 policy). In order to comply with the requirements of DER-31, the following actions were taken during the RI:

1. All vehicles and fuel-consuming equipment on the Site were shut off if not in use for more than three minutes;
2. Fuel-consuming equipment utilized low-sulfur diesel fuel (LSDF) or applicable alternate fuels when possible;
3. Work was sequenced, to the extent practicable, to limit unnecessary mobilizations to and throughout the Site; and
4. To the extent practicable, energy-efficient systems and office equipment were utilized.

2.1.6 Documentation

Below is a summary of RI findings. A detailed discussion of analytical results is included in Section 2.5. Results are provided in Figures 4 through 6.

- In general, Site contaminants of concern (COCs) include VOCs, primarily the CVOC PCE, metals, SVOCs (specifically PAHs), pesticides, and PCBs in soil; SVOCs (PAHs), metals, and PFAS in groundwater; and CVOCs, specifically PCE, in soil vapor.
- Elevated concentrations of metals, SVOCs, pesticides, and PCBs are present throughout the contaminated fill layer, which extends from surface grade up to about 7 ft bgs with localized metal exceedances up to 23 ft bgs. These contaminants are characteristic of historical fill material commonly found throughout the New York City area.
- CVOC contamination, primarily PCE, in localized soil and shallow soil vapor at the Site may potentially be a result of historical Site uses, specifically, impacts likely originating from dry cleaning, metal works, and auto repair activities. However, deeper soil vapor impacts may be the result of off-Site sources, as an on-Site source in groundwater was not identified.
- The elevated concentrations of PAHs and lead in Site groundwater may have been introduced by Site-wide contaminated fill and the use of petroleum products during historical Site operations, including auto repair. PFAS impacts to groundwater observed Site-wide are likely the result of an off-Site source, as PFOS and PFOA were not identified in soils above any GV.

2.2 SIGNIFICANT THREAT

The NYSDEC and NYSDOH have determined that the Site poses a significant threat to human health and the environment.

2.3 SITE HISTORY

2.3.1 Past Uses and Ownership

The Site was first developed as early as 1898 with two one-story garage buildings. By 1915, the northern half of the Site was occupied by two residential buildings. Between 1936 and 1950, two shed buildings were added on the southern portion of the Site. Around 1971, the current commercial warehouse was constructed and has been utilized for commercial uses, including a metal works, a dry cleaners, a laundry facility with two oil storage tanks, a printer, and an auto repair business. The property was occupied by Federal Express Corp in 1976, Perfect Auto Repair in 1991, Anco Transmissions Corp and Redline Auto Repair from 1991 to 2004, CP Trading and Locksmith in 2005, Max Cleaners Inc. in 2007, Max JDJ Cleaners in 2008 (registered dry cleaner site), and Walnut Printing and A Roofing in 2014 and 2017, respectively. The Site is currently improved with a vacant one-story, slab-on-grade warehouse and was most recently used for parking and storage.

2.3.2 Previous Environmental Reports

The following reports were prepared for the Site prior to the Requestors' application:

- April 2021 Phase I Environmental Site Assessment, prepared by P.W. Grosser Consulting, Inc. (PWGC) (included as Appendix A of the July 2025 *Remedial Investigation Report*, prepared by GEI Consultants, Inc., P.C. [GEI]).
- May 2021 Phase II Environmental Site Assessment, prepared by PWGC (included as Appendix A of the July 2025 *Remedial Investigation Report*, prepared by GEI).
- July 2025 NYCOER *Remedial Investigation Report*, prepared by GEI.A summary of the environmental findings of these investigations is provided below.

April 2021 Phase I Environmental Site Assessment Prepared by PWGC

PWGC completed a Phase I Environmental Site Assessment (ESA) on behalf of iCross Capital for the Site. The Phase I ESA indicated that the Site was first improved with a residential building prior to 1898 and was used for residential purposes through 1970. In approximately 1971, the present-day commercial warehouse was constructed, and the Site has been utilized for commercial uses, including metal works, dry cleaning, printing, a laundry facility with two storage tanks, and auto repair, through the present day.

The Phase I ESA identified the following Recognized Environmental Conditions (RECs):

- According to the provided historical documents and reasonably ascertainable information, the Site has historically been used for metal works, dry cleaning, and auto repair. Such activities commonly use petroleum products and chlorinated solvents as part of their routine operations. Improper storage and handling of such materials can potentially impact the subsurface. PWGC identified the Site's historical use for metal works, dry cleaning, and auto repair as a REC.
- During the Site reconnaissance, PWGC identified a metal-rimmed object approximately 3 inches in diameter in the sidewalk adjacent to the northwest corner of the building, indicative of a possible former port for an underground storage tank (UST). PWGC did not identify an

aboveground storage tank (AST) or UST within the property, and the Site is currently connected to natural gas; however, this metal-rimmed object can potentially be associated with a UST under the sidewalk, which was used for storing heating oil prior to the Site's conversion to natural gas heat. Improperly abandoned USTs are prone to corrosion and leaks, which can go unchecked and impact the subsurface. PWGC identified the potential presence of a UST beneath the sidewalk in front of the building as a REC.

- The subject property is listed as an E-Designation site (E-104) for Hazardous Materials, with Phase I and Phase II testing protocol required. Based on this potential, PWGC believes that this represents a REC for the subject property.

The Phase I ESA identified the following environmental concerns:

- Possible presence of asbestos-containing material (ACM) and/or lead-based paint within the structure, with recommendation to complete an asbestos and/or lead-based paint survey prior to demolition or renovation of the building.
- Potential presence of historic fill beneath the Site, which would require special handling and disposal during construction.

The Phase I ESA recommended that a geophysical survey be completed, focusing on the potential UST area and a subsurface investigation with soil, groundwater, and soil vapor sampling be completed.

May 2021 Phase II Environmental Site Assessment Prepared by PWGC

PWGC completed a Phase II ESA on behalf of iCross Capital to investigate soil, groundwater, and sub-slab soil vapor quality beneath the Site. The investigation was performed on April 21, 2021, and included a geophysical investigation using ground-penetrating radar (GPR) to determine the absence or presence of a UST along the northern portion of the Site underneath the sidewalk and other subsurface objects; the installation of four soil borings to 25 ft bgs (SB001 through SB004) and collection of four shallow soil samples between 0 to 2, 3 to 5, and 5 to 7 ft bgs; the advancement of discrete groundwater sampling screens to 25 ft bgs and collection of two groundwater samples (GW001 and GW002); and, the installation of two temporary sub-slab soil vapor probes immediately below concrete cover and collection of two soil vapor samples (SV001 and SV002).

Soils observed generally consisted of fill material comprised of brown, medium to coarse sands with gravel and pieces of concrete to a depth of approximately 7 ft bgs. From 7 to 15 ft bgs, soils consisted of light brown medium sand with trace fine sand, and from 15 to 25 ft bgs, soils consisted of brown fine sand with some silt. Minor staining with black coloration was observed at the SB002 and SB004 boring locations at 3 to 5 and 5 to 7 ft bgs; however, no odors or PID readings were documented. Groundwater was observed at approximately 22 ft bgs.
Four soil samples were collected during the Phase II ESA. Soil samples were compared to Title 6 of the New York Codes, Rules and Regulations (6 NYCRR) Part 375 Unrestricted Use Soil Cleanup Objectives (UUSCOs), Restricted Residential Use Soil Cleanup Objectives (RRSCOs), and Protection of Groundwater Soil Cleanup Objectives (PGWSCOs). Soil analytical results identified SVOCs and metals at concentrations above RRSCOs, which are indicative of historical fill. No VOCs were detected at concentrations greater than UUSCOs; however, tetrachloroethene (PCE) was detected at a concentration below its UUSCO.

Two groundwater samples were collected as part of the Phase II ESA. Groundwater samples were compared to 6 NYCRR Part 703.5 NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (AWQS) and GVs for Class GA Water. VOCs were not detected above AWQS, but it should be noted that PCE was detected at concentrations below its AWQS. Several SVOCs and several total metals were detected above AWQS in each sample. Iron was the only dissolved metal detected above AWQS.

Two temporary sub-slab soil vapor probes were installed during the Phase II ESA. Sub-slab soil vapor results indicated elevated levels of PCE (maximum of 1,390 micrograms per cubic meter [µg/m^3]). No other elevated VOCs were identified.

The Phase II ESA concluded that:

- The geophysical investigation did not identify a UST at the Site.
- Historic fill impacted with SVOCs and metals at concentrations exceeding RRSCOs was observed up to 7 ft bgs.
- Soil vapor impacted with PCE may be associated with an on-Site source of contamination and potentially associated with the Site's historical uses.

Prior to and as part of any future redevelopment, PWGC recommended that disposal of historic fill be handled in accordance with local, state, and federal rules and regulations, that an additional subsurface investigation be completed to further investigate the presence of PCE in soil vapor (1,390 µg/m^3), and that a soil vapor mitigation system such as a vapor barrier or sub-slab depressurization system (SSDS) be installed during redevelopment.

July 2025 NYCOER Remedial Investigation Report Prepared by GEI

GEI completed a New York City Office of Environmental Remediation (NYCOER) RI on behalf of 28 12 41ST AVE LLC to establish Remedial Action Objectives (RAOs), evaluate Remedial Action Alternatives, and select a remedy that included further investigation of soil, groundwater, sub-slab, and soil vapor quality beneath the Site. The investigation was performed on June 5 and 6, 2025 and included a Site inspection to identify Areas of Concern (AOCs) and physical obstructions; the installation of five soil borings to 25 ft bgs and collection of 12 soil samples; the installation of three temporary groundwater monitoring wells to establish groundwater flow and collection of three groundwater samples; and, the installation of five soil vapor probes and collection of five soil vapor samples and one indoor ambient air sample.

The NYCOER RI provided the following environmental findings:

1. Elevation of the property is 31 ft above mean sea level (amsl).
2. Depth to groundwater ranges from approximately 24.89 ft bgs to 25.78 ft bgs at the Site.
3. Groundwater flow is generally from northeast to southwest beneath the Site.
4. Depth to bedrock is greater than 30 ft bgs at the Site.

5. The stratigraphy of the Site, from the surface down, consists of up to 2 ft of fill material. This fill layer, where identified, was underlain by predominantly medium-grained sand, with a silt layer identified around the groundwater interface. In borings where fill material was identified, the fill consisted of predominantly sand and silt with varying amounts of brick, wood, asphalt, and concrete fragments.
6. Soil/fill samples collected during the NYCOER RI showed:
   - No VOCs or PCBs were detected above UUSCOs in the soil borings.
   - The SVOC benzo(b)fluoranthene was detected at 1.4 milligrams per kilogram (mg/kg) in the soil boring SB-4 at a depth of 5 to 7 ft bgs. Additionally, the SVOC indeno(1,2,3-cd)pyrene was detected at 0.68 mg/kg in this same boring at depth. Both detections exceed UUSCOs and PGWSCOs but are below RRSCOs. No other SVOCs were detected above RRSCOs or PGWSCOs.
   - The pesticide 4,4'-DDT was detected at 0.0071 mg/kg, above its UUSCO of 0.0033 mg/kg, in the soil sample collected from boring SB-4 at a depth of 5 to 7 ft bgs. This detection is below the RRSCO and PGWSCO for 4,4'-DDT. No other pesticides were detected above UUSCOs during the RI.
   - Lead was detected at 67.1 mg/kg in soil boring SB-3 at a depth of 5 to 7 ft bgs. Additionally, lead was detected at 85 mg/kg in soil boring SB-4 at a depth of 5 to 7 ft bgs. Both detections exceed UUSCOs but are below RRSCOs and PGWSCOs. No other metals were detected above UUSCOs during the RI.
   - The emerging contaminants PFAS were analyzed in the soil collected from boring SB-3 at a depth of 5 to 7 ft bgs. PFAS were not detected above laboratory detection limits. No historical on- or off-Site sources were identified for PFAS.
7. Groundwater samples collected during the NYCOER RI showed:
   - No VOCs, pesticides, or PCBs were detected above their respective AWQS.
   - The SVOC benzo(a)pyrene was identified at 0.59 micrograms per liter (µg/L) in the groundwater sample collected from monitoring well TW-3. No other SVOCs were detected above their respective AWQS.
   - The total metals arsenic (maximum of 133 µg/L in TW-2), barium (maximum of 4,410 µg/L in TW-2), cadmium (maximum of 9.1 µg/L in TW-2), chromium (maximum of 1,090 µg/L in TW-2), copper (maximum of 1,970 µg/L in TW-2), iron (maximum of 986,000 µg/L in TW-2), lead (maximum of 1,740 µg/L in TW-2), magnesium (maximum 586,000 µg/L in TW-2), nickel (maximum of 1,300 µg/L in TW-2), sodium (maximum of 51,900 µg/L in TW-1), and mercury (0.93 µg/L in TW-2 only) were detected above their respective AWQS. Sodium was the sole dissolved metal detected above AWQS (51,800 µg/L in TW-1).
   - The emerging contaminant 1,4-dioxane was analyzed using SIM and was not detected in any groundwater samples.
   - The emerging contaminants PFAS were analyzed in groundwater samples from all three monitoring wells. The NYSDEC issued its most recent GVs for PFAS in April 2023, noting 6.7 nanograms per liter (ng/L) for PFOA and 2.7 ng/L for PFOS. PFOA was detected above the GV (maximum of 33.5 ng/L in TW-2) in all three monitoring wells. PFOS was

detected above the GV in two of the three monitoring wells (maximum of 28.2 ng/L in TW-2). No on-Site sources were identified for PFAS.

8. Soil Vapor and Indoor Air samples collected during the NYCOER RI showed:
   - All the petroleum-related VOCs included in the NYSDOH matrix guidance compounds were detected in soil vapor. Benzene was detected at concentrations ranging from 0.45 µg/m³ in SV-2 to 13.7 µg/m³ in SV-3, ethylbenzene was detected at concentrations ranging from 2.08 µg/m³ in SV-1 to 64.2 µg/m³ in SV-4, naphthalene was detected at concentrations ranging from 0.63 µg/m³ in SV-1 to 65.8 µg/m³ in SV-4, cyclohexane was detected at concentrations ranging from 0.25 µg/m³ in SV-2 to 4.34 µg/m³ in SV-3, 2,2,4-trimethylpentane was detected at 7.84 µg/m³ in SV-3, only, 1,2,4-trimethylbenzene was detected at concentrations ranging from 2.87 µg/m³ in SV-1 to 8.71 µg/m³ in SV-5, 1,3,5-trimethylbenze was detected at concentrations ranging from 0.63 µg/m³ in SV-1 to 2.02 µg/m³ in SV-3, o-xylene was detected at concentrations ranging from 3.78 µg/m³ in SV-2 to 95.1 µg/m³ in SV-4, total xylene was detected at concentrations ranging from 12.9 µg/m³ in SV-2 to 386 µg/m³ in SV-4, n-heptane was detected at concentrations ranging from 1.48 µg/m³ in SV-1 to 13.7 µg/m³ in SV-3, n-hexane was detected at concentrations ranging from 0.84 µg/m³ in SV-5 to 17.6 µg/m³ in SV-3, and toluene was detected at concentrations ranging from 3.04 µg/m³ in SV-2 to 16.4 µg/m³ in SV-3.
   - All of the petroleum-related VOCs included in the NYSDOH matrix guidance were also detected in indoor air. The NYSDOH decision matrices were utilized to compare the sub-slab soil vapor samples with the indoor air sample. According to the NYSDOH matrices, when comparing to soil vapor detections, no further action is recommended for benzene, cyclohexane, naphthalene, 2,2,4-trimethylpentane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, n-hexane, n-heptane, and toluene. Monitoring is recommended for ethyl benzene, o-xylene, and m,p-xylene.
   - CVOCs included in the NYSDOH matrix guidance detected in soil vapor include trichloroethylene (TCE) ranging from 0.25 µg/m³ in SV-2 to 95.7 µg/m³ in SV-4, carbon tetrachloride ranging from 0.26 µg/m³ in SV-1 to 0.50 µg/m³ in SV-3, PCE ranging from 171 µg/m³ in SV-3 to 11,500 µg/m³ in SV-4, 1,1,1-trichloroethane ranging from 0.65 µg/m³ in SV-3 to 77.1 µg/m³ in SV-5, and methylene chloride at 2.59 µg/m³ in SV-3 only; no other CVOCs included in the NYSDOH matrix guidance were detected.
   - CVOCs included in the NYSDOH matrix guidance detected in indoor air include TCE, carbon tetrachloride, and PCE. The NYSDOH decision matrices were utilized to compare the sub-slab soil vapor samples with the indoor air sample. According to the NYSDOH matrices, mitigation is recommended for TCE and PCE. No further action is recommended for carbon tetrachloride.

The NYCOER RI concluded that, based on the evaluation of the data and information from the RIR, disposal of significant amounts of hazardous waste was not suspected at the Site and that there are no known impediments to RA at the Site.

2.4 GEOLOGY AND HYDROGEOLOGY

2.4.1 Historic Fill Material

The Site is underlain by a layer of urban fill consisting of brown to dark brown to black fine to medium sand with varying amounts of silt, fine gravel, brick, concrete, and asphalt observed from surface grade to approximately 5 to 7 ft bgs.

2.4.2 Native Soil

The urban fill layer was underlain by a potential native layer consisting of brown fine to medium sand with varying amounts of clay, silt, and fine to coarse gravel.

2.4.3 Bedrock

According to the U.S. Geological Survey (USGS) Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, New Jersey (dated 1994), the uppermost geologic formation underlying the soils at the Site is the Hartland Formation. Bedrock was not encountered during the RI; however, depth to bedrock in this region of Queens is estimated to be about 105 ft bgs.

2.4.4 Hydrogeology

Groundwater was encountered at depths ranging from approximately 25.78 to 26.06 ft bgs, and groundwater beneath the Site generally flows to the southeast, with groundwater elevations ranging from elevation (El.) 11.65 at RI-MW-02 and RI-MW-04 to El. 11.43 at RI-MW-05 (North American Vertical Datum [NAVD] of 1988). A groundwater contour map is provided as **Figure 7**.

2.5 CONTAMINANT CONDITIONS

A Conceptual Site Model (CSM) was developed based on the findings of the 2025 RI. The CSM provides a framework for the distribution of impacted materials Site-wide and potential migration/exposure pathways.

2.5.1 Conceptual Site Model

Elevated concentrations of metals, SVOCs, pesticides, and PCBs are present throughout the contaminated fill layer, which extends from surface grade up to about 7 ft bgs with localized metal exceedances up to 23 ft bgs. These contaminants are characteristic of historical fill material commonly found throughout the New York City area.

CVOC contamination, primarily PCE, in localized soil and shallow soil vapor at the Site may potentially be a result of historical Site uses, specifically, impacts likely originating from dry cleaning, metal works, and auto repair activities. However, deeper soil vapor impacts may be the result of off-Site sources, as an on-Site source in groundwater was not identified.

The elevated concentrations of PAHs and lead in Site groundwater may have been introduced by Site-wide contaminated fill and the use of petroleum products during historical Site operations, including auto repair. PFAS impacts to groundwater observed Site-wide are likely the result of an off-Site source, as PFOS and PFOA were not identified in soils above any GV.

2.5.2 Description of Areas of Concern

The site has been developed as early as 1898 and used for residential purposes through 1970. In approximately 1971, the present-day commercial warehouse was constructed, and the Site has been utilized for commercial uses including metal works, dry cleaning, printing, and auto repair. Operations involving dry cleaners and auto repair services typically utilize chemical agents, petroleum and/or hazardous materials, the discharge of which may have adversely impacted the environmental quality of the property. A summary of the AOCs identified from the 2025 RI findings is provided below:

- AOC 1 – Site-Wide Contaminated Fill in Subsurface Soils: Shallow subsurface soils throughout the Site are impacted with elevated concentrations of SVOCs (specifically PAHs), metals (including arsenic, barium, copper, lead, mercury, selenium, and zinc), and, in some areas, pesticides and PCBs up to 8 ft bgs. Deeper soils are impacted with elevated concentrations of metals with localized detections of lead, mercury, and zinc at RI-SB-07 up to 23 ft bgs and zinc at RI-SB-05 up to 14 ft bgs. These findings are consistent with characteristics of contaminated fill found throughout the New York City area. Contaminated fill material varies in depth throughout the Site, generally extending from surface grade up to about 7 ft bgs.
- AOC 2 – Localized PCE Impacted Shallow Soils: Shallow soils are impacted with elevated concentrations of PCE with localized detections at RIB-05_0-2, RIB-08_0-2, and RIB-08_6-8. Shallow PCE impacted soils likely resulted from historical uses at the Site.
- AOC 3 – Groundwater Impacts: SVOCs (specifically PAHs), lead, and PFAS were detected above AWQS and GVs in Site groundwater. PAH contamination and lead in groundwater appears to be limited to the southeast corner of the Site. PFAS impacts in groundwater were encountered only within the central and southern portion of the Site. Naturally occurring metals, including iron, magnesium, manganese, and sodium, were also identified in groundwater but not as contaminants of concern (COCs). Groundwater contamination likely resulted from Site-wide contaminated fill and historical uses at the Site and/or nearby properties.
- AOC 4 – Soil Vapor Impacts: VOCs, primarily PCE, are present in the vapor phase at elevated concentrations Site-wide in shallow soil (0-2 ft bgs), intermediate soil (10 ft bgs), and soil above the groundwater (20 ft bgs) table. The highest concentrations of PCE appear to be present in the central and southern portions of the Site. Soil vapor contamination likely resulted from historical uses at the Site and/or nearby upgradient properties.

2.5.3 Identification of Standards, Criteria, and Guidance Values

See **Table 1** of this document for an RI SCO exceedance summary and **Table 2** for Applicable SCGs.

2.5.3.1 Soil/Fill Contamination

Soil analytical results were compared to NYSDEC 6 NYCRR Part 375 UUSCOs and RRSCOs. When compounds were identified in groundwater above applicable standards, described below, soil analytical results were also compared to PGWSCOs. Refer to Section 2.1.5.3 for applicable soil results compared to PGWSCOs. Note that no standards for PFAS in soil currently exist in New York State; however, NYSDEC published soil GVs for PFOA and PFOS in October 2020 (latest revision April 2023). PFOA and PFOS soil sample results are compared to the unrestricted use and restricted residential use and protection of groundwater GVs outlined in the April 2023 PFAS Guidance. Soil analytical results are summarized below and shown on **Figure 4**.

2.5.3.2 Volatile Organic Compounds

One VOC, PCE, was detected above its UUSCO in two shallow soil samples collected between 0 to 2 ft bgs and one sample from the bottom of fill between 4 to 6 ft bgs at a maximum concentration of 6.8 mg/kg in RI-SB-08_4-6.

No other VOCs were detected above the UUSCOs, RRSCOs, and/or applicable PGWSCOs in the soil samples analyzed.

2.5.3.3 Semi-Volatile Organic Compounds

Up to ten SVOCs, specifically polycyclic aromatic hydrocarbons (PAHs), were detected at concentrations above UUSCOs and/or RRSCOs in six shallow soil samples between 0 to 2 ft bgs and one sample from the bottom of fill between 6 to 8 ft bgs. Maximum concentrations of SVOCs were all detected in one soil sample, RI-SB-03_0-2. SVOCs detected above applicable criteria include: benzo(a)anthracene (24 mg/kg), benzo(a)pyrene (26 mg/kg), benzo(b)fluoranthene (30 mg/kg), benzo(g,h,i)perylene (11 mg/kg), benzo(k)fluoranthene (8.8 mg/kg), chrysene (23 mg/kg), dibenzo(a,h)anthracene (3.8 mg/kg), dibenzofuran (3.2 mg/kg), indeno(1,2,3-cd)pyrene (10 mg/kg), and phenanthrene (37 mg/kg).

In addition, SVOCs were compared to PGWSCOs for compounds detected above NYSDEC AWQS in groundwater samples. SVOCs including benzo(a)anthracene, benzo(b)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene were detected above NYSDEC AWQS in groundwater samples during the October 2025 groundwater sampling events and were found to exceed the PGWSCOs.

No other SVOCs were detected above the UUSCOs, RRSCOs, and/or applicable PGWSCOs in the soil samples analyzed.

2.5.3.4 Pesticides

Up to five pesticides were detected at concentrations exceeding their UUSCOs in six shallow soil samples collected between 0 to 2 ft bgs and two samples from the bottom of fill between 6 to 8 ft bgs. Maximum concentrations of pesticides were all detected in one soil sample, RI-SB-08_0-2. Pesticides detected above applicable criteria include: 4,4'-DDD (0.03 mg/kg), 4,4'-DDE (0.0195 mg/kg), 4,4'-DDT (0.0469 mg/kg), alpha-Chlordane (cis) (0.018 mg/kg), and dieldrin (0.0173 mg/kg).

No other pesticides were detected above the UUSCOs or RRSCOs in the soil samples analyzed.

2.5.3.5 Metals

Up to seven metals were detected above UUSCOs and/or RRSCOs in fifteen soil samples analyzed, specifically: arsenic (maximum concentration of 25.7 mg/kg in RI-SB-07_0-2); barium (maximum concentration of 537 mg/kg in RI-SB-05_0-2; copper (maximum concentration of 204 J+ mg/kg in RI-SB-07_0-2; lead (maximum concentration of 1,210 mg/kg in RI-SB-05_0-2); mercury (maximum concentration of 2.87 mg/kg in RI-SB-07_12-14; selenium (concentration of 4.26 mg/kg in RI-SB-07_0-2); and, zinc (maximum concentration of 850 mg/kg in RI-SB-09_0-2). Metals were compared to PGWSCOs for compounds detected in groundwater samples. Lead (maximum concentration of 1,210 mg/kg in RI-SB-05_0-2 was detected above AWQS in groundwater samples from October 2025 groundwater sampling event and was found to exceed the PGWSCOs.

No other metals were detected above their UUSCOs, RRSCOs, or PGWSCOs in the soil samples analyzed.

2.5.3.6 Polychlorinated Biphenyls

Total PCBs in RI-SB-08_0-2 were detected above the UUSCO at a concentration of 0.242 mg/kg.

No other PCBs were detected above the UUSCOs or RRSCOs in the soil samples analyzed.

2.5.3.7 Emerging Contaminants

The emerging contaminant 1,4-dioxane was not detected above laboratory detection limits in the soil samples analyzed.

Neither PFOS nor PFOA were detected above the UUSCO or PGWSCO GVs in any of the soil samples.

2.5.4 Groundwater Contamination

Groundwater analytical results were compared to 6 NYCRR Part 703.5 NYSDEC TOGS 1.1.1 AWQS and GVs for Class GA Water. Emerging contaminants PFOA and PFOS were compared to the GVs for PFOA and PFOS outlined in the NYSDEC April 2023 PFAS Guidance. Emerging contaminant 1,4-dioxane was compared to the GV as set by NYSDEC in March 2023. Groundwater analytical results are summarized below and shown on **Figure 5**.

2.5.4.1 Volatile Organic Compounds

No VOCs were detected above the AWQS in the groundwater samples analyzed.

2.5.4.2 Semi-Volatile Organic Compounds

Benzo(a)anthracene was detected above AWQS in one groundwater sample analyzed, at a concentration of 0.03 J µg/L in RI-MW-01_20251023. Phenol was detected above AWQS in one groundwater sample analyzed, at a concentration of 1.5 J µg/L in RI-MW-03_20251023 Two additional SVOCs exceeded AWQS in RI-MW-05_20251022, including: benzo(b)fluoranthene (concentration of 0.07 J µg/L) and chrysene (concentration of 0.05 J µg/L).

No other SVOCs were detected above the AWQS in the groundwater samples analyzed.

2.5.4.3 Organochlorine Pesticides

No pesticides were detected above the AWQS in the groundwater samples analyzed.

2.5.4.4 Polychlorinated Biphenyls

No PCBs were detected above the AWQS in the groundwater samples analyzed.

2.5.4.5 Total Metals

Up to three metals were detected above AWQS in six groundwater samples, including the duplicate, as follows: total iron (maximum concentration of 21,200 µg/L in RI-MW-02_20251022), total lead (concentration of 102.6 µg/L in RI-MW-05_20251022), total magnesium (maximum concentration of 48,300 µg/L in RI-MW-01_20251023), total manganese (maximum concentration of 1,109 µg/L in MW-02), and total sodium (maximum concentration of 29,000 µg/L in RI-MW-05_20251022).

No other total metals were detected above the AWQS in the groundwater samples analyzed.

2.5.4.6 Dissolved Metals

Two dissolved metals were detected above the AWQS in groundwater sample RI-MW-01_20251023: dissolved magnesium (concentration of 44,800 µg/L) and dissolved sodium (concentration of 28,200 µg/L).

No other dissolved metals were detected above the AWQS in the groundwater samples analyzed.

2.5.4.7 Emerging Contaminants

Concentrations of the emerging contaminants PFOA and PFOS were compared to the NYSDEC GVs of 6.7 ng/L for PFOA and 2.7 ng/L for PFOS. PFOA was detected in four groundwater samples, including the duplicate, above the NYSDEC GVs (maximum concentration of 9.52 ng/L in RI-MW-04_20251022). PFOS was detected in RI-MW-04_20251022 and it's duplicate above the NYSDEC GVs (maximum concentration of 16.4 ng/L in RI-MW-04_20251022).

The emerging contaminant 1,4-dioxane was compared to the NYSDEC GV of 0.35 µg/L; however, 1,4-dioxane was not detected above laboratory detection limits in the groundwater samples analyzed.

2.5.5 Soil Vapor Contamination

Table 4 provides a summary of the analytical results from the soil vapor sampling event. **Figure 6** provides the soil vapor sampling locations, as well as a summary of all soil vapor data that were considered in the findings of this report.

Total VOC concentrations in soil vapor samples ranged from 242.26 µg/m^3 in sample RI-SG-02_20251016 to 3,154.9 µg/m^3 in sample RI-SG-06_20251016. Total benzene, toluene, ethylbenzene, and xylenes

(BTEX) concentrations ranged from non-detect in sample RI-SG-06_20251016 to 14.45 µg/m^3 in sample RI-SG-05_20251016. Total CVOC concentrations in soil vapor samples ranged from 208.36 µg/m^3 in sample RI-SG-02_20251016 to 3,154.9 µg/m^3 in sample RI-SG-06_20251016.

CVOCs were detected in all seven soil vapor samples collected during this investigation. Detected CVOCs include PCE in all soil vapor samples (maximum concentration of 3,070 µg/m^3 in RI-SG-06_20251016; TCE in six soil vapor samples (maximum concentration of 37.9 µg/m^3 in RI-SG-07_20251016); 1,1,1-trichloroethane in all soil vapor samples (maximum concentration of 141 µg/m^3 in RI-SG-07_20251016); and chloroform in four soil vapor samples (maximum concentration of 6.84 µg/m^3 in RI-SG-04_20251016).

2.6 QUALITATIVE HUMAN EXPOSURE ASSESSMENT

A qualitative exposure assessment consists of characterizing the exposure setting (including the physical environment and potentially exposed human populations), identifying exposure pathways, and evaluating chemical fate and transport. An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has the following five elements:

1. Receptor population;
2. Contaminant source;
3. Contaminant release and transport mechanism;
4. Point of exposure; and
5. Route of exposure.

An exposure pathway is complete when all five elements of an exposure pathway are documented; a potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway is not documented but could reasonably occur. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway does not exist in the present and will not exist in the future.

2.6.1.1 Receptor Population

The receptor population includes the people who are or may be exposed to contaminants at a point of exposure. The identification of potential human receptors is based on the characteristics of the Site, the surrounding land uses, and the probable future land uses. The Site is currently vacant, capped with an impervious surface (concrete), and secured with locked gates. Since the Site is vacant, individual receptors would currently only include construction/maintenance workers who may be employed to perform work on the property.

The development will consist of the construction of a ten-story residential building with a full cellar, which is consistent/compatible with surrounding property use and zoning. Exposed receptors under the future use scenario may comprise residents of the future building, indoor employees, outdoor employees (e.g., groundskeepers or maintenance staff), and construction workers who may be employed at or perform work on the property. Site visitors may also be considered receptors; however, their exposure would be similar to that of the indoor employees but at a lesser frequency and duration.

In addition, residents or employees in off-Site adjoining buildings have the potential to be exposed to vapors.

2.6.1.2 Contaminant Sources

The source of contamination is defined as either the source of contaminant release to the environment (such as a waste disposal area or point of discharge) or the impacted environmental medium (soil, air, and/or water) at the point of exposure.

Sections 6 and 7 discuss the COCs present in the Site media at elevated concentrations. In general, Site COCs include VOCs, primarily the CVOC PCE, metals, SVOCs (specifically PAHs), pesticides, and PCBs in soil; SVOCs (PAHs), metals, and PFAS in groundwater; and CVOCs, specifically PCE, in soil vapor.

2.6.1.3 Contaminant Release and Transport Mechanisms

Contaminant release and transport mechanisms carry contaminants from the source to points where people may be exposed and are specific to the type of contaminant and site use. This would include the indoor vapor intrusion pathway, also referred to as “soil vapor intrusion” (SVI). Additional pathways could include skin contact, inhalation, and incidental ingestion of VOCs present in groundwater when and where construction workers are involved in subsurface activities where volatiles are present at elevated concentrations.

2.6.1.4 Point of Exposure

The point of exposure is a location where actual or potential human contact with a contaminated medium may occur. Based on the exceedances of applicable criteria in soil, groundwater, and soil vapor, the point of exposure is defined as the entire Site.

2.6.1.5 Route of Exposure

The route of exposure is the manner in which a contaminant actually enters or contacts the human body (e.g., ingestion, inhalation, and/or dermal absorption). Based on the types of receptors and point of exposure identified above, potential routes of exposure are listed below:

2.6.1.5.1 Current Use Scenario

The Site building is currently vacant and secured with locked gates, preventing access to the entire Site. The risk of exposure to contaminated soil and contaminated groundwater is very low. Release and transport mechanisms include contaminated surface soil transported as dust, contaminated groundwater flow, and volatilization of contaminants from soil and/or groundwater into the vapor phase. Persons at risk of exposure, via the indicated exposure routes, are noted below:

- Occupant/Employee/Visitor – skin contact, inhalation, and incidental ingestion
- Construction/Utility Worker – skin contact, inhalation, and incidental ingestion

2.6.1.5.2 Construction/Remediation Scenario

In the continued absence of Engineering Controls (ECs) and Institutional Controls (ICs), there will be continued exposure pathways during construction/remediation, specifically related to surface soil. Planned construction/remedial activities include removal of the impervious Site cover, removal of USTs (if present), excavation and off-Site disposal of soil, and dewatering of impacted groundwater (if required) to facilitate the construction of the foundation elements. Release and transport mechanisms include disturbed and exposed soil during excavation, contaminated soil transported as dust, contaminated groundwater flow (during dewatering, if required), and volatilization of contaminants from soil and/or groundwater into the vapor phase. Persons at risk of exposure, via the indicated exposure routes, are noted below:

- Construction/Utility Worker – skin contact, inhalation, and incidental ingestion
- Public Adjacent to the Site – inhalation

2.6.1.5.3 Future Use Scenario

The anticipated future use as a redeveloped property with a ten-story residential building will include a cellar. In the absence of remedial removal of impacted material, remaining contaminant release and transport would include potential migration of contaminated groundwater and volatilization of contaminants from soil and/or groundwater into the vapor phase. However, with remedial removal of impacted material, routes of future exposure include cracks in the foundation or slab, or emergency repairs to the foundation walls or slab. Persons at risk of exposure, via the indicated exposure routes, are noted below:

- Construction/Utility Worker – skin contact, inhalation, and incidental ingestion
- Occupant/Employee/Visitor – inhalation
- Public Adjacent to the Site – inhalation.

2.6.1.6 Exposure Assessment

Based on the above assessment, the potential exposure pathways for the current and future use conditions are discussed below.

2.6.1.6.1 Current Use Scenario

Site COCs include VOCs (specifically PCE), metals, SVOCs (specifically PAHs), and PFOA in soil; SVOCs (specifically PAHs) and PFOA in groundwater; and petroleum-related VOCs in soil vapor. Under current conditions, the likelihood of exposure to soil or groundwater is limited as groundwater is encountered at greater than 25 ft bgs. The Site is currently vacant and secured with locked gates, with Site access only granted to personnel associated with the planned development. Potable water for Queens, including the Site, will continue to be sourced from reservoirs in the Catskill and Delaware watersheds. Intrusive work on the Site will be performed in accordance with a Site-specific Health and Safety Plan (HASP) and the donning of personal protective equipment (PPE).

2.6.1.6.2 Construction/Remediation Scenario

The exposure element exists for each element during the construction/remediation phase. The overall risk will be minimized by the implementation of a Site-specific Construction Health and Safety Plan (CHASP), localized monitoring of organic vapors, community air monitoring on the Site perimeter for particulates and VOCs, vapor and dust suppression techniques, installation of a stabilized entrance, cleaning truck tires and undercarriages, and use of appropriate PPE. Additionally, the Site will be remediated under this RAWP, which will include a Soil/Materials Management Plan (S/MMP) that will highlight measures for PPE, covering of stockpiles, housekeeping, suppression techniques (particulates and vapor), and measures to prevent off-Site migration of contaminants. In addition, the Site will be secured and inaccessible to the public during remedial construction.

2.6.1.6.3 Future Use Scenario

Under the proposed future condition (after construction/remediation), residual contaminants may remain on the Site depending on the remedy achieved. The remaining contaminants would include those listed in the current conditions. If contaminants remain on the Site after construction/ remediation, the route of exposure will be mitigated by proper installation of ECs, such as an SSDS or a Site composite cover system, and implementation of ICs, such as land use and groundwater use restrictions.

2.6.2 Fish and Wildlife Remedial Impact Analysis

NYSDEC DER-10 requires an on-Site and off-Site Fish and Wildlife Resource Impact Analysis (FWRIA) if certain criteria are met. The Site was developed as early as the late 1800s for residential use until the early 1970s, when a commercial warehouse was constructed and utilized for metal works, dry cleaning, printing, and auto repair until the present day. The Site is located in the Long Island City neighborhood of Queens, New York. The Site provides little or no wildlife habitat or food value and/or access to the detected subsurface contamination. No natural waterways are present on or adjacent to the Site. The proposed future use of the Site is for residential and commercial purposes. Based on the requirements stipulated in Section 3.10 and Appendix 3C of DER-10, there was no need to prepare a FWRIA for the Site.

2.7 REMEDIAL ACTION OBJECTIVES

Based on the results of the 2025 RI, the following RAOs have been identified for this Site.

2.7.1 Soil

RAOs for Public Health Protection:

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation exposure to contaminants volatilizing from soil.

RAOs for Environmental Protection:

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

2.7.2 Groundwater

RAOs for Public Health Protection:

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

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.

2.7.3 Soil Vapor

RAOs for Public Health Protection:

- Mitigate impacts to public health resulting from existing or potential SVI into buildings at the Site.

3. Summary of Remedial Action

3.1 ALTERNATIVE I – TECHNICAL DESCRIPTION

The Track 1 (Alternative I) remedy will include the following tasks:

1. Development and implementation of a CHASP and Community Air Monitoring Plan (CAMP) for the protection of on-Site workers, the community, residents, and the environment during remediation and construction activities.
2. Design and construction of a support-of-excavation (SOE) system to facilitate the Track 1 remediation and provide hydraulic control.
3. Implementation of soil erosion, pollution, and sediment control measures in compliance with applicable laws and regulations.
4. Demolition of the warehouse building and removal of the existing concrete cover and miscellaneous debris on the Site.
5. Decommissioning of on-Site monitoring wells, as necessary, in accordance with NYSDEC Commissioner Policy (CP)-43: Groundwater Monitoring Well Decommissioning Policy.
6. Excavation, stockpiling, off-Site transport, and disposal of contaminated soil/fill material Site-wide that exceeds UUSCOs as defined by 6 NYCRR Part 375-6.8. Site-wide excavation will extend to 25 ft bgs. An estimated 4,630 cubic yards (cu yd) of remedial soil/fill will be removed for Track 1 excavation.
7. Removal, decommissioning, and off-Site disposal of any unknown USTs, if encountered, and/or associated appurtenances (e.g., fill lines, vent lines, and electrical conduit) during redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.
8. Screening for indications of contamination (by visual means, odor, and monitoring with PIDs) of excavated material during intrusive Site work.
9. Implementation of a preliminary waste characterization to facilitate off-Site disposal of excavated soil/fill.
10. Appropriate off-Site disposal of material removed from the Site in accordance with federal, state, and local rules and regulations for handling, transport, and disposal.
11. Backfilling of excavated areas, as necessary for development, with certified-clean material (i.e., meeting UUSCOs), recycled concrete aggregate (RCA), and/or virgin, native crushed stone.
12. Collection and analysis of confirmation soil samples from the excavation base, in accordance with DER-10, to document post-excavation conditions to confirm a Track 1 remedy was achieved.
13. Completion of an SVI Evaluation in accordance with DER-10 and NYSDOH Final Guidance on Soil Vapor Intrusion following remedial activities and prior to occupancy.

3.1.1 On-Site Worker, Public Health, and Environmental Protection

A Site-specific CHASP is appended to this RAWP (**Appendix D**) and will be implemented during excavation and foundation construction to protect on-Site workers from accidents and acute and chronic exposures to the identified contaminated media. Public health will be protected by implementing and enforcing dust, odor, and organic vapor control and monitoring procedures included in the CAMP. The CAMP will include continuous perimeter monitoring of dust and organic vapor using aerosol monitors and PIDs capable of recording data and calculating 15-minute averages. Field personnel will monitor Site perimeters for visible dust and odors.

3.1.2 Support of Excavation

To accommodate the removal of soil that exceeds Track 1 UUSCOs, an SOE system will be required. The SOE elements will be designed and installed as per the New York City Department of Buildings (NYCDOB) Code.

3.1.3 Waste Characterization

Waste characterization will be performed for off-Site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results, and QA/QC results will be reported. Data available for excavated material to be disposed of at a given facility will be submitted to the disposal facility with a suitable explanation prior to shipment and receipt.

Hazardous soil, if present, will be managed in accordance with applicable federal, state, and local regulations. As such, the handling, transport, and disposal of hazardous fill material is subject to USEPA and Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations. The excavated material would be segregated in the field and temporarily placed in stockpiles, or direct loaded and transported by Part 364-permitted trucks to a facility permitted by the Resource Conservation and Recovery Act (RCRA) to accept hazardous waste.

3.1.4 Fill and Soil Removal

Analytical data from the NYCOER RI prepared by GEI in July 2025 indicate metals exceeding the UUSCOs as deep as 7 ft bgs. Site COCs include VOCs, primarily the CVOC PCE, metals, SVOCs (specifically PAHs), pesticides, and, in some areas, PCBs that exceed UUSCOs detected in shallow fill material throughout the Site with localized metal exceedances up to 23 ft bgs during the 2025 RI prepared by Haley & Aldrich of New York. Furthermore, elevated soil vapor, specifically the CVOC PCE, is present in soils throughout the Site. Therefore, excavation will extend from the surface to at least 25 ft bgs across the Site to remove material exceeding UUSCOs and soils with elevated soil vapor concentrations. The Alternative I excavation plan is shown in **Figure 8**.

The estimated volume of material requiring removal and off-Site disposal for an Alternative I (Track 1) cleanup is approximately 4,260 cu yd. The soil will be screened for visual, olfactory, and instrumental evidence of environmental impacts.

3.1.5 UST Removal

If encountered, USTs and/or associated appurtenances (e.g., fill lines, vent lines, and electrical conduits) will be decommissioned in accordance with applicable NYSDEC tank closure requirements, including DER-10 Section 5.5 and 6 NYCRR Part 613.9, and NYSDEC CP-51. USTs and/or associated appurtenances would be registered and administratively closed with the NYSDEC Petroleum Bulk Storage (PBS) unit. Petroleum-impacted soil would be excavated and disposed of off-Site at a permitted disposal facility in accordance with applicable regulations. Closure documentation, such as contractor affidavits, bills of lading for sludge disposal, and tank disposal receipts, would be provided as appendices in the Final Engineering Report (FER).

3.1.6 Excavation Backfill

To the extent required for construction purposes, imported material will consist of clean fill that meets the UUSCOs or other acceptable fill material, such as virgin stone from a quarry or RCA. If RCA is imported to the Site, it will come from an NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of RCA acquisition. RCA imported from compliant facilities will not require chemical testing unless required by NYSDEC under its terms for operation of the source facility. Imported RCA must be derived from recognizable and uncontaminated concrete (less than 10 percent by weight passing through a No. 80 sieve). RCA is not acceptable for, and will not be used as, Site cover or drainage material. **Figure 11** shows backfill locations. NYSDEC Request to Import/Reuse forms will be submitted, and a template is provided in **Appendix E**.

3.1.7 Confirmation Soil Sampling

Per NYSDEC DER-10, confirmation soil samples will be collected from the bottom of the proposed remedial excavation at a frequency of one sample per 900 sq ft. Sidewall samples will not be collected from the Site perimeter because excavation will extend across the Site footprint and SOE measures (e.g., sheeting and lagging) will have vertical excavation faces along the Site perimeter. If the Site is sloped for SOE, then one sidewall sample will be collected for every 30 linear feet per DER-10 An estimated six confirmation soil samples, plus QA/QC samples, would be collected and initially analyzed for the Part 375 list of VOCs, SVOCs, pesticides, PCBs, metals, PFAS, and 1,4-dioxane. If a proposed endpoint sample does not meet Track 1 UUSCOs, over-excavation and sampling for compounds exceeding UUSCOs will be performed to ensure that impacted material above Track 1 UUSCOs has been removed from the Site.

3.1.8 Fluids Management

The water table is estimated at approximately 25 ft bgs (El. 11.65 to El. 11.43). Localized dewatering is anticipated and will be performed in compliance with city, state, and federal laws and regulations. Dewatering, characterization, and treatment of water accumulated in excavations will occur prior to discharge to a New York City Department of Environmental Protection (NYCDEP)-approved sewer/sanitary line, or localized dewatering with containerization, classification, and disposal at an approved receiving facility.

3.1.9 Composite Cover and Waterproofing/Vapor Barrier System

As part of construction, a composite cover system will be constructed in the rear courtyard area and comprised of a minimum of two foot (passive recreational uses) of NYSDEC-approved gravel/clean fill/topsoil imported from an approved facility/source and graded across all landscaped/grass covered areas of the Site not capped with concrete/asphalt. The composite cover within the building footprint will consist of 8-inches of compacted granular fill (per project specifications) overlain by a 6-inch thick concrete slab. In addition to the composite cover, a waterproofing/vapor barrier (20-mil thick) would be installed to mitigate the potential for a soil vapor exposure pathway under the building.

Under the Alternative I – Track 1 cleanup, this composite cover system would not be considered an EC.

3.1.10 Post-Remedy Soil Vapor Intrusion Evaluation

VOC contamination, specifically CVOCs, is observed in the southern and south-central portions of the Site in the vicinity of the former dry cleaner operations. Following RAs and prior to occupancy, an SVI Evaluation will be conducted at the Site and submitted to NYSDEC and NYSDOH. The SVI would include indoor air sampling only, as development depth would extend into groundwater. Should the SVI Evaluation indicate SVI, a potential remedial alternative/element may be proposed.

3.2 ALTERNATIVE II – TECHNICAL DESCRIPTION

The Track 2 (Alternative II) remedy will include the following tasks:

1. Development and implementation of a CHASP and CAMP for the protection of on-Site workers, the community, residents, and the environment during remediation and construction activities.
2. Design and construction of a support-of-excavation (SOE) system to facilitate the Track 2 remediation.
3. Implementation of soil erosion, pollution, and sediment control measures in compliance with applicable laws and regulations.
4. Demolition of the warehouse building and removal of the existing concrete cover and miscellaneous debris on the Site.
5. Decommissioning of on-Site monitoring wells, as necessary, in accordance with NYSDEC Commissioner Policy (CP)-43: Groundwater Monitoring Well Decommissioning Policy.
6. Excavation, stockpiling, off-Site transport, and disposal of contaminated soil/fill material Site-wide that exceeds Restricted Residential Soil Cleanup Objectives (RRSCOs) as defined by 6 NYCRR Part 375-6.8. Site-wide excavation will extend to 7 ft bgs with hotspot excavations to at least 9 ft bgs centered on RI-SB-02, where PAHs exceeded RRSCOs to a depth of 8 ft bgs, 9 ft bgs centered on RI-SB-04, where mercury exceeded its RRSCO to a depth of 8 ft bgs, and 15 ft bgs centered on RI-SB-07, where metals exceeded RRSCOs to a depth of 14 ft bgs. An estimated 1,342 cubic yards (cu yd) of soil/fill will be removed for Track 2 excavation.
7. Removal, decommissioning, and off-Site disposal of any unknown USTs, if encountered, and/or associated appurtenances (e.g., fill lines, vent lines, and electrical conduit) during redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.

8. Screening for indications of contamination (by visual means, odor, and monitoring with photoionization detectors [PIDs]) of excavated material during intrusive Site work.
9. Implementation of a preliminary waste characterization to facilitate off-Site disposal of excavated soil/fill.
10. Appropriate off-Site disposal of material removed from the Site in accordance with federal, state, and local rules and regulations for handling, transport, and disposal.
11. Backfilling of excavated areas, as necessary for development, with certified-clean material (i.e., meeting UUSCOs), recycled concrete aggregate (RCA), and/or virgin, native crushed stone.
12. Collection and analysis of Site-wide excavation confirmation soil samples and hotspot post - excavation confirmation soil samples from the excavation base and sidewalls of the hotspot excavation areas, in accordance with DER-10, to document post-excavation conditions to confirm a Track 2 remedy was achieved. If the proposed confirmation endpoint sample exceeds the Track 2 RRSCOs, over-excavation and resampling may be performed, as necessary, to meet Track 2 standards.
13. Installation of a Soil Vapor Extraction (SVE) system to address elevated CVOCs in soil vapor from the proposed cellar development depth of 14 ft bgs to 24 ft bgs, terminating slightly above the observed groundwater depth, in the central portion of the Site beneath the building footprint and an active SSDS beneath the building footprint.
14. Operation of an active sub-slab depressurization system (SSDS) as an engineering control in the building. The active SSDS will consist of a horizontal perforated polyvinyl chloride (PVC) pipeline within a permeable layer immediately beneath the building foundation slab and a vapor barrier system connecting to steel risers penetrating through the building to the roof. A blower fan will be installed on the roof and connected to the SSDS piping.
15. Completion of post-mitigation sampling conducted concurrently with performance testing of the active SSDS and no sooner than 30 days after installation Details of the SSDS operation, maintenance, and monitoring will be provided in the Site Management Plan (SMP).
16. Establishment of use restrictions including prohibitions on the use of groundwater from the Site and prohibitions on sensitive Site uses, such as farming or vegetable gardening in residual Site soil, to significantly reduce the potential for future exposure pathways.
17. Recording of an Environmental Easement (EE), including ICs, to prevent future exposure to any residual contamination remaining at the Site;
18. Publication of a Site Management Plan (SMP) for long-term management of residual contamination as required by the EE, including plans for: (1) ICs and ECs, (2) monitoring, (3) operation and maintenance, and (4) reporting;
19. All responsibilities associated with the RA, including permitting requirements will be addressed in accordance with all applicable federal, state, and local rules and regulations.

3.2.1 On-Site Worker, Public Health, and Environmental Protection

A Site-specific CHASP is appended to this RAWP (**Appendix D**) and will be implemented during excavation and foundation construction to protect on-Site workers from accidents and acute and chronic exposures to the identified contaminated media. Public health will be protected by

implementing and enforcing dust, odor, and organic vapor control and monitoring procedures included in the CAMP. The CAMP will include continuous perimeter monitoring of dust and organic vapor using DustTrak aerosol monitors and PIDs capable of recording data and calculating 15-minute averages. Field personnel will monitor Site perimeters for visible dust and odors.

3.2.2 Support of Excavation

To accommodate the removal of soil that exceeds Track 2 RRSCOs, an SOE system will be required. The SOE elements will be designed and installed as per the NYCDOB Code. Additional SOE to support the hotspot excavation area may be constructed, as necessary.

3.2.3 Waste Characterization

Waste characterization will be performed for off-Site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results, and QA/QC results will be reported. Data available for excavated material to be disposed of at a given facility will be submitted to the disposal facility with a suitable explanation prior to shipment and receipt.

Hazardous soil, if present, will be managed in accordance with applicable federal, state, and local regulations. As such, the handling, transport, and disposal of hazardous fill material is subject to USEPA and OSHA HAZWOPER regulations. The excavated material would be segregated in the field and temporarily placed in stockpiles, or direct loaded and transported by Part 364-permitted trucks to a facility permitted by the RCRA to accept hazardous waste.

3.2.4 Fill and Soil Removal

Metals and SVOCs that exceed RRSCOs were detected in fill material throughout the Site. Excavation will extend from the surface to at least 7 ft bgs across the Site to remove material exceeding RRSCOs. Localized areas surrounding RI-SB-02 will be over-excavated to at least 9 ft bgs, where PAHs exceeded RRSCOs to a depth of 8 ft bgs, RI-SB-04 will be over-excavated to at least 9 ft bgs, where mercury exceeded its RRSCO to a depth of 8 ft bgs, and RI-SB-07 will be over-excavated to 15 ft bgs, where metals exceeded RRSCOs to depths of 14 ft bgs. The Alternative II excavation plan is shown in **Figure 9**.

The estimated volume of remedial material requiring removal and off-Site disposal for an Alternative II (Track 2) cleanup is approximately 1,342 cu yd. The soil will be screened for visual, olfactory, and instrumental evidence of environmental impacts.

3.2.5 UST Removal

If encountered, USTs and/or associated appurtenances (e.g., fill lines, vent lines, and electrical conduits) will be decommissioned in accordance with applicable NYSDEC tank closure requirements, including DER-10 Section 5.5 and 6 NYCRR Part 613.9, and NYSDEC CP-51. USTs and/or associated appurtenances would be registered and administratively closed with the NYSDEC PBS unit. Petroleum-impacted soil would be excavated and disposed of off Site at a permitted disposal facility in accordance with applicable regulations. Closure documentation, such as contractor affidavits, bills of lading for sludge disposal, and tank disposal receipts, would be provided as appendices in the FER.

3.2.6 Excavation Backfill

To the extent required for construction purposes, imported material will consist of clean fill that meets the RRSCOs and applicable PGWSCOs or other acceptable fill material, such as virgin stone from a quarry or RCA. If RCA is imported to the Site, it will come from an NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of RCA acquisition. RCA imported from compliant facilities will not require chemical testing unless required by NYSDEC under its terms for operation of the source facility. Imported RCA must be derived from recognizable and uncontaminated concrete (less than 10 percent by weight passing through a No. 80 sieve). RCA is not acceptable for, and will not be used as, Site cover or drainage material. **Figure 11** shows backfill locations. NYSDEC Request to Import/Reuse forms will be submitted, and a template is provided in **Appendix E**.

3.2.7 Confirmation and Documentation Soil Sampling

Per NYSDEC DER-10, confirmation soil samples will be collected from the bottom of the proposed remedial excavation at a frequency of one sample per 900 sq ft, and sidewall samples and bottom samples will be collected from the hotspot excavation to confirm Track 2 RRSCOs were achieved. Sidewall samples will not be collected from the Site perimeter because excavation will extend across the Site footprint and SOE measures (e.g., sheeting and lagging) will have vertical excavation faces along the Site perimeter. If the Site is sloped for SOE, then one sidewall sample will be collected for every 30 linear feet per DER-10. An estimated six confirmation soil samples, plus QA/QC samples, would be collected and initially analyzed for the Part 375 list of VOCs, SVOCs, pesticides, PCBs, metals, PFAS, and 1,4-dioxane. In addition, each hotspot excavation (i.e. RI-SB-02, RI-SB-04, and RI-SB-07) will have one base confirmation and one sidewall confirmation sample from each direction (not including where excavation extents will reach the property boundary) to be analyzed for the Part 375 list of VOCs, SVOCs, pesticides, PCBs, metals, PFAS, and 1,4-dioxane. The results of confirmation sampling will be provided to NYSDEC for review to determine the sampling procedures for any necessary over-excavations. If a proposed endpoint sample does not meet Track 2 RRSCOs, over-excavation and sampling for compounds exceeding RRSCOs will be performed as documentation that impacted material above Track 2 RRSCOs has been removed from the Site. The proposed confirmation sample locations are included on **Figure 12**.

3.2.8 Fluids Management

The water table is estimated at approximately 25 ft bgs (El. 11.65 to El. 11.43). Groundwater is not expected to be encountered under this Alternative.

3.2.9 Soil Vapor Extraction System

An SVE system will be installed throughout the unsaturated soil in the central portion of the Site beneath the building footprint from approximately 14 to 24 ft bgs to prevent off-site migration of noted CVOC vapors. An SVE Pilot Study will be performed to determine the vapor extraction point (VEP) radius of influence (ROI) and the vacuum required to achieve the desired flow rates. Based on an assumed 15-ft ROI, six VEPs will be required to cover the area. VEPs will be installed in the excavated area and will be screened from 14 to 24 ft bgs. The VEPs will be at least 2-inch diameter, schedule 40 PVC, and have 0.010-inch slot screens. Each VEP well pipe will enter the basement area through sealed penetrations in the basement concrete wall or floor. The 2-inch diameter pipes will each have a dedicated sample port

and valve prior to being plumbed to a 4-inch header pipe that will be connected to the SVE system. The pipe will be sloped such that any condensate in the lines will drain back to the VEPs. The extraction points will be valved independently. A conceptual SVE system layout is shown on **Figure 14**.

The above-grade SVE system will have an air-water separator, blower, and vapor treatment system. The air-water separator will be used to separate condensate from the vapor stream. The extracted water will be pumped from the separator to a tank. Any collected water will be analyzed for VOCs and properly disposed of off the Site. Off-gas from the SVE blower would be treated with two drums of granular activated carbon in series. The exhaust point of the SVE system shall be at least 12 inches above the highest roof surface and at least 10 ft away from any adjacent building or heating, ventilation, and air conditioning (HVAC) intakes.

Prior to remedy implementation, a Pilot Test Work Plan will be submitted to NYSDEC/NYSDOH for review and approval. The SVE system blower will be sized based on the results of the Pilot Test to remove at least four pore volumes of soil vapor per day. For the conceptual design and using an ROI of 15 ft, a treatment thickness of 15 ft, and a porosity of 30 percent, the soil vapor pore volume is approximately 8,800 cubic feet (cf). The flow rate to remove at least four pore volumes per day is approximately 10 cubic feet per minute (cfm) from each VEP. The SVE system blower will therefore need a total flow rate of at least 60 cfm. The vacuum of the blower is unknown at this time, since no SVE Pilot Test has been performed; however, once the VEPs have been installed, a short Pilot Test will be performed to determine the appropriate vacuum required to remove at least 10 cfm from each VEP.

Confirmation of the SVE system influence will be determined by measuring the vacuum in newly installed monitoring points (MPs) to be installed within the SVE treatment system footprint. There will be a total of four MPs to measure the vacuum induced by the SVE system. The MPs will consist of 12-inch stainless steel screens, connected to the surface with Teflon tubing. The proposed locations of these MPs are shown on **Figure 14**.

3.2.10 Composite Cover and Waterproofing/Vapor Barrier System

As part of construction, a composite cover system will be constructed in the rear courtyard area and comprised of a minimum of two foot (passive recreational uses) of NYSDEC-approved gravel/clean fill/topsoil imported from an approved facility/source and graded across all landscaped/grass covered areas of the Site not capped with concrete/asphalt. The composite cover within the building footprint will consist of 8-inches of compacted granular fill (per project specifications) overlain by a 6-inch thick concrete slab. In addition to the composite cover, a waterproofing/vapor barrier (20-mil thick) would be installed to mitigate the potential for a soil vapor exposure pathway under the building.

Under the Alternative II – Track 2 cleanup, this composite cover system would not be considered a remedial element or an EC for the site.

Under the Track 2 remedy, assuming the documentation sampling results meet RRSCOs, the composite cover system would not function as an EC. Should Track 2 not be achieved and a Track 4 remedy completed, the composite cover (excluding the waterproofing/vapor barrier) would function as an EC to be monitored under Site management.

3.2.11 Sub-Slab Depressurization System

An active SSDS will be installed as a permanent EC. The SSDS will consist of horizontal perforated piping installed in a permeable layer under the vapor barrier. The permeable layer will be 8 inches thick of 3/4-inch washed aggregate, or similar permeable material. The horizontal piping will consist of 3-inch-diameter perforated schedule 40 PVC pipes with leader pipes connecting to the vertical risers. The vertical risers will be constructed of solid steel pipe risers and exit through the cover systems with sealed penetrations. Each riser will have a blower fan to actively remove sub-slab vapor from below the building. The exhaust point of the riser shall be at least 12 inches above the highest roof surface and at least 10 ft away from any adjacent building or heating, ventilation, and air conditioning (HVAC) intakes, and be complete with a rain cap. At least four permanent sub-slab vapor monitoring points will be installed in the permeable layer below the vapor barrier to allow for the collection of sub-slab vacuum readings. A SSDS Design Work Plan will be submitted to NYSDEC/NYSDOH for review and approval. Conceptual SSDS design and details are shown on **Figures 15** and **16**, respectively.

3.2.12 Post-Remedy Soil Vapor Intrusion Evaluation

VOC contamination, specifically CVOCs, was observed in the southern and south-central portions of the Site in the vicinity of the former dry cleaner operations. Following RAs and prior to occupancy, an SVI Evaluation will be conducted at the Site and submitted to confirm the system's efficacy. It is noted that post-mitigation confirmatory sampling will occur when the mitigation system has been fully operational for a minimum of 30 days, when the building is complete and operating under normal conditions, and will occur prior to occupancy. The sampling event will include the measurement of sub-slab vacuum from the monitoring points and collection of indoor/ambient air samples. It is noted that this sampling may be performed in the heating season to confirm effectiveness of addressing this potential exposure pathway. Sub-slab vapor samples are not required to evaluate the system's effectiveness.

3.2.12.1 Indoor/Ambient Air Sampling Plan

Three indoor air samples and one ambient air sample will be collected. The indoor and ambient air samples will be collected from breathing height (3 to 5 ft above the floor) from within the Site building and outside the Site building, respectively. The sampling flow rate will not exceed 0.2 L/min. Sampling will occur for 24 hours in residential spaces and eight hours in commercial spaces. Indoor air samples will be collected in laboratory-supplied 2- or 6-liter SUMMA® canisters using 24-hour regulators. All indoor air sample containers will be appropriately labeled and closed. Chain of custody documents will be completed before shipment. All indoor air samples will be analyzed for VOCs by USEPA Method TO-15 and sent to an Environmental Laboratory Accreditation Program-certified laboratory. While post-mitigation indoor air sampling is conducted, field parameters such as PID readings and sub-slab vacuum will be measured at each sub-slab vapor monitoring point to confirm the system efficacy. The results of the pressure and indoor air testing will be submitted to NYSDEC and NYSDOH. Proposed locations of the indoor and ambient air samples are shown on **Figure 15**.

3.2.13 Site Management Plan and Environmental Easement

An EE would be recorded referencing ICs that are part of the selected remedy, which would be binding upon all subsequent owners and occupants of the property. The ICs would: 1) restrict the Site's use to restricted residential, commercial, and industrial uses, although land use is subject to local zoning laws;

2) restrict the use of groundwater as a source of potable or process water, unless it undergoes necessary water quality treatment as determined by the NYSDEC or NYSDOH; 3) require implementation of an NYSDEC-approved SMP; 4) require the completion and submission to the NYSDEC of a periodic certification of ICs and ECs in accordance with Part 375; and 5) include notice-of-use restrictions of the Site's soil. The ECs for the Site would include the composite cover system and SSDS. The SVE system would function as a temporary EC/remedial element requiring monitoring prior to decommissioning, with approval from NYSDEC and NYSDOH. The SVE would require ECs during the SVE operation for the Site.

The SMP would identify all use restrictions and long-term monitoring and maintenance requirements to ensure the ICs and remedial systems remain in place and are effective. The SMP will include, but may not be limited to:

1. An IC and EC Plan that includes:
    a. Descriptions of the provisions of the ICs, including any land use and/or groundwater use restrictions;
    b. Provisions for the management and inspection of the identified ICs and ECs;
    c. Provisions to add the EE or deed restrictions;
    d. Maintaining Site access controls and NYSDEC notification;
    e. The steps necessary for the periodic reviews and certification of the ICs and/or ECs;
    f. An Excavation Work Plan which details the provisions for management of future excavations in areas of remaining contamination;
    g. Media-specific implementation plans, including, but not limited to, cap system management, installation/operation, etc.; and,
    h. The HASP and CAMP.
2. A monitoring plan to assess the performance and effectiveness of the remedy. The monitoring plan includes, but may not be limited to:
    a. Periodic monitoring of SVE and SSDS; and,
    b. A schedule of monitoring and frequency of submittals to the NYSDEC.
3. An Operation and Maintenance Plan as may be required by the EC Plan discussed above.

3.3 ALTERNATIVE III – TECHNICAL DESCRIPTION

The Track 4 (Alternative III) remedy will include the following tasks:

1. Development and implementation of a CHASP and CAMP for the protection of on-Site workers, the community, residents, and the environment during remediation and construction activities.
2. Design and construction of a support-of-excavation (SOE) system to support excavation to facilitate a Track 4 remedy.
3. Implementation of soil erosion, pollution, and sediment control measures in compliance with applicable laws and regulations.
4. Removal of the existing concrete cover and miscellaneous debris on the Site.

5. Decommissioning of on-Site monitoring wells, as necessary, in accordance with NYSDEC CP-43: Groundwater Monitoring Well Decommissioning Policy.
6. Excavation, stockpiling, off-Site transport, and disposal of contaminated soil/fill material Site-wide that exceeds RRSCOs in shallow soils as defined by 6 NYCRR Part 375-6.8. Site-wide excavation will extend to 2 ft bgs. An estimated 370 cu yd of remedial soil/fill will be removed for Track 4 excavation.
7. Removal, decommissioning, and off-Site disposal of any unknown USTs, if encountered, and/or associated appurtenances (e.g., fill lines, vent lines, and electrical conduits) during redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.
8. Screening for indications of contamination (by visual means, odor, and monitoring with PIDs) of excavated material during intrusive Site work.
9. Implementation of a preliminary waste characterization to facilitate off-Site disposal of excavated soil/fill.
10. Appropriate off-Site disposal of material removed from the Site in accordance with federal, state, and local rules and regulations for handling, transport, and disposal.
11. Backfilling of excavated areas, as necessary for development, with certified-clean material (i.e., meeting UUSCOs), RCA, and/or virgin, native crushed stone.
12. Collection and analysis of confirmation soil samples from the excavation base and sidewalls of the excavation areas, in accordance with DER-10, to document post-excavation conditions to confirm source material was removed. If the proposed confirmation endpoint samples exceed the applicable PGWSCOs, over-excavation and resampling may be performed, as necessary.
13. Documentation samples will be collected at the base of the excavation to document residual contamination remaining on the Site.
14. Installation of a Soil Vapor Extraction (SVE) system to address elevated CVOCs in soil vapor from the proposed cellar development depth of 14 ft bgs to 24 ft bgs, terminating slightly above the observed groundwater depth, in the central portion of the Site beneath the building footprint and an active SSDS beneath the building footprint.
15. Operation of an active SSDS as an EC in the building. The active SSDS will consist of a horizontal perforated PVC pipeline within a permeable layer immediately beneath the building foundation slab and a vapor barrier system connecting to steel risers penetrating through the building to the roof. A blower fan will be installed on the roof and connected to the SSDS piping.
16. Construction of a composite cover system in the rear courtyard area and comprised of a minimum of two foot (passive recreational use) of NYSDEC-approved gravel/clean fill/topsoil imported from an approved facility/source and graded across all landscaped/grass covered areas of the site not capped with concrete/asphalt. The composite cover system within the building footprint will consist of 8-inches of compacted granular fill (per project specifications) overlain by a 6-inch thick concrete slab and installation of a waterproofing/vapor barrier (20-mil thick) within the building footprint.

17. Completion of post-mitigation sampling conducted concurrently with performance testing of the active SSDS and no sooner than 30 days after installation. Details of the SSDS operation, maintenance, and monitoring will be provided in the SMP.
18. Establishment of use restrictions including prohibitions on the use of groundwater from the Site and prohibitions on sensitive Site uses, such as farming or vegetable gardening in residual Site soil, to significantly reduce the potential for future exposure pathways.
19. Recording of an EE, including ICs, to prevent future exposure to any residual contamination remaining at the Site.
20. Publication of an SMP for long-term management of residual contamination as required by the EE, including plans for: (1) ICs and ECs, (2) monitoring, (3) operation and maintenance, and (4) reporting.
21. All responsibilities associated with the RA, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable federal, state, and local rules and regulations.

3.3.1 On-Site Worker, Public Health, and Environmental Protection

A Site-specific CHASP is appended to this RAWP (**Appendix D**) and will be implemented during excavation and foundation construction to protect on-Site workers from accidents and acute and chronic exposures to the identified contaminated media. Public health will be protected by implementing and enforcing dust, odor, and organic vapor control and monitoring procedures included in the CAMP. The CAMP will include continuous perimeter monitoring of dust and organic vapor using DustTrak aerosol monitors and PIDs capable of recording data and calculating 15-minute averages. Field personnel will monitor Site perimeters for visible dust and odors.

3.3.2 Waste Characterization

Waste characterization will be performed for off-Site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results, and QA/QC results will be reported. Data available for excavated material to be disposed of at a given facility will be submitted to the disposal facility with a suitable explanation prior to shipment and receipt.

Hazardous soil, if present, will be managed in accordance with applicable federal, state, and local regulations. As such, the handling, transport, and disposal of hazardous fill material is subject to USEPA and OSHA HAZWOPER regulations. The excavated material would be segregated in the field and temporarily placed in stockpiles, or direct loaded and transported by Part 364-permitted trucks to a facility permitted by the RCRA to accept hazardous waste.

3.3.3 Fill and Soil Removal

Metals and SVOCs that exceed RRSCOs were detected in fill material throughout the Site. Excavation will extend from the surface to at least 2 ft bgs across the Site to remove material exceeding RRSCOs. The Alternative III excavation plan is shown in **Figure 10**.

The estimated volume of remedial material requiring removal and off-Site disposal for an Alternative III (Track 4) cleanup is approximately 370 cu yd. The soil will be screened for visual, olfactory, and instrumental evidence of environmental impacts.

3.3.4 UST Removal

If encountered, USTs and/or associated appurtenances (e.g., fill lines, vent lines, and electrical conduits) will be decommissioned in accordance with applicable NYSDEC tank closure requirements, including DER-10 Section 5.5 and 6 NYCRR Part 613.9, and NYSDEC CP-51. USTs and/or associated appurtenances would be registered and administratively closed with the NYSDEC PBS unit. Petroleum-impacted soil would be excavated and disposed of off Site at a permitted disposal facility in accordance with applicable regulations. Closure documentation, such as Contractor affidavits, bills of lading for sludge disposal, and tank disposal receipts, would be provided as appendices in the FER.

3.3.5 Excavation Backfill

To the extent required for construction purposes, imported material will consist of clean fill that meets the RRSCOs and applicable PGWSCOs or other acceptable fill material, such as virgin stone from a quarry or RCA. If RCA is imported to the Site, it will come from an NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of RCA acquisition. RCA imported from compliant facilities will not require chemical testing unless required by NYSDEC under its terms for operation of the source facility. Imported RCA must be derived from recognizable and uncontaminated concrete (less than 10 percent by weight passing through a No. 80 sieve). RCA is not acceptable for, and will not be used as, Site cover or drainage material. **Figure 11** shows backfill locations. NYSDEC Request to Import/Reuse forms will be submitted, and a template is provided in **Appendix E**.

3.3.6 Confirmation and Documentation Soil Sampling

Per NYSDEC DER-10, documentation soil samples will be collected from the bottom of the proposed remedial excavation at a frequency of one sample per 900 sq ft to document post-excavation conditions. An estimated six confirmation soil samples, plus QA/QC samples, would be collected and analyzed for the Part 375 list of VOCs, SVOCs, pesticides, PCBs, metals, PFAS, and 1,4-dioxane.

3.3.7 Fluids Management

The water table is estimated at approximately 25 ft bgs (El. 11.65 to El. 11.43). Groundwater is not expected to be encountered under this Alternative.

3.3.8 Soil Vapor Extraction System

An SVE system will be installed throughout the unsaturated soil in the central portion of the Site beneath the building footprint from approximately 14 to 24 ft bgs to prevent off-site migration of noted CVOC vapors. An SVE Pilot Study will be performed to determine the vapor extraction point (VEP) radius of influence (ROI) and the vacuum required to achieve the desired flow rates. Based on an assumed 15-ft ROI, three VEPs will be required to cover the area. VEPs will be installed in the excavated area and will be screened from 14 to 24 ft bgs. The VEPs will be at least 2-inch diameter, schedule 40 PVC, and have

0.010-inch slot screens. Each VEP well pipe will enter the basement area through sealed penetrations in the basement concrete wall or floor. The 2-inch diameter pipes will each have a dedicated sample port and valve prior to being plumbed to a 4-inch header pipe that will be connected to the SVE system. The pipe will be sloped such that any condensate in the lines will drain back to the VEPs. The extraction points will be valved independently. A conceptual SVE system layout is shown on **Figure 14**.

The above-grade SVE system will have an air-water separator, blower, and vapor treatment system. The air-water separator will be used to separate condensate from the vapor stream. The extracted water will be pumped from the separator to a tank. Any collected water will be analyzed for VOCs and properly disposed of off the Site. Off-gas from the SVE blower would be treated with two drums of granular activated carbon in series. The exhaust point of the SVE system shall be at least 12 inches above the highest roof surface and at least 10 ft away from any adjacent building or heating, ventilation, and air conditioning (HVAC) intakes.

Prior to remedy implementation, a Pilot Test Work Plan will be submitted to NYSDEC/NYSDOH for review and approval. The SVE system blower will be sized based on the results of a Pilot Test to remove at least four pore volumes of soil vapor per day. For the conceptual design and using an ROI of 15 ft, a treatment thickness of 15 ft, and a porosity of 30 percent, the soil vapor pore volume is approximately 8,800 cubic feet (cf). The flow rate to remove at least four pore volumes per day is approximately 10 cubic feet per minute (cfm). The SVE system blower will therefore need a total flow rate of at least 60 cfm. The vacuum of the blower is unknown at this time, since no SVE Pilot Test has been performed; however, once the VEPs have been installed, a short Pilot Test will be performed to determine the appropriate vacuum required to remove at least 10 cfm from each VEP.

Confirmation of the SVE system influence will be determined by measuring the vacuum in newly installed monitoring points (MPs) to be installed within the SVE treatment system footprint. There will be a total of four MPs to measure the vacuum induced by the SVE system. The MPs will consist of 12-inch stainless steel screens, connected to the surface with Teflon tubing. The proposed locations of these MPs are shown on **Figure 14**.

3.3.9 Composite Cover and Waterproofing/Vapor Barrier System

As part of the remedy, a composite cover system will be constructed in the rear courtyard area and comprised of a minimum of two foot (passive recreational uses) of NYSDEC-approved gravel/clean fill/topsoil imported from an approved facility/source and graded across all landscaped/grass covered areas of the Site not capped with concrete/asphalt. The composite cover within the building footprint will consist of 8-inches of compacted granular fill (per project specifications) overlain by a 6-inch thick concrete slab. In addition to the composite cover, a waterproofing/vapor barrier (20-mil thick) would be installed to mitigate the potential for a soil vapor exposure pathway under the building.

Under the Alternative III – Track 4 cleanup, this composite cover system would be considered an EC to be monitored under the SMP.

3.3.10 Sub-Slab Depressurization System

An active SSDS will be installed as a permanent EC. The SSDS will consist of horizontal perforated piping installed in a permeable layer under the vapor barrier. The permeable layer will be 8 inches thick of

3/4-inch washed aggregate, or similar permeable material. The horizontal piping will consist of 3-inch-diameter perforated schedule 40 PVC pipes with leader pipes connecting to the vertical risers. The vertical risers will be constructed of solid steel pipe risers and exit through the cover systems with sealed penetrations. Each riser will have a blower fan to actively remove sub-slab vapor from below the building. The exhaust point of the riser shall be at least 12 inches above the highest roof surface and at least 10 ft away from any adjacent building or HVAC intakes, and shall be complete with a rain cap. At least four permanent sub-slab vapor monitoring points will be installed in the permeable layer below the vapor barrier to allow for the collection of sub-slab vacuum readings. A SSDS Design Work Plan will be submitted to NYSDEC/NYSDOH for review and approval. Conceptual SSDS design and details are shown on **Figures 15** and **16**, respectively.

3.3.11 Post-Remedy Soil Vapor Intrusion Evaluation

VOC contamination, specifically CVOCs, is observed in the southern and south-central portions of the Site in the vicinity of the former dry cleaner operations. Following RAs and prior to occupancy, an SVI Evaluation will be conducted at the Site and submitted to confirm the system's efficacy.

It is noted that post-mitigation confirmatory sampling will occur when the mitigation system has been fully operational for a minimum of 30 days, when the building is complete and operating under normal conditions, and will occur prior to occupancy. The sampling event will include the measurement of sub-slab vacuum from the monitoring points and collection of indoor/ambient air samples. It is noted that this sampling may be performed in the heating season to confirm effectiveness of addressing this potential exposure pathway. Sub-slab vapor samples are not required to evaluate the system's effectiveness.

3.3.11.1 Indoor/Ambient Air Sampling Plan

Three indoor air samples and one ambient air sample will be collected. The indoor and ambient air samples will be collected from breathing height (3 to 5 ft above the floor) from within the Site building and outside the Site building, respectively. The sampling flow rate will not exceed 0.2 L/min. Sampling will occur for 24 hours in residential spaces and eight hours in commercial spaces. Indoor air samples will be collected in laboratory-supplied 2- or 6-liter SUMMA® canisters using 24-hour regulators. All indoor air sample containers will be appropriately labeled and closed. Chain of custody documents will be completed before shipment. All indoor air samples will be analyzed for VOCs by USEPA Method TO-15 and sent to an Environmental Laboratory Accreditation Program-certified laboratory. While post-mitigation indoor air sampling is conducted, field parameters such as PID readings and sub-slab vacuum will be measured at each sub-slab vapor monitoring point to confirm the system efficacy. The results of the pressure and indoor air testing will be submitted to NYSDEC and NYSDOH. Proposed locations of the indoor and ambient air samples are shown on **Figure 15**.

3.3.12 Site Management Plan and Environmental Easement

An EE would be recorded referencing ICs that are part of the selected remedy, which would be binding upon all subsequent owners and occupants of the property. The ICs would: 1) restrict the Site's use to restricted residential, commercial, and industrial uses, although land use is subject to local zoning laws; 2) restrict the use of groundwater as a source of potable or process water, unless it undergoes necessary water quality treatment as determined by the NYSDEC or NYSDOH; 3) require implementation of an

NYSDEC-approved SMP; 4) require the completion and submission to the NYSDEC of a periodic certification of ICs and ECs in accordance with Part 375; and 5) include notice-of-use restrictions of the Site's soil. The ECs for the Site would include the composite cover system (including concrete foundation) and SSDS. The SVE system would function as a temporary EC/remedial element requiring monitoring prior to decommissioning, with approval from NYSDEC and NYSDOH. The SVE would require ECs during the SVE operation for the Site.

The SMP would identify all use restrictions, ECs, and long-term monitoring and maintenance requirements to ensure the ICs and/or ECs remain in place and are effective. The SMP will include, but may not be limited to:

1. An IC and EC Plan that includes:
    a. Descriptions of the provisions of the ICs, including any land use and/or groundwater use restrictions;
    b. Provisions for the management and inspection of the identified ICs and ECs;
    c. Provisions to add the EE or deed restrictions;
    d. Maintaining Site access controls and NYSDEC notification;
    e. The steps necessary for the periodic reviews and certification of the ICs and/or ECs;
    f. An Excavation Work Plan which details the provisions for management of future excavations in areas of remaining contamination;
    g. Media-specific implementation plans, including, but not limited to, cap system management, installation/operation, etc.; and,
    h. The HASP and CAMP.
2. A monitoring plan to assess the performance and effectiveness of the remedy. The monitoring plan includes, but may not be limited to:
    a. Periodic monitoring of SVE and SSDS; and,
    b. A schedule of monitoring and frequency of submittals to the NYSDEC.
3. An Operation and Maintenance Plan as may be required by the EC Plan discussed above.

3.4 EVALUATION OF REMEDIAL ALTERNATIVES

The following is an evaluation of the proposed remedy based on the BCP remedy evaluation criteria listed below. The first two criteria are considered "threshold criteria," and the remaining criteria are "balancing criteria."

A remedial alternative must meet the threshold criteria to be considered and evaluated further under the balancing criteria:

1. Protection of human health and the environment
2. Compliance with SCG
3. Short-term effectiveness and impacts
4. Long-term effectiveness and permanence

5. Reduction of toxicity, mobility, or volume of contaminated material
6. Implementability
7. Cost-effectiveness
8. Community acceptance
9. Green and Sustainable Remediation (including climate resiliency)
10. Land use

3.4.1 Protection of Human Health and the Environment

All three alternatives will be protective to human health and the environment, with Alternative I (Track 1) being most protective by removing all source material and material exceeding UUSCOs. Alternative II would be the next most protective by removing all material exceeding RRSCOs and treating residual soil vapor contamination via an SVE and SSDS. Alternative III (Track 4) would be the least protective but would still remove soil impacted above RRSCOs in the top 2 ft of material at the Site and control soil vapor impacts via an SVE and active SSDS.

3.4.2 Compliance with Standards, Criteria, and Guidance

All three alternatives will be in compliance with applicable SCGs listed in Section 4.1 by removing Site sources of contamination to achieve the RAOs. While implementing either remedy, the protection of public health and the environment will be maintained by enforcing a Site-specific CHASP and CAMP. OSHA requirements for on-Site construction safety will be followed by Site contractors performing work.

3.4.3 Short-Term Effectiveness and Impacts

Alternative I would have greater short-term impacts due to the longevity of construction to excavation and achieve a Track 1 remedy. Increasing excavation increases the longevity of noise and construction activities. Additional materials, equipment, and machinery will be required for Alternative I in comparison to the other two alternatives due to the required depths of excavation.

Short-term construction activities of all three remedial alternatives include soil excavation, structure installation, and off-Site trucking. Remediation under all three remedial alternatives will involve ground-intrusive work that would potentially cause dust, odor, and VOC migration from the Site to off-Site receptors, as well as require off-Site trucking for contaminated soil disposal, resulting in automobile emissions to the environment. Under Alternative I, the excavated soil would require approximately 232 20-cu-yd truck trips for disposal. Under Alternative II, the excavated soil and fill would require approximately 67 20-cu-yd truck trips for disposal. Under Alternative III, the excavated soil would require approximately 19 20-cu-yd truck trips for disposal. Alternative I would require five to seven months of effort (assuming normal work hours). Alternative II would require four to six months of effort (assuming normal work hours). Alternative III would require three to five months of effort (assuming normal work hours). Therefore, the short-term impacts with respect to excavation for all three alternatives are very similar.

The most significant short-term adverse impacts and risks to the community for all three alternatives will be the potential complications and risks involved with designing and constructing the SOE and

underpinning for the building and structures adjoining the Site. Short-term construction activities of all three remedial alternatives include Site-wide soil excavation for development purposes. Alternative I would include excavation to the greatest depth of 25 ft bgs, resulting in a moderate increase in short-term adverse impacts from excavation.

Truck traffic will be routed on the most direct course using major thoroughfares where possible and appropriate (see Section 5.4.4 for a full discussion of truck routing), and flaggers will be used to protect pedestrians at Site entrances and exits. Waiting times associated with the analysis of confirmation sampling and resampling may delay construction, leaving soil exposed for a longer time, resulting in a potential increase in dust, odors, and/or organic vapor from the excavation and construction-related noise. The effects of these potential adverse impacts on the community, workers, and the environment will be minimized by implementing the respective control plans.

Under all three remedial alternatives, dust suppression efforts, such as slowing the pace of work, applying foam and/or dust suppressant, and/or covering portions of the excavation, will be used to mitigate odors/dust when required. Work will be modified or stopped according to the action levels defined in the CAMP.

3.4.4 Long-Term Effectiveness and Performance

Alternative I will remove contaminated soil from the Site that exceeds UUSCOs and soils with elevated VOCs, primarily the CVOC PCE in soil vapor. Alternative II will remove contaminated soil from 0 to 7 ft bgs that exceeds RRSCOs, along with hotspots to 9 and 15 ft bgs. Alternative III will remove contaminated soil from 0 to 2 ft bgs that exceeds RRSCOs. Alternatives I, II, and III will require post-remediation soil confirmation/documentation sampling to document soil quality and residual contamination below the Site. All alternatives will require a post-construction SVI Evaluation to evaluate the potential for vapor intrusion into the newly constructed building. For Alternatives II and III, ICs will be in place for long-term protection of human health and the environment. Long-term ECs will be in place for Alternative II and III for protection of human health and the environment, including ongoing maintenance of the SSDS. All alternatives are effective long term; however, Alternative I requires the least performance monitoring.

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

All three remedial alternatives would permanently and significantly reduce the toxicity, mobility, and volume of contamination through removal of contaminated fill and buried solid waste through excavation and off-Site disposal.

3.4.6 Implementability

Implementing a Track 1 remedy will require more effort due to the increased excavation and dewatering, which require additional personnel, equipment, and space for excavation rigs and equipment and material staging. If deeper contamination above UUSCOs is encountered, requiring unanticipated over-excavation, the implementability of Alternative I will become more challenging in comparison to the installation of ECs for Alternatives II and III due to the challenges and unknown conditions that may be encountered at greater depths.

Implementing the Track 2 and Track 4 remedies will require effort to install the SSDS, which will require equipment, qualified contractors, startup testing, and monitoring to confirm

All three Alternatives will be technically challenging because of SOE requirements associated with the protection of the neighboring buildings and streets; however, the SOE requirements will be comparable to those required for construction. All three remedies would consist primarily of excavation with standard bucket excavators. The availability of local contractors, personnel, and equipment suitable for working in a structurally challenging environment is high due to the frequency of this type of remediation in the region. The excavation and SOE are not expected to require schedule extensions or incur additional costs.

All three Alternatives are considered feasible.

3.4.7 Cost Effectiveness

Alternative I – Based on the assumptions detailed for Alternative I, the estimated remediation cost of a Track 1 cleanup is approximately $3,077,000. As the Site would reach a Track 1 cleanup level, there would not be costs incurred over the first five years post-remedy for maintenance, Site management, and monitoring activities upon the completion of remedial activities. **Table 3** details the individual cost components used to derive this cost estimate.

Alternative II – Based on the assumptions detailed for Alternative II, the estimated remediation cost of a Track 2 cleanup is approximately $2,912,000. As the Site will reach a Track 2 cleanup level, there would be some costs incurred related to post-remedy for maintenance, Site management, and monitoring activities upon the completion of remedial activities. **Table 4** details the individual cost components used to derive this cost estimate.

Alternative III – Based on the assumptions detailed for Alternative III, the estimated remediation cost of a Track 4 cleanup is approximately $2,494,000. **Table 5** details the individual cost components used to derive this cost estimate.

3.4.8 Community Acceptance

All three remedial alternatives should be acceptable to the community because the potential exposure pathways to on-Site contamination will be addressed upon completion of the respective remedies, and the Site will be remediated to allow for a higher-level use. The selected remedy will be subject to a 45-day public comment period in accordance with the Citizen Participation Plan (CPP), included as **Appendix F**. Substantive public comments will be addressed before the remedy is approved.

3.4.9 Green and Sustainable Remediation

An environmental footprint analysis was conducted for Alternative I (Track I remedy), Alternative II (Track 2 remedy), and Alternative III (Track 4 remedy). Alternative I would potentially export a greater volume (approximately 6,945 tons) of non-hazardous waste and construction debris off the Site to disposal facilities than Alternative II, a Track 2 remedy (approximately 2,005 tons), due to deeper excavations to remove soils exceeding UUSCOs and soils with elevated soil vapor, and Alternative III, a Track 4 remedy will potentially export the least volume at 555 tons. Additionally, Alternative I will result

in slightly more air emissions for the use of equipment for additional excavation and off-Site disposal to achieve the remedy than Alternatives II and III.

3.4.10 Land Use

The current, intended, and reasonably anticipated future residential land use of the Site and its surroundings is compatible with both remedial alternatives. The proposed development will include the construction of a residential building with a full cellar situated approximately 14 ft bgs. Low- to mid-rise residential and commercial use buildings are located at properties surrounding the Site.

3.5 SELECTION OF THE PREFERRED REMEDY

All Alternatives will be protective of human health and the environment and meet the remedy selection criteria. Alternative I is feasible but challenging due to the potential for extensive excavation to achieve a Track 1 remedy. Alternative II achieves the RAOs established for the project and is effective in the short and long term. Alternative II effectively reduces contaminant mobility, toxicity, and volume. The SOE requirements for all three Alternatives are comparable and have similar remedial costs; however, the potential for increased costs due to deeper excavation may increase the cost for Alternative I and Alternative II. Alternative II is preferred over Alternatives I and III, as it provides a similar protection to human health and the environment and is more defined in comparison to Alternative I and at a slightly reduced cost. Therefore, Alternative II is the recommended remedial alternative for this Site.

Figure 8 depicts the Alternative I cleanup plan; **Figure 9** depicts the Alternative II cleanup plan; and **Figure 10** depicts the Alternative III cleanup plan. The Alternative I, II, and III remediation extents are based on data presented in the RIR.

3.5.1 Zoning

The Site is located within an M1-5/R7-3 manufacturing and residential zoning district, characterized by low-rise commercial and residential, multi-family high-rise, and manufacturing buildings. The preferred remedy will support the proposed development that is under the current zoning.

3.5.2 Applicable Comprehensive Community Master Plans or Land Use Plans

While there are no applicable comprehensive community master plans or land use plans associated with the Long Island City, Queens neighborhood, where the Site is located, development trends include the promotion of housing preservation, encouragement of economic development, and creation of pedestrian-friendly streets. The proposed housing components and redevelopment plan are consistent with the reasonably anticipated development patterns of the area. A copy of the zoning map is included in **Appendix B**.

3.5.3 Surrounding Property Uses

The current, intended, and reasonably anticipated future land use of the Site and its surroundings is compatible with the selected remedy. The construction of a residential building conforms to recent development patterns in the area and current zoning.

3.5.4 Citizen Participation

All three remedial alternatives should be acceptable to the community because the potential exposure pathways to on-Site contamination will be addressed upon completion of the respective remedies, and the Site will be remediated to allow for a higher-level use. The selected remedy will be subject to a 45-day public comment period in accordance with the CPP, included as **Appendix F**. Substantive public comments will be addressed before the remedy is approved.

3.5.5 Environmental Justice Concerns

Per the "Potential Environmental Justice Areas in Queens County, New York," the Site is in a potential Environmental Justice area, identified as Census Block Group 15000US360810033001, with 13.73 percent of the population below the poverty level and a minority population of 58.46 percent. The NYSDEC's Office of Environmental Justice acts as an advocate on behalf of these areas, which are disproportionately affected by environmental burdens. The proposed remedy will best reduce the environmental burden on the surrounding area.

3.5.6 Land Use Designations

There are no federal or state land use designations.

3.5.7 Population Growth Patterns

The population growth patterns and projections support the current and anticipated future land use.

3.5.8 Accessibility to Existing Infrastructure

The Site is accessible via existing infrastructure.

3.5.9 Proximity To Cultural Resources

The Site is not in close proximity to a registered landmark.

3.5.10 Proximity to Natural Resources

The Site is not located in close proximity to important federal, state, or local natural resources, including waterways, wildlife refuges, wetlands, and critical habitats of endangered or threatened species.

3.5.11 Off-Site Groundwater Impacts

Municipal water supply wells are not present in this area of New York City; therefore, groundwater from the Site does not affect municipal water supply wells or recharge areas.

3.5.12 Proximity to Floodplains

The Site is not located in a floodplain.

3.5.13 Geography and Geology of the Site

The Site geology is described in Section 2.4 and will not pose greater challenges to the implementation of the preferred remedy than to the alternative.

3.5.14 Current Institutional Controls

There are currently no ICs being implemented at the Site.

3.6 SUMMARY OF THE SELECTED REMEDIAL ACTION

The selected Track 2 (Alternative II) remedy will include the following tasks:

1. Development and implementation of a CHASP and CAMP for the protection of on-Site workers, the community, residents, and the environment during remediation and construction activities.
2. Design and construction of a support-of-excavation (SOE) system to facilitate the Track 2 remediation.
3. Implementation of soil erosion, pollution, and sediment control measures in compliance with applicable laws and regulations.
4. Demolition of the warehouse building and removal of the existing concrete cover and miscellaneous debris on the Site.
5. Decommissioning of on-Site monitoring wells, as necessary, in accordance with NYSDEC Commissioner Policy (CP)-43: Groundwater Monitoring Well Decommissioning Policy.
6. Excavation, stockpiling, off-Site transport, and disposal of contaminated soil/fill material Site-wide that exceeds Restricted Residential Soil Cleanup Objectives (RRSCOs) as defined by 6 NYCRR Part 375-6.8. Site-wide excavation will extend to 7 ft bgs with hotspot excavations to at least 9 ft bgs centered on RI-SB-02, where PAHs exceeded RRSCOs to a depth of 8 ft bgs, 9 ft bgs centered on RI-SB-04, where mercury exceeded its RRSCO to a depth of 8 ft bgs, and 15 ft bgs centered on RI-SB-07, where metals exceeded RRSCOs to a depth of 14 ft bgs and. An estimated 1,342 cubic yards (cu yd) of soil/fill will be removed for Track 2 excavation.
7. Removal, decommissioning, and off-Site disposal of any unknown USTs, if encountered, and/or associated appurtenances (e.g., fill lines, vent lines, and electrical conduit) during redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.
8. Screening for indications of contamination (by visual means, odor, and monitoring with photoionization detectors [PIDs]) of excavated material during intrusive Site work.
9. Implementation of a preliminary waste characterization to facilitate off-Site disposal of excavated soil/fill.
10. Appropriate off-Site disposal of material removed from the Site in accordance with federal, state, and local rules and regulations for handling, transport, and disposal.
11. Backfilling of excavated areas, as necessary for development, with certified-clean material (i.e., meeting UUSCOs), recycled concrete aggregate (RCA), and/or virgin, native crushed stone.

12. Collection and analysis of Side-wide excavation confirmation soil samples and hotspot post - excavation confirmation soil samples from the excavation base and sidewalls of the hotspot excavation area, in accordance with DER-10, to document post-excavation conditions to confirm a Track 2 remedy was achieved. If the proposed confirmation endpoint sample exceeds the Track 2 RRSCOs, over-excavation and resampling may be performed, as necessary, to meet Track 2 standards.
13. Installation of a Soil Vapor Extraction (SVE) system to address elevated CVOCs in soil vapor from the proposed cellar development depth of 14 ft bgs to 24 ft bgs, terminating slightly above the observed groundwater depth, in the central portion of the Site beneath the building footprint and an active SSDS beneath the building footprint.
14. Operation of an active sub-slab depressurization system (SSDS) as an engineering control in the building. The active SSDS will consist of a horizontal perforated polyvinyl chloride (PVC) pipeline within a permeable layer immediately beneath the building foundation slab and a vapor barrier system connecting to steel risers penetrating through the building to the roof. A blower fan will be installed on the roof and connected to the SSDS piping.
15. Completion of post-mitigation sampling conducted concurrently with performance testing of the active SSDS and no sooner than 30 days after installation Details of the SSDS operation, maintenance, and monitoring will be provided in the Site Management Plan (SMP).
16. Establishment of use restrictions including prohibitions on the use of groundwater from the Site and prohibitions on sensitive Site uses, such as farming or vegetable gardening in residual Site soil, to significantly reduce the potential for future exposure pathways.
17. Recording of an Environmental Easement (EE), including ICs, to prevent future exposure to any residual contamination remaining at the Site;
18. Publication of a Site Management Plan (SMP) for long-term management of residual contamination as required by the EE, including plans for: (1) ICs and ECs, (2) monitoring, (3) operation and maintenance, and (4) reporting;
19. All responsibilities associated with the RA, including permitting requirements will be addressed in accordance with all applicable federal, state, and local rules and regulations.

Remedial activities will be performed in accordance with this RAWP and the NYSDEC-issued Decision Document under the oversight of a New York State-licensed Professional Engineer. Deviations from the RAWP and/or Decision Document will be promptly reported to the NYSDEC for approval and explained in the FER.

Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and Site management of the remedy per DER-31. The major green remediation components are as follows:

1. Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
2. Reducing direct and indirect greenhouse gases and other emissions;
3. Increasing energy efficiency and minimizing the use of non-renewable energy;
4. Conserving and efficiently managing resources and materials;

5. Reducing waste, increasing recycling, and increasing reuse of materials which would otherwise be considered waste;
6. Maximizing habitat value and creating habitat when possible;
7. Fostering green and healthy communities and working landscapes which balance ecological, economic, and social goals; and,
8. Integrating the remedy with the end use where possible and encouraging green and sustainable redevelopment.

As part of the Remedial Design program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis was completed and is included in **Appendix G**. The environmental footprint analysis was completed using USEPA's Spreadsheets for Environmental Footprint Analysis (SEFA), which is an NYSDEC-accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction, and material use were estimated for both alternatives. 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, are incorporated into the Remedial Design program, as appropriate. The project design specifications 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 the implementation of the RA and reported in the FER, including a comparison to the goals established during the Remedial Design program.

Additionally, the Remedial Design program includes 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 Design program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities. Climate change is not expected to have a significant impact on the remedial system.

4. Remedial Action Program

4.1 GOVERNING DOCUMENTS

The primary documents governing the RA are summarized in this section.

4.1.1 Standards, Criteria, and Guidance

- 6 NYCRR Part 364 – Waste Transporter Permits
- 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 Subpart 373-4 – Facility Standards for the Collection of Household Hazardous Waste and Hazardous Waste from Conditionally Exempt Small Quantity Generators
- 6 NYCRR Subpart 374-1 – Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
- 6 NYCRR Subpart 374-3 – Standards for Universal Waste
- 6 NYCRR Part 375 – Environmental Remediation Programs
- 6 NYCRR Part 376 – Land Disposal Restrictions
- 6 NYCRR Part 750 – State Pollution Discharge Elimination System (SPDES) Permits
- Code of Federal Regulations (CFR) Title 29 Part 1910.120 – HAZWOPER
- CFR Title 29 Part 1926 – Safety and Health Regulations for Construction
- CP-43 – Commissioners Policy on Groundwater Monitoring Well Decommissioning (December 2009)
- CP-51 – Soil Cleanup Guidance (2010)
- DER-10 – Technical Guidance for Site Investigation and Remediation (May 3, 2010)
- DER-23 – Citizen Participation Handbook for Remedial Programs (March 2010)
- DER-31 – Green Remediation (2011)
- NYSDEC Spill Response Guidance Manual
- NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances Under NYSDEC's Part 375 Remedial Programs (April 2023)
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006)
- Screening and Assessment of Contaminated Sediment (Division of Fish, Wildlife and Marine Resources, June 2014)
- TOGS 1.1.1 – Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations

4.1.2 Site-Specific Construction Health & Safety Plan

A site-specific CHASP has been prepared (**Appendix D**). The CHASP will apply to remedial and construction-related work on the Site. The CHASP provides a mechanism for establishing on-Site safe working conditions, safety organization, procedures, and PPE requirements during the implementation of the remedy. The CHASP meets the requirements of 29 CFR §1910 and 29 CFR §1926 (which includes 29 CFR §1910.120 and 29 CFR §1926.65, respectively). The CHASP includes, but is not limited to, the following components:

- Organization and identification of key personnel;
- Training requirements;
- Medical surveillance requirements;
- List of Site hazards;
- Excavation safety;
- Drill rig safety;
- Work zone descriptions and monitoring procedures;
- Personal safety equipment and PPE requirements;
- Decontamination requirements;
- Standard operating procedures;
- Contingency plan;
- CAMP; and
- Safety data sheets (SDS).

The Requestor and associated parties preparing the remedial documents submitted to the state of New York, and those performing the construction work, are completely responsible for the preparation of an appropriate CHASP and for the performance of the work according to the CHASP and applicable laws. The CHASP and requirements defined in this RAWP pertain to all remedial and ground-intrusive work performed at the Site until the issuance of a Certificate of Completion. The Haley & Aldrich of New York Safety Coordinator will be Brian Ferguson; project personnel resumes are provided in the Quality Assurance Project Plan (QAPP), which is attached as **Appendix H**. If required, confined space entry will comply with OSHA requirements to address the potential risk posed by combustible and toxic gases. All remedial work performed under this plan will be in full compliance with governmental requirements, including Site and worker safety requirements mandated federally by OSHA. Confined space entry will comply with all OSHA requirements to address the potential risk posed by combustible and toxic gases.

4.1.3 Quality Assurance Project Plan

A QAPP has been prepared that describes the QC components that will ensure that the proposed remedy accomplishes the remedial goals and RAOs and is completed in accordance with the design specifications. The QAPP is provided as **Appendix H** and includes:

- Responsibilities of key personnel and their organizations for the proposed remedy;

- Qualifications of the QA Officer;
- Sampling requirements, including methodologies, quantity, volume, locations, frequency, and acceptance and rejection criteria; and
- Description of the reporting requirements for QA activities, including weekly QA review reports.

4.1.4 Construction Quality Assurance Plan

A Construction Quality Assurance Plan (CQAP) has been prepared that describes the QC components that will ensure that the proposed remedy accomplishes the remedial goals and RAOs and is completed in accordance with the design specifications. Because the remedy will be accomplished concurrently with building construction, the Contractor and Construction Manager will have the primary responsibility to provide construction QC. A list of engineering personnel involved in the implementation of the CQAP and the procedures that will be carried out by the remedial engineering team are listed in Section 4.2.1. Project personnel resumes are provided in the QAPP, which is attached as **Appendix H**.

4.1.5 Soil/Materials Management Plan

An S/MMP has been prepared that includes detailed plans for managing soils/materials that are disturbed at the Site, including excavation, handling, storage, transport, and disposal. The S/MMP also includes controls that will be applied to these efforts to facilitate effective, nuisance-free performance in compliance with applicable federal, state, and local laws and regulations (see Section 5.4).

4.1.6 Stormwater Pollution Prevention Plan

Erosion and sediment controls will be implemented as necessary in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control. Best management practices for soil erosion and sediment control will be selected to minimize erosion and sedimentation off the Site from the outset of remediation to the completion of development. Stormwater pollution prevention will be implemented as described below in Section 5.4.10. A Stormwater Pollution Prevention Plan (SWPPP) is not necessary because the project will disturb less than 1 acre, and stormwater discharge will be to a combined sewer in accordance with the New York City generic SPDES permit.

4.1.7 Community Air Monitoring Program

Details of the CAMP are discussed in Section 5.4.12.

4.1.8 Contractors' Site Operations Plan

The Remedial Engineer (RE) has reviewed all plans and submittals for this remedial project (including those listed above and contractor and subcontractor document submittals) and confirms that they comply with this RAWP. The RE is responsible for ensuring that all later document submittals for this remedial project, including contractor and subcontractor document submittals, comply with this RAWP. All remedial documents will be submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work associated with the RA.

4.1.9 Citizen Participation Plan

Document repositories were established at the following locations and contain the applicable project documents:

1. Queens Public Library – Hunters Point Branch
   Attn: Euni (Eun Young) Abalmasov, Managing Librarian
   47-40 Center Blvd.
   Long Island City, NY 11109
   Phone: 718.707.9944
   Email: Eunyoung.Abalmasov@queenslibrary.org
   Hours: Monday – 9 a.m. to 8 p.m.
   Tuesday – 1 p.m. to 6 p.m.
   Wednesday – 10 a.m. to 6 p.m.
   Thursday – 12 p.m. to 8 p.m.
   Friday – 10 a.m. to 6 p.m.
   Saturday – Closed
   Sunday – 12 p.m. to 5 p.m.

2. Queens Public Library – Long Island City Branch
   Attn: Abigail Goldberg, Managing Librarian
   37-44 21 Street
   Long Island City, New York 11101
   Phone: 718.752.3700
   Email: Abigail.goldberg@queenslibrary.org
   Hours: Monday – 10 a.m. to 6 p.m.
   Tuesday – 1 p.m. to 6 p.m.
   Wednesday – 10 a.m. to 6 p.m.
   Thursday – 12 p.m. to 8 p.m.
   Friday – 10 a.m. to 6 p.m.
   Saturday – 10 a.m. to 5 p.m.
   Sunday – Closed

3. Queens Community Board 1
   Attn: Florence Kouloris, District Manager
   45-02 Ditmars Boulevard, LL Suite 1025
   Astoria, New York 11105
   Phone: 718.626.1024
   Email: Qn01@cb.nyc.gov
   Hours: Monday – 9 a.m. to 5 p.m.
   Tuesday – 9 a.m. to 5 p.m.
   Wednesday – 9 a.m. to 5 p.m.
   Thursday – 9 a.m. to 5 p.m.
   Friday – 9 a.m. to 5 p.m.
   Saturday – Closed
   Sunday – Closed

4. NYSDEC
   Central Office
   625 Broadway, 12th Floor
   Albany, New York 12233-7016
   Hours: Monday to Friday – 9 a.m. to 5 p.m.

In addition, an electronic repository can be accessed via DECInfo Locator at the following link: https://extapps.dec.ny.gov/data/DecDocs/C241300/

A certification of mailing will be sent by the Requestor to the NYSDEC Case 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 (contact list); and (5) a statement that the repository was inspected on (date to be determined) and that it contained all of applicable project documents.

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

4.2 GENERAL REMEDIAL CONSTRUCTION INFORMATION

4.2.1 Project Organization

A project team for the Site was created based on qualifications and experience with personnel suited for the successful completion of the project.

The following project personnel are anticipated for oversight of the RAWP implementation. Project personnel resumes are provided in the QAPP, which is attached as **Appendix H**.

NYSDEC Case Manager	Shawn Roberts
NYSDOH Case Manager	Christopher Budd
RE	Zhan Shu, P.E., Ph.D.
Principal	James M. Bellew
Project Manager/Qualified Environmental Professional (QEP)	Luke J. McCartney, P.G.
Haley & Aldrich of New York Health & Safety Director	Brian Fitzpatrick, CHMM
Health & Safety Officer	Brian Ferguson
Field Team Leader/QA Officer	Owen Hennigan

Haley & Aldrich of New York personnel, under the direct supervision of the QEP and the RE, will be on Site during the implementation of the RAWP to monitor particulates and organic vapors in accordance with the CAMP. CAMP results that exceed specified action levels will be reported to the NYSDEC and NYSDOH.

Haley & Aldrich of New York personnel will meet with the Construction Superintendent daily to discuss the plans for that day and schedule upcoming activities. Field personnel will document remedial activities. Field activities will be forwarded to the Field Team Leader and Project Manager daily and to

the QEP and the RE weekly. Daily reports will also be submitted to the NYSDEC and NYSDOH Case Managers by noon the following business day.

Field personnel will screen excavations with a PID during ground-intrusive work. PID readings, including specifically elevated readings, will be recorded in the project field book (or on separate logs) and reported to the NYSDEC and NYSDOH. Field personnel under the direct supervision of the RE and QEP will collect endpoint samples from the base and sidewalls of the excavation in accordance with this RAWP.

Field observations and laboratory tests will be recorded in the project field book or on separate logs. Recorded field observations may take the form of notes, charts, sketches, and/or photographs. A photo log will be kept to document construction activities during remediation.

The Field Team Leader will maintain original field paperwork during performance of the remedy. Remedial activities will be documented in the monthly BCP progress reports. The Project Manager will maintain the field paperwork after completion and will maintain submittal document files.

4.2.2 Resident Engineer

The RE for this project will be Zhan Shu, P.E., Ph.D. The RE is a registered Professional Engineer licensed by the state of New York. The RE will have primary direct responsibility for the implementation of the remedial program at the Site. The RE will certify in the FER that the remedial activities were observed by the QEP under their supervision and that the remediation requirements set forth in this RAWP and other relevant provisions of ECL 27-1419 have been achieved in substantial conformance with the RAWP.

Under the direction of the RE, the work of other contractors and subcontractors involved in aspects of the remedial construction will be documented, including soil excavation, stockpiling, confirmation sample collection, air monitoring, emergency spill response services, import of backfill, and management of waste transport and disposal. The RE will be responsible for all appropriate communications with NYSDEC and NYSDOH.

The RE will review the pre-remedial plans submitted by contractors and subcontractors for substantial conformance with this RAWP and will provide a certification in the FER. The RE will provide the certifications listed below in Section 9.1.

4.2.3 Remedial Action Construction Schedule

The RA construction schedule is discussed below in Section 10 and included in **Appendix I**. The NYSDEC will be promptly notified of proposed changes, delays, and/or deviations to the schedule.

4.2.4 Work Hours

The hours for operation of remedial construction will conform to the NYCDOB Code requirements or be in accordance with specific variances issued by that agency. The NYSDEC will be notified by the Requestor of any variances issued by the NYCDOB. The NYSDEC reserves the right to deny alternate remedial construction hours.

4.2.5 Site Security

Site access will be controlled by gate entrances to the property. The Site perimeter will be secured with gated and signed plywood fencing with restricted points of entry in accordance with the NYCDOB and New York City Department of Transportation (NYCDOT) permits and requirements. The purpose of the fencing is to limit Site access to authorized personnel, protect pedestrians from Site activities, and maintain Site security.

4.2.6 Traffic Control

Site traffic will be controlled through designated points of access along 41st Avenue. Access points will be continuously monitored, and if necessary, a flagging system will be used to protect workers, pedestrians, and authorized guests. Traffic will also be required to adhere to applicable local, state, and federal laws.

4.2.7 Contingency Plan

Contingency plans, as described below, have been developed to effectively deal with the potential unexpected discovery of additional contaminated media or USTs.

4.2.8 Worker Training and Monitoring

Worker training and monitoring will be conducted in accordance with the Site-specific CHASP.

4.2.9 Agency Approvals

Permits or government approvals required for remedial construction have been or will be obtained prior to the start of remedial construction.

4.2.10 NYSDEC BCP Signage

Signs are optional for BCP sites and will be discussed with the NYSDEC Case Manager. If a sign is to be displayed, it will follow NYSDEC specifications for design and content. The NYSDEC Case Manager will provide details on signage protocol as necessary.

4.2.11 Pre-Construction Meeting with the NYSDEC

Prior to the start of remedial construction, a meeting will be held among the NYSDEC, the RE, the Requestor, the Construction Manager, and the Remediation Contractor to discuss project roles, responsibilities, and expectations associated with this RAWP.

4.2.12 Emergency Contact Information

An emergency contact sheet that states the specific project contacts (with names and phone numbers) for use by NYSDEC and NYSDOH in the case of an emergency is included in the CHASP.

4.2.13 Remedial Action Costs

Detailed summaries of the total estimated costs of the Track 1, Track 2, and Track 4 remedies are included in Tables 2, 3, and 4, respectively.

4.3 SITE PREPARATION

4.3.1 Mobilization

Prior to commencing remedial construction, the Remediation Contractor will mobilize to the Site and prepare for remedial activities.

Mobilization and Site preparation activities may include the following:

- Identifying the location of aboveground and underground utilities (e.g., power, gas, water, sewer, and telephone), equipment, and structures as necessary to implement the remediation;
- Mobilizing necessary remediation personnel, equipment, and materials to the Site;
- Constructing one or more stabilized construction entrance(s) consisting of non-hazardous material at or near the Site exit, which takes into consideration the Site setting and Site perimeter;
- Constructing an equipment decontamination pad for trucks, equipment, and personnel that come into contact with impacted materials during remediation; and/or
- Marking out of hotspot areas (as identified during the RI or preliminary waste characterization sampling event).

4.3.2 Monitoring Well Decommissioning

Monitoring wells will be decommissioned in accordance with NYSDEC CP-43 by an experienced driller with oversight from Haley & Aldrich of New York. Decommissioning documentation will be provided in the FER.

4.3.3 Erosion and Sedimentation Controls

Since the planned earthwork activities will be below the adjacent sidewalk grade, full-time erosion and sedimentation measures are not anticipated. Best management practices for soil erosion will be implemented to minimize erosion and sedimentation off Site.

4.3.4 Temporarily Stabilized Construction Entrance(s)

Temporary stabilized construction entrances will be installed along 41st Avenue. The entrance(s) will be covered with NYSDEC-approved gravel or RCA and graded so that runoff water will be directed on the Site. Vehicles exiting construction areas will be cleaned using clean water or dry brushing, as needed, to remove Site soil from the tires and undercarriages. The Contractor will protect and maintain the existing sidewalks and roadways at both Site access points.

4.3.5 Utility Marker and Easement Layouts

The Requestor and its Contractors are solely responsible for the identification of utilities and/or easements that might be affected by work under this RAWP and implementation of the required, appropriate, or necessary health and safety measures during the performance of the work under this RAWP. The Requestor and its Contractors are solely responsible for the safe execution of the work performed under this RAWP. The Requestor and its Contractors must obtain the necessary local, state, and/or federal permits or approvals that may be required to perform the work detailed in this RAWP. Approval of this RAWP by the NYSDEC does not constitute satisfaction of these requirements.

The presence of utilities and easements on the Site has been investigated by the RE. 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.

4.3.6 Excavation Support

Appropriate management of the structural stability of on-Site or off-Site structures during Site activities is the sole responsibility of the Requestor and its Contractors. The Requestor and its Contractors are solely responsible for the safe execution of the work performed under this RAWP. The Requestor and its Contractors must obtain the necessary local, state, and/or federal permits or approvals that may be required to perform the work detailed in this RAWP. Additionally, the Requestor and its Contractors are solely responsible for the implementation of the required, appropriate, and necessary health and safety measures during the performance of work conducted under this RAWP.

4.3.7 Equipment and Material Staging

The Contractor will notify the RE and the Requestor in writing, with receipt confirmed at least 30 calendar days in advance of pending Site work mobilization. During mobilization, construction equipment will be delivered to the Site, temporary facilities constructed, and temporary utilities installed. The Contractor will place and maintain temporary toilet facilities within the work areas for use by Site personnel.

4.3.8 Truck-Inspection/Decontamination Station

An outbound-truck inspection station will be set up at or near the Site exit and sloped towards the interior of the Site. Before exiting the Site, trucks will be required to stop at the truck inspection station and will be examined for evidence of contaminated soil on the undercarriage, body, and wheels. If observed, soil and debris will be removed. Brooms, shovels, and potable water will be utilized for the removal of soil from vehicles and equipment, as necessary. The Contractor is responsible for collecting soil that is tracked immediately off the Site and returning the soil to the Site.

4.3.9 Site Fencing

The Site will be secured with a gated fence with appropriate signage maintained by the Contractor. The fence will limit access to authorized personnel and protect pedestrians from Site activities.

4.3.10 Demobilization

After remediation and construction are completed, the Contractor will be responsible for demobilizing equipment and materials not designated for off-Site disposal. The RE's representative will document that the Contractor performs follow-up coordination and maintenance for the following activities:

- Removal of sediment and erosion control measures and disposal of materials in accordance with applicable rules and regulations;
- Equipment decontamination;
- Refuse disposal; and
- Removal of remaining contaminated material or waste.

4.4 REPORTING

Periodic reports and an FER will be required to document the RA. The RE, Zhan Shu, will be responsible for certifying the FER and is licensed to practice engineering in the state of New York. Should Ms. Shu become unable to fulfill this responsibility, another suitably qualified New York State Professional Engineer will take her place. Field reports will be included as appendices to the FER. In addition to the periodic reports and the FER, copies of the relevant Contractor documents will be submitted to the NYSDEC.

4.4.1 Daily Reports

Reports providing a summary of activities for each day of active remedial work will be emailed to the NYSDEC and NYSDOH Case Managers by noon on the following business day. These reports will include:

- The project number, statement of activities, an update of the progress made, locations of excavation, and other remedial work performed;
- Quantities of material imported and exported from the Site;
- Status of on-Site soil/fill stockpiles;
- A summary of citizen complaints, including relevant details (i.e., name, phone number, basis of complaint, and actions taken);
- A summary of CAMP results, noting exceedances; and
- Photographs of notable Site conditions and activities.

Reports are not intended to be the primary mode of communication for notifying NYSDEC of emergencies, requests for changes to the RAWP, or time-critical information. However, if these conditions occur, information will be included in the daily reports. Emergency conditions and changes to the RAWP will be directly communicated to the NYSDEC Case Manager.

Daily reports will include a description of daily activities with a Site Map that identifies work areas. These reports will include a summary of air sampling results, odor and dust problems and corrective actions, and all complaints received from the public. The NYSDEC-assigned project number will appear on all reports.

4.4.2 Monthly Reports

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

- Investigative or remedial actions relative to the Site during the reporting period;
- Actions relative to the Site anticipated for the next reporting period;
- Approved changes of work scope or schedule, if applicable;
- Results of sampling or testing;
- Deliverables submitted during the reporting period;
- The approximate percentage of completion of the project at the Site;
- Unresolved delays encountered that may affect the schedule;
- CPP activities during this reporting period and activities anticipated in support of the CPP for the next reporting period; and
- All daily reports submitted to NYSDEC during the reporting period.

4.4.3 Other Reporting

Photographs of the remedial activities will be taken and included in the daily reports and FER with descriptions of the representative photographs.

Progress with respect to green and sustainable remediation metrics will be tracked during the implementation of the RA and reported in the FER, including a comparison to the analyses provided in this RAWP. The climate screening process and results will be documented in the form of a completed checklist and brief letter report. A completed climate screening checklist for the remediation phase is provided in **Appendix G**. An updated checklist will be included in the FER to document the post-remediation status of the Site.

4.4.4 Complaint Management Plan

Complaints from the public regarding nuisance or other Site conditions will be addressed by notifying the NYSDEC of the complaint and investigating the cause/source of the issue. Records will be maintained regarding the date and time of the complaint, the nature of the complaint, the type of communication (i.e., telephone, email, letter, etc.), and the name and contact information of the complaint provider. Corrective measures will then be formulated and put into place to address the complaint as soon as possible. The resolution will be documented and submitted to the NYSDEC. A representative of the Requestor will reply within two weeks of receipt to the complaint provider to ensure resolution.

4.4.5 Deviations from the RAWP

Deviations from the RAWP will be communicated to and coordinated with the NYSDEC in advance. Notification will be provided to the NYSDEC by telephone and email for conditions requiring immediate action (e.g., conditions judged to be a danger to the surrounding community). Based on the significance of the deviation, an addendum to this RAWP may be necessary and will include:

- Reasons for deviating from the approved RAWP;
- Approval process to be followed for changes/editions to the RAWP; and
- Effect of the deviations on the overall remedy.

5. Remedial Action: Material Removal From Site

Remediation will include the following material removal:

- Excavation, stockpiling, off-Site transport, and disposal of contaminated soil/fill material that exceeds RRSCOs, as defined by 6 NYCRR Part 375-6.8. Site-wide excavation will extend to approximately 7 ft bgs, with hotspot excavations extending to approximately 9 ft bgs centered on RI-SB-02 and RI-SB-04 and 14 ft bgs centered on RI-SB-07 to address elevated metals and PAHs in deeper soil. Approximately 1,342 cu yd of soil/fill will be removed as part of this Track 2 remedial excavation.

5.1 SOIL CLEANUP OBJECTIVES

The SCOs for this Site are listed in **Table 2**.

Soil and materials management on Site and off Site will be conducted in accordance with the S/MMP as described below.

A spider map that shows all soil samples that exceed the SCOs proposed for this RA is shown in Figures 4 through 6. UST closures (if necessary) will, at a minimum, conform to criteria defined in DER-10.

5.2 REMEDIAL PERFORMANCE EVALUATION (CONFIRMATION SAMPLING)

5.2.1 Soil Sampling Frequency

One confirmation soil sample will be collected for every 900 sq ft of excavation base Site-wide, in accordance with NYSDEC DER-10, or at an alternative frequency approved by NYSDEC. Based on the area of the Site, six endpoint samples will be collected. Endpoint samples will be collected to confirm that RRSCOs have been achieved. Confirmation soil samples will also be collected from the bottom and four sidewalls of the hotspot excavations surrounding RI-SB-02 and RI-SB-07 to confirm that RRSCOs have been achieved. The proposed endpoint sample locations are shown on **Figure 12**.

5.2.2 Methodology

Confirmation and documentation soil samples will be collected from the base of the remedial excavations in accordance with NYSDEC DER-10 to document remedial performance and will be analyzed for the Part 375 list of VOCs, SVOCs, pesticides, metals, PCBs, PFAS, and 1,4-dioxane. The post excavation hot spot confirmation soil samples from the base and sidewalls of the hotspot excavations (i.e. RI-SB-02, RI-SB-04, and RI-SB-07) will be analyzed for the Part 375 list of VOCs, SVOCs, pesticides, metals, PCBs, PFAS, and 1,4-dioxane.

Samples will be collected into laboratory-provided bottle ware. VOCs will be collected into Terra Cores® or Encores®. Samples will be transported under chain of custody protocol to an Environmental Laboratory Accreditation Program (ELAP)-certified laboratory. Should additional soil samples be deemed necessary (e.g., additional tank closure, an unknown environmental condition through visual evidence of a remaining source, or over-excavation of a failed confirmation sample), confirmation sampling will be conducted in accordance with NYSDEC DER-10.

5.2.3 Reporting of Results

Analytical laboratories that analyze confirmation soil samples, prepare results, and perform contingency sampling will be NYSDOH ELAP-certified.

5.2.4 QA/QC

QC procedures for confirmation soil sampling are included in the QAPP (refer to **Appendix H**). Confirmation analytical results will be provided in the NYSDEC's electronic data deliverable (EDD) format for EQuIS™. Guidance on the sampling frequency is presented in NYSDEC DER-10 Section 5.4.

The QA/QC procedures required by the NYSDEC Analytical Services Protocol (ASP) and SW-846 methods will be followed, including instrument calibration, standard compound spikes, surrogate compound spikes, and analysis of QC samples. The laboratory will provide sample bottles, which will be pre-cleaned and preserved. Where there are differences in the SW-846 and NYSDEC ASP requirements, the NYSDEC ASP will take precedence.

5.2.5 Data Usability Summary Reports and Electronic Data Deliverables

ASP Category B deliverables will be prepared for remedial performance samples collected during the implementation of this RAWP. Data Usability Summary Reports (DUSRs) will be prepared by a qualified data validator, and the findings will be reported in the FER. EDDs will be prepared based on validated data in the NYSDEC format and submitted to NYSDEC via zipfile.

5.2.6 Reporting of Endpoint Data in FER

Analytical laboratories used for all confirmation/documentation sample results and contingency sampling will be NYSDOH ELAP-certified. Sampling will be performed in accordance with DER-10 sample frequency requirements. Sidewall samples will be collected surrounding hotspots and, if necessary, at a minimum of every 30 linear ft. Bottom samples will be collected at a rate of one for every 900 sq ft from the base of the remedial excavation. The FER will provide a tabular and map summary of all sample results and exceedances of SCOs.

5.3 ESTIMATED MATERIAL REMOVAL QUANTITIES

A summary of anticipated material types to be excavated and disposed of off Site is provided below:

1. Remedial excavation, stockpiling, off-Site transport, and disposal of up to approximately 1,342 cu yd of contaminated fill/material that exceeds RRSCOs as defined by 6 NYCRR Part 375-6.8.

5.4 SOIL/MATERIALS MANAGEMENT PLAN

This section presents the approach to management, disposal, and reuse of soil, fill, and materials excavated from the Site. This plan is based on the current knowledge of Site conditions and will be altered as necessary. Field personnel, under the direction of the RE, will monitor and document the handling and transport of material removed from the Site for disposal as a regulated solid waste. Field personnel, under the direction of the RE, will assist the Remediation Contractor in identifying impacted

materials during remediation, determining materials suitable for direct load-out versus temporary on-Site stockpiling, selection of samples for waste characterization, if necessary, and determining the proper off-Site disposal facility. Separate stockpile areas will be constructed as needed for the various materials to be excavated or generated to avoid commingling impacted with non-impacted soil.

5.4.1 Soil Screening Methods

Visual, olfactory, and instrumental soil screening and assessment will be performed during remediation and development-related ground-intrusive activities into known or potentially contaminated material. Soil screening will be performed regardless of when the invasive work is performed and will include excavation and invasive work performed during the remedy and development, such as excavations for foundations and utility work.

All primary contaminant sources (including but not limited to tanks and hotspots) identified during Site Characterization, the RI, and RA will be surveyed by a surveyor licensed to practice in the state of New York. This information will be provided on maps in the FER. Screening will be overseen by the QEP. Resumes are provided in the QAPP (**Appendix H**) for personnel responsible for field screening (i.e., those representing the RE) of invasive work for unknown contaminant sources during remediation and development work.

5.4.2 Stockpile Methods

Stockpiles will be used as necessary to separate and stage excavated material pending loading or characterization sampling. Separate stockpile areas will be constructed to avoid commingling materials and will be sloped inwards to prevent migration of contaminants across the Site. Stockpile areas will meet the following minimum requirements:

- Excavated soil will be placed onto a minimum thickness of 6-mil low-permeability liner of sufficient strength and thickness to prevent puncture during use; separate stockpiles will be created where material types are different. The use of multiple layers of thinner liners is permissible.
- Efforts will be made to place and remove the soil to minimize the potential to jeopardize the integrity of the liner.
- Stockpiles will be covered at the designated times (see below) with minimum 6-mil plastic sheeting or tarps, which will be securely anchored to the ground. Stockpiles will be routinely inspected, and damaged tarp covers will be promptly replaced.
- Stockpiles will be inspected at a minimum of once daily and after every storm event.
- Stockpiles will be covered upon reaching their capacity (approximately 1,000 cu yd) until ready for loading. Stockpiles that have not reached their capacity will be covered at the end of each workday.
- Long-term stockpiles will be encircled with silt fences and hay bales, as needed, to contain and filter particulates from rainwater that has drained off the soils and to mitigate the potential for surface water runoff.

- If hazardous material is encountered, stockpiling on the Site will be avoided to the extent possible, in favor of live-loading into trucks permitted to transport hazardous waste.
- Water will be available on the Site at a suitable supply and pressure for use in dust control.

5.4.3 Materials Excavation and Load Out

Field personnel, under the supervision of the RE, will monitor all ground-intrusive work and the excavation and load-out of excavated material.

The Requestor and its Contractors are solely responsible for the safe performance of all invasive and other work performed under this RAWP.

The presence of utilities and easements on the Site has been investigated by the RE. 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.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate federal, state, local, and New York State Department of Transportation (NYSDOT) requirements (and all other applicable transportation requirements).

A truck wash will be operated on the Site. The RE will be responsible for ensuring that all outbound trucks are washed at the truck wash 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 RE 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 Requestor and its Contractors are completely responsible for the safe performance of all invasive work, the structural integrity of excavations, and for structures that may be affected by excavations (such as building foundations and bridge footings).

The Requestors and associated parties will ensure that Site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this RAWP. Development-related grading cuts and fills will not interfere with, or otherwise impair or compromise, the performance of remediation required by this RAWP. Mechanical processing of historical fill and contaminated soil on the Site is prohibited unless otherwise approved by NYSDEC.

Each hotspot and structure to be remediated will be removed, and remedial performance sampling will be completed before excavations related to Site development commence proximal to the hotspot or structure.

5.4.4 Materials Transport Off-Site

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 will be properly placarded. Trucks heading to disposal facilities will travel east on 41st Avenue, proceed south on 29th Street, and south on Jackson Avenue towards the Queens Midtown Tunnel. Once in Manhattan, trucks will head west on 34th Street and proceed into the Lincoln Tunnel towards other major highways (or other NYSDEC-approved routes). Truck routes are shown on **Figure 13**.

Loaded trucks will exit in the vicinity of the Site using approved truck routes. These routes are the most appropriate to and from the Site, and consider the following:

- Limiting transport through residential areas and past sensitive sites;
- Use of City-mapped truck routes;
- Prohibiting off-Site queuing of trucks entering the facility;
- Limiting total distance to major highways;
- Promoting safety in access to highways;
- Overall safety in transport; and
- Community input (where necessary).

Trucks will be prohibited from excessive stopping and idling in the neighborhood outside of the Site. Material transported by trucks exiting the Site will be secured with tight-fitting, opaque covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid or hazardous metals-impacted material, truck liners will be used. Trucks will be washed as necessary prior to leaving the Site. Truck wash waters will be collected and disposed of off Site in an appropriate manner.

5.4.5 Materials Disposal Off-Site

Disposal location(s) will be established at a later date and will be reported to the NYSDEC Case Manager. About 1,342 cu yd of historic fill and solid waste that exceeds RRSCOs will be excavated and disposed, and an additional approximately 1,253 cu yd of historic fill and soil will be removed as part of redevelopment to 14 ft bgs, totaling approximately 2,595 cu yd of historical fill and soil.

All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed of in accordance with all local, state (including 6 NYCRR 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 Case Manager. Unregulated off-Site management of materials from this Site is prohibited without formal NYSDEC approval.

Excavated material that does not meet UUSCOs, such as non-hazardous historical fill material, contaminated soil, and hazardous lead-impacted material, is prohibited from being taken to a New York State recycling facility (6 NYCRR Part 360.15 Registration Facility).

If hazardous soil is identified, it will be managed in accordance with applicable federal, state, and local regulations. As such, the handling, transport, and disposal of hazardous fill material is subject to USEPA and OSHA HAZWOPER regulations. The presence of hazardous waste requires compliance with both federal and state regulations and the following requirements:

1. Hazardous waste disposal requires obtaining a USEPA RCRA generator ID number;
2. Hazardous waste must be transported to an RCRA-permitted facility to accept hazardous waste;
3. Hazardous waste must be segregated and cannot be commingled with other Site material; and
4. Hazardous waste must be transported and disposed of by properly permitted (Part 364) transporters and facilities.

The following documentation will be obtained and reported by the RE for each disposal location used in this project to fully demonstrate and document that the disposal of material derived from the Site conforms with all applicable laws:

- A letter from the RE or Requestor to the receiving facility describing the material to be disposed of and requesting formal written acceptance of the material. This letter will state that the material to be disposed of is contaminated material generated at an environmental remediation site in New York State. The letter will provide the project identity and the name and phone number of the RE. The letter will include, as an attachment, a summary of all chemical data for the material being transported (including Site Characterization data).
- A letter from each receiving facility stating it is in receipt of the correspondence (above) and is approved to accept the material.

These documents will be included in the FER.

Non-hazardous historical fill and contaminated soils taken off the Site will be handled, at a minimum, as Municipal Solid Waste per 6 NYCRR Part 360.2. The RE is responsible for assuring material is properly characterized and determining the appropriate disposal methods based on the characterization results.

Historical fill and contaminated soils from the Site are prohibited from being disposed of at Part 360.15 Registration Facilities (also known as Soil Recycling Facilities).

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the NYSDEC Division of Materials Management (DMM) 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. This material is prohibited from being sent or redirected to a Part 360-15 Registration Facility. 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 an off-Site Soil Recycling Facility. The letter will provide the project identity and the name and phone number of the RE. The letter will include, as an attachment, a summary of all chemical data for the material being transported.

The FER will include an accounting of the destination of all material removed from the Site during this RA, including excavated soil, contaminated soil, historical fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with the 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 FER. Hazardous wastes derived from the Site will be stored, transported, and disposed of in full compliance with applicable local, state, and federal regulations. Appropriately licensed haulers will be used for material removed from this Site and will be in full compliance with all applicable local, state, and federal regulations.

Waste characterization sampling will be performed exclusively for the purposes of off-Site soil disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state, and local laws, rules, regulations, and facility-specific permits. Sampling and analytical methods, sampling frequency, analytical results, and QA/QC associated with waste characterization activities will be reported in the FER. All data available for soil/material to be disposed of at a given facility must be submitted to the disposal facility with a suitable explanation prior to shipment and receipt. Waste characterization data will be used solely for complying with requirements for off-Site disposal. Waste characterization sampling cannot be utilized for:

- Delineating the extent of contamination required for remediation at a Site.
- Replacing or substituting data collected as part of Site Characterization and/or RI.
- Replacing or substituting confirmation or documentation sampling as described in NYSDEC DER-10, Section 5.4.
- Modifying remedial decisions as formalized in a NYSDEC-approved Decision Document or Record of Decision.

5.4.6 Materials Reuse On-Site

Materials reuse is not anticipated at the Site. If on-Site material is proposed for reuse, the chemical criteria for on-Site reuse of material will be approved by NYSDEC. The RE will ensure that procedures defined for materials reuse in this RAWP are followed and that unacceptable material will not remain on the Site. A “Request to Import/Reuse Fill Material” form will be filed with the NYSDEC Case Manager for review and approval prior to material reuse on the Site. A copy of the form is presented in **Appendix E**.

Organic matter (e.g., wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site is prohibited for reuse on the Site. Demolition material reuse is not anticipated at the Site. Concrete crushing or processing on the Site is prohibited unless NYSDEC has specifically approved on-Site processing and reuse of acceptable demolition material.

Contaminated on-Site material, including historical fill and contaminated soil, removed for grading or other purposes, will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines. This will be expressed in the final SMP.

5.4.7 Fluids Management

Liquids to be removed from the Site, including dewatering fluids, will be handled, transported, and disposed of in accordance with applicable local, state, and federal regulations. Liquids discharged into the New York City sewer system will be addressed through approval by the NYCDEP. Based on the depth to water, localized dewatering is not anticipated to facilitate the excavation of material in hotspots. If necessary, a dewatering and treatment system will be designed by the Remediation Contractor's New York State-licensed Professional Engineer.

If generated, dewatered fluids will not be recharged back to the land surface or subsurface. Dewatering fluids will be managed off Site. Discharge of water generated during remedial construction to surface waters (i.e., a local pond, stream, and/or river) is prohibited without an SPDES permit.

5.4.8 Backfill from Off-Site Sources

If imported materials are proposed, documentation of the material will be provided to NYSDEC for approval prior to its use on the Site. Imported soil for backfill must meet the requirements of 6 NYCRR Part 375-6.7(d) and NYSDEC DER-10 Section 5.4(e), Table 5.4(e)10. Material from industrial sites, spill sites, other environmental remediation sites, or other potentially contaminated sites will not be imported to the Site. Solid waste will not be imported onto the Site.

Backfill material will consist of clean fill (as described in the following paragraph) or other acceptable fill material, such as virgin stone from a quarry or RCA. If RCA is imported to the Site, it will be from a NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require chemical testing unless required by the NYSDEC under the terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete, with no more than 10 percent by weight passing through a No. 80 sieve. RCA is not acceptable for and will not be used as cover or drainage material.

Imported soil (i.e., clean fill) will meet the Allowable Constituents Levels of Imported Fill or Soil defined in DER-10 Appendix 5. Non-compliant soils will not be imported to the Site. Clean fill will be segregated at a source/facility that is free of environmental contaminants. Qualified environmental personnel will collect representative samples at a frequency consistent with NYSDEC CP-51. The samples will be analyzed for Part 375 VOCs, SVOCs, pesticides/herbicides, PCBs, cyanide, metals (including trivalent and hexavalent chromium), 1,4-dioxane, and PFAS by an NYSDOH ELAP-certified laboratory. Upon meeting these criteria, the certified-clean fill will be transported to the Site and segregated from impacted material, as necessary, on plastic sheeting until used as backfill. Trucks entering the Site with imported soils will be secured with tight-fitting covers.

Soils that meet "general fill" requirements under 6 NYCRR Part 360.13, 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 Case Manager for review and approval prior to import to the Site. A copy of the form is presented in **Appendix E**. All materials proposed for import onto the Site will be approved by the RE and will be in compliance with provisions

in this RAWP prior to receipt at the Site. Material from industrial sites, spill sites, other environmental remediation sites, or other potentially contaminated sites will not be imported to the Site. Solid waste will not be imported onto the Site.

The FER will include the following certification by the RE: "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."

5.4.9 Stormwater Pollution Prevention

A silt fence or hay bales will be installed around the perimeter of the remedial construction area, as required. Barriers and hay bale checks will be installed and inspected once per week and after every storm event. Results of inspections will be recorded in a logbook maintained at the Site and available for inspection by the NYSDEC. Necessary repairs to the silt fence and/or hay bales will be made immediately. Accumulated sediments will be removed as required to keep the barriers and hay bale checks functional. The manufacturer's recommendations will be followed for replacing the silt fence damaged due to weathering. Erosion and sediment control measures identified in the RAWP will be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they will be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to the sewer system. The perimeter of the Site will be sloped toward the interior of the Site as much as practicable.

5.4.10 Contingency Plan

As discussed above in Section 4.2.7, if USTs or other previously unidentified contaminant sources are found during on-Site remedial excavation or development-related construction, sampling will be performed on the product, if encountered, and surrounding subsurface materials (e.g., soil and stone). Chemical analyses will include CP-51 VOCs and SVOCs. Analyses will not be otherwise limited without NYSDEC approval. Identification of unknown or unexpected contaminated media identified by screening during ground-intrusive work will be promptly communicated by phone to the NYSDEC Case Manager. These findings will also be detailed in the monthly BCP progress report.

5.4.10.1 Extreme Storm Preparedness and Response Contingency Plan

Damage from flooding or storm surge can include the dislocation of soil and stockpiled materials, the dislocation of Site structures, construction materials, and equipment, and the dislocation of SOE 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 Requestor will undertake the following steps for Site preparedness prior to the event and in response to the event.

5.4.10.2 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 of 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, cleaning and repositioning silt fences and hay bales; storm sewer filters and traps will be cleaned; and pumps and hosing will be secured and protected.

5.4.10.3 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 the Site inspection and after the Site security is assessed, as necessary. Site conditions will be compared to the inventory of Site conditions and materials performed prior to the storm event, and significant differences will be noted. Damage from storm conditions that results 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 two hours of identification and consistent with New York 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 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. SOE structures 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 the Site to adjacent properties, property owners and NYSDEC will be notified, and a 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 QEP will determine the nature and extent of the spill and report the incident to NYSDEC's spill hotline at 800.457.7362 within statutorily defined timelines. If the source of the spill is ongoing and can be identified, it should be stopped if this can be performed safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYSDEC.

5.4.10.4 Storm Response Reporting

A Site Inspection Report will be submitted to NYSDEC at the completion of the Site inspection. Site conditions will be compared to the inventory of Site conditions and materials performed prior to the storm event, and significant differences will be noted. The Site Inspection Report will be sent to the NYSDEC Case Manager and will include the Site name, address, tax block and lot, and the Site's 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 SOE; 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; and a schedule for corrective actions.

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

5.4.11 Community Air Monitoring Plan

The CAMP will require real-time monitoring for particulates (i.e., dust) and VOCs at the upwind and downwind perimeters when ground-intrusive activities, including soil/waste excavation, soil handling, test pit excavation, and/or trenching, are in progress at the Site during remedial construction activities. The CAMP aims to provide protection for residents in the designated work area and residents of the downwind community from potential airborne releases that directly result from the remedial construction activities conducted at the Site. Adherence to the monitoring action levels specified in the CAMP requires monitoring, and when necessary, corrective actions to abate emissions and/or shut down work. The CAMP also helps to confirm that work activities do not spread contamination off the Site through the air. In addition, visual and olfactory observations will be made to keep dust and odors to a minimum around the work areas. VOCs will be monitored using PIDs, and particulates will be monitored using DustTrak equipment. Readings will be recorded every 15 minutes at the Site by field personnel.

The following actions will be taken based on monitoring of particulate concentrations:

- If the downwind inhalable particles with diameters generally less than 10 micrometers and smaller (PM-10) particulate level is 100 µg/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 will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 µg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 µg/m^3 above the upwind level, work will be stopped, and a re-evaluation of activities initiated. Work will resume if dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 µg/m^3 of the upwind level and in preventing visible dust migration.

The following actions will be taken based on VOC monitoring:

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 ppm above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level

readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.

- 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 will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume, provided that the total organic vapor level 200 ft 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 ft, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shut down.

Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Case Managers within 24 hours of the exceedance and will include the reason(s) for the exceedance and steps taken to address the exceedance. CAMP exceedances will be included in the daily report. Should it be required, special CAMP requirements, as outlined in **Appendix J**, will be employed.

5.4.12 Odor, Dust, and Nuisance Control Plan

Dust, odor, and nuisance controls will be accomplished by the Remediation Contractor as described in this section.

The FER will include the following certification by the RE: "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."

5.4.12.1 Odor Control Plan

This Odor Control Plan is capable of controlling emissions of nuisance odors off the Site. Specific odor control methods to be used, if needed, will include the application of foam suppressants or tarps over the odor or VOC source areas. If nuisance odors are identified, work will be halted, and the source of the odors will be identified and corrected. Work will not resume until nuisance odors have been abated. The NYSDEC and NYSDOH will be notified of odor events and other complaints about the project. Implementation of odor controls is the responsibility of the Contractor. Monitoring odor emissions, including the halt of work, will be the responsibility of the RE or his/her designated representative.

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: (a) direct load-out of soils to trucks for off-Site disposal; (b) use of chemical odorants in spray or misting systems (e.g., Blanket 510 Wintergreen™); and (c) use of staff to monitor odors in surrounding neighborhoods. Odor control suppressant will be available and located on-site during implementation of the RAWP and will be accessible to workers. In addition, workers will be provided the instructions to operate the odor control equipment

The SDS for an odor control suppressant is provided in **Appendix K**.

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.

5.4.12.2 Dust Control Plan

A dust control plan that addresses dust management during ground-intrusive on-Site work will include, at a minimum: (a) the use of a dedicated water distribution system, an on-Site water truck for road wetting, or an alternate water source with suitable supply and pressure for use in dust control; (b) the use of gravel for on-Site roads to provide a clean and dust-free road surface; and (c) the limiting of the total area of on-Site roads to minimize the area required for water spraying. Dust suppression equipment will be accessible at all times during implementation of the RAWP. In addition, workers will be provided the instructions to to operate the dust suppression equipment.

5.4.12.3 Other Nuisances

A plan for rodent control will be developed and used by the Remediation Contractor during Site preparation (including clearing and grubbing) and during remedial work. A plan for noise control will be developed and used by the Remediation Contractor during Site preparation and remedial work and will conform, at a minimum, to NYCDEP noise control standards.

6. Residual Contamination to Remain on the Site

After completing a Track 2 remedy, residual soils with concentrations exceeding UUSCOs will remain beneath the Site. Therefore, ECs and ICs will be required post-excavation.

The following Site management elements will be implemented prior to the Certificate of Completion:

- Establishment of an approved SMP to ensure long-term management of ICs, including the performance of periodic inspections and certification that the controls are performing as they were intended; and
- Recording of an EE to ensure future owners of the Site maintain the required ICs.

7. Engineering Controls

Alternative II will include ECs, and it is anticipated to achieve Track 2 cleanup levels. The following ECs have been designed for incorporation into the RA.

7.1 SOIL VAPOR EXTRACTION AND SUB-SLAB DEPRESSURIZATION SYSTEMS

An SVE system will be installed to prevent off-site migration of noted CVOC vapors in soil not excavated from the Site and an active SSDS system will be installed during construction and both will act as methods to actively contain, stabilize, and monitor residual contamination in soil gas beneath the Site to ensure the long-term effectiveness of the remedial program. The SVE and SSDS will be considered ECs. The SSDS will consist of a horizontal perforated PVC pipeline within a permeable layer immediately beneath the building foundation slab and a vapor barrier system connecting to steel risers penetrating through the building to the roof and blower fans attached to each riser. The CVOC-impacted soil vapor removed with the SVE system will be treated with granular activated carbon (GAC) prior to discharge to the atmosphere. Conceptual SSDS design and details are provided as **Figures 15** and **16**, respectively.

As part of the Track 2 remedy, an SMP will be established for ICs and monitoring that includes an IC Plan, a Monitoring Plan, and an Operations and Maintenance Plan. The following will be discussed in the SMP as part of the remedy:

- Post-remedy SVE and SSDS monitoring and maintenance.
- Completion of an SVI Evaluation in accordance with DER-10 and NYSDOH's "Final Guidance on Soil Vapor Intrusion" following remedial activities and prior to occupancy.

7.2 COMPOSITE COVER SYSTEM

The cover will consist of structures, such as buildings, pavement, and sidewalks, comprising the Site development. Where a soil cover is required, it will be a minimum of 2 ft (for restricted residential use) of soil, meeting the SCOs for cover material as set forth in 6 NYCRR
Part 375-6.7(d). The soil cover will be placed over a demarcation layer, with the upper 6 in. of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the Site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d). An S/MMP will be included in the SMP and will outline the procedures to be followed in the event that the soil cover system and underlying residual contamination are disturbed after the Remedial Action is complete. Maintenance of the soil cover system will be described in the SMP in the FER.

Under the Track 2 remedy, assuming the documentation sampling results meet RRSCOs, the composite cover system would not function as an EC. Should Track 2 not be achieved and a Track 4 remedy completed, the composite cover (excluding the waterproofing/vapor barrier) would function as an EC to be monitored under Site management.

8. Institutional Controls

After the remedy is complete, the Site will have residual contamination remaining in place. ECs for the residual contamination have been incorporated into the remedy to render the overall Site remedy protective of public health and the environment. Two elements have been designed to ensure continual and proper management of residual contamination in perpetuity: an EE and an SMP.

All as-built drawings, diagrams, calculations, and manufacturer documentation for treatment systems will be presented in the FER. A Site-specific EE will be recorded with Queens County 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 EE and the grantor's successors and assigns adhere to all ECs and 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 ECs and ICs. The SMP describes appropriate methods and procedures to ensure compliance with all ECs and ICs that are required by the EE. Once the SMP has been approved by the NYSDEC, compliance with the SMP is required by the grantor of the EE and the grantor's successors and assigns.

8.1 ENVIRONMENTAL EASEMENT

An EE, as defined in Article 71 Title 36 of the ECL, is required when residual contamination is left on the Site after the RA is complete. As part of this remedy, an EE approved by NYSDEC will be filed and recorded with the Queens County Office of the City Register. The EE will be submitted as part of the FER.

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

- Compliance with the EE by the Grantee and the Grantee's successors and adherence to all elements of the SMP are required;
- All ECs must be operated and maintained as specified in the SMP;
- A soil vapor treatment system consisting of an SSDS must be inspected, certified, operated, and maintained as required by the SMP;
- All ECs on the Controlled Property (the Site) must be inspected and certified at a frequency and in a manner defined in the SMP;

- Environmental or public health monitoring must be performed as defined in the SMP;
- 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;
- On-Site environmental monitoring devices must be protected and replaced as necessary to ensure proper functioning in the manner specified in the SMP; and
- ECs may not be discontinued without an amendment or extinguishment of the EE.

Adherence to these ICs for the Site is mandated by the EE and will be implemented under the SMP (discussed in the next section). The Controlled Property will also have a series of ICs 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 its 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 residential and commercial use only, provided the long-term ECs and ICs included in the SMP are employed;
- The Controlled Property may not be used for a higher level of use without an amendment or extinguishment of this EE; 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 constitutes 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 periodic statement must be certified by an expert whom the NYSDEC finds acceptable.

9. Final Engineering Report

An FER will be submitted to NYSDEC following implementation of the RA 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 FER 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. The FER will provide a description of the changes in the RA from the elements provided in the RAWP and associated design documents. The FER will provide a tabular summary of all performance evaluation sampling results, all material characterization results, and other sampling and chemical analyses performed as part of the RA. The FER will provide test results demonstrating that all mitigation and remedial systems are functioning properly. 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 SMP and EE. 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 provide a thorough summary of all residual contamination left on the Site after the remedy is complete; residual contamination includes all contamination that exceeds the Track 2 RRSCOs in 6 NYCRR Part 375-6. A table that shows exceedances from Track 2 RRSCOs for all soil/fill remaining at the Site after the RA and a map that shows the locations and summarizes exceedances from Track 2 RRSCOs for all soil/fill remaining at the Site after the RA 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 this RAWP and must provide an explanation for why the material was not removed as part of the RA. 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 for remedial purposes, including excavated contaminated soil, historic fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with the disposal of all material must also include records and approvals for receipt of the material. The FER 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 an FER and issuance of a Certificate of Completion, all project reports must be submitted in digital form on electronic media (PDF).

9.1 CERTIFICATIONS

The following certification will appear in front of the Executive Summary of the FER.

The FER will be prepared, stamped, and the following certification will be signed by an individual licensed or otherwise authorized in accordance with Article 145 of the New York Education Law to practice the profession of engineering.

The certification will include the following statements:

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.

If the RAWP or Remedial Design identifies time frames to be achieved by the remedial program:

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 or Remedial Design] 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 to 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 the Department.

If financial assurance is required:

I certify that any financial assurance mechanisms required by the Department pursuant to Environmental Conservation Law have been executed.

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 a 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.

10. Schedule

Mobilization for implementation of the RAWP is expected to take place in about one to two weeks from receipt of the Decision Document. Once mobilization is complete, remediation of the Site will proceed. The remedy, which will be implemented in accordance with this RAWP, is anticipated to take approximately three to four months to complete. After completion of the remedy, the FER will be drafted and subsequently submitted to the NYSDEC for review and approval. A proposed project schedule is included in **Appendix I**.

References

1. P.W. Grosser Consulting, Inc., 2021. Phase I Environmental Site Assessment, 28-12 41st Avenue, Long Island City, New York. April.
2. P.W. Grosser Consulting, Inc., 2021. Phase II Environmental Site Assessment, 28-12 41st Avenue, Long Island City, New York. May.
3. GEI Consultants, Inc., P.C., 2025. Remedial Investigation Report, 28-12 41st Avenue, Long Island City, New York. July.
4. H & A of New York Engineering and Geology, LLP, 2024. NYSDEC Brownfield Cleanup Application, 28-12 41st Avenue, Prepared for 28 12 41ST AVE LLC. October.
5. H & A of New York Engineering and Geology, LLP, 2026. Remedial Investigation Report, 28-12 41st Avenue, Prepared for 28 12 41ST AVE LLC. January.
6. New York State Department of Environmental Conservation, 2010. Program Policy DER-10, "Technical Guidance for Site Investigation and Remediation." May.
7. New York State Department of Environmental Conservation, 2011. Program Policy DER-31, "Green Remediation." January.
8. New York State Department of Environmental Conservation, 2022a. Guidelines for Sampling and Analysis of PFAS. November.
9. New York State Department of Environmental Conservation, 2022b. Sampling for 1,4-dioxane and Per- and Polyfluoroalkyl Substances (PFAS) under NYSDEC's Part 375 Remedial Programs. November.
10. New York State Department of Environmental Conservation, 2023. Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) under NYSDEC's Part 375 Remedial Programs. April.
11. New York State Department of Environmental Conservation, Part 375 of Title 6 of the New York Compilation of Codes, Rules, and Regulations, Effective December 14, 2006.
12. New York State Department of Health, 2006. Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York. October.
13. New York State Division of Water Technical and Operational Guidance Series (TOGS) (1.1.1) dated June 1998.
14. United States Environmental Protection Agency, 2017. "Low Flow Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells," EQASOP-GW 001. September 19.

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TABLES

TABLE 1.

SOIL CLEANUP OBJECTIVE AND AMBIENT WATER QUALITY STANDARDS EXCEEDANCE SUMMARY

28-12 41ST AVENUE

LONG ISLAND CITY, NEW YORK

NYSDEC BCP SITE NO. C241300

Soil					
Analyte	**PGWSCO**	**RRSCO**	**UUSCO**	**Max Concentration (mg/kg)**	**Sample**
Tetrachloroethene	1.3	18	1.3	5.5	RI-SB-05_0-2
Benzo(a)anthracene	1	1.4	1	24	RI-SB-03_0-2
Benzo(a)pyrene	22	1	1	26	RI-SB-03_0-2
Benzo(b)fluoranthene	2.1	1.4	1	30	RI-SB-03_0-2
Benzo(g,h,i)perylene	1000	4.9	0.64	11	RI-SB-03_0-2
Benzo(k)fluoranthene	2	4.9	0.8	8.8	RI-SB-03_0-2
Chrysene	1	4.9	1	23	RI-SB-03_0-2
Indeno(1,2,3-cd)pyrene	6.6	1.4	0.5	10	RI-SB-03_0-2
Dibenz(a,h)anthracene	1000	0.33	0.33	3.8	RI-SB-03_0-2
Phenanthrene	1000	4.9	1.1	37	RI-SB-03_0-2
4,4'-DDD	14	5	0.0033	0.03	RI-SB-08_0-2
4,4'-DDT	135	3.8	0.0033	0.0469	RI-SB-08_0-2
Dieldrin	0.1	0.075	0.005	0.0173	RI-SB-08_0-2
4,4'-DDE	9.3	3.4	0.0033	0.0195	RI-SB-08_0-2
alpha-Chlordane (cis)	4.5	0.65	0.014	0.018	RI-SB-08_0-2
Polychlorinated biphenyls (PCBs)	3.2	1	0.1	0.242	RI-SB-08_0-2
Mercury	0.73	0.3	0.18	2.87	RI-SB-07_12-14
Selenium	4	110	3.9	4.26	RI-SB-07_0-2
Zinc	2480	6600	109	850	RI-SB-09_0-2
Lead	450	400	63	1210	RI-SB-05_0-2
Copper	1720	280	50	204	RI-SB-07_0-2
Arsenic	16	16	13	25.7	RI-SB-07_0-2
Barium	820	410	410	537	RI-SB-05_0-2

Groundwater			
Analyte	**AWQS**	**Max Concentration (µg/L)**	**Sample**
Phenol	1	1.5 J	RI-MW-03_20251023
Benzo(a)anthracene	0.002	0.03 J	RI-MW-01_20251023
Benzo(b)fluoranthene	0.002	0.07 J	RI-MW-05_20251022
Chrysene	0.002	0.05 J	RI-MW-05_20251022
Perfluorooctanesulfonic acid (PFOS)	0.0027	0.00952	RI-MW-04_20251022
Perfluorooctanoic acid (PFOA)	0.0067	0.0164	RI-MW-04_20251022
Manganese, Total	300	1109	RI-MW-02_20251022
Magnesium, Total	35000	48300	RI-MW-01_20251023
Sodium, Total	20000	29000	RI-MW-01_20251023
Lead, Total	25	102.6	RI-MW-05_20251022
Iron, Total	300	21200	RI-MW-02_20251022
Magnesium, Dissolved	35000	44800	RI-MW-01_20251023
Sodium, Dissolved	20000	28200	RI-MW-01_20251023

Notes:

Soil analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Title 6 of the Official Compilation of New York Codes, Rules, and Regulations (NYCRR) Part 375 Unrestricted Use Soil Cleanup Objectives (UUSCO), Restricted-Use Residential Soil Cleanup Objectives (RRSCO), and Protection of Groundwater Soil Cleanup Objectives (PGWSCO).

Groundwater Analytical Results Compared to New York TOGS 111 Ambient Water Quality Standards (AWQS)

mg/kg = milligrams per kilogram

µg/L = micrograms per liter

J = Estimated concentration

TABLE 2.
TRACK 2 SOIL CLEANUP OBJECTIVES
28-12 41ST AVENUE, LONG ISLAND CITY, NEW YORK
NYSDEC BCP SITE NO. C241300

PCBs/Pesticides (mg/kg)	
4,4'-DDD	5
4,4'-DDE	3.4
4,4'-DDT	3.8
Aldrin	0.044
alpha-BHC	0.18
alpha-Chlordane (cis)	0.65
beta-BHC	0.18
Chlordane	NA
delta-BHC	100
Dieldrin	0.075
Endosulfan I	35
Endosulfan II	35
Endosulfan sulfate	35
Endrin	5.3
Endrin aldehyde	NA
Endrin ketone	NA
gamma-BHC (Lindane)	0.21
gamma-Chlordane (trans)	NA
Heptachlor	0.53
Heptachlor epoxide	NA
Methoxychlor	NA
Toxaphene	NA
Polychlorinated biphenyls (PCBs)	1

Volatile Organic Compounds (mg/kg)	
1,1,1,2-Tetrachloroethane	NA
1,1,1-Trichloroethane	100
1,1,2,2-Tetrachloroethane	NA
1,1,2-Trichloroethane	NA
1,1-Dichloroethane	47
1,1-Dichloroethene	0.98
1,1-Dichloropropene	NA
1,2,3-Trichlorobenzene	NA
1,2,3-Trichloropropane	NA
1,2,4,5-Tetramethylbenzene	NA
1,2,4-Trichlorobenzene	NA
1,2,4-Trimethylbenzene	100
1,2-Dibromo-3-chloropropane (DBCP)	NA
1,2-Dibromoethane (Ethylene Dibromide)	NA
1,2-Dichlorobenzene	100
1,2-Dichloroethane	5.8
1,2-Dichloroethene (total)	NA
1,2-Dichloropropane	NA
1,3,5-Trimethylbenzene	100
1,3-Dichlorobenzene	38
1,3-Dichloropropane	NA
1,3-Dichloropropene	NA
1,4-Dichlorobenzene	24
1,4-Diethylbenzene	NA
1,4-Dioxane	5.7
2,2-Dichloropropane	NA
2-Butanone (Methyl Ethyl Ketone)	100
2-Chlorotoluene	NA
2-Hexanone (Methyl Butyl Ketone)	NA
2-Phenylbutane (sec-Butylbenzene)	100
4-Chlorotoluene	NA
4-Ethyltoluene (1-Ethyl-4-Methylbenzene)	NA
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA
Acetone	100
Acrylonitrile	NA
Benzene	3.7
Bromobenzene	NA
Bromodichloromethane	NA
Bromoform	NA
Bromomethane (Methyl Bromide)	NA
Carbon disulfide	NA
Carbon tetrachloride	7.1
Chlorobenzene	100
Chlorobromomethane	NA
Chloroethane	NA
Chloroform (Trichloromethane)	24
Chloromethane (Methyl Chloride)	NA
cis-1,2-Dichloroethene	41
cis-1,3-Dichloropropene	NA
Cymene (p-Isopropyltoluene)	NA
Dibromochloromethane	NA
Dibromomethane	NA
Dichlorodifluoromethane (CFC-12)	NA
Ethyl Ether	NA
Ethylbenzene	76
Hexachlorobutadiene	NA
Isopropylbenzene (Cumene)	NA
m,p-Xylenes	NA
Methyl Tert Butyl Ether (MTBE)	100
Methylene chloride (Dichloromethane)	81
Naphthalene	100
n-Butylbenzene	100
n-Propylbenzene	100
o-Xylene	NA
Styrene	NA
tert-Butylbenzene	100
Tetrachloroethene	18
Toluene	100
trans-1,2-Dichloroethene	100
trans-1,3-Dichloropropene	NA
trans-1,4-Dichloro-2-butene	NA
Trichloroethene	6.4
Trichlorofluoromethane (CFC-11)	NA
Vinyl acetate	NA
Vinyl chloride	0.48
Xylene (Total)	100

Semivolatile Organic Compounds (mg/kg)	
1,2,4,5-Tetrachlorobenzene	NA
1,2,4-Trichlorobenzene	NA
1,2-Dichlorobenzene	100
1,3-Dichlorobenzene	38
1,4-Dichlorobenzene	24
1,4-Dioxane	5.7
2,2'-oxybis(1-Chloropropane)	NA
2,4,5-Trichlorophenol	NA
2,4,6-Trichlorophenol	NA
2,4-Dichlorophenol	NA
2,4-Dimethylphenol	NA
2,4-Dinitrophenol	NA
2,4-Dinitrotoluene	NA
2,6-Dinitrotoluene	NA
2-Chloronaphthalene	NA
2-Chlorophenol	NA
2-Methylnaphthalene	NA
2-Methylphenol (o-Cresol)	100
2-Nitroaniline	NA
2-Nitrophenol	NA
3&4-Methylphenol	NA
3,3'-Dichlorobenzidine	NA
3-Nitroaniline	NA
4,6-Dinitro-2-methylphenol	NA
4-Bromophenyl phenyl ether (BDE-3)	NA
4-Chloro-3-methylphenol	NA
4-Chloroaniline	NA
4-Chlorophenyl phenyl ether	NA
4-Nitroaniline	NA
4-Nitrophenol	NA
Acenaphthene	100
Acenaphthylene	100
Acetophenone	NA
Anthracene	100
Benzo(a)anthracene	1.4
Benzo(a)pyrene	1
Benzo(b)fluoranthene	1.4
Benzo(g,h,i)perylene	4.9
Benzo(k)fluoranthene	4.9
Benzoic acid	NA
Benzyl Alcohol	NA
Biphenyl	NA
bis(2-Chloroethoxy)methane	NA
bis(2-Chloroethyl)ether	NA
bis(2-Ethylhexyl)phthalate	NA
Butyl benzylphthalate (BBP)	NA
Carbazole	NA
Chrysene	4.9
Dibenz(a,h)anthracene	0.33
Dibenzofuran	18
Diethyl phthalate	NA
Dimethyl phthalate	NA
Di-n-butylphthalate (DBP)	NA
Di-n-octyl phthalate (DnOP)	NA
Fluoranthene	100
Fluorene	100
Hexachlorobenzene	0.33
Hexachlorobutadiene	NA
Hexachlorocyclopentadiene	NA
Hexachloroethane	NA
Indeno(1,2,3-cd)pyrene	1.4
Isophorone	NA
Naphthalene	100
Nitrobenzene	NA
N-Nitrosodi-n-propylamine	NA
N-Nitrosodiphenylamine	NA
Pentachlorophenol	1.3
Phenanthrene	4.9
Phenol	100
Pyrene	100

Metals (mg/kg)	
Aluminum	NA
Antimony	NA
Arsenic	16
Barium	410
Beryllium	43
Cadmium	2.5
Calcium	NA
Chromium	NA
Chromium VI (Hexavalent)	1
Cobalt	NA
Copper	280
Iron	NA
Lead	400
Magnesium	NA
Manganese	2000
Mercury	0.3
Nickel	320
Potassium	NA
Selenium	110
Silver	110
Sodium	NA
Thallium	NA
Vanadium	NA
Zinc	6,600

Notes:
1. Criteria are 6 NYCRR Part 375 Restricted Residential Soil Cleanup Objectives (December 2025)
2. mg/kg: milligram per kilogram

TABLE 3.
ALTERNATIVE I REMEDIAL COST ESTIMATE
28-12 41ST AVENUE, LONG ISLAND CITY, NEW YORK
NYSDEC BCP SITE NO. C241300

Consulting/Engineering Costs					
Task	**Description**	**Unit**	**Unit Cost**	**Quantity**	**Total Cost**
1	Waste Characterization	Lump Sum	$ 75,000	1	$ 75,000
2	Program Management (NYSDEC/NYSDOH Correspondence, Daily/Weekly/Monthly Reporting, etc.)	Month	$ 15,000	10	$ 150,000
3	Remedial Oversight	Month	$ 38,000	6	$ 228,000
4	Confirmation Sampling	Sample	$ 2,000	16	$ 32,000
5	Soil Vapor Intrusion Evaluation	Allowance	$ 5,000	1	$ 5,000
6	Soil Vapor Intrusion Reporting	Lump Sum	$ 3,000	1	$ 3,000
7	Final Engineering Report and COC Coordination	Allowance	$ 50,000	1	$ 50,000
				Consulting/Engineering Subtotal	$ 543,000
Contractor Costs					
Task	**Description**	**Unit**	**Unit Cost**	**Quantity**	**Total Cost**
1	Mobilization/Demobilization, Site Maintenance, Security, etc.	Allowance	$ 200,000	1	$ 200,000
2	Truck Wash Station	Month	$ 25,000	6	$ 150,000
3	Management/Handling Contaminated Material	Cubic Yard	$ 40	4,630	$ 185,200
4	Support of Excavation ($4,000/Linear Foot X Site Perimeter 305 ft = $1,220,000)	Percentage	$ 1,220,000	1	$ 1,220,000
5	Transport and Disposal of Non-Hazardous Contaminated Material	Ton	$ 46	6,945	$ 319,470
6	Transport and Disposal of Hazardous Material (F Listed and/or Lead)	Ton	$ 350	150	$ 52,500
7	Backfill Procurement, Placement and Compaction	Cubic Yard	$ 30	185	$ 5,550
8	Underground Storage Tank (Contingency Budget)	Allowance	$ 75,000	0	$ -
				Contractor Subtotal	$ 2,132,720
				Total	$ 2,675,720
				15% Contingency	$ 401,358
				Estimated Total (Rounded to the nearest $1,000)	$ 3,077,000

Notes:

1. Assuming a Track 1 Remedy requiring excavation to 25 ft bgs Site-wide to remove soils exceeding UUSCOs and soil with elevated soil vapor.

2. Assumes density of 1.5 tons per cubic yard of fill/soil.

3. Assumes residual soil will meet Track 1 Unrestricted Use Soil Cleanup Objectives.

4. Assumes dewatering of water accumulated in excavations will be required.

5. SOE Costs are based on a conventional soldier pile and timber lagging system with lateral bracing provided by either steel rakers or tiebacks.

6. Costs are estimated and subject to change. Costs do not include new building construction.

7. RAWP implementation is assumed to take 6 months.

8. This cost estimate was prepared to compare various remedial alternatives as was based on available information at the time of preparation. The estimate may be +/- 30-50% of the actual cost. This estimate was not prepared for financial or legal consulting purposes and was not intended for use regarding compliance with financial reporting requirements or liability services.

9. This estimate does not include legal fees associated with attorneys involved in the project, insurance fees or outside consulting fees.

TABLE 4.
ALTERNATIVE II REMEDIAL COST ESTIMATE
28-12 41ST AVENUE, LONG ISLAND CITY, NEW YORK
NYSDEC BCP SITE NO. TBD

Consulting/Engineering Costs					
Task	**Description**	**Unit**	**Unit Cost**	**Quantity**	**Total Cost**
1	Waste Characterization	Lump Sum	$ 75,000	1	$ 75,000
2	Program Management (NYSDEC/NYSDOH Correspondence, Daily/Weekly/Monthly Reporting, etc.)	Month	$ 15,000	10	$ 150,000
3	Remedial Oversight	Month	$ 38,000	4	$ 152,000
4	Confirmation Sampling	Sample	$ 2,000	16	$ 32,000
5	Soil Vapor Intrusion Evaluation	Allowance	$ 5,000	1	$ 5,000
6	Soil Vapor Intrusion Reporting	Lump Sum	$ 3,000	1	$ 3,000
7	SSD System Design	Lump Sum	$ 15,000	1	$ 15,000
8	Final Engineering Report, Site Management Plan and COC Coordination	Allowance	$ 75,000	1	$ 75,000
9	Annual Site Management (engineering control monitoring, reporting)	Year	$ 25,000	2	$ 50,000
				Consulting/Engineering Subtotal	$ 557,000
Contractor Costs					
Task	**Description**	**Unit**	**Unit Cost**	**Quantity**	**Total Cost**
1	Mobilization/Demobilization, Site Maintenance, Security, etc.	Allowance	$ 200,000	1	$ 200,000
2	Truck Wash Station	Month	$ 25,000	4	$ 100,000
3	Management/Handling Contaminated Material	Cubic Yard	$ 40	1,342	$ 53,680
4	Support of Excavation ($4,000/Linear Foot X Site Perimeter 305 ft = $1,220,000)	Percentage	$ 1,220,000	0.28	$ 341,600
5	Add. Support of Excavation ($4,000/Linear Foot X SOE for RI-SB-07 and RI-SB-02 Hotspots 145 ft = $580,000)	Percentage	$ 580,000	0.50	$ 290,000
6	Transport and Disposal of Non-Hazardous Contaminated Material	Ton	$ 50	1,342	$ 67,100
7	Transport and Disposal of Hazardous Material (F Listed and/or Lead)	Ton	$ 350	150	$ 52,500
8	Backfill Procurement, Placement and Compaction	Cubic Yard	$ 30	185	$ 5,550
9	Underground Storage Tank (Contingency Budget)	Allowance	$ 75,000	0	$ -
10	Active Sub-slab Depressurization System (SSDS) Installation	Lump Sum	$ 150,000	1	$ 150,000
11	SSDS Startup Testing	Lump Sum	$ 25,000	1	$ 25,000
12	SVE System Installation	Lump Sum	$ 150,000	1	$ 150,000
13	SVE Startup Testing	Lump Sum	$ 25,000	1	$ 25,000
14	Composite Cover System (inc. vapor barrier/waterproofing membrane)	Allowance	$ 500,000	1	$ 500,000
				Contractor Subtotal	$ 1,960,430
				Total	$ 2,517,430
				15% Contingency	$ 377,615
				Estimated Total (Rounded to the nearest $1,000)	$ 2,895,000

Notes:

1. Assuming a Track 2 Remedy requiring excavation to 7 ft bgs, with localized excavations to 9 ft bgs around RI-SB-02 and RI-SB-04 and to 15 ft bgs around RI-SB-07 to remove soils exceeding RRSCOs.
2. Assumes density of 1.5 tons per cubic yard of fill/soil.
3. Assumes residual soil will meet Track 2 Restricted Residential Soil Cleanup Objectives.
4. Assumes dewatering of water accumulated in excavations will be required.
5. SOE Costs are based on a conventional soldier pile and timber lagging system with lateral bracing provided by either steel rakers or tiebacks.
6. Costs are estimated and subject to change. Costs do not include new building construction.
7. RAWP implementation is assumed to take 4 months.
8. This cost estimate was prepared to compare various remedial alternatives as was based on available information at the time of preparation. The estimate may be +/- 30-50% of the actual cost. This estimate was not prepared for financial or legal consulting purposes and was not intended for use regarding compliance with financial reporting requirements or liability services.
9. This estimate does not include legal fees associated with attorneys involved in the project, insurance fees or outside consulting fees.

TABLE 5.
ALTERNATIVE III REMEDIAL COST ESTIMATE
28-12 41ST AVENUE, LONG ISLAND CITY, NEW YORK
NYSDEC BCP SITE NO. C241300

Consulting/Engineering Costs					
Task	**Description**	**Unit**	**Unit Cost**	**Quantity**	**Total Cost**
1	Waste Characterization	Lump Sum	$ 35,000	1	$ 35,000
2	Program Management (NYSDEC/NYSDOH Correspondence, Daily/Weekly/Monthly Reporting, etc.)	Month	$ 15,000	8	$ 120,000
3	Remedial Oversight	Month	$ 38,000	4	$ 152,000
4	Confirmation Sampling	Sample	$ 2,000	30	$ 60,000
5	SSDS System Design	Lump Sum	$ 15,000	1	$ 15,000
6	SVE System Design	Lump Sum	$ 15,000	1	$ 15,000
7	Soil Vapor Intrusion Evaluation	Allowance	$ 5,000	1	$ 5,000
8	Soil Vapor Intrusion Reporting	Lump Sum	$ 3,000	1	$ 3,000
9	Final Engineering Report, Site Management Plan and COC Coordination	Allowance	$ 75,000	1	$ 75,000
10	Annual Site Management (engineering control monitoring, reporting)	Year	$ 40,000	10	$ 400,000
				Consulting/Engineering Subtotal	$ 880,000
Contractor Costs					
Task	**Description**	**Unit**	**Unit Cost**	**Quantity**	**Total Cost**
1	Mobilization/Demobilization, Site Maintenance, Security, etc.	Allowance	$ 200,000	1	$ 200,000
2	Truck Wash Station	Month	$ 25,000	2	$ 50,000
3	Management/Handling Contaminated Material	Cubic Yard	$ 40	370	$ 14,800
4	Support of Excavation ($4,000/Linear Foot X Site Perimeter 305 ft = $1,220,000)	Percentage	$ 1,220,000	0.08	$ 97,600
5	Transport and Disposal of Non-Hazardous Contaminated Material	Ton	$ 50	370	$ 18,500
6	Transport and Disposal of Hazardous Material (F Listed and/or Lead)	Ton	$ 350	150	$ 52,500
7	Backfill Procurement, Placement and Compaction	Cubic Yard	$ 30	185	$ 5,550
8	Underground Storage Tank (Contingency Budget)	Allowance	$ 75,000	0	$ -
9	Active Sub-slab Depressurization System (SSDS) Installation	Lump Sum	$ 150,000	1	$ 150,000
10	SSDS Startup Testing	Lump Sum	$ 25,000	1	$ 25,000
11	SVE System Installation	Lump Sum	$ 150,000	1	$ 150,000
12	SVE Startup Testing	Lump Sum	$ 25,000	1	$ 25,000
13	Composite Cover System (inc. vapor barrier/waterproofing membrane)	Allowance	$ 500,000	1	$ 500,000
				Contractor Subtotal	$ 1,288,950
				Total	$ 2,168,950
				15% Contingency	$ 325,343
				Estimated Total	$ 2,494,000

Notes:

1. Assuming a Track 4 Remedy with site management, requiring excavation to 2 ft bgs to remove soils exceeding RRSCOs.

2. Assumes density of 1.5 tons per cubic yard of fill/soil

3. Assumes residual soil will meet Track 4 Restricted Residential Soil Cleanup Objectives.

4. Assumes dewatering of water accumulated in excavations will be required.

5. SOE Costs are based on a conventional soldier pile and timber lagging system with lateral bracing provided by either steel rakers or tiebacks.

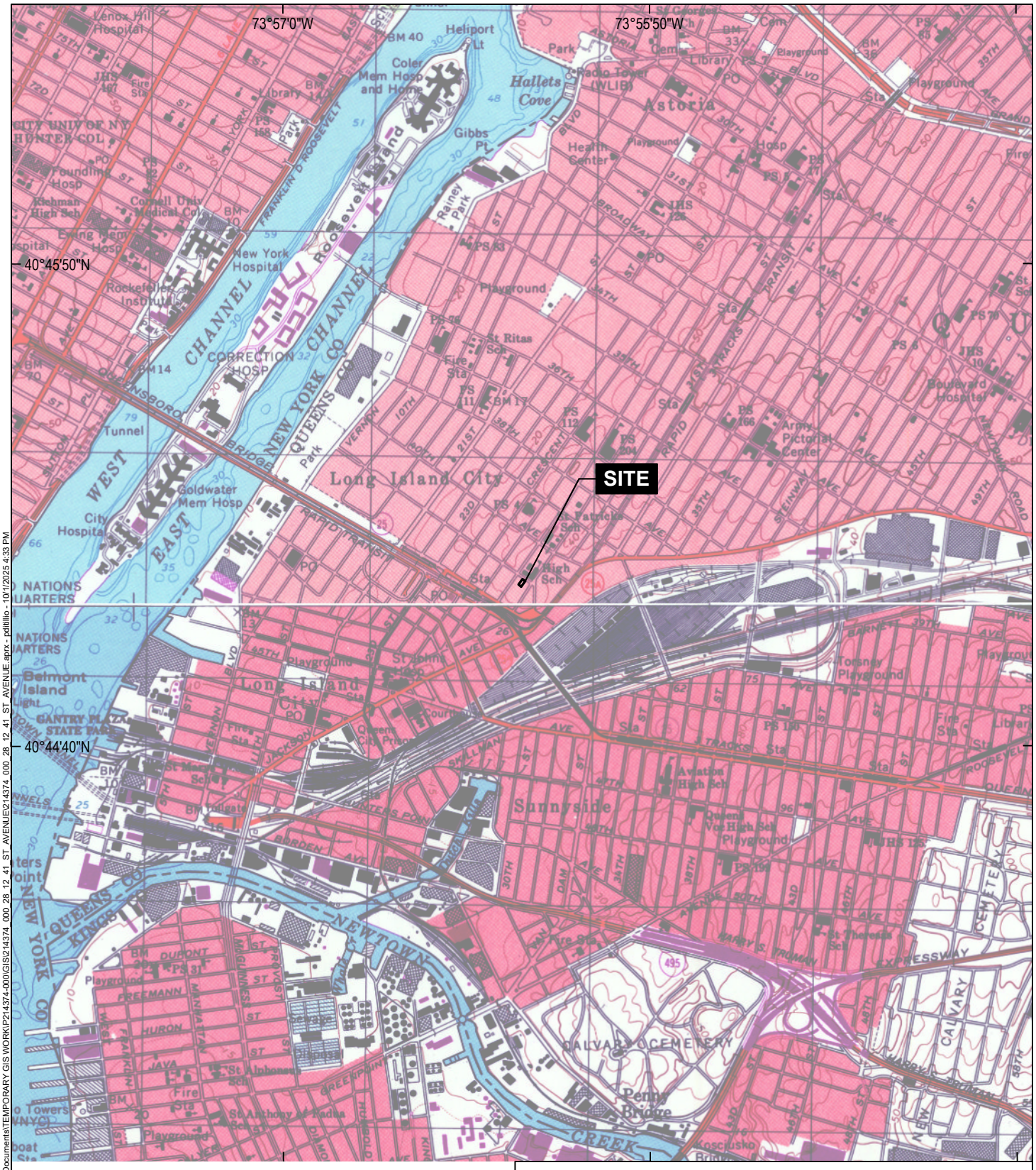
6. Costs are estimated and subject to change. Costs do not include new building construction.

7. RAWP implementation is assumed to take 4 months.

8. This cost estimate was prepared to compare various remedial alternatives as was based on available information at the time of preparation. The estimate may be +/- 30-50% of the actual cost. This estimate was not prepared for financial or legal consulting purposes and was not intended for use regarding compliance with financial reporting requirements or liability

9. This estimate does not include legal fees associated with attorneys involved in the project, insurance fees or outside consulting fees.

FIGURES



GIS: C:\Users\pdilillo\OneDrive - haleyaldrich.com\Documents\TEMPORARY GIS WORK\P2143740000\GIS\2143740000_28_12_41_ST_AVENUE.aprx - pdilillo - 10/1/2025 4:33 PM





MAP SOURCE: USGS
SITE COORDINATES: 40°45'04"N, 73°56'14"W

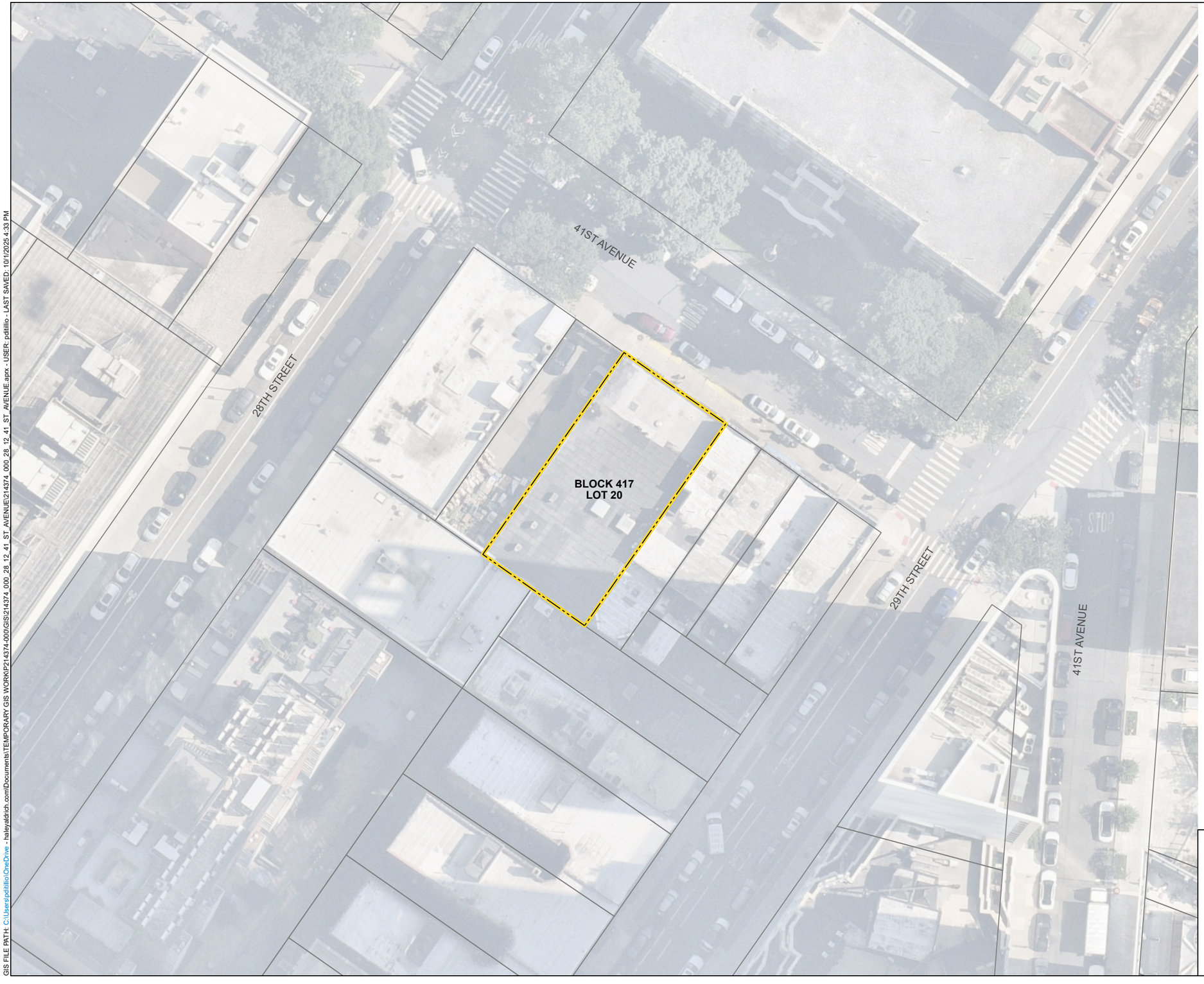
HALEY ALDRICH

28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
MAY 2026

FIGURE 1



LEGEND

SITE BOUNDARY

PARCEL BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. ASSESSOR PARCEL DATA SOURCE: NYC DEPARTMENT OF CITY PLANNING, INFORMATION TECHNOLOGY DIVISION

3. AERIAL IMAGERY SOURCE: NEARMAP, JULY 3, 2025

N

0 40 80

SCALE IN FEET

HALEY ALDRICH

28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

SITE PLAN

MAY 2026

FIGURE 2

GIS FILE PATH: C:\Users\pdilillo\OneDrive - haleyaldrich.com\Documents\TEMPORARY GIS WORK\P214374-000\GIS\214374_000_28_12_41_ST_AVENUE\214374_000_28_12_41_ST_AVENUE.aprx - USER: pdilillo - LAST SAVED: 10/1/2025 4:33 PM



LEGEND

- SOIL BORING
- SOIL BORING/MONITORING WELL
- SOIL VAPOR SAMPLE
- SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: NEARMAP, OCTOBER 1, 2025

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SCALE IN FEET

HALEY ALDRICH

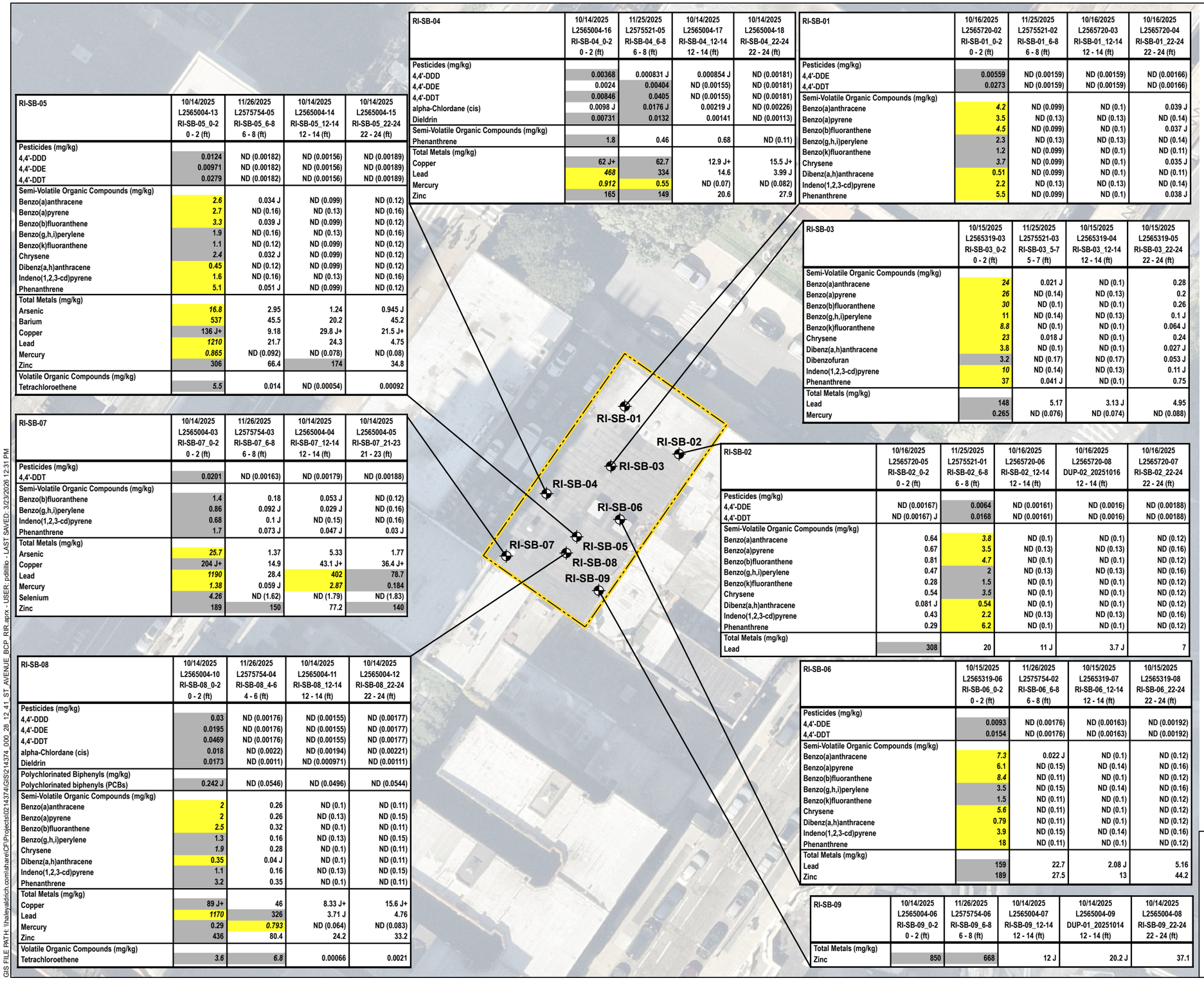
28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

SAMPLE LOCATION MAP

MAY 2026

FIGURE 3

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\0214374\GIS\214374_000_28_12_41_ST_AVENUE_BCP_RIR.aprx - USER: pdilillo - LAST SAVED: 11/11/2025 9:43 AM



RI-SB-05	10/14/2025 L2565004-13 RI-SB-05_0-2 0 - 2 (ft)	11/26/2025 L2575754-05 RI-SB-05_6-8 6 - 8 (ft)	10/14/2025 L2565004-14 RI-SB-05_12-14 12 - 14 (ft)	10/14/2025 L2565004-15 RI-SB-05_22-24 22 - 24 (ft)
Pesticides (mg/kg)				
4,4'-DDD	0.0124	ND (0.00182)	ND (0.00156)	ND (0.00189)
4,4'-DDE	0.00971	ND (0.00182)	ND (0.00156)	ND (0.00189)
4,4'-DDT	0.0279	ND (0.00182)	ND (0.00156)	ND (0.00189)
Semi-Volatile Organic Compounds (mg/kg)				
Benzo(a)anthracene	*2.6*	0.034 J	ND (0.099)	ND (0.12)
Benzo(a)pyrene	2.7	ND (0.16)	ND (0.13)	ND (0.16)
Benzo(b)fluoranthene	*3.3*	0.039 J	ND (0.099)	ND (0.12)
Benzo(g,h,i)perylene	1.9	ND (0.16)	ND (0.13)	ND (0.16)
Benzo(k)fluoranthene	1.1	ND (0.12)	ND (0.099)	ND (0.12)
Chrysene	*2.4*	0.032 J	ND (0.099)	ND (0.12)
Dibenz(a,h)anthracene	0.45	ND (0.12)	ND (0.099)	ND (0.12)
Indeno(1,2,3-cd)pyrene	1.6	ND (0.16)	ND (0.13)	ND (0.16)
Phenanthrene	5.1	0.051 J	ND (0.099)	ND (0.12)
Total Metals (mg/kg)				
Arsenic	*16.8*	2.95	1.24	0.945 J
Barium	537	45.5	20.2	45.2
Copper	136 J+	9.18	29.8 J+	21.5 J+
Lead	*1210*	21.7	24.3	4.75
Mercury	*0.865*	ND (0.092)	ND (0.078)	ND (0.08)
Zinc	306	66.4	174	34.8
Volatile Organic Compounds (mg/kg)				
Tetrachloroethene	*5.5*	0.014	ND (0.00054)	0.00092

RI-SB-04	10/14/2025 L2565004-16 RI-SB-04_0-2 0 - 2 (ft)	11/25/2025 L2575521-05 RI-SB-04_6-8 6 - 8 (ft)	10/14/2025 L2565004-17 RI-SB-04_12-14 12 - 14 (ft)	10/14/2025 L2565004-18 RI-SB-04_22-24 22 - 24 (ft)
Pesticides (mg/kg)				
4,4'-DDD	0.00368	0.000831 J	0.000854 J	ND (0.00181)
4,4'-DDE	0.0024	0.00404	ND (0.00155)	ND (0.00181)
4,4'-DDT	0.00846	0.0405	ND (0.00155)	ND (0.00181)
alpha-Chlordane (cis)	0.0098 J	0.0176 J	0.00219 J	ND (0.00226)
Dieldrin	0.00731	0.0132	0.00141	ND (0.00113)
Semi-Volatile Organic Compounds (mg/kg)				
Phenanthrene	1.8	0.46	0.68	ND (0.11)
Total Metals (mg/kg)				
Copper	62 J+	62.7	12.9 J+	15.5 J+
Lead	*468*	334	14.6	3.99 J
Mercury	*0.912*	0.55	ND (0.07)	ND (0.082)
Zinc	165	149	20.6	27.9

RI-SB-01	10/16/2025 L2565720-02 RI-SB-01_0-2 0 - 2 (ft)	11/25/2025 L2575521-02 RI-SB-01_6-8 6 - 8 (ft)	10/16/2025 L2565720-03 RI-SB-01_12-14 12 - 14 (ft)	10/16/2025 L2565720-04 RI-SB-01_22-24 22 - 24 (ft)
Pesticides (mg/kg)				
4,4'-DDE	0.00559	ND (0.00159)	ND (0.00159)	ND (0.00166)
4,4'-DDT	0.0273	ND (0.00159)	ND (0.00159)	ND (0.00166)
Semi-Volatile Organic Compounds (mg/kg)				
Benzo(a)anthracene	*4.2*	ND (0.099)	ND (0.1)	0.039 J
Benzo(a)pyrene	3.5	ND (0.13)	ND (0.13)	ND (0.14)
Benzo(b)fluoranthene	*4.5*	ND (0.099)	ND (0.1)	0.037 J
Benzo(g,h,i)perylene	2.3	ND (0.13)	ND (0.13)	ND (0.14)
Benzo(k)fluoranthene	1.2	ND (0.099)	ND (0.1)	ND (0.11)
Chrysene	*3.7*	ND (0.099)	ND (0.1)	0.035 J
Dibenz(a,h)anthracene	0.51	ND (0.099)	ND (0.1)	ND (0.11)
Indeno(1,2,3-cd)pyrene	2.2	ND (0.13)	ND (0.13)	ND (0.14)
Phenanthrene	5.5	ND (0.099)	ND (0.1)	0.038 J

RI-SB-03	10/15/2025 L2565319-03 RI-SB-03_0-2 0 - 2 (ft)	11/25/2025 L2575521-03 RI-SB-03_5-7 5 - 7 (ft)	10/15/2025 L2565319-04 RI-SB-03_12-14 12 - 14 (ft)	10/15/2025 L2565319-05 RI-SB-03_22-24 22 - 24 (ft)
Semi-Volatile Organic Compounds (mg/kg)				
Benzo(a)anthracene	*24*	0.021 J	ND (0.1)	0.28
Benzo(a)pyrene	*26*	ND (0.14)	ND (0.13)	0.2
Benzo(b)fluoranthene	*30*	ND (0.1)	ND (0.1)	0.26
Benzo(g,h,i)perylene	11	ND (0.14)	ND (0.13)	0.1 J
Benzo(k)fluoranthene	*8.8*	ND (0.1)	ND (0.1)	0.064 J
Chrysene	*23*	0.018 J	ND (0.1)	0.24
Dibenz(a,h)anthracene	3.8	ND (0.1)	ND (0.1)	0.027 J
Dibenzofuran	3.2	ND (0.17)	ND (0.17)	0.053 J
Indeno(1,2,3-cd)pyrene	*10*	ND (0.14)	ND (0.13)	0.11 J
Phenanthrene	37	0.041 J	ND (0.1)	0.75
Total Metals (mg/kg)				
Lead	148	5.17	3.13 J	4.95
Mercury	0.265	ND (0.076)	ND (0.074)	ND (0.088)

RI-SB-07	10/14/2025 L2565004-03 RI-SB-07_0-2 0 - 2 (ft)	11/26/2025 L2575754-03 RI-SB-07_6-8 6 - 8 (ft)	10/14/2025 L2565004-04 RI-SB-07_12-14 12 - 14 (ft)	10/14/2025 L2565004-05 RI-SB-07_21-23 21 - 23 (ft)
Pesticides (mg/kg)				
4,4'-DDT	0.0201	ND (0.00163)	ND (0.00179)	ND (0.00188)
Semi-Volatile Organic Compounds (mg/kg)				
Benzo(b)fluoranthene	1.4	0.18	0.053 J	ND (0.12)
Benzo(g,h,i)perylene	0.86	0.092 J	0.029 J	ND (0.16)
Indeno(1,2,3-cd)pyrene	0.68	0.1 J	ND (0.15)	ND (0.16)
Phenanthrene	1.7	0.073 J	0.047 J	0.03 J
Total Metals (mg/kg)				
Arsenic	*25.7*	1.37	5.33	1.77
Copper	204 J+	14.9	43.1 J+	36.4 J+
Lead	*1190*	28.4	402	78.7
Mercury	*1.38*	0.059 J	*2.87*	0.184
Selenium	*4.26*	ND (1.62)	ND (1.79)	ND (1.83)
Zinc	189	150	77.2	140

RI-SB-02	10/16/2025 L2565720-05 RI-SB-02_0-2 0 - 2 (ft)	11/25/2025 L2575521-01 RI-SB-02_6-8 6 - 8 (ft)	10/16/2025 L2565720-06 RI-SB-02_12-14 12 - 14 (ft)	10/16/2025 L2565720-08 DUP-02_20251016 12 - 14 (ft)	10/16/2025 L2565720-07 RI-SB-02_22-24 22 - 24 (ft)
Pesticides (mg/kg)					
4,4'-DDE	ND (0.00167)	0.0064	ND (0.00161)	ND (0.0016)	ND (0.00188)
4,4'-DDT	ND (0.00167) J	0.0168	ND (0.00161)	ND (0.0016)	ND (0.00188)
Semi-Volatile Organic Compounds (mg/kg)					
Benzo(a)anthracene	0.64	*3.8*	ND (0.1)	ND (0.1)	ND (0.12)
Benzo(a)pyrene	0.67	3.5	ND (0.13)	ND (0.13)	ND (0.16)
Benzo(b)fluoranthene	0.81	*4.7*	ND (0.1)	ND (0.1)	ND (0.12)
Benzo(g,h,i)perylene	0.47	2	ND (0.13)	ND (0.13)	ND (0.16)
Benzo(k)fluoranthene	0.28	1.5	ND (0.1)	ND (0.1)	ND (0.12)
Chrysene	0.54	*3.5*	ND (0.1)	ND (0.1)	ND (0.12)
Dibenz(a,h)anthracene	0.081 J	0.54	ND (0.1)	ND (0.1)	ND (0.12)
Indeno(1,2,3-cd)pyrene	0.43	2.2	ND (0.13)	ND (0.13)	ND (0.16)
Phenanthrene	0.29	6.2	ND (0.1)	ND (0.1)	ND (0.12)
Total Metals (mg/kg)					
Lead	308	20	11 J	3.7 J	7

RI-SB-08	10/14/2025 L2565004-10 RI-SB-08_0-2 0 - 2 (ft)	11/26/2025 L2575754-04 RI-SB-08_4-6 4 - 6 (ft)	10/14/2025 L2565004-11 RI-SB-08_12-14 12 - 14 (ft)	10/14/2025 L2565004-12 RI-SB-08_22-24 22 - 24 (ft)
Pesticides (mg/kg)				
4,4'-DDD	0.03	ND (0.00176)	ND (0.00155)	ND (0.00177)
4,4'-DDE	0.0195	ND (0.00176)	ND (0.00155)	ND (0.00177)
4,4'-DDT	0.0469	ND (0.00176)	ND (0.00155)	ND (0.00177)
alpha-Chlordane (cis)	0.018	ND (0.0022)	ND (0.00194)	ND (0.00221)
Dieldrin	0.0173	ND (0.0011)	ND (0.000971)	ND (0.00111)
Polychlorinated Biphenyls (mg/kg)				
Polychlorinated biphenyls (PCBs)	0.242 J	ND (0.0546)	ND (0.0496)	ND (0.0544)
Semi-Volatile Organic Compounds (mg/kg)				
Benzo(a)anthracene	*2*	0.26	ND (0.1)	ND (0.11)
Benzo(a)pyrene	2	0.26	ND (0.13)	ND (0.15)
Benzo(b)fluoranthene	*2.5*	0.32	ND (0.1)	ND (0.11)
Benzo(g,h,i)perylene	1.3	0.16	ND (0.13)	ND (0.15)
Chrysene	*1.9*	0.28	ND (0.1)	ND (0.11)
Dibenz(a,h)anthracene	0.35	0.04 J	ND (0.1)	ND (0.11)
Indeno(1,2,3-cd)pyrene	1.1	0.16	ND (0.13)	ND (0.15)
Phenanthrene	3.2	0.35	ND (0.1)	ND (0.11)
Total Metals (mg/kg)				
Copper	89 J+	46	8.33 J+	15.6 J+
Lead	*1170*	326	3.71 J	4.76
Mercury	0.29	*0.793*	ND (0.064)	ND (0.083)
Zinc	436	80.4	24.2	33.2
Volatile Organic Compounds (mg/kg)				
Tetrachloroethene	*3.6*	*6.8*	0.00066	0.0021

RI-SB-06	10/15/2025 L2565319-06 RI-SB-06_0-2 0 - 2 (ft)	11/26/2025 L2575754-02 RI-SB-06_6-8 6 - 8 (ft)	10/15/2025 L2565319-07 RI-SB-06_12-14 12 - 14 (ft)	10/15/2025 L2565319-08 RI-SB-06_22-24 22 - 24 (ft)
Pesticides (mg/kg)				
4,4'-DDE	0.0093	ND (0.00176)	ND (0.00163)	ND (0.00192)
4,4'-DDT	0.0154	ND (0.00176)	ND (0.00163)	ND (0.00192)
Semi-Volatile Organic Compounds (mg/kg)				
Benzo(a)anthracene	*7.3*	0.022 J	ND (0.1)	ND (0.12)
Benzo(a)pyrene	6.1	ND (0.15)	ND (0.14)	ND (0.16)
Benzo(b)fluoranthene	*8.4*	ND (0.11)	ND (0.1)	ND (0.12)
Benzo(g,h,i)perylene	3.5	ND (0.15)	ND (0.14)	ND (0.16)
Benzo(k)fluoranthene	1.5	ND (0.11)	ND (0.1)	ND (0.12)
Chrysene	*5.6*	ND (0.11)	ND (0.1)	ND (0.12)
Dibenz(a,h)anthracene	0.79	ND (0.11)	ND (0.1)	ND (0.12)
Indeno(1,2,3-cd)pyrene	3.9	ND (0.15)	ND (0.14)	ND (0.16)
Phenanthrene	18	ND (0.11)	ND (0.1)	ND (0.12)
Total Metals (mg/kg)				
Lead	159	22.7	2.08 J	5.16
Zinc	189	27.5	13	44.2

RI-SB-09	10/14/2025 L2565004-06 RI-SB-09_0-2 0 - 2 (ft)	11/26/2025 L2575754-06 RI-SB-09_6-8 6 - 8 (ft)	10/14/2025 L2565004-07 RI-SB-09_12-14 12 - 14 (ft)	10/14/2025 L2565004-09 DUP-01_20251014 12 - 14 (ft)	10/14/2025 L2565004-08 RI-SB-09_22-24 22 - 24 (ft)
Total Metals (mg/kg)					
Zinc	850	668	12 J	20.2 J	37.1

LEGEND

- SOIL BORING
- SITE BOUNDARY
- PARCEL BOUNDARY

Analyte	*NY-PGW*	NY-RESR	NY-UNRES
PCBs (mg/kg)			
Polychlorinated biphenyls	3.2	1	0.1
Pesticides (mg/kg)			
4,4'-DDD	14	5	0.0033
4,4'-DDE	9.3	3.4	0.0033
4,4'-DDT	135	3.8	0.0033
alpha-Chlordane (cis)	4.5	0.65	0.014
Dieldrin	0.1	0.075	0.005
Semi-Volatile Organic Compounds (mg/kg)			
Benzo(a)anthracene	1	1.4	1
Benzo(a)pyrene	22	1	1
Benzo(b)fluoranthene	2.1	1.4	1
Benzo(g,h,i)perylene	1000	4.9	0.64
Benzo(k)fluoranthene	2	4.9	0.8
Chrysene	1	4.9	1
Dibenz(a,h)anthracene	1000	0.33	0.33
Dibenzofuran	110	18	2.1
Indeno(1,2,3-cd)pyrene	6.6	1.4	0.5
Phenanthrene	1000	4.9	1.1
Total Metals (mg/kg)			
Arsenic	16	16	13
Barium	820	410	410
Copper	1720	280	50
Lead	450	400	63
Mercury	0.73	0.3	0.18
Selenium	4	110	3.9
Zinc	2480	6600	109
Volatile Organic Compounds (mg/kg)			
Tetrachloroethene	1.3	18	1.3

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. SOIL ANALYTICAL RESULTS ARE COMPARED TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TITLE 6 OF THE OFFICIAL COMPILATION OF NEW YORK CODES, RULES, AND REGULATIONS (NYCRR) PART 375 UNRESTRICTED USE SOIL CLEANUP OBJECTIVES (SCO), RESTRICTED-USE RESIDENTIAL SCOS, AND PROTECTION OF GROUNDWATER SCO'S.
3. EXCEEDANCES PROTECTION OF GROUNDWATER CRITERIA ARE SHOWN IN ***ITALICS***
4. EXCEEDANCES OF THE UNRESTRICTED SCOS ARE SHADED GRAY.
5. EXCEEDANCES OF THE RESTRICTED SCOS ARE SHADED YELLOW.
6. DEFINITIONS:
   NY-PGW - NYSDEC PART 375 PROTECTION OF GROUNDWATER CRITERIA
   NY-RESR - NYSDEC PART 375 RESTRICTED-USE RESIDENTIAL SCOs
   NY-UNRES - NYSDEC PART 375 UNRESTRICTED USE SCOs
   mg/kg: MILLIGRAM PER KILOGRAM
   ND (2.5): NOT DETECTED, NUMBER IN PARENTHESES IS THE LABORATORY REPORTING LIMIT
   J: VALUE IS ESTIMATED.
7. AERIAL IMAGERY SOURCE: NEARMAP, OCTOBER 1, 2025

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0 40 80
SCALE IN FEET

HALEY ALDRICH

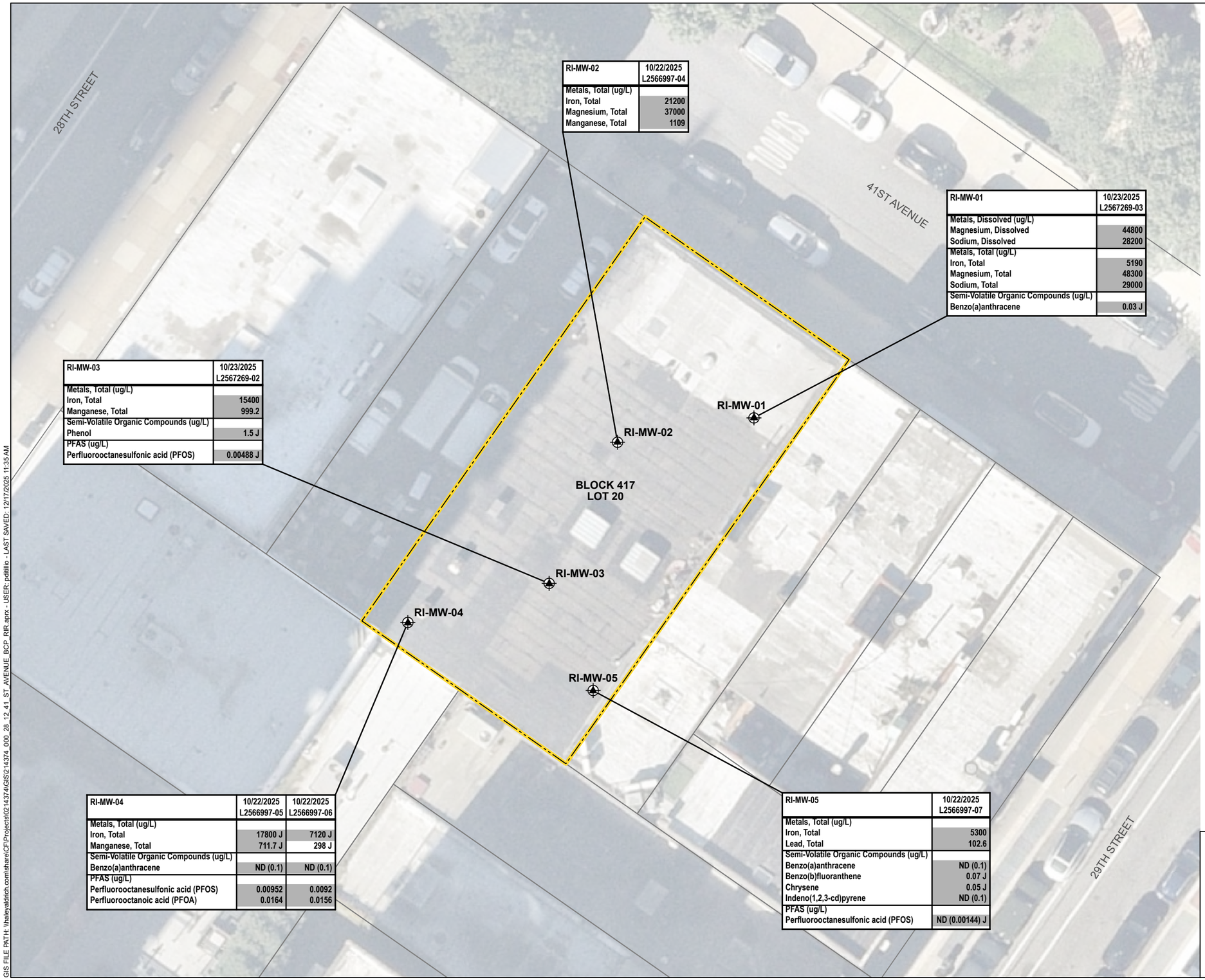
28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

SOIL RESULTS EXCEEDANCE MAP

MAY 2026

FIGURE 4

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\0214374\GIS\214374_000_28_12_41_ST_AVENUE_BCP_RIR.aprx - USER: pdilillo - LAST SAVED: 3/23/2026 12:31 PM



RI-MW-02	10/22/2025 L2566997-04
Metals, Total (ug/L)	
Iron, Total	21200
Magnesium, Total	37000
Manganese, Total	1109

RI-MW-01	10/23/2025 L2567269-03
Metals, Dissolved (ug/L)	
Magnesium, Dissolved	44800
Sodium, Dissolved	28200
Metals, Total (ug/L)	
Iron, Total	5190
Magnesium, Total	48300
Sodium, Total	29000
Semi-Volatile Organic Compounds (ug/L)	
Benzo(a)anthracene	0.03 J

RI-MW-03	10/23/2025 L2567269-02
Metals, Total (ug/L)	
Iron, Total	15400
Manganese, Total	999.2
Semi-Volatile Organic Compounds (ug/L)	
Phenol	1.5 J
PFAS (ug/L)	
Perfluorooctanesulfonic acid (PFOS)	0.00488 J

RI-MW-04	10/22/2025 L2566997-05	10/22/2025 L2566997-06
Metals, Total (ug/L)		
Iron, Total	17800 J	7120 J
Manganese, Total	711.7 J	298 J
Semi-Volatile Organic Compounds (ug/L)		
Benzo(a)anthracene	ND (0.1)	ND (0.1)
PFAS (ug/L)		
Perfluorooctanesulfonic acid (PFOS)	0.00952	0.0092
Perfluorooctanoic acid (PFOA)	0.0164	0.0156

RI-MW-05	10/22/2025 L2566997-07
Metals, Total (ug/L)	
Iron, Total	5300
Lead, Total	102.6
Semi-Volatile Organic Compounds (ug/L)	
Benzo(a)anthracene	ND (0.1)
Benzo(b)fluoranthene	0.07 J
Chrysene	0.05 J
Indeno(1,2,3-cd)pyrene	ND (0.1)
PFAS (ug/L)	
Perfluorooctanesulfonic acid (PFOS)	ND (0.00144) J

LEGEND

- MONITORING WELL
- SITE BOUNDARY
- PARCEL BOUNDARY

	New York TOGS 111 Ambient Water Quality Standards	New York April 2023 Ambient Water Quality Guidance Values (AWQGV)
Metals, Dissolved (ug/L)		
Magnesium, Dissolved	35000	NA
Sodium, Dissolved	20000	NA
Metals, Total (ug/L)		
Iron, Total	300	NA
Lead, Total	25	NA
Magnesium, Total	35000	NA
Manganese, Total	300	NA
Sodium, Total	20000	NA
PFAS (ug/L)		
Perfluorooctanesulfonic	NA	0.0027
Perfluorooctanoic acid (	NA	0.0067
Semi-Volatile Organic Compounds (ug/L)		
Benzo(a)anthracene	0.002	NA
Benzo(b)fluoranthene	0.002	NA
Chrysene	0.002	NA
Indeno(1,2,3-cd)pyrene	0.002	NA
Phenol	1	NA

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. PFAS: PER- AND POLYFLUOROALKYL SUBSTANCES.
3. GROUNDWATER ANALYTICAL RESULTS ARE COMPARED TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TECHNICAL AND OPERATIONAL GUIDANCE SERIES (TOGS) 1.1.1 AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES (SGVS) FOR CLASS GA WATER.
4. EXCEEDANCES OF THE CRITERIA ARE SHADED GRAY
5. DEFINITIONS:
J: VALUE IS ESTIMATED.
F: RESULTS ARE CONSIDERED TO BE AN ESTIMATED MAXIMUM CONCENTRATION.
6. AERIAL IMAGERY SOURCE: NEARMAP, OCTOBER 1, 2025

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SCALE IN FEET

HALEY ALDRICH

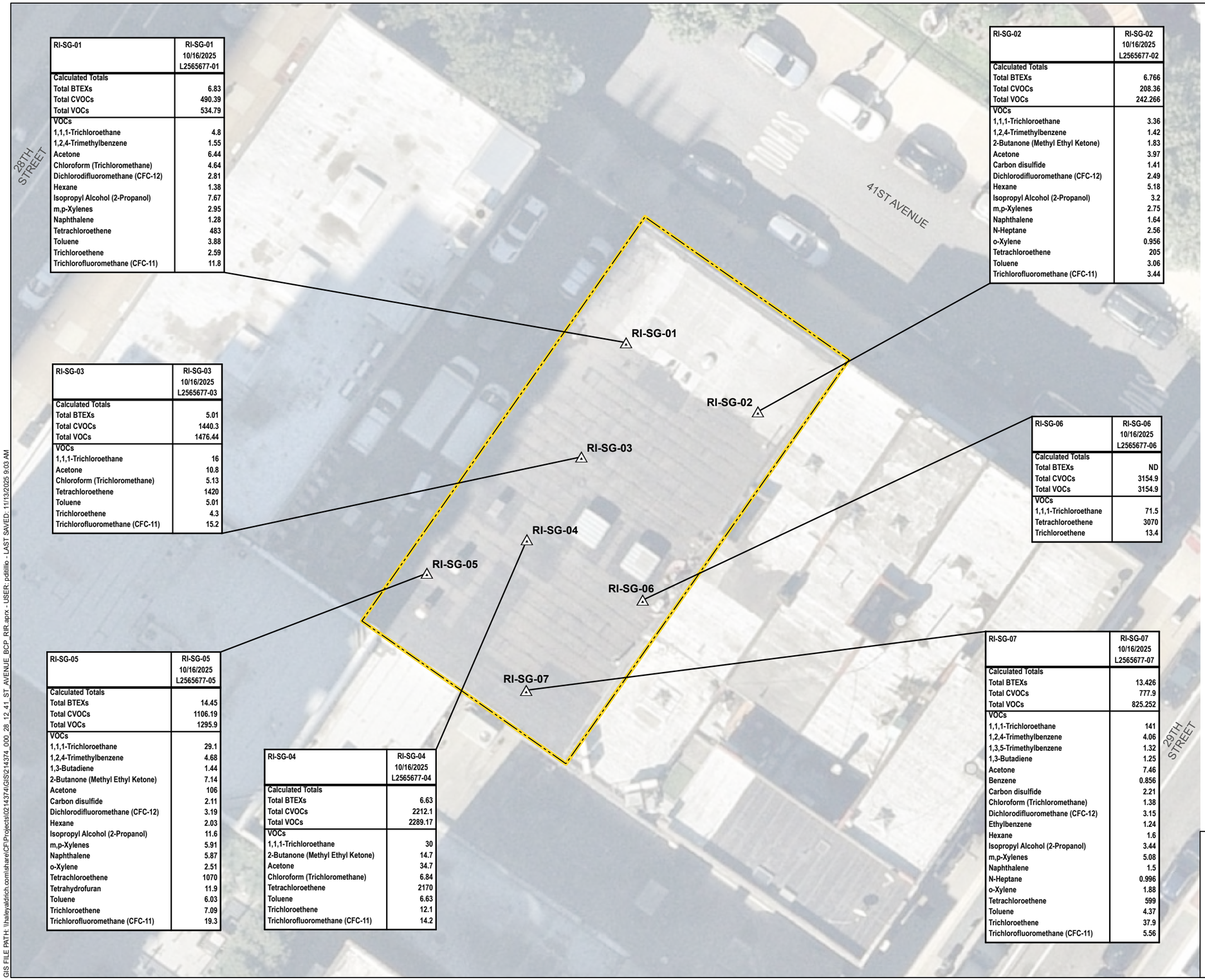
28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

GROUNDWATER EXCEEDANCE MAP

MAY 2026

FIGURE 5

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\021437\GIS\214374_000_28_12_41_ST_AVENUE_BCP_RIR.aprx - USER: pdilillo - LAST SAVED: 12/17/2025 11:35 AM



RI-SG-01	RI-SG-01 10/16/2025 L2565677-01
Calculated Totals	
Total BTEXs	6.83
Total CVOCs	490.39
Total VOCs	534.79
VOCs	
1,1,1-Trichloroethane	4.8
1,2,4-Trimethylbenzene	1.55
Acetone	6.44
Chloroform (Trichloromethane)	4.64
Dichlorodifluoromethane (CFC-12)	2.81
Hexane	1.38
Isopropyl Alcohol (2-Propanol)	7.67
m,p-Xylenes	2.95
Naphthalene	1.28
Tetrachloroethene	483
Toluene	3.88
Trichloroethene	2.59
Trichlorofluoromethane (CFC-11)	11.8

RI-SG-02	RI-SG-02 10/16/2025 L2565677-02
Calculated Totals	
Total BTEXs	6.766
Total CVOCs	208.36
Total VOCs	242.266
VOCs	
1,1,1-Trichloroethane	3.36
1,2,4-Trimethylbenzene	1.42
2-Butanone (Methyl Ethyl Ketone)	1.83
Acetone	3.97
Carbon disulfide	1.41
Dichlorodifluoromethane (CFC-12)	2.49
Hexane	5.18
Isopropyl Alcohol (2-Propanol)	3.2
m,p-Xylenes	2.75
Naphthalene	1.64
N-Heptane	2.56
o-Xylene	0.956
Tetrachloroethene	205
Toluene	3.06
Trichlorofluoromethane (CFC-11)	3.44

RI-SG-03	RI-SG-03 10/16/2025 L2565677-03
Calculated Totals	
Total BTEXs	5.01
Total CVOCs	1440.3
Total VOCs	1476.44
VOCs	
1,1,1-Trichloroethane	16
Acetone	10.8
Chloroform (Trichloromethane)	5.13
Tetrachloroethene	1420
Toluene	5.01
Trichloroethene	4.3
Trichlorofluoromethane (CFC-11)	15.2

RI-SG-06	RI-SG-06 10/16/2025 L2565677-06
Calculated Totals	
Total BTEXs	ND
Total CVOCs	3154.9
Total VOCs	3154.9
VOCs	
1,1,1-Trichloroethane	71.5
Tetrachloroethene	3070
Trichloroethene	13.4

RI-SG-05	RI-SG-05 10/16/2025 L2565677-05
Calculated Totals	
Total BTEXs	14.45
Total CVOCs	1106.19
Total VOCs	1295.9
VOCs	
1,1,1-Trichloroethane	29.1
1,2,4-Trimethylbenzene	4.68
1,3-Butadiene	1.44
2-Butanone (Methyl Ethyl Ketone)	7.14
Acetone	106
Carbon disulfide	2.11
Dichlorodifluoromethane (CFC-12)	3.19
Hexane	2.03
Isopropyl Alcohol (2-Propanol)	11.6
m,p-Xylenes	5.91
Naphthalene	5.87
o-Xylene	2.51
Tetrachloroethene	1070
Tetrahydrofuran	11.9
Toluene	6.03
Trichloroethene	7.09
Trichlorofluoromethane (CFC-11)	19.3

RI-SG-04	RI-SG-04 10/16/2025 L2565677-04
Calculated Totals	
Total BTEXs	6.63
Total CVOCs	2212.1
Total VOCs	2289.17
VOCs	
1,1,1-Trichloroethane	30
2-Butanone (Methyl Ethyl Ketone)	14.7
Acetone	34.7
Chloroform (Trichloromethane)	6.84
Tetrachloroethene	2170
Toluene	6.63
Trichloroethene	12.1
Trichlorofluoromethane (CFC-11)	14.2

RI-SG-07	RI-SG-07 10/16/2025 L2565677-07
Calculated Totals	
Total BTEXs	13.426
Total CVOCs	777.9
Total VOCs	825.252
VOCs	
1,1,1-Trichloroethane	141
1,2,4-Trimethylbenzene	4.06
1,3,5-Trimethylbenzene	1.32
1,3-Butadiene	1.25
Acetone	7.46
Benzene	0.856
Carbon disulfide	2.21
Chloroform (Trichloromethane)	1.38
Dichlorodifluoromethane (CFC-12)	3.15
Ethylbenzene	1.24
Hexane	1.6
Isopropyl Alcohol (2-Propanol)	3.44
m,p-Xylenes	5.08
Naphthalene	1.5
N-Heptane	0.996
o-Xylene	1.88
Tetrachloroethene	599
Toluene	4.37
Trichloroethene	37.9
Trichlorofluoromethane (CFC-11)	5.56

LEGEND

- SOIL VAPOR SAMPLE
- SITE BOUNDARY
- PARCEL BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. RESULTS ARE DISPLAYED IN MICROGRAMS PER CUBIC METER (µg/m³).
3. CVOCs = CHLORINATED VOLATILE ORGANIC COMPOUNDS.
4. TOTAL BTEX IS THE SUM OF BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES.
5. TOTAL CVOCS IS THE SUM OF ALL THE DETECTED CONCENTRATIONS OF CARBON TETRACHLORIDE, 1,1-DICHLOROETHENE, CIS-1,2-DICHLOROETHENE, TRICHLOROETHENE, METHYLENE CHLORIDE, TETRACHLOROETHENE, 1,1,1-TRICHLOROETHANE, CHLOROFORM, AND VINYL CHLORIDE
6. TOTAL VOCs IS THE SUM OF ALL THE DETECTED CONCENTRATIONS.
7. AERIAL IMAGERY SOURCE: NEARMAP, OCTOBER 1, 2025

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SCALE IN FEET

HALEY ALDRICH

28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

SOIL VAPOR RESULTS MAP

MAY 2026

FIGURE 6

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\021437\GIS\214374_000_28_12_41_ST_AVENUE_BCP_RIR.aprx - USER: pdilillo - LAST SAVED: 11/13/2025 9:03 AM



LEGEND

- GROUNDWATER MONITORING WELL WITH **GROUNDWATER ELEVATION** IN FEET
- GROUNDWATER ELEVATION CONTOUR, 0.5-FT INTERVAL
- INFERRED GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- SITE BOUNDARY
- PARCEL BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER MONITORING WELLS WERE SURVEYED BY DPK LAND SURVEYING LLC ON OCTOBER 31, 2025.

3. GROUNDWATER ELEVATIONS WERE MEASURED ON OCTOBER 31, 2025.

4. NAVD 88 = NORTH AMERICAN VERTICAL DATUM OF 1988.

5. ASSESSOR PARCEL DATA SOURCE: NYC DEPARTMENT OF CITY PLANNING, INFORMATION TECHNOLOGY DIVISION

6. AERIAL IMAGERY SOURCE: NEARMAP, OCTOBER 1, 2025

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SCALE IN FEET

HALEY ALDRICH

28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

GROUNDWATER CONTOUR MAP

MAY 2026

FIGURE 7

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\0214374\GIS\214374_000_28_12_41_ST_AVENUE_BCP_RIR.aprx - USER: pdilillo - LAST SAVED: 11/13/2025 9:19 AM



LEGEND

EXCAVATION DEPTHS IN FEET BELOW GROUND SURFACE (BGS)

25 FT

SITE BOUNDARY

PARCEL BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: NEARMAP, OCTOBER 1, 2025

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SCALE IN FEET

HALEY ALDRICH

28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

ALTERNATIVE I EXCAVATION PLAN

MAY 2026

FIGURE 8

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\0214374\GIS\214374_000_28_12_41_ST_AVENUE_BCP_RAWP.aprx - USER: pdilillio - LAST SAVED: 11/10/2025 4:21 PM



LEGEND

EXCAVATION DEPTHS IN FEET BELOW GROUND SURFACE (BGS)

- SITE-WIDE EXCAVATION TO 7 FT
- RI-SB-07 HOTSPOT EXCAVATION TO 15 FT
- RI-SB-02 AND RI-SB-04 HOTSPOT EXCAVATIONS TO 9 FT
- SITE BOUNDARY
- PARCEL BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: NEARMAP, OCTOBER 1, 2025

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SCALE IN FEET

HALEY ALDRICH

28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

ALTERNATIVE II EXCAVATION PLAN

MAY 2026

FIGURE 9

GIS FILE PATH: \\haleyaldrich.com\share\CP\Projects\0214374\GIS\214374_000_28_12_41_ST_AVENUE_BCP_RAWP.aprx - USER: pdilillo - LAST SAVED: 11/10/2025 4:21 PM



LEGEND

EXCAVATION DEPTHS IN FEET BELOW GROUND SURFACE (BGS)

2 FT

SITE BOUNDARY

PARCEL BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: NEARMAP, OCTOBER 1, 2025

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SCALE IN FEET

HALEY ALDRICH

28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

ALTERNATIVE III EXCAVATION PLAN

MAY 2026

FIGURE 10

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\0214374\GIS\214374_000_28_12_41_ST_AVENUE_BCP_RAWP.aprx - USER: pdilillio - LAST SAVED: 11/10/2025 4:21 PM



LEGEND

- PROPOSED BACKFILL
- PROPOSED BUILDING FOOTPRINT
- SITE BOUNDARY
- PARCEL BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: NEARMAP, OCTOBER 1, 2025

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SCALE IN FEET

HALEY ALDRICH

28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

PROPOSED BACKFILL LOCATION PLAN

MAY 2026

FIGURE 11

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LEGEND

- PROPOSED HOT SPOT CONFIRMATION BASE SAMPLE
- PROPOSED HOT SPOT CONFIRMATION SIDEWALL SAMPLE
- PROPOSED SITE-WIDE EXCAVATION BASE CONFIRMATION AND DOCUMENTATION SAMPLE

EXCAVATION DEPTHS IN FEET BELOW GROUND SURFACE (BGS)

- 7 FT
- 9 FT (RI-SB-02 AND RI-SB-04)
- 15 FT (RI-SB-07)
- SITE BOUNDARY
- PARCEL BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ASSESSOR PARCEL DATA SOURCE: NYC DEPARTMENT OF CITY PLANNING, INFORMATION TECHNOLOGY DIVISION
3. AERIAL IMAGERY SOURCE: NEARMAP, OCTOBER 1, 2025

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SCALE IN FEET

HALEY ALDRICH

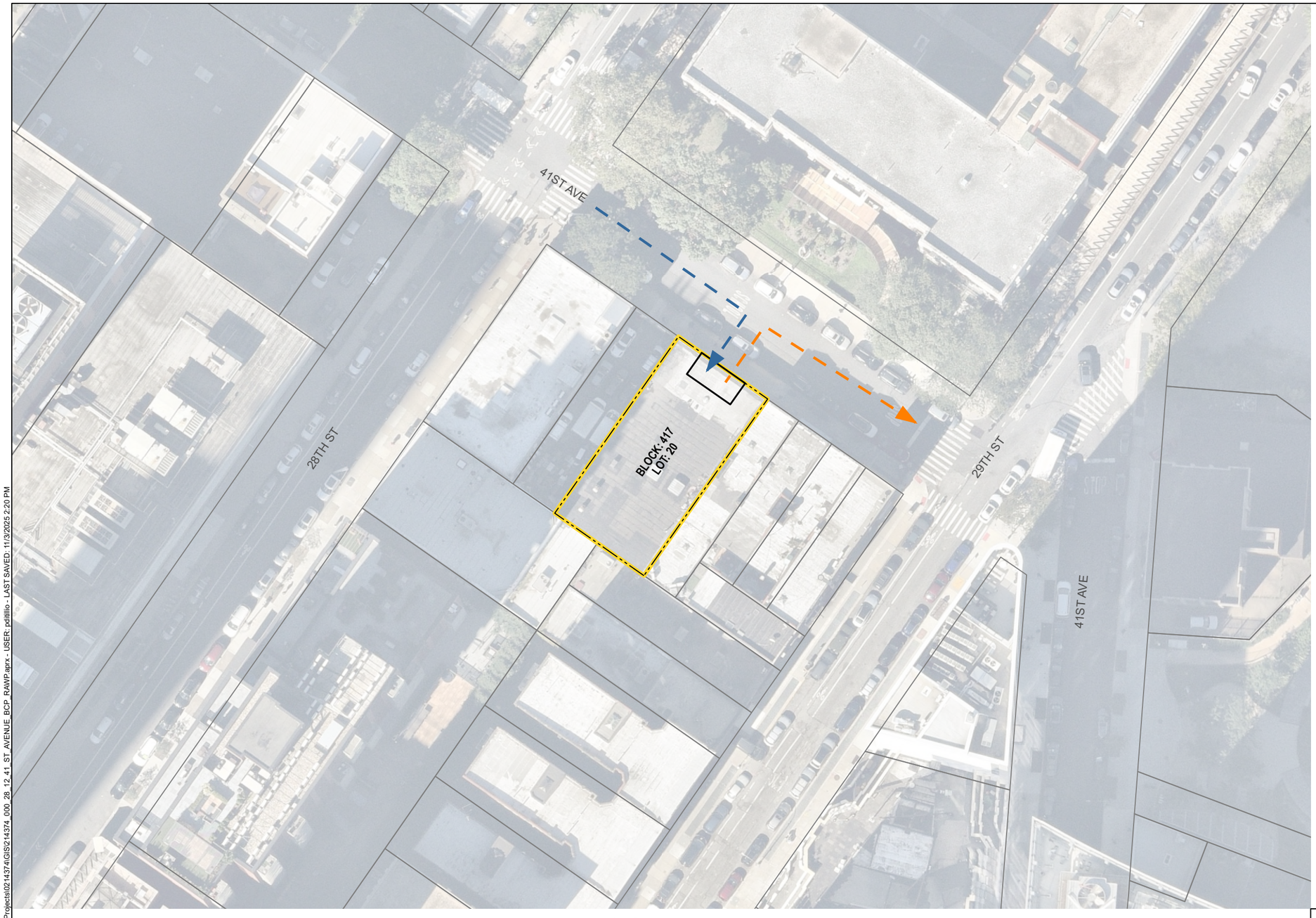
28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

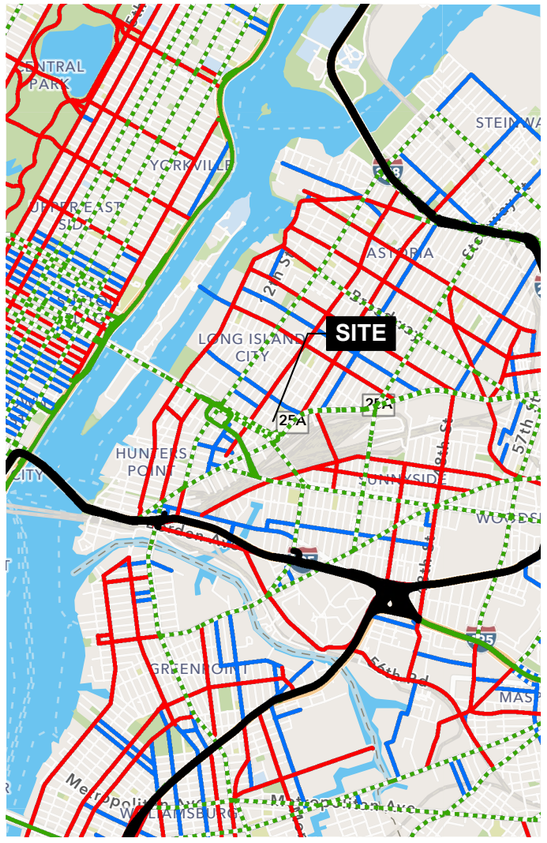
PROPOSED DOCUMENTATION AND CONFIRMATION SAMPLE MAP

MAY 2026

FIGURE 12

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\0214374\GIS\214374_000_28_12_41_ST_AVENUE_BCP_RAWP.aprx - USER: pditillio - LAST SAVED: 11/11/2025 1:17 PM





Legend

Truck Routes

- **Local Truck Route** — Trucks with an origin or destination for the purpose of delivery, loading or servicing within the respective Borough, shall only operate on designated local routes, except that an operator may operate on a non-designated street for the purpose of arriving at their destination. This shall be accomplished by leaving a designated truck route at the intersection that is nearest to their destination, proceeding by the most direct route, and then returning to the nearest designated truck route by the most direct route. If the operator has additional destinations in the same general area, they may proceed by the most direct route to their next destination without returning to a designated truck route, provided that the operator's next destination does not require that they cross a designated truck route.
- **Through Truck Route** — Trucks having neither an origin nor a destination within the respective Borough shall restrict the operation of such vehicles to those street segments designated as Through Truck Routes.
- **Through Truck Route on Expressway**
- **53 FT Trailer Exception**
- **Connecting Road Outside NYC**

Restricted Routes

- **No Commercial Vehicles**

Hazards

- Alert: see additional information
- Low Vertical Clearance (14 feet and under)

Navigation / Landmarks

- Highway Exit
- Major Highway
- Industrial Business Zone
- Parks and Open Spaces
- Limited Truck Zone

LEGEND

- TRUCK EGRESS
- TRUCK INGRESS
- CONSTRUCTION ENTRANCE
- SITE BOUNDARY
- PARCEL BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ASSESSOR PARCEL DATA SOURCE: NYC DEPARTMENT OF CITY PLANNING, INFORMATION TECHNOLOGY DIVISION
3. TRUCK ROUTE MAP DATA SOURCE: NYC DEPARTMENT OF TRANSPORTATION, 2022
4. AERIAL IMAGERY SOURCE: NEARMAP, OCTOBER 1, 2025

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HALEY ALDRICH

28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

TRUCK ROUTE MAP

MAY 2026

FIGURE 13

GIS FILE PATH: \\haleyaldrich.com\share\CFI\Projects\0214374\GIS\214374_000_28_12_41_ST_AVENUE_BCP_RAWP.aprx - USER: rdilillo - LAST SAVED: 11/3/2025 2:20 PM



LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- SITE-WIDE REMEDIAL EXCAVATION TO 7 FT BGS
- DEVELOPMENT EXCAVATION TO 14 FT BGS
- SVE WELL SCREENED FROM 14 TO 24 FT BGS
- ASSUMED 15 FEET RADIUS OF INFLUENCE
- SVE MONITORING POINT

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ASSESSOR PARCEL DATA SOURCE: NYC DEPARTMENT OF CITY PLANNING, INFORMATION TECHNOLOGY DIVISION
3. AERIAL IMAGERY SOURCE: NEARMAP, JULY 3, 2025
4. SOURCE MAP: FOUNDATION PLAN BY JUST CONSULTING ENGINEERING PLLC DATED 8/5/2024

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SCALE IN FEET

HALEY ALDRICH

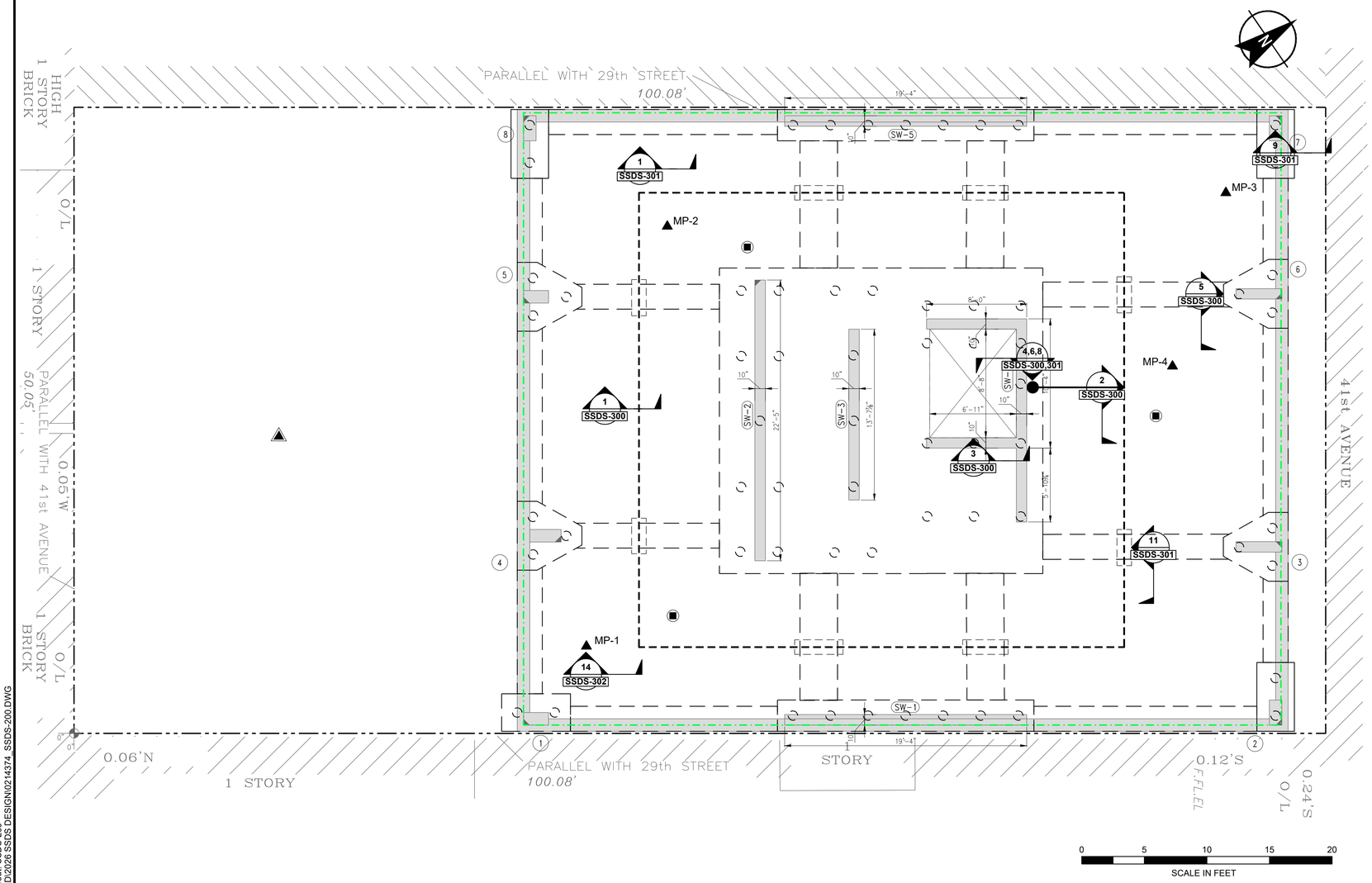
28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

CONCEPTUAL SVE SYSTEM LAYOUT

MAY 2026

FIGURE 14

GIS FILE PATH: C:\Users\pdilillo\OneDrive - haleyaldrich.com\Documents\TEMPORARY GIS WORK\P214374-000\GIS\214374_000_28_12_41_ST_AVENUE.aprx - USER: pdilillo - LAST SAVED: 10/1/2025 4:33 PM
41_ST_AVENUE\214374_000_28_12_41_ST_AVENUE.aprx



LEGEND

- 4-INCH CAST IRON LEADER PIPE
- 3-INCH PERFORATED PVC SCH 40 PIPE
- PIPE END CAP
- PIPE SLEEVE
- APPROXIMATE EXTENT OF 20-MIL VAPOR BARRIER MEMBRANE
- 4-INCH CAST IRON VERTICAL RISER PIPE
- MP-1 SUB-SLAB MONITORING POINT
- PROPERTY LINE
- 1 / SSDS-300 — DETAIL NUMBER / SHEET NUMBER (ie. SSDS-300)
- INDOOR AIR SAMPLE LOCATION
- AMBIENT AIR SAMPLE LOCATION

NOTES

1. HORIZONTAL SOLID PIPES SHOULD HAVE A 1% SLOPE TOWARDS SOLID PIPES.
2. BACKGROUND ADAPTED FROM FOUNDATION PLAN, DRAWING FO-100.00, DATED AUGUST 5, 2024, FROM JUST CONSULTING ENGINEERING PLLC OF BAYSIDE, NEW YORK.
3. RISER LOCATION SHALL BE DETERMINED BY ARCHITECT.
4. THE LOCATIONS OF SUB-SLAB MONITORING POINTS SHALL BE COORDINATED WITH ARCHITECT AND PENETRATIONS COORDINATED WITH STRUCTURAL ENGINEER. MONITORING POINTS MUST REMAIN ACCESSIBLE AFTER CONSTRUCTION
5. HALEY & ALDRICH OF NEW YORK WILL BE RESPONSIBLE FOR IMPLEMENTING THE OVERALL REMEDY AND SSDS INSTALLATION AT THE SITE AND WILL CERTIFY THE FINAL ENGINEERING REPORT.
6. ALL DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

HALEY ALDRICH

H & A OF NEW YORK
ENGINEERING AND GEOLOGY, LLP
213 W 35th Street, 7th Floor
New York, NY 10001
Tel: 646.277.5685
www.haleyaldrich.com

PREPARED FOR:

Project No	0214374_000
Scale:	AS SHOWN
Date:	JANUARY 2026
Drawn By:	KFP
Designed By:	MF
Checked By:	ZS
Approved By:	ZS
Stamp:	

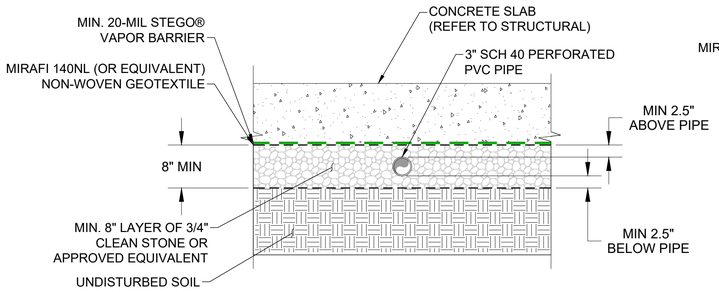
Rev.	Description	By	Date

NEW 10-STORY
RESIDENTIAL BUILDING
28-12 41ST AVENUE
LONG ISLAND CITY,
NEW YORK
PASSIVE SUB-SLAB
DEPRESSURZATION
SYSTEM (SSDS) DESIGN

SUB-SLAB DEPRESSURIZATION SYSTEM PLAN

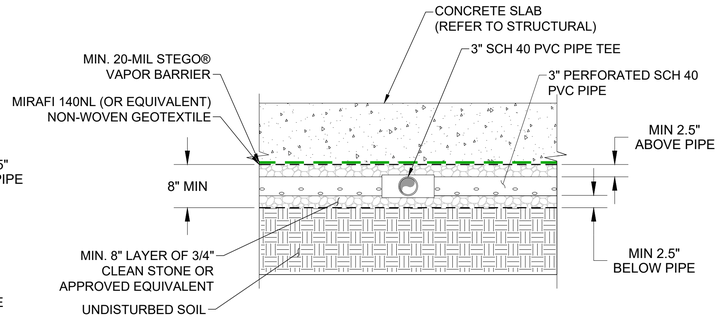
FIGURE 15

NOLAN, JULIAN Printed: 2/17/2026 9:17 AM Layout: SSDS-200
\\HALEYALDRICH.COM\SHARE\CF\PROJECTS\0214374\CAD\2026 SSDS DESIGN\0214374_SSDS-200.DWG



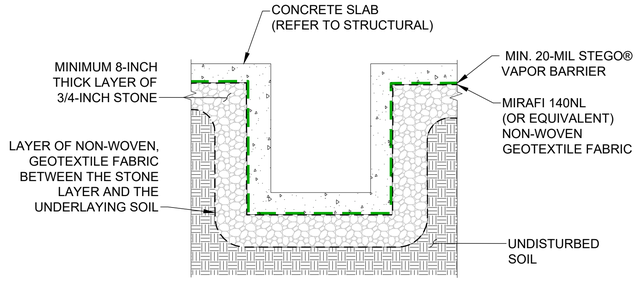
1 SSDS-300 **TYPICAL SUB-SLAB 3" PERFORATED CONVEYANCE PIPING**

NTS



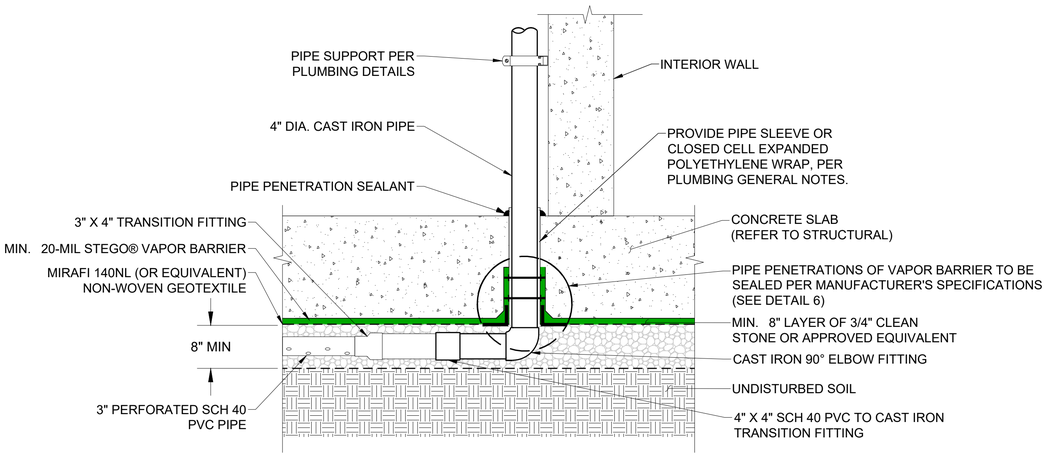
2 SSDS-300 **TYPICAL SUB-SLAB 3" PERFORATED CONVEYANCE PIPING TEE CONNECTION**

NTS



3 SSDS-300 **TYPICAL PIT SECTION (ABOVE GROUNDWATER)**

NOT TO SCALE

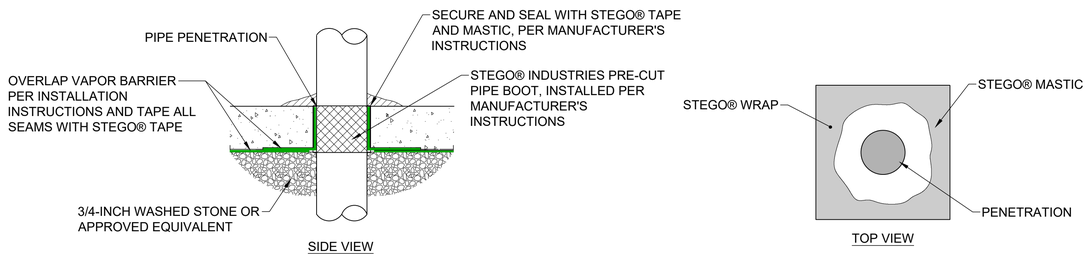


NOTE:

1. PRODUCT SUBSTITUTIONS MUST BE APPROVED IN ADVANCE BY ENGINEER.

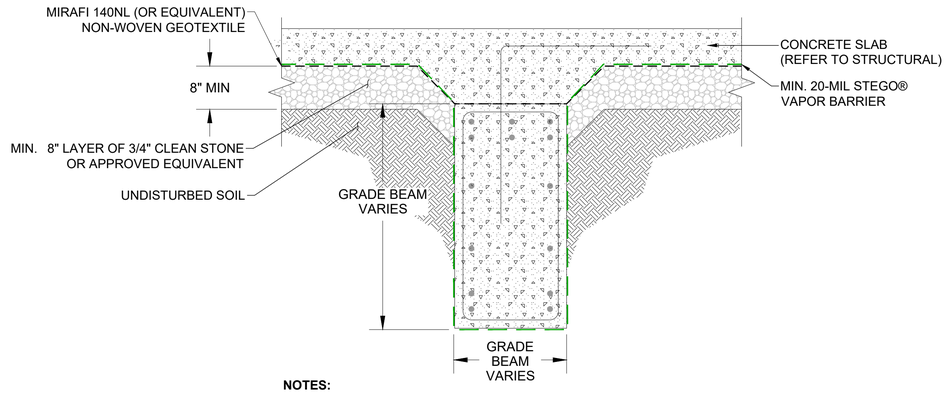
4 SSDS-300 **PERFORATED PIPE TRANSITION TO VERTICAL RISER (TYP.)**

NTS



6 SSDS-300 **PIPE PENETRATION SEAL - STEGO® AND PIPE BOOT (TYP.)**

NTS

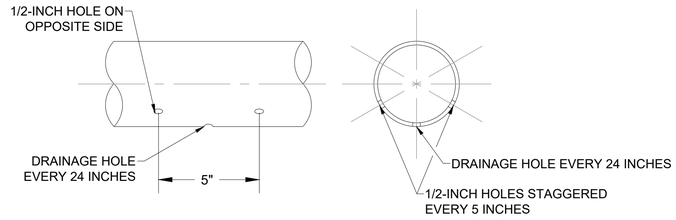


NOTES:

1. VAPOR BARRIER SHOULD WRAP INTERIOR GRADE BEAMS AND INTERIOR WALLS.

5 SSDS-300 **TYPICAL INTERIOR GRADE BEAM SECTION (TYP.)**

NTS



NOTES:

1. PERFORATED PIPE SHALL BE 3-INCH SCH 40 PVC WITH PERFORATION ARRANGEMENT OF TWO 1/2-INCH HOLES SEPARATED BY 120 DEGREES, 60 DEGREE FROM THE HORIZONTAL TOWARD THE BOTTOM OF THE PIPE, SPACED 5-INCH CENTER-TO-CENTER WITH HOLES STAGGERED ON OPPOSITE SIDES AND ONE DRAINAGE HOLE ON THE BOTTOM OF THE PIPE EVERY 24 INCHES.

7 SSDS-300 **3-INCH PERFORATED PIPE DETAIL**

NTS

HALEY ALDRICH

H & A OF NEW YORK
ENGINEERING AND GEOLOGY, LLP
213 W 35th Street, 7th Floor
New York, NY 10001
Tel: 646.277.5685
www.haleyaldrich.com

PREPARED FOR:

Project No	0214374_000
Scale:	AS SHOWN
Date:	JANUARY 2026
Drawn By:	KFP
Designed By:	MF
Checked By:	ZS
Approved By:	ZS
Stamp:	

Rev.	Description	By	Date

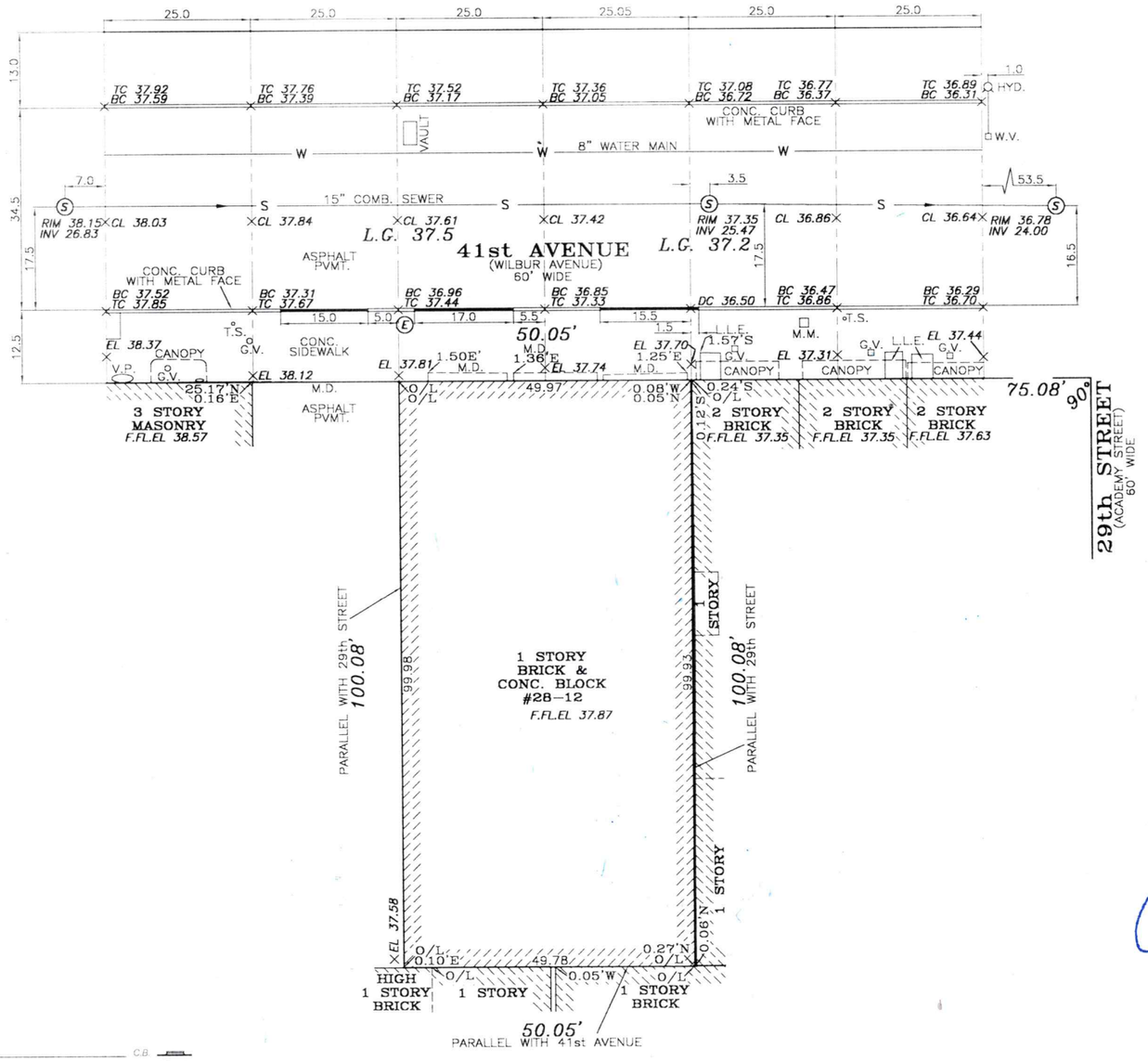
NEW 10-STORY
RESIDENTIAL BUILDING
28-12 41ST AVENUE
LONG ISLAND CITY,
NEW YORK
PASSIVE SUB-SLAB
DEPRESSURIZATION
SYSTEM (SSDS) DESIGN

SUB-SLAB
DEPRESSURIZATION
SYSTEM - DETAILS

FIGURE 16

Printed: 2/17/2026 9:18 AM Layout: SSDS-300
NOLAN, JULIAN
\\HALEYALDRICH.COM\SHARE\CF\PROJECTS\0214374\CAD\2026 SSDS DESIGN\0214374_SSDS-300-303.DWG

APPENDIX A
Survey Maps & Metes and Bounds



LEGEND:

CATCH BASIN	C.B.
TREE DIAMETER	3"
UTILITY POLE	
VALVES	GAS G.V. WATER W.V. OIL G.V.
OVERHEAD SERVICE WIRES	O.H.S.W.
CURB AND CURB CUT	
MANHOLES	SEWER (S) GAS (G) WATER (W) ELECTRIC (E)
ELECTRIC	E
GAS	G
TELEPHONE	T
SEWER	S
WATER	W
FIRE HYDRANT	HYD.

CONCRETE — CONC., PAVEMENT — PVMT., METAL DOOR — M.D.,
METAL PIPE — M.P., VENT PIPE — V.P., TRAFFIC SIGN — T.S.,
MUNI METER — M.M., LOWER LEVEL ENTRANCE — L.L.E.,
EXISTING ELEVATION — EL 43.54 TOP OF CURB — TC 43.54
BOTTOM OF CURB — BC 43.53 DROP CURB — DC 43.54
CENTER LINE OF STREET — CL 43.54 LEGAL GRADES — L.G.43.60

NOTES & DISCLAIMERS:

1. *ALL ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). EXCEPT AS NOTED, USE ONLY THE ELEVATIONS WE PROVIDE ON THIS SURVEY FOR DESIGN. DO NOT USE OR MIX OUR ELEVATIONS (ON THIS SURVEY) WITH ANY ELEVATIONS FROM THE SEWER DEPARTMENT OR ELSEWHERE AS THE DATUMS MAY BE DIFFERENT.*

2. *CONSULT WITH THE HIGHWAY DEPARTMENT BEFORE DESIGNING, INSTALLING OR MODIFYING ANY NEW OR EXISTING CURBS, WALKS OR ROADWAYS IN THE STREETS SHOWN HEREON.*

3. *THE OFFSETS OR DIMENSIONS SHOWN FROM THE STRUCTURES TO THE PROPERTY LINES ARE FOR A SPECIFIC PURPOSE AND USE AND THEREFORE ARE NOT INTENDED TO GUIDE THE ERECTION OF FENCES, RETAINING WALLS, POOLS, PLANTING AREAS, ADDITIONS TO STRUCTURES AND ANY OTHER CONSTRUCTION.*

4. *SUBSURFACE INFORMATION SHOWN HEREON WAS OBTAINED FROM VARIOUS CITY DEPARTMENTS AND/OR PRIVATE UTILITY COMPANIES. THE SURVEYOR DOES NOT CERTIFY AS TO THE ACCURACY OR COMPLETENESS OF THIS DATA AND ALL USERS OF THIS SURVEY AGREE TO HOLD THE SURVEYOR HARMLESS FOR THE LOCATION OF SAID UTILITIES. ALL UTILITIES SHOULD BE CONSIDERED APPROXIMATE AND MUST BE CONFIRMED BY THE USER OF THIS SURVEY PRIOR TO CONSTRUCTION AND/OR THE PURCHASE OF PROPERTY.*

5. *THIS IS TO CERTIFY THAT THERE ARE NO VISIBLE STREAMS OR NATURAL WATER COURSES IN THE PROPERTY AS SHOWN ON THE SURVEY.*

6. *NO SUBSURFACE UTILITY INFORMATION WITHIN THE PROPERTY IS SHOWN. CONTACT ONE CALL TO HAVE ALL SUBSURFACE UTILITY INFORMATION WITHIN THE PROPERTY MARKED OUT PRIOR TO CONSTRUCTION. THE SURVEYOR WILL NOT BE LIABLE OR HELD RESPONSIBLE FOR DAMAGES TO SUBSURFACE UTILITIES EITHER WITHIN OR OUTSIDE THE SURVEYED PROPERTY DUE TO CONSTRUCTION.*

7. *THE USER OF THE SURVEY EXPRESSLY UNDERSTANDS AND AGREES THAT THE SURVEYOR MAKES NO CLAIM AND DOES NOT GUARANTEE THAT THE SEWERS SHOWN HEREON ARE PUBLIC OR THAT ANY PROPERTIES SHOWN ON THIS SURVEY WILL BE ABLE TO CONNECT TO SAME.*

8. *SEWERS MAY NOT EXIST IN FRONT OF SURVEYED PROPERTY. EXISTENCE OR ABSENCE OF SEWERS MUST BE VERIFIED BY USER OF THIS SURVEY PRIOR TO PURCHASING PROPERTY OR BEGINNING ANY PLANNING OR CONSTRUCTION.*

9. *THE USER OF THIS SURVEY EXPRESSLY AGREES AND UNDERSTANDS THAT SHOULD CHRISTOPHER BUCKLEY, CHRISTOPHER BUCKLEY L.S.P.C., PRECISION SURVEYS, EMPLOYEES THEREOF, BE FOUND LIABLE IN A COURT OF LAW FOR ERRORS OR OMISSIONS ARISING FROM THIS SURVEY THAT THE LIMIT OF LIABILITY IS THE PRICE PAID FOR THIS SURVEY.*

10. *NOT TO BE USED FOR TITLE PURPOSES.*

11. *USE OF THIS SURVEY SIGNIFIES THAT YOU AGREE AND CONSENT TO ALL OF THE ABOVE.*

NOTE:
AREA INDICATED IS SHOWN ON FINAL SECTION MAP #14 L.I.C., CITY OF NEW YORK, BOROUGH OF QUEENS.

NOTE:
PLEASE CONTACT APPROPRIATE UTILITY FOR GAS MAIN INFORMATION.

TOTAL LOT AREA IS 5009 sq.ft.
FOR BUILDING DEPARTMENT USE ONLY

STATE OF NEW YORK
CHRISTOPHER M. BUCKLEY
EXCELSIOR
050357
LICENSED LAND SURVEYOR

5/12/25

NOTE:
UNAUTHORIZED ALTERATION OR ADDITION TO THIS SURVEY IS A VIOLATION OF SECTION 7209 OF THE NEW YORK STATE EDUCATION LAW. COPIES OF THIS SURVEY MAP NOT BEARING THE LAND SURVEYORS BLACK INKED OR EMBOSSED SEAL SHALL NOT BE CONSIDERED TO BE A VALID TRUE COPY.
GUARANTEES OR CERTIFICATIONS INDICATED HEREON SHALL RUN ONLY TO THE PERSON AND/OR PERSONS FOR WHOM THE SURVEY IS PREPARED, AND ONLY ON HIS/HER BEHALF TO THE TITLE COMPANY, GOVERNMENTAL AGENCY AND LENDING INSTITUTION LISTED HEREON, AND TO THE ASSIGNEES OF THE LENDING INSTITUTION GUARANTEES OR CERTIFICATIONS ARE NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS OR SUBSEQUENT OWNERS.

TOPOGRAPHIC SURVEY

LOCATED AT:
28–12 41st Street, Long Island City
Borough and County of Queens
City and State of New York

TAX DESIG: Block 417, Lot 20

Precision Surveys

TITLE • ARCHITECTURAL • BOUNDARY • CONSTRUCTION

40 FRANKLIN AVE. FRANKLIN SQUARE, N.Y. 11010
Phone (718)472-1571 • (516)488-1608• Fax (718)609-0026

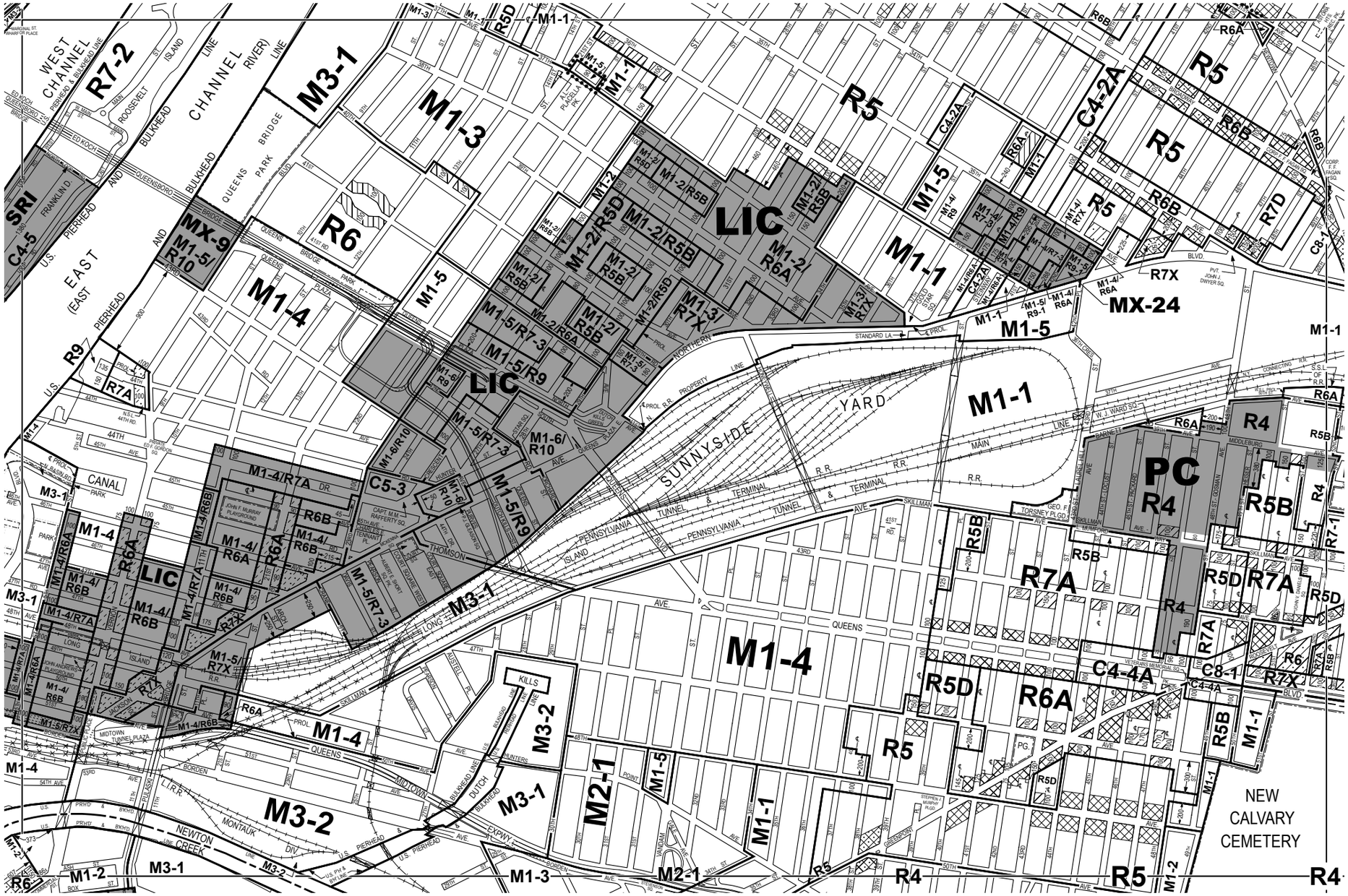
CHRISTOPHER M. BUCKLEY
PROFESSIONAL LAND SURVEYOR

CERTIFIED TO:
Angelo Ng & Anthony Ng
Architects Studio PC

DATE: May 12, 2025
SCALE: 1" = 20'

Job No.52720
Drawn by MK

APPENDIX B
Zoning Map



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 6 (Location of District Boundaries) of the Zoning Resolution.

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:

03-19-2024 C 230306 ZMQ

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

8c	9a	9c
8d	**9b**	9d
12c	13a	13c

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ZONING MAP **9b**

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.

APPENDIX C
Proposed Development Plans

A. CODES AND STANDARDS:

1. THE FOLLOWING CODES AND STANDARDS SHALL APPLY TO THE DESIGN, CONSTRUCTION, AND QUALITY CONTROL OF ALL WORK PERFORMED ON THE PROJECT. USE THE LATEST EDITIONS UNLESS NOTED OTHERWISE.
   - NEW YORK CITY CONSTRUCTION CODE, 2022 EDITION.
   - INTERNATIONAL BUILDING CODE (IBC) 2009
   - "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES" ANSI/ASCE 7-16, AMERICAN SOCIETY OF CIVIL ENGINEERS
   - "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318-14)", AMERICAN CONCRETE INSTITUTE.
   - "ACI MANUAL OF CONCRETE PRACTICE - PART 1 THROUGH 5 - 2011", AMERICAN CONCRETE INSTITUTE.
   - "MANUAL OF STANDARD PRACTICE 2008", CONCRETE REINFORCING STEEL INSTITUTE.

B. DESIGN DATA:

1. FLOOR LIVE LOAD

AREA	UNIFORM LOAD	CONC. LOAD	LL RED.?
• LOBBY	100 PSF	NO	
• APARTMENT	40 PSF		YES
• STAIRS	100 PSF	300 LBS	NO

2. ROOF LIVE LOAD

AREA	UNIFORM LOAD	CONC. LOAD	LL RED.?
• MINIMUM ROOF LOAD	30 PSF	300 LBS	NO
• PRIVATE ROOF TERRACE	60 PSF	2000 LBS	NO

3. ROOF SNOW LOAD
   - GROUND SNOW LOAD, P_g 25 PSF
   - FLAT ROOF SNOW LOAD, P_f 20 PSF
   - SNOW EXPOSURE FACTOR, C_e 0.9
   - SNOW LOAD IMPORTANCE FACTOR, I 1.0
   - THERMAL FACTOR, C_t 1.0

4. DEAD LOAD
   - PARTITION LOAD 12 PSF
   - FLOOR FINISHES 5 PSF
   - ROOFING AND INSULATION 10 PSF
   - MECHANICAL AND CEILING 5 PSF

5. WIND LOAD
   - BASIC WIND SPEED 117 MPH
   - WIND IMPORTANCE FACTOR, I 1.0
   - OCCUPANCY CATEGORY II
   - WIND EXPOSURE B
   - INTERNAL PRESSURE COEFFICIENT +/-0.18 (ENCLOSED)
   - COMPONENTS AND CLADDING DESIGN BASE SHEAR 30 PSF 130 KIPS

6. EARTHQUAKE DESIGN DATA
   - SEISMIC IMPORTANCE FACTOR I 1.0
   - OCCUPANCY CATEGORY II
   - SPECTRAL RESPONSE COEFFICIENTS S_S=0.296g, S1=0.061g
   - SITE CLASS D
   - SEISMIC DESIGN CATEGORY B
   - BASIC SEISMIC-FORCE-RESISTING SYSTEM: ORDINARY REINFORCED CONCRETE SHEAR WALL
   - DESIGN BASE SHEAR 74 KIPS
   - SEISMIC RESPONSE COEFFICIENT C_S 0.026
   - RESPONSE MODIFICATION FACTOR R 5
   - ANALYSIS PROCEDURE EQUIVALENT LATERAL FORCE PROCEDURE

D. MATERIALS:

1. THE FOLLOWING ASTM STANDARDS AND DESIGN STRESSES SHALL BE USED FOR THE APPROPRIATE MATERIALS USED IN THE CONSTRUCTION OF THIS PROJECT.
2. CEMENT: ASTM C150; TYPE I SEE SPEC
3. AGGREGATES: ASTM C33 (NORMAL WEIGHT)
   ASTM C330 (STRUCTURAL LIGHTWEIGHT)
4. CONCRETE: SEE SPEC.

	APPLICATION	f'c AT 28 DAYS (psi)	WT (pcf)	W/C (MAX.)
4.1.	FOOTING	6000	145	0.45
4.2.	FOUNDATION WALLS	6000	145	0.45
4.3.	COLUMN, SHEAR WALL CELLAR TO 6TH FLOOR	6000	145	0.40
4.4.	SLAB, BEAM CELLAR TO 6TH FLOOR	6000	145	0.45
4.5.	NON-STRUCTURAL TOPPING	3500	145	0.55
4.6.	SLAB ON GRADE	4000	145	0.45

5. REINFORCEMENT:
   DEFORMED REINFORCING BARS ASTM A615, GRADE 60
   WELDABLE DEFORMED REINF. BARS ASTM A706
   WELDED WIRE FABRIC (WWF) ASTM A185
   SLAB PUNCHING SHEAR STUDS ASTM A1044

6. STEEL:

6.1.	STRUCTURAL STEEL (UON)	ASTM A992
6.2.	CHANNELS, ANGLES, PLATES AND BASE PLATES	ASTM A36
6.3.	ROUND HOLLOW STRUCTURAL SHAPES	ASTM A500, GRADE B, FY=42KSI
6.4.	RECTANGULAR HOLLOW STRUCTURAL SHAPES	ASTM A500, GRADE B, FY=46KSI
6.5.	LIGHT GAGE/LIGHTWEIGHT STEEL FRAMING	ASTM A446 (GALVANIZED)
6.6.	HIGH STRENGTH BOLTS	ASTM A325, ASTM A490
6.7.	ANCHOR BOLTS	ASTM F1554 GRADE 36
6.8.	SMOOTH & THREADED ROD	ASTM A36
6.9.	HEADED SHEAR STUDS	ASTM A108
6.10.	WELDING ELECTRODES	AWS A5.1 OR A5.5, E70XX
6.11.	EXPANSION BOLTS	HILTI KWIK-BOLT III OR APPROVED EQUAL
6.12.	ADHESIVE ANCHORING SYSTEM	HILTI HVA SYSTEM OR APPROVED EQUAL
6.13.	GALVANIZED METAL FLOOR DECK	ASTM A446

E. CONSTRUCTION:

1. GENERAL:
   1.1. STRUCTURAL DRAWINGS MUST BE USED IN CONJUNCTION WITH SPECIFICATIONS, ARCHITECTURAL AND MECHANICAL DRAWINGS DURING ALL PHASES OF CONSTRUCTION. DISCREPANCIES BETWEEN STRUCTURAL AND ARCHITECTURAL DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR CLARIFICATION BEFORE COMMENCING WORK.
   1.2. TYPICAL DETAILS APPLY REPETITIVELY ON THE PROJECT. CONTRACTOR SHALL COORDINATE THE GENERAL REQUIREMENTS OF TYPICAL DETAILS WITH PROJECT CONDITIONS, PLANS, SPECIFICATIONS, AND SECTIONS. IF CERTAIN DETAILS ARE NOT FULLY SHOWN ON DRAWINGS OR SPECIFICATIONS THEIR CONFIGURATION SHALL BE SIMILAR TO THE TYPICAL DETAILS, SUBJECT TO THE ENGINEER'S APPROVAL.
   1.3. REPRODUCTION OF ANY PORTION OF THE STRUCTURAL CONTRACT DRAWINGS FOR RESUBMITTAL AS SHOP DRAWINGS IS PROHIBITED. SHOP DRAWINGS PRODUCED IN SUCH A MANNER WILL BE REJECTED AND RETURNED.
   1.4. SHOP DRAWINGS SUBMITTED FOR STRUCTURAL REVIEW SHALL CONSIST OF TWO SETS OF PRINTS AND ONE SET OF SEPIAS. ONE MARKED UP SET OF SEPIAS WITH THE STRUCTURAL ENGINEER'S COMMENTS WILL BE RETURNED TO THE ARCHITECT.
   1.5. SUBMIT SHOP DRAWINGS AT LEAST 15 BUSINESS DAYS BEFORE DATE REVIEWED SUBMITTALS WILL BE NEEDED. SHOP DRAWINGS SHALL BEAR THE CONTRACTOR'S STAMP OF APPROVAL WHICH SHALL CONSTITUTE CERTIFICATION THAT HE HAS VERIFIED ALL FIELD MEASUREMENTS, CONSTRUCTION CRITERIA, MATERIALS AND SIMILAR DATA AND HAS CHECKED EACH DRAWING FOR COMPLETENESS, COORDINATION AND COMPLIANCE WITH THE CONTRACT DOCUMENTS.
   1.6. THESE DRAWINGS REPRESENT THE COMPLETED PROJECT, WHICH HAS BEEN DESIGNED FOR THE WEIGHTS OF THE MATERIALS INDICATED ON THE DRAWINGS AND FOR THE SUPERIMPOSED LOADS INDICATED IN THE DESIGN DATA. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ALLOWABLE CONSTRUCTION LOADS AND TO PROVIDE PROPER DESIGN AND CONSTRUCTION OF FALSEWORK, FORMWORK, STAGINGS, BRACING, SHEETING AND SHORING, ETC. THE CONTRACTOR MUST COMPLY WITH ALL DEPARTMENT OF BUILDINGS RULES REGARDING STRUCTURAL STABILITY INTEGRITY DURING CONSTRUCTION OPERATIONS.
   1.7. EXISTING BUILDING INFORMATION SHOWN IS AS INDICATED ON EXISTING BUILDING DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL EXISTING BUILDING INFORMATION SHOWN (DIMENSIONS, ELEVATIONS, ETC.) AND NOTIFY THE ARCHITECT AND STRUCTURAL ENGINEER OF ANY DISCREPANCIES. UNLESS INDICATED OTHERWISE, NEW SLABS ARE TO BE AT THE SAME ELEVATIONS AS ADJACENT EXISTING SLABS. FOUNDATION ELEVATIONS OR COLUMN LENGTHS SHALL BE ADJUSTED WITH THE APPROVAL OF THE STRUCTURAL ENGINEER TO ACHIEVE MATCHING SLAB ELEVATIONS.
   1.8. IMPLEMENTING JOB SITE SAFETY AND CONSTRUCTION PROCEDURES (MEANS AND METHODS), TEMPORARY SHORING, AND BRACING OF EXISTING CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT ANY DAMAGE TO ADJACENT STRUCTURES AND UTILITIES.
   1.9. ALL COSTS OF INVESTIGATION AND/OR REDESIGN, DUE TO CONTRACTOR MISLOCATION OF STRUCTURAL ELEMENTS OR OTHER LACK OF CONFORMANCE WITH THE PROJECT DOCUMENTS, SHALL BE AT THE CONTRACTOR'S EXPENSE.
   1.10. CONTRACTOR SHALL REFER TO ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL, LAUNDRY AND FOOD SERVICE DRAWINGS FOR SIZE AND LOCATIONS OF OPENINGS, SLEEVES, CONCRETE HOUSEKEEPING PADS, INSERTS, SLAB DEPRESSIONS, CHASES, INSERTS, CURBS, ANCHOR BOLTS, EXPANSION JOINT DETAILS, ANGLE FRAMES AND ALL OTHER REQUIREMENTS NOT SHOWN ON STRUCTURAL DRAWINGS.
   1.11. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR DETAILED INFORMATION REGARDING FINISHES, PAINT, FIREPROOFING, FLOOR PITCHING AND DRAIN LOCATION, ETC.
   1.12. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF MASONRY AND DRYWALL NON-LOAD BEARING PARTITIONS. PROVIDE SLIP CONNECTIONS THAT ALLOW VERTICAL MOVEMENT AT THE HEADS OF ALL SUCH PARTITIONS. CONNECTIONS ARE DESIGNED TO SUPPORT THE TOP OF THE WALLS LATERALLY FOR THE CODE-REQUIRED LATERAL LOAD. PROVIDE COMPRESSIBLE FIRESAFING AT TOP OF WALL AS REQUIRED BY ARCHITECTURAL DRAWINGS.
   1.13. THE CONTRACTOR SHALL SUBMIT, FOR REVIEW, DRAWINGS AND CALCULATIONS FOR ALL OF THE FOLLOWING ASSEMBLIES. THE DESIGN OF THESE ASSEMBLIES IS THE RESPONSIBILITY OF THE CONTRACTOR'S ENGINEER REGISTERED IN THE PROJECT'S JURISDICTION. ALL SUBMITTALS SHALL BEAR THIS ENGINEER'S SEAL & SIGNATURE. REVIEW SHALL BE FOR GENERAL CONFORMANCE WITH THE PROJECT PARAMETERS AS INDICATED ON THE DRAWINGS AND IN THE GENERAL NOTES.
      a. NON-LOAD BEARING STUD WALL AND CURTAIN WALL SYSTEMS AND RELATED CONNECTIONS: DESIGNS SHALL TAKE INTO ACCOUNT ALL VERTICAL AND LATERAL LOADS REQUIRED BY APPLICABLE BUILDING CODES. BACK UP SYSTEM AND CURTAIN WALL SHALL BE DESIGNED FOR A MAXIMUM DEFLECTION OF 1/600 OF THE SPAN IN INCHES, OR 3/8", WHICHEVER IS LESS, AT THE APPLICABLE DESIGN WIND LOAD.
      b. METAL STAIRS AND METAL RAILINGS: DESIGNS SHALL TAKE INTO ACCOUNT ALL VERTICAL AND LATERAL LOADS REQUIRED BY APPLICABLE BUILDING CODES. WHERE HEADERS OR OTHER TYPES OF STRUCTURAL MEMBERS HAVE BEEN DESIGNATED BY THE STRUCTURAL ENGINEER OF RECORD TO SUPPORT THE STAIRS, THE CONNECTIONS FROM THE STAIRS SHALL BE DESIGNED SO THAT NO ECCENTRIC OR TORSIONAL FORCES ARE INDUCED IN THESE STRUCTURAL MEMBERS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING EMBEDS AND HARDWARE AS REQUIRED BY THE STAIR DESIGN.
   1.1. IN CASE OF CONFLICT BETWEEN THE GENERAL NOTES, DETAILS AND SPECIFICATIONS, THE MOST RIGID REQUIREMENTS SHALL GOVERN.
   1.2. CONTRACTOR SHALL FURNISH DIMENSIONED SHOP DRAWINGS AT ALL LEVELS LOCATING FLOOR AND ROOF EDGES FOR REVIEW BY THE ARCHITECT AND STRUCTURAL ENGINEER.
   1.3. CONTRACTOR SHALL FURNISH DIMENSIONED COORDINATED SHOP DRAWINGS AT ALL LEVELS SHOWING THE LOCATIONS OF ALL SLEEVES AND OPENINGS REQUIRED BY ALL TRADES.
   1.4. CONTRACTOR TO PROVIDE ANY ALTERATIONS AND/OR ADDITIONAL COMPONENTS NEEDED TO ACCOMMODATE THE INSTALLATION OF EQUIPMENT OF ANY NATURE. ALSO COORDINATE SUCH WORK WITH THE EQUIPMENT SUPPLIER. INCORPORATE SUCH REFINEMENTS ON THE SHOP DRAWINGS AND OBTAIN THE EQUIPMENT SUPPLIER'S APPROVAL (CLEARLY DISPLAYED ON SHOP DRAWINGS) PRIOR TO SUBMITTING THE SHOP DRAWINGS TO THE ARCHITECT FOR REVIEW.
   1.5. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL ANCHOR BOLTS, NUTS, WASHERS, GROUT, CONCRETE PADS AND REINFORCING STEEL REQUIRED FOR THE PROPER INSTALLATION OF ALL EQUIPMENT. REFER TO TYPICAL DETAILS.

2. INSPECTION AND TESTING:
   2.1. ENGAGE A TESTING AGENCY AND A SPECIAL INSPECTOR TO PROVIDE SERVICES AS INDICATED BELOW AND SUBMIT REPORTS.
   2.2. CAST-IN-PLACE CONCRETE:
      a. THE SPECIAL INSPECTOR SHALL INSPECT THE FORMWORK AND REINFORCING STEEL PLACEMENT FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND SHOP DRAWINGS. THE SPECIAL INSPECTOR SHALL MONITOR ALL STRUCTURAL CONCRETE PLACEMENT FOR CONFORMANCE WITH APPLICABLE ACI REQUIREMENTS.
      b. TESTING AGENCY SHALL SAMPLE FRESH CONCRETE IN ACCORDANCE WITH ASTM C172. MOLD TEST CYLINDERS IN ACCORDANCE WITH ASTM C31. MEASURE AIR ENTRAINMENT IN ACCORDANCE WITH ASTM C231 AND PERFORM SLUMP TESTS IN ACCORDANCE WITH C143.
      c. THE FOLLOWING NUMBER OF TEST CYLINDERS SHALL BE CAST FOR EACH DAY'S POUR OR EACH 50 CUBIC YARDS, WHICHEVER RESULTS IN MORE TEST CYLINDERS:

FOR ELEVATED SLAB (TO INCLUDE BEAM JOISTS, GIRDERS):	FOR FOOTINGS AND OTHER STRUCTURAL CONCRETE:	FOR WALLS, COLUIMNS:
1 @7 DAYS, LAB CURED	1 @7 DAYS, LAB CURED	1 @7 DAYS, LAB CURED
1 @7 DAYS, FIELD CURED	2 @28 DAYS, LAB CURED	1 @7 DAYS, FIELD CURED
2 @28 DAYS, LAB CURED	1 SPARE, LAB CURED	2 @28 DAYS, LAB CURED
2 @28 DAYS, FIELD CURED		2 @ 28 DAYS, FIELD CURED
1 SPARE, LAB CURED		1 SPARE, LAB CURED
1 SPARE, FIELD CURED		1 SPARE, FIELD CURED

      d. COMPRESSION TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM C39.
      e. THE AGENCY WILL MAKE ADDITIONAL TESTS OF IN-PLACE CONCRETE AT THE CONTRACTOR'S EXPENSE, AS DIRECTED BY THE STRUCTURAL ENGINEER, WHEN TEST RESULTS INDICATE SPECIFIED CONCRETE STRENGTHS HAVE NOT BEEN ATTAINED.

F. FOUNDATIONS & STRUCTURAL EARTHWORK:

1. GENERAL:
   1.1. SEE THE SPECIFICATIONS AND GEOTECHNICAL REPORT REQUIREMENTS FOR EXCAVATION AND PREPARATION OF THE FOUNDATION AND SLAB-ON-GRADE SUBGRADE, INCLUDING COMPACTION PROCEDURES. REQUIREMENTS CONTAINED IN THE GEOTECHNICAL REPORT ARE PART OF THIS WORK.
   1.2. CONTRACTOR SHALL VERIFY ALL EXISTING FIELD CONDITIONS THAT MAY AFFECT THE INSTALLATION OF THE FOUNDATION SYSTEM AS SHOWN PRIOR TO STARTING WORK.
   1.3. EXISTING UTILITIES KNOWN TO BE IN THE CONSTRUCTION AREA HAVE BEEN INDICATED. THE SIZE, LOCATION AND DEPTH OF THE UTILITIES ARE NOT KNOWN EXACTLY AND MAY VARY SIGNIFICANTLY FROM THAT INDICATED. OTHER UNKNOWN UTILITIES NOT INDICATED MAY ALSO BE PRESENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES, WHETHER INDICATED OR NOT, WHICH MAY BE AFFECTED BY THE CONSTRUCTION PROCESS.
   1.4. ALL FOUNDATIONS SUSCEPTIBLE TO FROST SHALL BEAR A MINIMUM OF 4'-0" BELOW GRADE. IN CASE OF CONFLICT, NOTIFY THE ARCHITECT AND STRUCTURAL ENGINEER IN ADVANCE OF ANY CONSTRUCTION TO ALLOW FOR ADJUSTMENT.
   1.5. UTILITY LINES SHALL NOT BE PLACED THROUGH OR BELOW FOUNDATIONS WITHOUT THE STRUCTURAL ENGINEER'S APPROVAL.
   1.6. THE SLOPE BETWEEN THE LOWER EDGES OF ADJACENT FOOTINGS SHALL NOT EXCEED 45 DEGREES WITH THE HORIZONTAL FOR ROCK OR 26 DEGREES FOR SOIL, UNLESS INDICATED OTHERWISE IN THE GEOTECHNICAL REPORT.
   1.7. PROVIDE CONTINUOUS BENTONITE STRIP WATERSTOPS AT ALL HORIZONTAL AND VERTICAL CONSTRUCTION JOINTS IN ALL BELOW GRADE WALLS AND ELEVATOR PITS.
   1.8. ALL SHORING, SHEETING, AND DEWATERING SHALL BE THE TOTAL RESPONSIBILITY OF THE CONTRACTOR. SHEETING AND SHORING SHALL BE DESIGNED BY THE CONTRACTOR'S ENGINEER REGISTERED IN THE PROJECT'S JURISDICTION. ALL SUBMITTALS SHALL BEAR CONTRACTOR'S/ENGINEERING SEAL AND SIGNATURE.
   1.9. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT ALL EXISTING STRUCTURES, CURBS, STREETS, ETC. FROM DAMAGE BY CONSTRUCTION EQUIPMENT. THE CONTRACTOR SHALL NOT DISPOSE OF ANY LIQUIDS, SLURRY, SPOILS OR CHEMICALS ON THE SITE EXCEPT AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND APPROVED BY THE DEPARTMENT OF ENVIRONMENTAL RESOURCES OR OTHER AGENCIES HAVING JURISDICTION.

2. BACKFILL:
   2.1. ALL BACKFILL SHALL BE ACCOMPLISHED USING MATERIAL CONSISTING OF BANK RUN GRAVEL, CRUSHED STONE AND/OR MATERIAL APPROVED BY THE GEOTECHNICAL ENGINEER, WITH OPTIMUM MOISTURE CONTENT FOR COMPACTING AND SHALL BE FREE OF ANY DEBRIS.
   2.2. NO BACKFILL MATERIAL SHALL BE PLACED AGAINST FOUNDATION WALLS UNTIL THE UPPER BRACING FLOORS ARE IN PLACE FOR AT LEAST 7 DAYS, OR ADEQUATE BRACING IS INSTALLED.
   2.3. WHERE THE FINAL GRADE ELEVATIONS ARE APPROXIMATELY EQUAL ON BOTH SIDES OF A WALL, BACKFILL IN LIFTS TO MAINTAIN LEVEL ELEVATIONS WITHIN 12" ON BOTH SIDES AT ANY TIME.
3. STRUCTURAL FILL:
   3.1. REFER TO SPECIFICATIONS AND GEOTECHNICAL REPORT REQUIREMENTS FOR COMPACTED STRUCTURAL FILL. REQUIREMENTS AND RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT ARE PART OF THIS WORK. INSPECTION OF THE PLACEMENT OF COMPACTED STRUCTURAL FILL SHALL BE BY AN EXPERIENCED, QUALIFIED GEOTECHNICAL ENGINEER.

G. CONCRETE:

1. CAST-IN-PLACE:
   1.1. REINFORCING STEEL CLEAR COVER SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE:
      a. NON-PRESTRESSED CONCRETE:

CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	3"
CONCRETE EXPOSED TO EARTH OR WEATHER:	
WALLS AND SLABS	2"
OTHER MEMBERS	2½"
CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	
SLABS, WALL, JOISTS: #11 BARS AND SMALLER	¾"
BEAMS, COLUMNS: PRIMARY REINFORCEMENT, TIES STIRRUPS, SPIRALS	1½"
SLABS CAST AGAINST MUD SLAB	2"

   1.1. CONCRETE SLABS ON GRADE SHALL BE 6 THICK, PLACED ON A MINIMUM 2" LAYER OF CLEAN, WELL-GRADED GRAVEL OR CRUSHED STONE OVER A VAPOR RETARDER OVER COMPACTED SUBGRADE.
   1.2. CONSTRUCTION JOINTS AND CONTROL JOINTS IN SLABS-ON-GRADE SHALL BE ARRANGED TO LIMIT MAXIMUM AREA BETWEEN JOINTS TO 400 S.F. APPROXIMATELY SQUARE. ALLOW A MINIMUM OF 48 HOURS TIME BETWEEN PLACEMENT OF ADJACENT SECTIONS.
   1.3. ALL FORMWORK, SHORING AND RESHORING SHALL BE DESIGNED BY THE CONTRACTOR'S ENGINEER REGISTERED IN THE STATE OF NEW YORK. ALL SUBMISSIONS SHALL BEAR HIS SEAL AND SIGNATURE.
   1.4. SLEEVES SHALL NOT BE PLACED THROUGH ANY CONCRETE ELEMENT UNLESS SHOWN ON THE STRUCTURAL DRAWINGS, APPROVED SLEEVING SHOP DRAWINGS OR SPECIFICALLY AUTHORIZED IN WRITING BY THE STRUCTURAL ENGINEER. IF PERMITTED THEY SHALL COMPLY WITH ACI, SECTION 6.3.
   1.5. DEVELOPMENT AND SPLICES OF REINFORCING BARS SHALL BE IN ACCORDANCE WITH ACI 318, EXCEPT AS NOTED OTHERWISE.
      a. ALL SPLICES FOR SLABS AND BEAMS SHALL BE TENSION SPLICE CLASS B.
      b. COMPRESSION SPLICES SHALL BE ONLY USED IN PIERS AND COLUMNS, UON.
      c. EMBEDMENT FOR DOWELS, ETC., SHALL BE TENSION DEVELOPMENT, UON.
      d. ALL REINFORCING BARS MARKED CONTINUOUS SHALL HAVE TENSION LAP SPLICES AT ALL SPLICES AND CORNERS, EXCEPT AS OTHERWISE NOTED ON DRAWINGS. LAP CONTINUOUS TOP BARS AT CENTER OF SPAN AND BOTTOM BARS NEAR SUPPORTS. HOOK AND FULLY EMBED TOP BARS AT ON-CONTINUOUS SUPPORTS.
      e. WELDING OF REINFORCING BARS SHALL CONFORM TO THE "REINFORCING STEEL WELDING CODE" AWS D12.1 AND ACI 318.
      f. WELDING OF REINFORCING BARS IS NOT PERMITTED UNLESS SPECIFICALLY CALLED OR APPROVED BY THE STRUCTURAL ENGINEER.
   1.1. ALL INSERTS AND SLEEVES SHALL BE CAST-IN-PLACE WHENEVER FEASIBLE. DRILLED OR POWDER DRIVEN FASTENERS WILL BE PERMITTED WHEN PROVEN TO THE SATISFACTION OF THE STRUCTURAL ENGINEER THAT THE FASTENERS WILL NOT SPALL THE CONCRETE AND HAVE THE SAME CAPACITY AS CAST-IN-PLACE INSERTS.
   1.2. WHEN INSTALLING EXPANSION BOLTS OR ADHESIVE ANCHORS, THE CONTRACTOR SHALL TAKE MEASURES TO AVOID DRILLING OR CUTTING OF ANY EXISTING REINFORCING AND DESTRUCTION OF CONCRETE. HOLES SHALL BE BLOWN CLEAN PRIOR TO PLACING BOLTS OR ADHESIVE ANCHORS.
   1.3. CHAMFER EXPOSED CONCRETE CORNERS UNLESS NOTED OTHERWISE ON ARCHITECTURAL DRAWINGS.
   1.4. CONCRETE SLABS SHALL BE FINISHED FLAT AND LEVEL WITHIN TOLERANCE, TO THE ELEVATION INDICATED ON THE DRAWINGS. NOMINAL SLAB THICKNESS IS INDICATED. ACTUAL SLAB THICKNESS MAY VARY DUE TO BEAM AND DECK DEFLECTIONS. CONTRACTOR SHALL PROVIDE ADDITIONAL CONCRETE AS NECESSARY TO MAINTAIN A LEVEL SLAB SURFACE AT THE ELEVATION INDICATED.
   1.5. FOUNDATIONS AND SLABS SHALL NOT HAVE COLD JOINTS IN A HORIZONTAL PLAN UNLESS SHOWN OTHERWISE.
   1.6. TO MINIMIZE THE EFFECTS OF SHRINKAGE, CAST CONCRETE IN ALTERNATE SECTIONS. ADJACENT SECTIONS MAY BE CAST WHEN THE PREVIOUSLY PLACED SECTION HAS CURED FOR 48 HOURS AFTER INITIAL SET.
   1.7. CONCRETE AND FOUNDATION CONCRETE WALLS SHALL BE CAST IN ALTERNATE PANELS NOT EXCEEDING 60 FEET IN LENGTH.
   1.8. CONSTRUCTION JOINTS FOR SLABS ON METAL DECK SHALL BE LOCATED MIDWAY BETWEEN BEAMS WHERE THE JOINT IS PARALLEL TO THE BEAM SPAN. JOINTS SHALL BE LOCATED WITHIN THE MIDDLE THIRD OF SPAN WHERE THE JOINT IS PERPENDICULAR TO THE BEAM SPAN. THE CONTRACTOR SHALL SUBMIT, FOR APPROVAL, A SHOP DRAWING INDICATING ALL PROPOSED JOINT LOCATIONS AND ALL REINFORCING STEEL TO BE PLACED IN THE SLAB. ANY STOP IN CONCRETE WORK MUST BE MADE WITH VERTICAL BULKHEADS, UNLESS OTHERWISE SHOWN. ALL REINFORCING IS TO BE CONTINUOUS THROUGH JOINTS.
   1.9. WELDED WIRE FABRIC REINFORCEMENT SHALL BE SUPPLIED IN SHEETS. LAP TWO FULL MESH LENGTHS AT SPLICES AND WIRE TOGETHER.
   1.10. ALL REINFORCING BARS SHALL BE SECURED IN THEIR PROPER POSITION WHILE POURING CONCRETE. IF REQUIRED PROVIDE ADDITIONAL BARS AND STIRRUPS TO SECURE REINFORCING STEEL. PROVIDE PLASTIC TIPPED BOLSTERS AND CHAIRS AT ALL LOCATIONS WHERE THE CONCRETE SURFACE IN CONTACT WITH THE BOLSTERS OR CHAIRS IS EXPOSED.
   1.11. SUBMIT MATERIAL TEST REPORTS FROM A QUALIFIED TESTING AGENCY INDICATIING THAT TEST RESULTS FOR TRIAL MIX BATCHES FOR EACH CONCRETE MIX DESIGN COMPLY WITH ACI 301 AND THE ADDITIONAL REQUIREMENTS OF THE PROJECT CONTRACT DOCUMENTS.

SPECIAL INSPECTIONS, PROGRESS INSPECTIONS AND QUALITY CONTROL

1. SPECIAL INSPECTIONS AND PROGRESS INSPECTIONS AS PER THE NEW YORK CITY BUILDING CODE SHALL BE PERFORMED FOR ALL REQUIRED STRUCTURAL ITEMS, INCLUDING:

CONCRETE - CAST-IN-PLACE	(BC1705.3)
SUBGRADE INSPECTION	(BC1705.6)
SUBSURFACE INVESTIGATIONS (BORING/TEST PITS)	(BC1705.6)
CONCRETE SAMPLING AND TESTING (TR2)	(BC1905.6, BC 1913.10)
CONCRETE DESIGN MIX (TR3)	(BC1905.3, BC1913.5)
FOOTING AND FOUNDATION	(BC110.3.1)
FINAL	(28-116.2.4.2, BC110.5)

2. FORM TR-1 TECHNICAL REPORT: STATEMENT OF RESPONSIBILITY SHALL BE FILED WITH THE NEW YORK CITY DEPARTMENT OF BUILDINGS BY THE ENGINEER(S) DESIGNATED AND RETAINED BY THE OWNER TO PERFORM CONTROLLED INSPECTIONS IN EACH OF THE ABOVE MENTIONED CATEGORIES. THE OWNER SHALL HIRE AND PAY FOR THE TESTING AND INSPECTIONS FOR EACH OF THE ABOVE MENTIONED CATEGORIES.

SCOPE OF WORK

INSTALLATION OF CONCRETE COLUMN, WALL, BEAM AND TWO-WAY SLAB FOR NEW 10 STORY BUILDING.

APPLICATION LIST:

1.ARCHITECTURE: QXXXX-I1
2.SOE: QXXXX-S1
3.FOUNDATION/EA: QXXXX-S2
4.STRUCTURE: QXXXX-S3

LEGEND

1. INDICATES NEW CAST-IN-PLACE CONCRETE
2. INDICATES WALL/COLUMN/BEAM BELOW
3. INDICATES STEP IN SLAB
4. INDICATES NEW CONCRETE COLUMN
5. INDICATES COLUMN (OR POST) ABOVE
6. INDICATES COLUMN (OR POST) BELOW

DOBNOW JOB#: BXXXXX-SX

ENGINEER:

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217-14 NORTHERN BLVD, SUITE 207
BAYSIDE, NY 11365
TEL: 929-303-3095
WEB: WWW.JCEPLLC.COM

ARCHITECT:

# 2		
# 1	NOT FOR CONSTRUCTION	
# 0	03/01/25	DOB SUBMISSION
No	Date	Description
Issued/Revised		

PROJECT:

28-12 41 ST AVE, QUEENS

DRAWING TITLE:

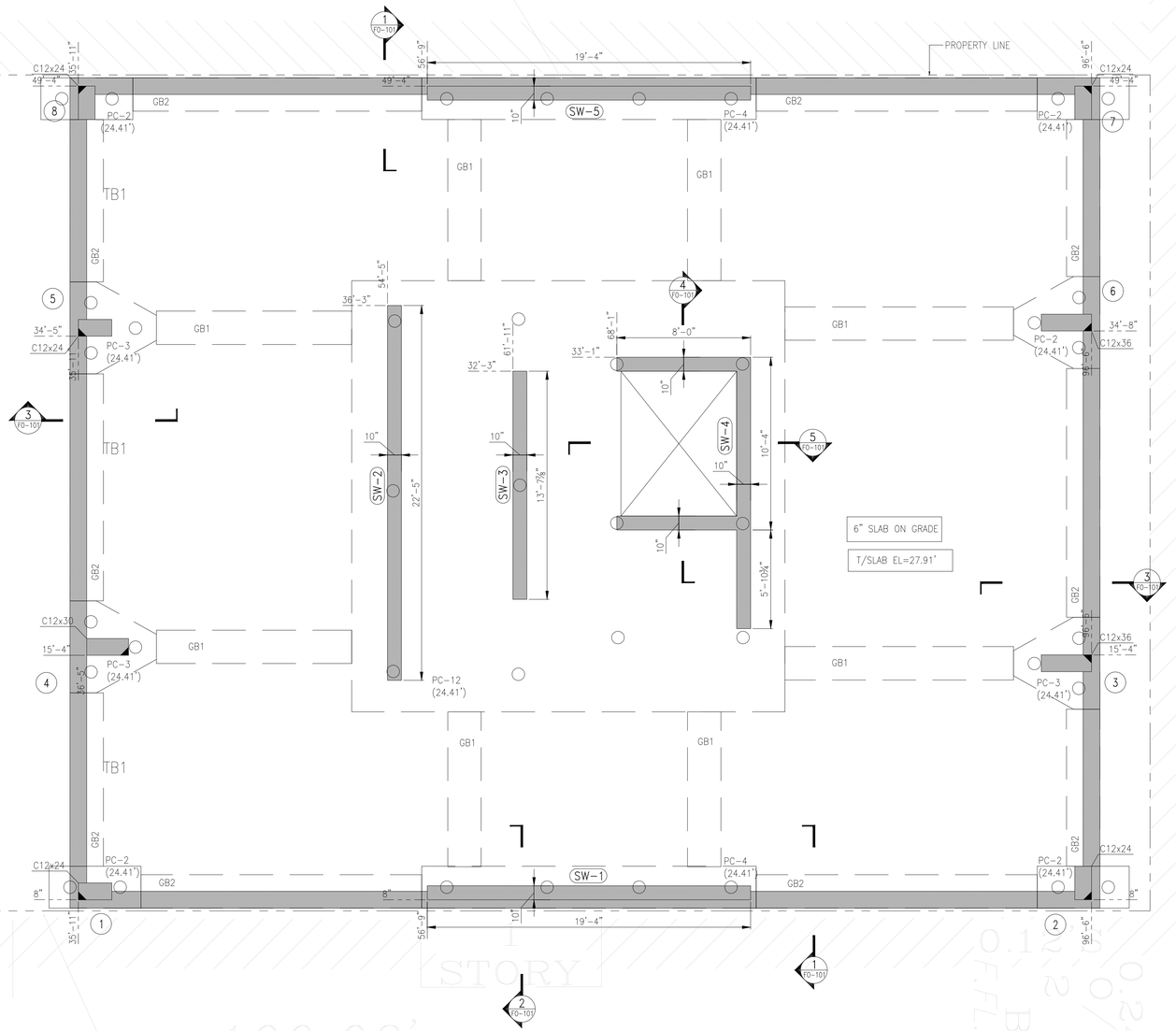
GENERAL NOTES

STATE OF NEW YORK · LICENSED PROFESSIONAL ENGINEER · AOJUN WANG · NO. 090417

DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW

DRAWING NO.: FO-100.00

SHEET NO: 1 OF 6



FOUNDATION PLAN
SCALE: 1/4"=1'-0"

FOUNDATION PLAN NOTES:

1. TOP OF CELLAR ELEVATION TO BE -9'-11" (ABSOLUTE DATUM EL.=11.69'), UNLESS OTHERWISE NOTED THUS ±___ INDICATING DISTANCE ABOVE OR BELOW TOP OF SLAB. GENERAL CONTRACTOR SHALL CONFIRM ALL ELEVATIONS AND DIMENSIONS WITH ARCH. PLAN.
2. PRESSURE SLAB TO BE 12" THICK C.I.P REINFORCED WITH #7@8" EACH WAY. SLAB ON GRADE TO BE 6" CIP CONCRETE W/WWF6X6-W2.9xW2.9. SUBSTRATE TO BE 6" CRUSHED GRAVEL.
3. ⌐ ¬ DENOTES NEW CONCRETE PILE CAP AND ϕ7" CAISSON PILE. SEE PILE CAP DETAILS FOR L C J BAL. OF INFO.
4. PILE CAPACITY TO BE 28 TONS VERTICAL COMPRESSION AND 0.9 TONS LATERAL, TOP OF PILE CAPS SHALL BE 6" BELOW TOP OF CELLAR SLAB, FOR PILE CAP DETAILS, SEE FO-202.
5. ALL CONC WALL TO BE REINFORCED WITH: #5@12" EACH FACE HORIZONTAL & VERTICAL U.N.O. ON SECTION; SEE PLAN FOR WALL THICKNESS.
6. ALL STEEL COLUMNS SHALL BE ENCASED IN CONCRETE FOR UP TO 3'-0" ABOVE CELLAR ELEVATION. SEE ARCH DWG FOR DETAILS.
7. SEE ARCH. DWG FOR WATERSTOP, DAMPER & WATER PROOFING REQUIREMENT.
8. SEE DWG S-301 & S-302 FOR TYPICAL DETAILS.

GRADE BEAM SCHEDULE

MARK	SIZE		REINFORCEMENT			STIRRUPS			REMARKS
	WIDTH(IN)	DEPTH(IN)	BOTTOM	TOP		SIZE	TYPE	SPACING	
				CONTINUOUS	ADDITIONAL				
GB-1	24	24	6-#9	6-#9	MARK	#4	4-legs	@10" o/c	
GB-2	36	24	9-#9	9-#9	MARK	#4	4-legs	@10" o/c	

NOTES:
1. CAISSON TO BE DESIGNED BY LICENSED GEOTECHNICAL ENGINEER

DOBNOW JOB#:
B[illegible]

ENGINEER:

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# 1		NOT FOR CONSTRUCTION
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Issued/Revised		

PROJECT:

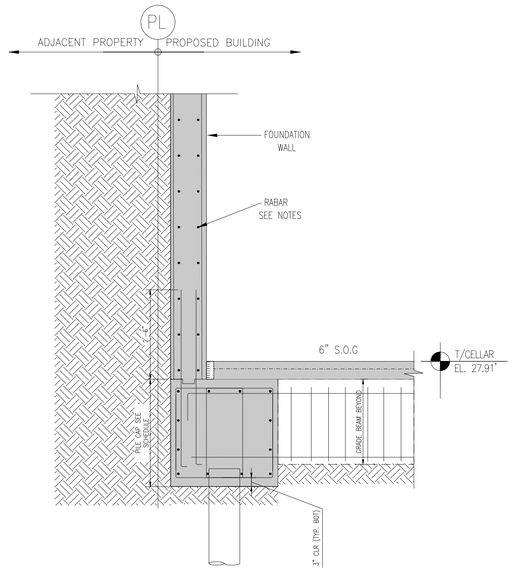
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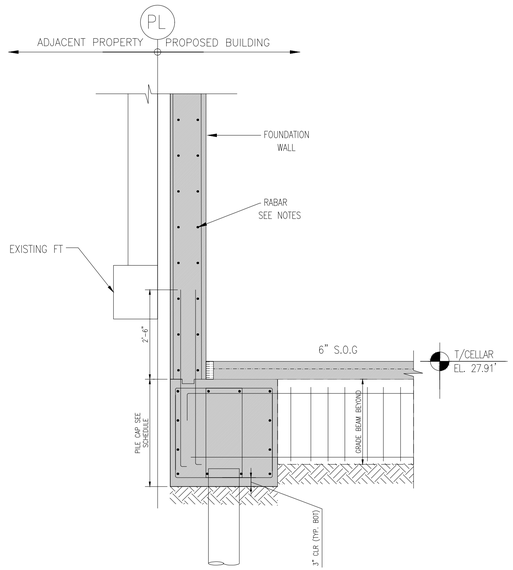
FOUNDATION PLAN

STATE OF NEW YORK · XIAOJUN WANG · LICENSED PROFESSIONAL ENGINEER · No. 090417

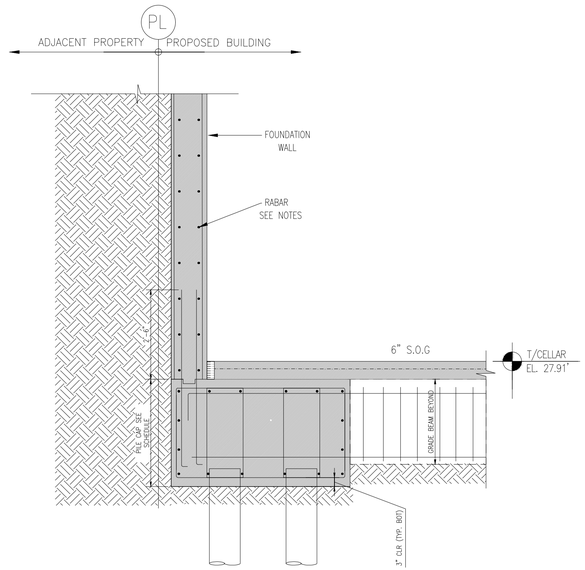
DATE:	08/05/2024
PROJECT NO.:	23039
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CHECKED BY:	MW
DRAWING NO.:	FO-100.00
SHEET NO:	2 OF 6



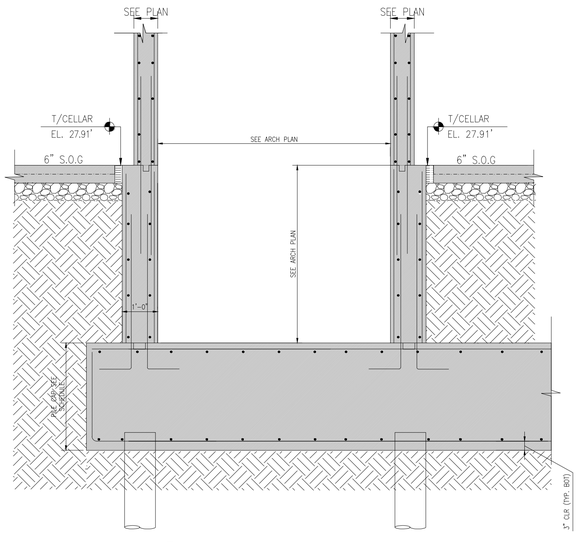
1 SECTION
FO-101 SCALE: N.T.S



2 SECTION
FO-101 SCALE: N.T.S

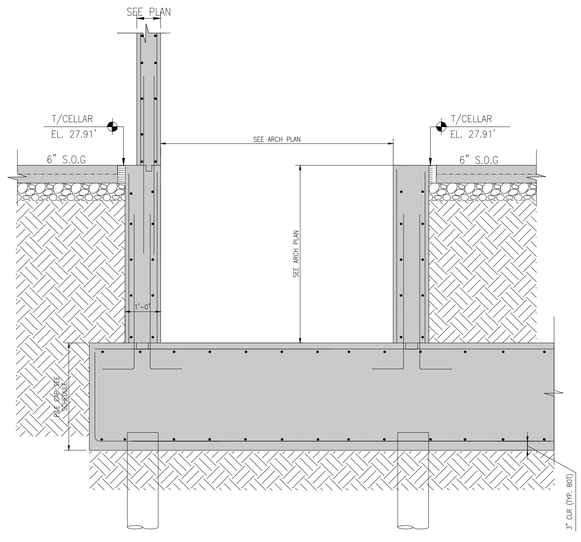


3 SECTION
FO-101 SCALE: N.T.S



4 SECTION THROUGH ELEVATOR PIT
FO-101 SCALE: N.T.S

NOTE: 1) SEE ARCH. DRAWING FOR ELEVATOR PIT DEPTH
2) FOR WATERPROOFING, SEE ARCH DRAWINGS.



5 SECTION THROUGH ELEVATOR PIT
FO-101 SCALE: N.T.S

NOTE: 1) SEE ARCH. DRAWING FOR ELEVATOR PIT DEPTH
2) FOR WATERPROOFING, SEE ARCH DRAWINGS.

DOBNOW JOB#:
B[illegible]S2

ENGINEER:

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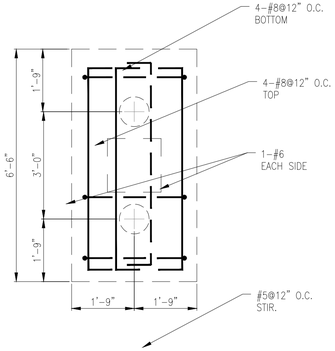
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FOUNDATION SECTIONS

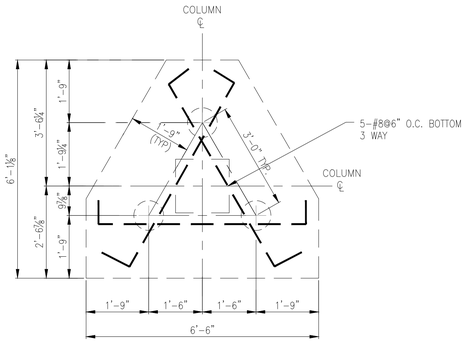
STATE OF NEW YORK
XIAOJUN WANG
LICENSED PROFESSIONAL ENGINEER
090417

DATE:	08/05/2024
PROJECT NO.:	23039
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SHEET NO:	3 OF 6



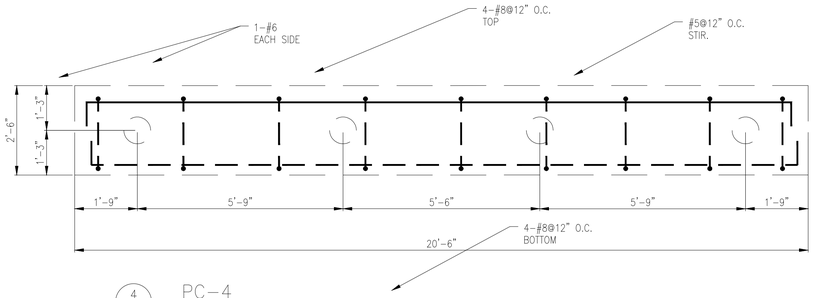
2 FO-202 PC-2
SCALE: 1/2"=1'-0".

DEPTH = 3'-0"
REINF. = SEE DETAIL
PILE CAPACITY = 100 T
PILE DIAMETER = 9.625"ø
f'c= 6 ksi
fy = 60 ksi



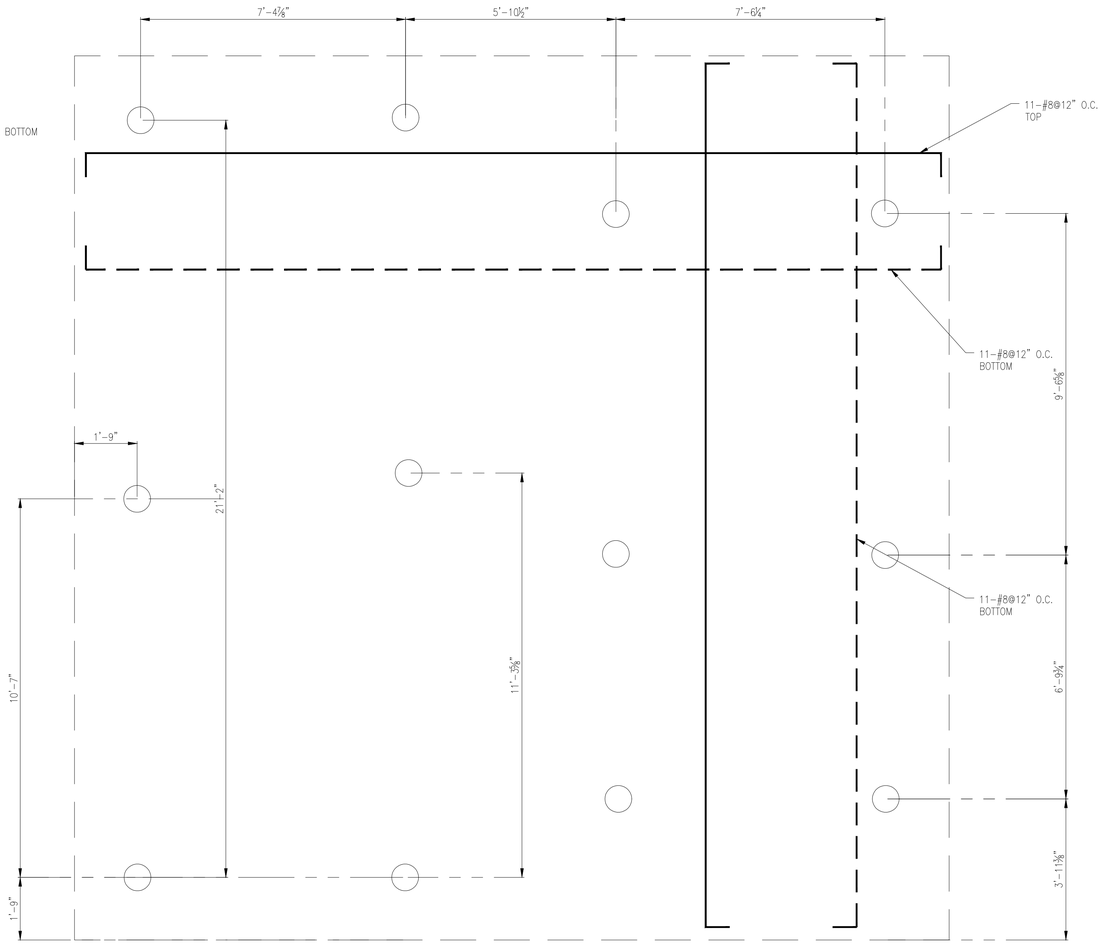
3 FO-202 PC-3
SCALE: 1/2"=1'-0".

DEPTH = 3'-0"
REINF. = SEE DETAIL
PILE CAPACITY = 100 T
PILE DIAMETER = 9.625"ø
f'c= 6 ksi
fy = 60 ksi



4 FO-202 PC-4
SCALE: 1/2"=1'-0".

DEPTH = 3'-0"
REINF. = SEE DETAIL
PILE CAPACITY = 100 T
PILE DIAMETER = 9.625"ø
f'c= 6 ksi
fy = 60 ksi



12 FO-202 PC-12
SCALE: 1/2"=1'-0".

DEPTH = 3'-0"
REINF. = SEE DETAIL
PILE CAPACITY = 100 T
PILE DIAMETER = 9.625"ø
f'c= 6 ksi
fy = 60 ksi

PILE CAP SCHEDULE

MARK	SIZE			PILE			REMARKS
	LENGTH	WIDTH	DEPTH	DIMATER	COMPRESSION CAPACITY	TENSION CAPACITY	
PC-2	6'-6''	3'-8''	3'-0''	9.625''	100 T		fc'=6ksi
PC-4	20'-6''	2'-6''	3'-0''	9.625''	100 T		fc'=6ksi
PC-3	SEE PLAN		3'-0''	9.625''	100 T		fc'=6ksi
PC-12	SEE PLAN		3'-0''	9.625''	100 T		fc'=6ksi

NOTES:

1. FOR NOTES & BALANCE OF INFO., SEE DRAWING FO-101.
2. FOR PILE CAP DETAILS, SEE FO-200 SERIES.
3. ———— INDICATES TOP BARS.
4. —— —— INDICATES BOTTOM BARS.
5. PROVIDE HORIZONTAL FACE BAR #6@6'' AT ALL VERTICAL FACES OF PILE CAP.
6. TOP BARS SHALL BE HOOKED DOWN TO BOTTOM OF PILE CAP. BOTTOM BARS SHALL BE HOOKED UP TO THE TOP OF PILE CAP.
7. MICROPILE DESIGNED BY LICENSED GEOTECHNICAL ENGINEER AND VERIFIED BY THE PROJECT GEOTECHNICAL ENGINEER.

DOBNOW JOB#:
BXXXXX-SX

ENGINEER:

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# 2		
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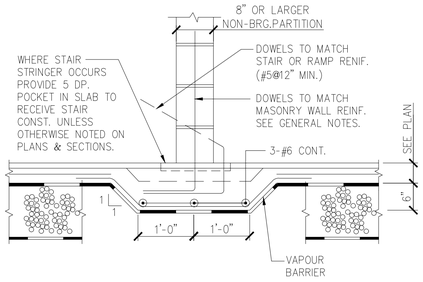
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DRAWING TITLE:

PILE CAP DETALLS

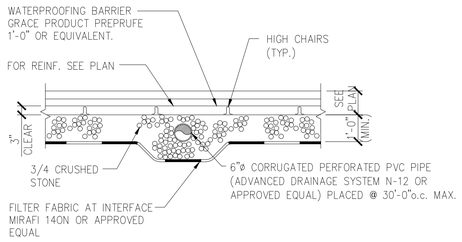


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PROJECT NO.:	23039
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DRAWING NO.:	FO-200.00
SHEET NO:	4 OF 6



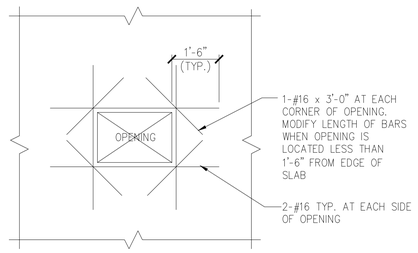
TYPICAL DETAIL AT PARTITIONS, STAIR OR RAMP BEARING ON SLAB ON GRADE

SCALE-1/2"=1'



TYPICAL SLAB ON GRADE AND UNDERDRAIN DETAIL

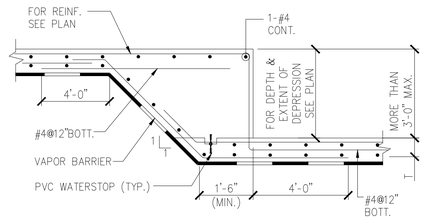
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(FOR SIZE OF OPENINGS SEE OTHER CONSULTANT DRAWINGS.)

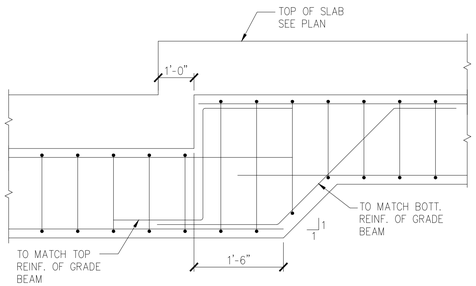
DETAIL OF ADDITIONAL REINF. AT OPNG. IN SLAB ON GRADE

SCALE-1/2"=1'



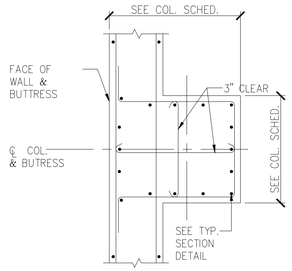
TYPICAL DETAILS AT DEPRESSION IN SLAB ON GRADE

SCALE-1/2"=1'



DETAIL OF STEP IN GRADE BEAM

SCALE: 1/2"=1'-0"

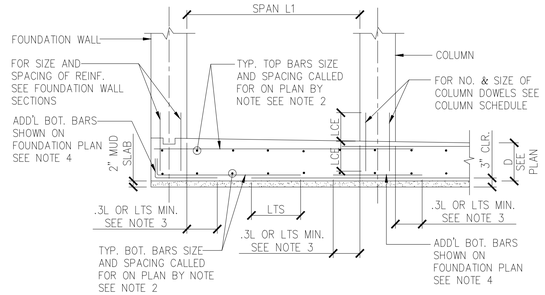


NOTES:

1. SEE COLUMN SCHEDULE FOR BUTTRESS REINF.
2. PLACE VERT. BARS EVENLY AROUND BUTTRESS.

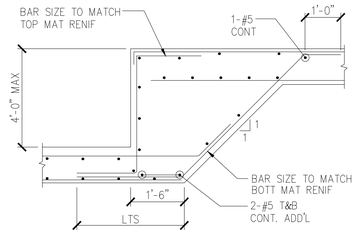
TYPICAL BUTTRESS PLAN DETAIL

SCALE-1/2"=1'



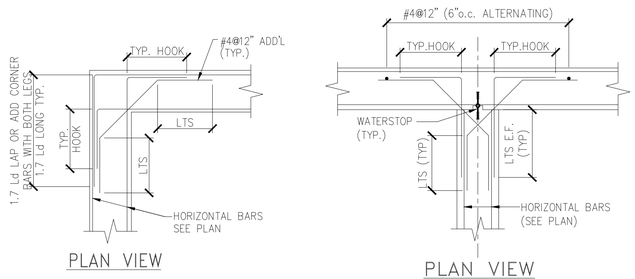
NOTES:

1. PLACE FIRST LAYER OF TOP AND BOTTOM REINFORCING IN THE N-S DIRECTION.
2. SPLICE TOP BARS AT COLUMN LINES AND BOTTOM BARS AT MIDSPAN WHEN REQUIRED.
3. SEE SCHEDULE OF EMBEDMENT AND SPLICE LENGTH THIS DRAWING.
4. ALTERNATE ADDITIONAL BOTTOM BARS WITH TYPICAL BOTTOM BARS. PLACE ADDITIONAL BARS SYMMETRICALLY AROUND COLUMN CENTERLINE.
5. L IS THE LONGER OF TWO ADJACENT SPANS L1 AND L2.



TYPICAL STEP IN MAT SLAB

SCALE: 1/2"=1'-0"



NOTE:
1. VERTICAL REINF. NOT SHOWN
2. WATERPROOFING NOT SHOWN (SEE ARCH)

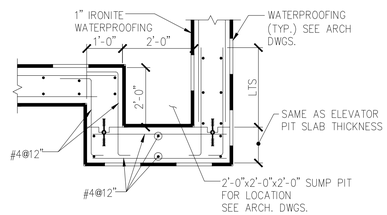
NOTE:
1. VERTICAL REINF. NOT SHOWN
2. WATERPROOFING NOT SHOWN (SEE ARCH.)

WALL INTERSECTION DETAILS

SCALE: 1/2"=1'-0"

TYPICAL DETAIL OF PLACEMENT OF REINFORCEMENT IN MAT FOUNDATION

SCALE: 1/2"=1'-0"



DETAIL AT SUMP PIT

NOTE: FOR BALANCE OF INFORMATION SEE DETAIL ABOVE.

DOBNOW JOB#: BXXXXX-SX

ENGINEER:

JUST CONSULTING ENGINEERING PLLC
217-14 NORTHERN BLVD, SUITE 207
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ARCHITECT:

# 2		
# 1	NOT FOR CONSTRUCTION	
# 0	03/01/25	DOB SUBMISSION
No	Date	Description
Issued/Revised		

PROJECT:

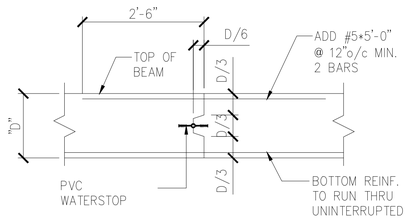
28-12 41 ST AVE, QUEENS

DRAWING TITLE:

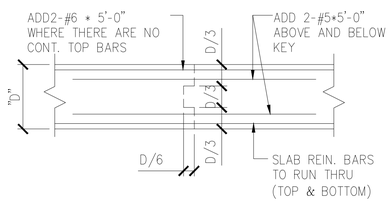
TYPICAL DETALLS-1



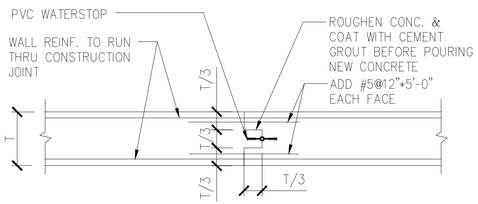
DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW
DRAWING NO.:	FO-201.00
SHEET NO:	5 OF 6

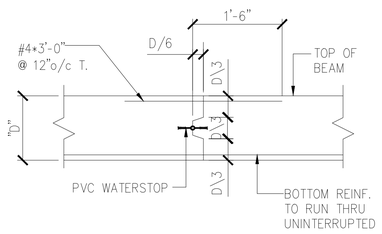


GRADE BEAM



BEAM





FOUNDATION WALLS

NOTES:

1. WHEN FOUNDATION WALL SPANS STAGGER KEY VERTICALLY 2. CHECK ON TYPE OF WATERSTOP

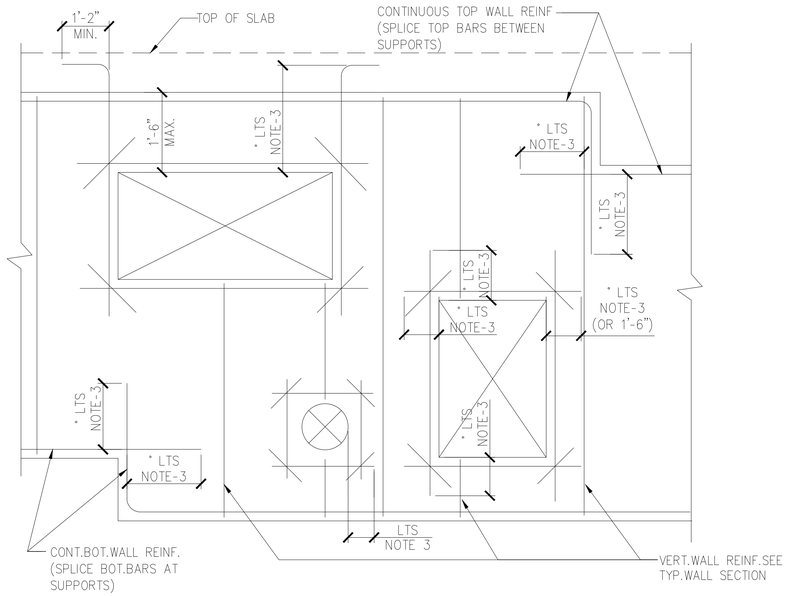
FRAMED SLAB

NOTES:

1. FOUNDATION WALLS AND GRADE BEAMS - LOCATE MIDWAY BETWEEN COLUMN CENTER LINE AND AT 60 FEET MAXIMUM. ALLOW 7 DAYS MINIMUM BETWEEN ADJACENT POURS.
2. OTHER CONCRETE - LOCATE MIDWAY AT SUPPORTS. ALLOW 7 DAYS MINIMUM BETWEEN PLACING ADJACENT CONCRETE. MAXIMUM LENGTH OF CASTING, 75 FEET.

TYPICAL CONSTRUCTION JOINT DETAILS

SCALE: 1/2"=1'-0"



NOTES:

1. ALL INTERRUPTED BARS IN EACH DIRECTION SHALL BE COMPENSATED BY ADD'L BAR EQUAL 1/2 THE INTERRUPTED AREA (OR 2-#22 MIN.) AT EACH SIDE OF OPENING.
2. ADD'L CORNER BARS AT OPNGS. TO BE ONE SIZE LARGER THAN TYP. REINF. IN LAYER, 4'-0" LONG. (ONE PER LAYER OF WALL REINF.)
3. FOR LENGTH OF SPLICES SEE SCHEDULE OF EMBEDMENT & SPLICE LENGTHS.
4. WHERE FDN. WALL OPENINGS ARE WIDER THAN 4'-0", CONTRACTOR SHALL SUBMIT LOCATIONS & DIMENSIONS TO ENGINEER FOR REDESIGN.

DETAIL OF ADDITIONAL REINF. AT OPNGS. AND AT STEPS OF FOUNDATION WALL

SCALE-1/2"=1'

DOBNOW JOB#: BXXXXX-SX

ENGINEER:

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ARCHITECT:

No	Date	Issued/Revised
# 2		
# 1		NOT FOR CONSTRUCTION
# 0	03/01/25	DOB SUBMISSION

PROJECT:

28-12 41 ST AVE, QUEENS

DRAWING TITLE:

TYPICAL DETALLS-2



DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW
DRAWING NO.:	FO-202.00
SHEET NO:	6 OF 6

A. CODES AND STANDARDS:

1. THE FOLLOWING CODES AND STANDARDS SHALL APPLY TO THE DESIGN, CONSTRUCTION, AND QUALITY CONTROL OF ALL WORK PERFORMED ON THE PROJECT. USE THE LATEST EDITIONS UNLESS NOTED OTHERWISE.
   - NEW YORK CITY CONSTRUCTION CODE, 2022 EDITION.
   - INTERNATIONAL BUILDING CODE (IBC) 2009
   - "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES" ANSI/ASCE 7-16, AMERICAN SOCIETY OF CIVIL ENGINEERS
   - "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318-14)", AMERICAN CONCRETE INSTITUTE.
   - "ACI MANUAL OF CONCRETE PRACTICE - PART 1 THROUGH 5 - 2011", AMERICAN CONCRETE INSTITUTE.
   - "MANUAL OF STANDARD PRACTICE 2008", CONCRETE REINFORCING STEEL INSTITUTE.

B. DESIGN DATA:

1. FLOOR LIVE LOAD

AREA	UNIFORM LOAD	CONC. LOAD	LL RED.?
• LOBBY	100 PSF	NO	
• APARTMENT	40 PSF		YES
• STAIRS	100 PSF	300 LBS	NO

2. ROOF LIVE LOAD

AREA	UNIFORM LOAD	CONC. LOAD	LL RED.?
• MINIMUM ROOF LOAD	30 PSF	300 LBS	NO
• PRIVATE ROOF TERRACE	60 PSF	2000 LBS	NO

3. ROOF SNOW LOAD
   - GROUND SNOW LOAD, P_g 25 PSF
   - FLAT ROOF SNOW LOAD, P_f 20 PSF
   - SNOW EXPOSURE FACTOR, C_e 0.9
   - SNOW LOAD IMPORTANCE FACTOR, I 1.0
   - THERMAL FACTOR, C_t 1.0

4. DEAD LOAD
   - PARTITION LOAD 12 PSF
   - FLOOR FINISHES 5 PSF
   - ROOFING AND INSULATION 10 PSF
   - MECHANICAL AND CEILING 5 PSF

5. WIND LOAD
   - BASIC WIND SPEED 117 MPH
   - WIND IMPORTANCE FACTOR, I 1.0
   - OCCUPANCY CATEGORY II
   - WIND EXPOSURE B
   - INTERNAL PRESSURE COEFFICIENT +/-0.18 (ENCLOSED)
   - COMPONENTS AND CLADDING DESIGN BASE SHEAR 30 PSF 130 KIPS

6. EARTHQUAKE DESIGN DATA
   - SEISMIC IMPORTANCE FACTOR I 1.0
   - OCCUPANCY CATEGORY II
   - SPECTRAL RESPONSE COEFFICIENTS S_S=0.296g, S1=0.061g
   - SITE CLASS D
   - SEISMIC DESIGN CATEGORY B
   - BASIC SEISMIC-FORCE-RESISTING SYSTEM: ORDINARY REINFORCED CONCRETE SHEAR WALL
   - DESIGN BASE SHEAR 74 KIPS
   - SEISMIC RESPONSE COEFFICIENT C_S 0.026
   - RESPONSE MODIFICATION FACTOR R 5
   - ANALYSIS PROCEDURE EQUIVALENT LATERAL FORCE PROCEDURE

D. MATERIALS:

1. THE FOLLOWING ASTM STANDARDS AND DESIGN STRESSES SHALL BE USED FOR THE APPROPRIATE MATERIALS USED IN THE CONSTRUCTION OF THIS PROJECT.
2. CEMENT: ASTM C150; TYPE I SEE SPEC
3. AGGREGATES: ASTM C33 (NORMAL WEIGHT)
   ASTM C330 (STRUCTURAL LIGHTWEIGHT)
4. CONCRETE: SEE SPEC.

	APPLICATION	f`c AT 28 DAYS (psi)	WT (pcf)	W/C (MAX.)
4.1.	FOOTING	6000	145	0.45
4.2.	FOUNDATION WALLS	6000	145	0.45
4.3.	COLUMN, SHEAR WALL, BEAM	6000	145	0.45
4.5.	NON-STRUCTURAL TOPPING	3500	145	0.55
4.6.	SLAB ON GRADE	4000	145	0.45

5. REINFORCEMENT:

DEFORMED REINFORCING BARS	ASTM A615, GRADE 60
WELDABLE DEFORMED REINF. BARS	ASTM A706
WELDED WIRE FABRIC (WWF)	ASTM A185
SLAB PUNCHING SHEAR STUDS	ASTM A1044

6. STEEL:

6.1.	STRUCTURAL STEEL (UON)	ASTM A992
6.2.	CHANNELS, ANGLES, PLATES AND BASE PLATES	ASTM A36
6.3.	ROUND HOLLOW STRUCTURAL SHAPES	ASTM A500, GRADE B, FY=42KSI
6.4.	RECTANGULAR HOLLOW STRUCTURAL SHAPES	ASTM A500, GRADE B, FY=46KSI
6.5.	LIGHT GAGE/LIGHTWEIGHT STEEL FRAMING	ASTM A446 (GALVANIZED)
6.6.	HIGH STRENGTH BOLTS	ASTM A325, ASTM A490
6.7.	ANCHOR BOLTS	ASTM F1554 GRADE 36
6.8.	SMOOTH & THREADED ROD	ASTM A36
6.9.	HEADED SHEAR STUDS	ASTM A108
6.10.	WELDING ELECTRODES	AWS A5.1 OR A5.5, E70XX
6.11.	EXPANSION BOLTS	HILTI KWIK-BOLT III OR APPROVED EQUAL
6.12.	ADHESIVE ANCHORING SYSTEM	HILTI HVA SYSTEM OR APPROVED EQUAL
6.13.	GALVANIZED METAL FLOOR DECK	ASTM A446

E. CONSTRUCTION:

1. GENERAL:
   - 1.1. STRUCTURAL DRAWINGS MUST BE USED IN CONJUNCTION WITH SPECIFICATIONS, ARCHITECTURAL AND MECHANICAL DRAWINGS DURING ALL PHASES OF CONSTRUCTION. DISCREPANCIES BETWEEN STRUCTURAL AND ARCHITECTURAL DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR CLARIFICATION BEFORE COMMENCING WORK.
   - 1.2. TYPICAL DETAILS APPLY REPETITIVELY ON THE PROJECT. CONTRACTOR SHALL COORDINATE THE GENERAL REQUIREMENTS OF TYPICAL DETAILS WITH PROJECT CONDITIONS, PLANS, SPECIFICATIONS, AND SECTIONS. IF CERTAIN DETAILS ARE NOT FULLY SHOWN ON DRAWINGS OR SPECIFICATIONS THEIR CONFIGURATION SHALL BE SIMILAR TO THE TYPICAL DETAILS, SUBJECT TO THE ENGINEER'S APPROVAL.
   - 1.3. REPRODUCTION OF ANY PORTION OF THE STRUCTURAL CONTRACT DRAWINGS FOR RESUBMITTAL AS SHOP DRAWINGS IS PROHIBITED. SHOP DRAWINGS PRODUCED IN SUCH A MANNER WILL BE REJECTED AND RETURNED.
   - 1.4. SHOP DRAWINGS SUBMITTED FOR STRUCTURAL REVIEW SHALL CONSIST OF TWO SETS OF PRINTS AND ONE SET OF SEPIAS. ONE MARKED UP SET OF SEPIAS WITH THE STRUCTURAL ENGINEER'S COMMENTS WILL BE RETURNED TO THE ARCHITECT.
   - 1.5. SUBMIT SHOP DRAWINGS AT LEAST 15 BUSINESS DAYS BEFORE DATE REVIEWED SUBMITTALS WILL BE NEEDED. SHOP DRAWINGS SHALL BEAR THE CONTRACTOR'S STAMP OF APPROVAL WHICH SHALL CONSTITUTE CERTIFICATION THAT HE HAS VERIFIED ALL FIELD MEASUREMENTS, CONSTRUCTION CRITERIA, MATERIALS AND SIMILAR DATA AND HAS CHECKED EACH DRAWING FOR COMPLETENESS, COORDINATION AND COMPLIANCE WITH THE CONTRACT DOCUMENTS.
   - 1.6. THESE DRAWINGS REPRESENT THE COMPLETED PROJECT, WHICH HAS BEEN DESIGNED FOR THE WEIGHTS OF THE MATERIALS INDICATED ON THE DRAWINGS AND FOR THE SUPERIMPOSED LOADS INDICATED IN THE DESIGN DATA. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ALLOWABLE CONSTRUCTION LOADS AND TO PROVIDE PROPER DESIGN AND CONSTRUCTION OF FALSEWORK, FORMWORK, STAGINGS, BRACING, SHEETING AND SHORING, ETC. THE CONTRACTOR MUST COMPLY WITH ALL DEPARTMENT OF BUILDINGS RULES REGARDING STRUCTURAL STABILITY INTEGRITY DURING CONSTRUCTION OPERATIONS.
   - 1.7. EXISTING BUILDING INFORMATION SHOWN IS AS INDICATED ON EXISTING BUILDING DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL EXISTING BUILDING INFORMATION SHOWN (DIMENSIONS, ELEVATIONS, ETC.) AND NOTIFY THE ARCHITECT AND STRUCTURAL ENGINEER OF ANY DISCREPANCIES. UNLESS INDICATED OTHERWISE, NEW SLABS ARE TO BE AT THE SAME ELEVATIONS AS ADJACENT EXISTING SLABS. FOUNDATION ELEVATIONS OR COLUMN LENGTHS SHALL BE ADJUSTED WITH THE APPROVAL OF THE STRUCTURAL ENGINEER TO ACHIEVE MATCHING SLAB ELEVATIONS.
   - 1.8. IMPLEMENTING JOB SITE SAFETY AND CONSTRUCTION PROCEDURES (MEANS AND METHODS), TEMPORARY SHORING, AND BRACING OF EXISTING CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT ANY DAMAGE TO ADJACENT STRUCTURES AND UTILITIES.
   - 1.9. ALL COSTS OF INVESTIGATION AND/OR REDESIGN, DUE TO CONTRACTOR MISLOCATION OF STRUCTURAL ELEMENTS OR OTHER LACK OF CONFORMANCE WITH THE PROJECT DOCUMENTS, SHALL BE AT THE CONTRACTOR'S EXPENSE.
   - 1.10. CONTRACTOR SHALL REFER TO ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL, LAUNDRY AND FOOD SERVICE DRAWINGS FOR SIZE AND LOCATIONS OF OPENINGS, SLEEVES, CONCRETE HOUSEKEEPING PADS, INSERTS, SLAB DEPRESSIONS, CHASES, INSERTS, CURBS, ANCHOR BOLTS, EXPANSION JOINT DETAILS, ANGLE FRAMES AND ALL OTHER REQUIREMENTS NOT SHOWN ON STRUCTURAL DRAWINGS.
   - 1.11. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR DETAILED INFORMATION REGARDING FINISHES, PAINT, FIREPROOFING, FLOOR PITCHING AND DRAIN LOCATION, ETC.
   - 1.12. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF MASONRY AND DRYWALL NON-LOAD BEARING PARTITIONS. PROVIDE SLIP CONNECTIONS THAT ALLOW VERTICAL MOVEMENT AT THE HEADS OF ALL SUCH PARTITIONS. CONNECTIONS ARE DESIGNED TO SUPPORT THE TOP OF THE WALLS LATERALLY FOR THE CODE-REQUIRED LATERAL LOAD. PROVIDE COMPRESSIBLE FIRESAFING AT TOP OF WALL AS REQUIRED BY ARCHITECTURAL DRAWINGS.
   - 1.13. THE CONTRACTOR SHALL SUBMIT, FOR REVIEW, DRAWINGS AND CALCULATIONS FOR ALL OF THE FOLLOWING ASSEMBLIES. THE DESIGN OF THESE ASSEMBLIES IS THE RESPONSIBILITY OF THE CONTRACTOR'S ENGINEER REGISTERED IN THE PROJECT'S JURISDICTION. ALL SUBMITTALS SHALL BEAR THIS ENGINEER'S SEAL & SIGNATURE. REVIEW SHALL BE FOR GENERAL CONFORMANCE WITH THE PROJECT PARAMETERS AS INDICATED ON THE DRAWINGS AND IN THE GENERAL NOTES.
     - a. NON-LOAD BEARING STUD WALL AND CURTAIN WALL SYSTEMS AND RELATED CONNECTIONS: DESIGNS SHALL TAKE INTO ACCOUNT ALL VERTICAL AND LATERAL LOADS REQUIRED BY APPLICABLE BUILDING CODES. BACK UP SYSTEM AND CURTAIN WALL SHALL BE DESIGNED FOR A MAXIMUM DEFLECTION OF 1/600 OF THE SPAN IN INCHES, OR ¾", WHICHEVER IS LESS, AT THE APPLICABLE DESIGN WIND LOAD.
     - b. METAL STAIRS AND METAL RAILINGS: DESIGNS SHALL TAKE INTO ACCOUNT ALL VERTICAL AND LATERAL LOADS REQUIRED BY APPLICABLE BUILDING CODES. WHERE HEADERS OR OTHER TYPES OF STRUCTURAL MEMBERS HAVE BEEN DESIGNATED BY THE STRUCTURAL ENGINEER OF RECORD TO SUPPORT THE STAIRS, THE CONNECTIONS FROM THE STAIRS SHALL BE DESIGNED SO THAT NO ECCENTRIC OR TORSIONAL FORCES ARE INDUCED IN THESE STRUCTURAL MEMBERS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING EMBEDS AND HARDWARE AS REQUIRED BY THE STAIR DESIGN.
   - 1.1. IN CASE OF CONFLICT BETWEEN THE GENERAL NOTES, DETAILS AND SPECIFICATIONS, THE MOST RIGID REQUIREMENTS SHALL GOVERN.
   - 1.2. CONTRACTOR SHALL FURNISH DIMENSIONED SHOP DRAWINGS AT ALL LEVELS LOCATING FLOOR AND ROOF EDGES FOR REVIEW BY THE ARCHITECT AND STRUCTURAL ENGINEER.
   - 1.3. CONTRACTOR SHALL FURNISH DIMENSIONED COORDINATED SHOP DRAWINGS AT ALL LEVELS SHOWING THE LOCATIONS OF ALL SLEEVES AND OPENINGS REQUIRED BY ALL TRADES.
   - 1.4. CONTRACTOR TO PROVIDE ANY ALTERATIONS AND/OR ADDITIONAL COMPONENTS NEEDED TO ACCOMMODATE THE INSTALLATION OF EQUIPMENT OF ANY NATURE. ALSO COORDINATE SUCH WORK WITH THE EQUIPMENT SUPPLIER. INCORPORATE SUCH REFINEMENTS ON THE SHOP DRAWINGS AND OBTAIN THE EQUIPMENT SUPPLIER'S APPROVAL (CLEARLY DISPLAYED ON SHOP DRAWINGS) PRIOR TO SUBMITTING THE SHOP DRAWINGS TO THE ARCHITECT FOR REVIEW.
   - 1.5. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL ANCHOR BOLTS, NUTS, WASHERS, GROUT, CONCRETE PADS AND REINFORCING STEEL REQUIRED FOR THE PROPER INSTALLATION OF ALL EQUIPMENT. REFER TO TYPICAL DETAILS.

2. INSPECTION AND TESTING:
   - 2.1. ENGAGE A TESTING AGENCY AND A SPECIAL INSPECTOR TO PROVIDE SERVICES AS INDICATED BELOW AND SUBMIT REPORTS.
   - 2.2. CAST-IN-PLACE CONCRETE:
     - a. THE SPECIAL INSPECTOR SHALL INSPECT THE FORMWORK AND REINFORCING STEEL PLACEMENT FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND SHOP DRAWINGS. THE SPECIAL INSPECTOR SHALL MONITOR ALL STRUCTURAL CONCRETE PLACEMENT FOR CONFORMANCE WITH APPLICABLE ACI REQUIREMENTS.
     - b. TESTING AGENCY SHALL SAMPLE FRESH CONCRETE IN ACCORDANCE WITH ASTM C172. MOLD TEST CYLINDERS IN ACCORDANCE WITH ASTM C31. MEASURE AIR ENTRAINMENT IN ACCORDANCE WITH ASTM C231 AND PERFORM SLUMP TESTS IN ACCORDANCE WITH C143.
     - c. THE FOLLOWING NUMBER OF TEST CYLINDERS SHALL BE CAST FOR EACH DAY'S POUR OR EACH 50 CUBIC YARDS, WHICHEVER RESULTS IN MORE TEST CYLINDERS:

FOR ELEVATED SLAB (TO INCLUDE BEAM JOISTS, GIRDERS):	FOR FOOTINGS AND OTHER STRUCTURAL CONCRETE:	FOR WALLS, COLUMNS:
1 @7 DAYS, LAB CURED	1 @7 DAYS, LAB CURED	1 @7 DAYS, LAB CURED
1 @7 DAYS, FIELD CURED	2 @28 DAYS, LAB CURED	1 @7 DAYS, FIELD CURED
2 @28 DAYS, LAB CURED	1 SPARE, LAB CURED	2 @28 DAYS, LAB CURED
2 @28 DAYS, FIELD CURED		2 @ 28 DAYS, FIELD CURED
1 SPARE, LAB CURED		1 SPARE, LAB CURED
1 SPARE, FIELD CURED		1 SPARE, FIELD CURED

     - d. COMPRESSION TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM C39.
     - e. THE AGENCY WILL MAKE ADDITIONAL TESTS OF IN-PLACE CONCRETE AT THE CONTRACTOR'S EXPENSE, AS DIRECTED BY THE STRUCTURAL ENGINEER, WHEN TEST RESULTS INDICATE SPECIFIED CONCRETE STRENGTHS HAVE NOT BEEN ATTAINED.

F. FOUNDATIONS & STRUCTURAL EARTHWORK:

1. GENERAL:
   - 1.1. SEE THE SPECIFICATIONS AND GEOTECHNICAL REPORT REQUIREMENTS FOR EXCAVATION AND PREPARATION OF THE FOUNDATION AND SLAB-ON-GRADE SUBGRADE, INCLUDING COMPACTION PROCEDURES. REQUIREMENTS CONTAINED IN THE GEOTECHNICAL REPORT ARE PART OF THIS WORK.
   - 1.2. CONTRACTOR SHALL VERIFY ALL EXISTING FIELD CONDITIONS THAT MAY AFFECT THE INSTALLATION OF THE FOUNDATION SYSTEM AS SHOWN PRIOR TO STARTING WORK.
   - 1.3. EXISTING UTILITIES KNOWN TO BE IN THE CONSTRUCTION AREA HAVE BEEN INDICATED. THE SIZE, LOCATION AND DEPTH OF THE UTILITIES ARE NOT KNOWN EXACTLY AND MAY VARY SIGNIFICANTLY FROM THAT INDICATED. OTHER UNKNOWN UTILITIES NOT INDICATED MAY ALSO BE PRESENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES, WHETHER INDICATED OR NOT, WHICH MAY BE AFFECTED BY THE CONSTRUCTION PROCESS.
   - 1.4. ALL FOUNDATIONS SUSCEPTIBLE TO FROST SHALL BEAR A MINIMUM OF 4'-0" BELOW GRADE. IN CASE OF CONFLICT, NOTIFY THE ARCHITECT AND STRUCTURAL ENGINEER IN ADVANCE OF ANY CONSTRUCTION TO ALLOW FOR ADJUSTMENT.
   - 1.5. UTILITY LINES SHALL NOT BE PLACED THROUGH OR BELOW FOUNDATIONS WITHOUT THE STRUCTURAL ENGINEER'S APPROVAL.
   - 1.6. THE SLOPE BETWEEN THE LOWER EDGES OF ADJACENT FOOTINGS SHALL NOT EXCEED 45 DEGREES WITH THE HORIZONTAL FOR ROCK OR 26 DEGREES FOR SOIL, UNLESS INDICATED OTHERWISE IN THE GEOTECHNICAL REPORT.
   - 1.7. PROVIDE CONTINUOUS BENTONITE STRIP WATERSTOPS AT ALL HORIZONTAL AND VERTICAL CONSTRUCTION JOINTS IN ALL BELOW GRADE WALLS AND ELEVATOR PITS.
   - 1.8. ALL SHORING, SHEETING, AND DEWATERING SHALL BE THE TOTAL RESPONSIBILITY OF THE CONTRACTOR. SHEETING AND SHORING SHALL BE DESIGNED BY THE CONTRACTOR'S ENGINEER REGISTERED IN THE PROJECT'S JURISDICTION. ALL SUBMITTALS SHALL BEAR CONTRACTOR'S/ENGINEERING SEAL AND SIGNATURE.
   - 1.9. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT ALL EXISTING STRUCTURES, CURBS, STREETS, ETC. FROM DAMAGE BY CONSTRUCTION EQUIPMENT. THE CONTRACTOR SHALL NOT DISPOSE OF ANY LIQUIDS, SLURRY, SPOILS OR CHEMICALS ON THE SITE EXCEPT AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND APPROVED BY THE DEPARTMENT OF ENVIRONMENTAL RESOURCES OR OTHER AGENCIES HAVING JURISDICTION.

2. BACKFILL:
   - 2.1. ALL BACKFILL SHALL BE ACCOMPLISHED USING MATERIAL CONSISTING OF BANK RUN GRAVEL, CRUSHED STONE AND/OR MATERIAL APPROVED BY THE GEOTECHNICAL ENGINEER, WITH OPTIMUM MOISTURE CONTENT FOR COMPACTING AND SHALL BE FREE OF ANY DEBRIS.
   - 2.2. NO BACKFILL MATERIAL SHALL BE PLACED AGAINST FOUNDATION WALLS UNTIL THE UPPER BRACING FLOORS ARE IN PLACE FOR AT LEAST 7 DAYS, OR ADEQUATE BRACING IS INSTALLED.
   - 2.3. WHERE THE FINAL GRADE ELEVATIONS ARE APPROXIMATELY EQUAL ON BOTH SIDES OF A WALL, BACKFILL IN LIFTS TO MAINTAIN LEVEL ELEVATIONS WITHIN 12" ON BOTH SIDES AT ANY TIME.

3. STRUCTURAL FILL:
   - 3.1. REFER TO SPECIFICATIONS AND GEOTECHNICAL REPORT REQUIREMENTS FOR COMPACTED STRUCTURAL FILL. REQUIREMENTS AND RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT ARE PART OF THIS WORK. INSPECTION OF THE PLACEMENT OF COMPACTED STRUCTURAL FILL SHALL BE BY AN EXPERIENCED, QUALIFIED GEOTECHNICAL ENGINEER.

G. CONCRETE:

1. CAST-IN-PLACE:
   - 1.1. REINFORCING STEEL CLEAR COVER SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE:
     - a. NON-PRESTRESSED CONCRETE:

CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	3"
CONCRETE EXPOSED TO EARTH OR WEATHER:	
WALLS AND SLABS	2"
OTHER MEMBERS	2½"
CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	
SLABS, WALL, JOISTS: #11 BARS AND SMALLER	¾"
BEAMS, COLUMNS: PRIMARY REINFORCEMENT, TIES STIRRUPS, SPIRALS	1½"
SLABS CAST AGAINST MUD SLAB	2"

   - 1.1. CONCRETE SLABS ON GRADE SHALL BE 6 THICK, PLACED ON A MINIMUM 2" LAYER OF CLEAN, WELL-GRADED GRAVEL OR CRUSHED STONE OVER A VAPOR RETARDER OVER COMPACTED SUBGRADE.
   - 1.2. CONSTRUCTION JOINTS AND CONTROL JOINTS IN SLABS-ON-GRADE SHALL BE ARRANGED TO LIMIT MAXIMUM AREA BETWEEN JOINTS TO 400 S.F. APPROXIMATELY SQUARE. ALLOW A MINIMUM OF 48 HOURS TIME BETWEEN PLACEMENT OF ADJACENT SECTIONS.
   - 1.3. ALL FORMWORK, SHORING AND RESHORING SHALL BE DESIGNED BY THE CONTRACTOR'S ENGINEER REGISTERED IN THE STATE OF NEW YORK. ALL SUBMISSIONS SHALL BEAR HIS SEAL AND SIGNATURE.
   - 1.4. SLEEVES SHALL NOT BE PLACED THROUGH ANY CONCRETE ELEMENT UNLESS SHOWN ON THE STRUCTURAL DRAWINGS, APPROVED SLEEVING SHOP DRAWINGS OR SPECIFICALLY AUTHORIZED IN WRITING BY THE STRUCTURAL ENGINEER. IF PERMITTED THEY SHALL COMPLY WITH ACI, SECTION 6.3.
   - 1.5. DEVELOPMENT AND SPLICES OF REINFORCING BARS SHALL BE IN ACCORDANCE WITH ACI 318, EXCEPT AS NOTED OTHERWISE.
     - a. ALL SPLICES FOR SLABS AND BEAMS SHALL BE TENSION SPLICE CLASS B.
     - b. COMPRESSION SPLICES SHALL BE ONLY USED IN PIERS AND COLUMNS, UON.
     - c. EMBEDMENT FOR DOWELS, ETC., SHALL BE TENSION DEVELOPMENT, UON.
     - d. ALL REINFORCING BARS MARKED CONTINUOUS SHALL HAVE TENSION LAP SPLICES AT ALL SPLICES AND CORNERS, EXCEPT AS OTHERWISE NOTED ON DRAWINGS. LAP CONTINUOUS TOP BARS AT CENTER OF SPAN AND BOTTOM BARS NEAR SUPPORTS. HOOK AND FULLY EMBED TOP BARS AT ON-CONTINUOUS SUPPORTS.
     - e. WELDING OF REINFORCING BARS SHALL CONFORM TO THE "REINFORCING STEEL WELDING CODE" AWS D12.1 AND ACI 318.
     - f. WELDING OF REINFORCING BARS IS NOT PERMITTED UNLESS SPECIFICALLY CALLED OR APPROVED BY THE STRUCTURAL ENGINEER.
   - 1.1. ALL INSERTS AND SLEEVES SHALL BE CAST-IN-PLACE WHENEVER FEASIBLE. DRILLED OR POWDER DRIVEN FASTENERS WILL BE PERMITTED WHEN PROVEN TO THE SATISFACTION OF THE STRUCTURAL ENGINEER THAT THE FASTENERS WILL NOT SPALL THE CONCRETE AND HAVE THE SAME CAPACITY AS CAST-IN-PLACE INSERTS.
   - 1.2. WHEN INSTALLING EXPANSION BOLTS OR ADHESIVE ANCHORS, THE CONTRACTOR SHALL TAKE MEASURES TO AVOID DRILLING OR CUTTING OF ANY EXISTING REINFORCING AND DESTRUCTION OF CONCRETE. HOLES SHALL BE BLOWN CLEAN PRIOR TO PLACING BOLTS OR ADHESIVE ANCHORS.
   - 1.3. CHAMFER EXPOSED CONCRETE CORNERS UNLESS NOTED OTHERWISE ON ARCHITECTURAL DRAWINGS.
   - 1.4. CONCRETE SLABS SHALL BE FINISHED FLAT AND LEVEL WITHIN TOLERANCE, TO THE ELEVATION INDICATED ON THE DRAWINGS. NOMINAL SLAB THICKNESS IS INDICATED. ACTUAL SLAB THICKNESS MAY VARY DUE TO BEAM AND DECK DEFLECTIONS. CONTRACTOR SHALL PROVIDE ADDITIONAL CONCRETE AS NECESSARY TO MAINTAIN A LEVEL SLAB SURFACE AT THE ELEVATION INDICATED.
   - 1.5. FOUNDATIONS AND SLABS SHALL NOT HAVE COLD JOINTS IN A HORIZONTAL PLAN UNLESS SHOWN OTHERWISE.
   - 1.6. TO MINIMIZE THE EFFECTS OF SHRINKAGE, CAST CONCRETE IN ALTERNATE SECTIONS. ADJACENT SECTIONS MAY BE CAST WHEN THE PREVIOUSLY PLACED SECTION HAS CURED FOR 48 HOURS AFTER INITIAL SET.
   - 1.7. CONCRETE AND FOUNDATION CONCRETE WALLS SHALL BE CAST IN ALTERNATE PANELS NOT EXCEEDING 60 FEET IN LENGTH.
   - 1.8. CONSTRUCTION JOINTS FOR SLABS ON METAL DECK SHALL BE LOCATED MIDWAY BETWEEN BEAMS WHERE THE JOINT IS PARALLEL TO THE BEAM SPAN. JOINTS SHALL BE LOCATED WITHIN THE MIDDLE THIRD OF SPAN WHERE THE JOINT IS PERPENDICULAR TO THE BEAM SPAN. THE CONTRACTOR SHALL SUBMIT, FOR APPROVAL, A SHOP DRAWING INDICATING ALL PROPOSED JOINT LOCATIONS AND ALL REINFORCING STEEL TO BE PLACED IN THE SLAB. ANY STOP IN CONCRETE WORK MUST BE MADE WITH VERTICAL BULKHEADS, UNLESS OTHERWISE SHOWN. ALL REINFORCING IS TO BE CONTINUOUS THROUGH JOINTS.
   - 1.9. WELDED WIRE FABRIC REINFORCEMENT SHALL BE SUPPLIED IN SHEETS. LAP TWO FULL MESH LENGTHS AT SPLICES AND WIRE TOGETHER.
   - 1.10. ALL REINFORCING BARS SHALL BE SECURED IN THEIR PROPER POSITION WHILE POURING CONCRETE. IF REQUIRED PROVIDE ADDITIONAL BARS AND STIRRUPS TO SECURE REINFORCING STEEL. PROVIDE PLASTIC TIPPED BOLSTERS AND CHAIRS AT ALL LOCATIONS WHERE THE CONCRETE SURFACE IN CONTACT WITH THE BOLSTERS OR CHAIRS IS EXPOSED.
   - 1.11. SUBMIT MATERIAL TEST REPORTS FROM A QUALIFIED TESTING AGENCY INDICATIING THAT TEST RESULTS FOR TRIAL MIX BATCHES FOR EACH CONCRETE MIX DESIGN COMPLY WITH ACI 301 AND THE ADDITIONAL REQUIREMENTS OF THE PROJECT CONTRACT DOCUMENTS.

SPECIAL INSPECTIONS, PROGRESS INSPECTIONS AND QUALITY CONTROL

1. SPECIAL INSPECTIONS AND PROGRESS INSPECTIONS AS PER THE NEW YORK CITY BUILDING CODE SHALL BE PERFORMED FOR ALL REQUIRED STRUCTURAL ITEMS, INCLUDING:

CONCRETE - CAST-IN-PLACE	(BC1705.3)
MASONRY	(BC1705.6)
FINAL	(28-116.2.4.2, BC110.5)

2. FORM TR-1 TECHNICAL REPORT: STATEMENT OF RESPONSIBILITY SHALL BE FILED WITH THE NEW YORK CITY DEPARTMENT OF BUILDINGS BY THE ENGINEER(S) DESIGNATED AND RETAINED BY THE OWNER TO PERFORM CONTROLLED INSPECTIONS IN EACH OF THE ABOVE MENTIONED CATEGORIES. THE OWNER SHALL HIRE AND PAY FOR THE TESTING AND INSPECTIONS FOR EACH OF THE ABOVE MENTIONED CATEGORIES.

SCOPE OF WORK

INSTALLATION OF CONCRETE COLUMN, WALL, BEAM AND TWO-WAY SLAB FOR NEW 10 STORY BUILDING.

APPLICATION LIST:

1. ARCHITECTURE: QXXXXXXX
2. SOE: QXXXX-S1
2. FOUNDATION/EA: QXXXX-S2
3. STRUCTURE: QXXXX-S3

LEGEND

1. INDICATES NEW CAST-IN-PLACE CONCRETE
2. INDICATES WALL/COLUMN/BEAM BELOW
3. INDICATES STEP IN SLAB
4. INDICATES NEW CONCRETE COLUMN
5. INDICATES COLUMN (OR POST) ABOVE
6. INDICATES COLUMN (OR POST) BELOW

DOBNOW JOB#: BXXXXX-SX

ENGINEER:

JUST CONSULTING ENGINEERING PLLC
217-14 NORTHERN BLVD, SUITE 207
BAYSIDE, NY 11365
TEL: 929-303-3095
WEB: WWW.JCEPLLC.COM

ARCHITECT:

No	Date	Description
# 2		
# 1		NOT FOR CONSTRUCTION
# 0	03/01/25	DOB SUBMISSION
Issued/Revised		

PROJECT:

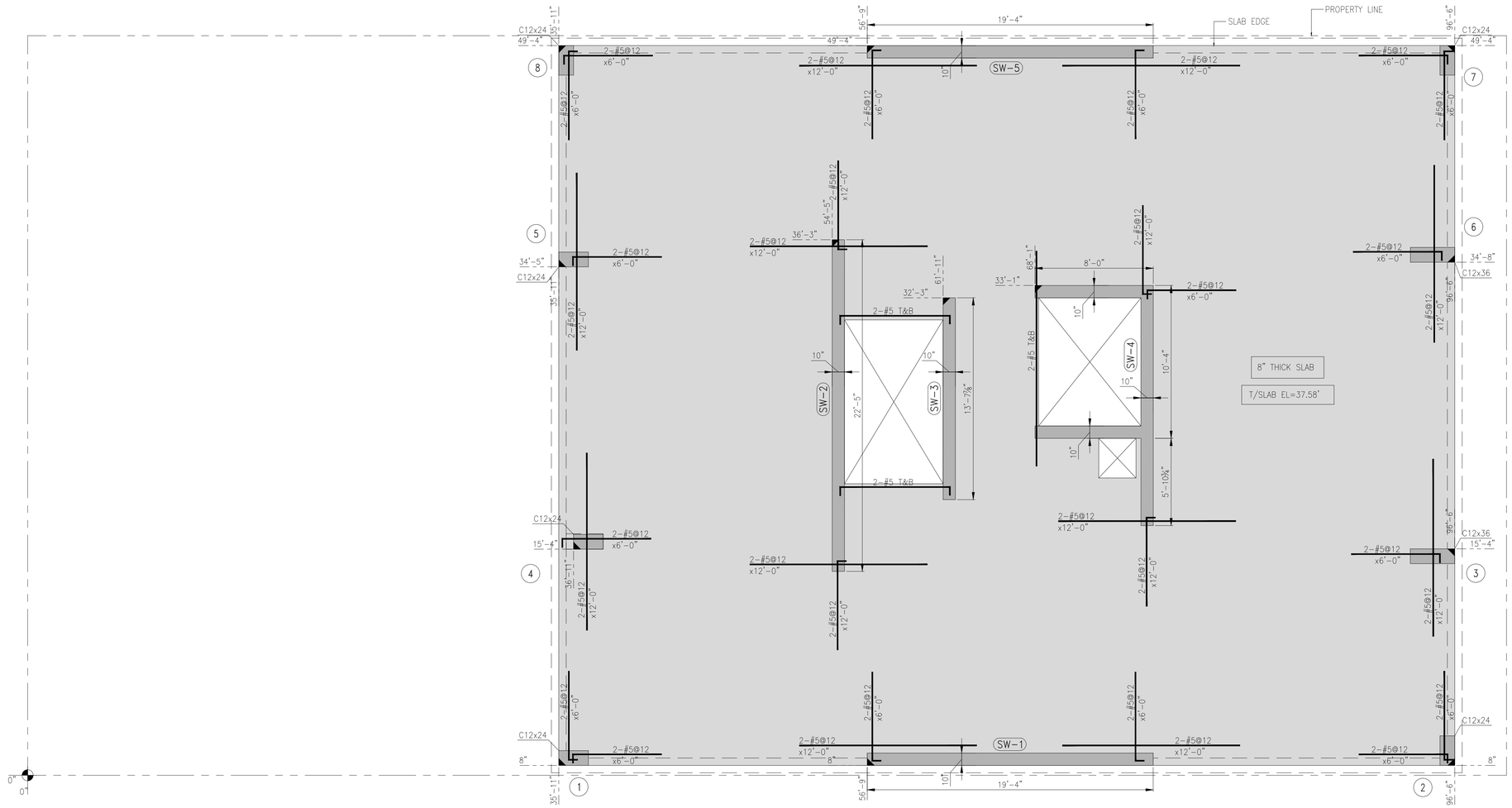
28-12 41 ST AVE, QUEENS

DRAWING TITLE:

GENERAL NOTES

STATE OF NEW YORK · XIAOJUN WANG · 090410 · LICENSED PROFESSIONAL ENGINEER

DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW
DRAWING NO.:	S-001.00
SHEET NO:	1 OF 16



1ST FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"

NOTES:

1. TOP OF SLAB ELEVATION, SEE SCHEDULE. CONTRACTOR TO CONFIRM ELEVATIONS WITH ARCH PLAN. FOR SLAB OPENINGS SIZES AND LOCATION, SEE ARCH& MECHANICAL PLAN
2. CONCRETE SLAB THICKNESS, SEE PLAN.
3. SLAB TOP AND BOTTOM MAT REINFORCEMENT SHALL BE #5@10" EACH WAY CONTINUOUS, U.O.N. ON PLAN.
   - ——— INDICATES ADDITIONAL TOP REINFORCEMENT.
   - — — INDICATES ADDITIONAL BOTTOM REINFORCEMENT.
4. PROVIDE 3-#6 T&B CONTINUOUS AT EDGE OF SLAB. SEE TYPICAL DETAILS ON S-600 DRAWING SERIES.
5. BARS IN THE EAST-WEST DIRECTION SHALL BE PLACED IN THE LOWEST & TOP MOST LAYERS:



6. FOR COLUMN SIZE AND REINFORCEMENT, SEE COLUMN SCHEDULES ON DRAWINGS S-200 & S-201.
7. FOR SHEARWALL DETAILS & LINK BEAMS SCHEDULE, SEE S-202 DRAWING SERIES.
8. FOR TYPICAL SUPERSTRUCTURE DETAILS, SEE S-300 DRAWING SERIES.
9. (SRS) INDICATES SLAB PUNCHING SHEAR REINFORCEMENT AT THIS COLUMN, SEE S-203 FOR DETAIL.

DOBNOW JOB#:
BXXXXX-SX

ENGINEER:

JUST CONSULTING ENGINEERING PLLC
217-14 NORTHERN BLVD, SUITE 207
BAYSIDE, NY 11365
TEL: 929-303-3095
WEB: WWW.JCEPLLC.COM

ARCHITECT:

No	Date	Issued/Revised
# 2		
# 1		NOT FOR CONSTRUCTION
# 0	03/01/25	DOB SUBMISSION

PROJECT:

28-12 41 ST AVE, QUEENS

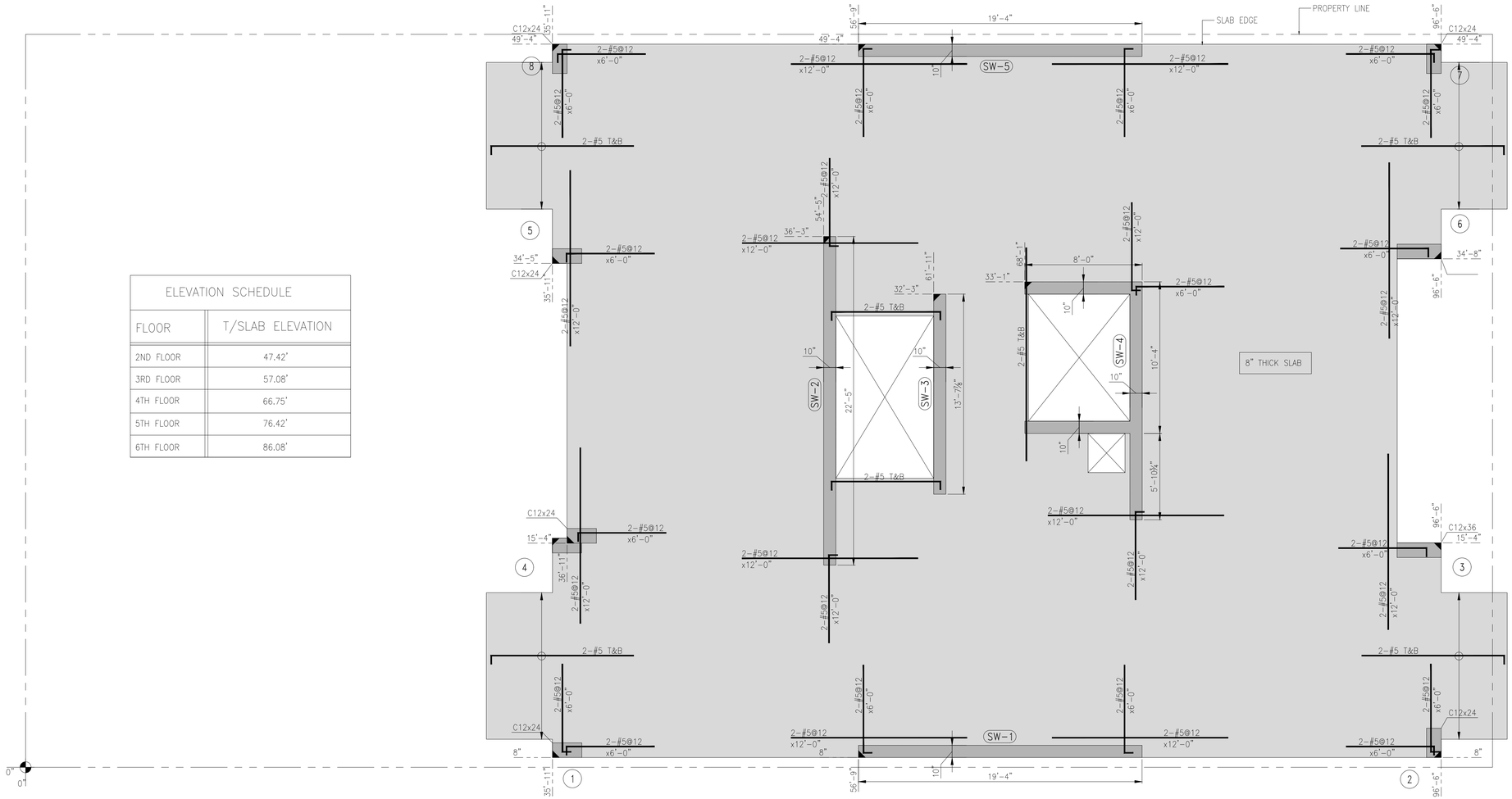
DRAWING TITLE:

1ST FLOOR FRAMING PLAN

STATE OF NEW YORK · XIAOJUN WANG · LICENSED PROFESSIONAL ENGINEER · No. 104178

DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW
DRAWING NO.:	S-101.00
SHEET NO:	2 OF 16

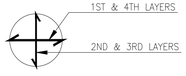
ELEVATION SCHEDULE	
FLOOR	T/SLAB ELEVATION
2ND FLOOR	47.42'
3RD FLOOR	57.08'
4TH FLOOR	66.75'
5TH FLOOR	76.42'
6TH FLOOR	86.08'



2ND THRU 6TH FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"

NOTES:

1. TOP OF SLAB ELEVATION, SEE SCHEDULE. CONTRACTOR TO CONFIRM ELEVATIONS WITH ARCH PLAN. FOR SLAB OPENINGS SIZES AND LOCATION, SEE ARCH& MECHANICAL PLAN
2. CONCRETE SLAB THICKNESS, SEE PLAN.
3. SLAB TOP AND BOTTOM MAT REINFORCEMENT SHALL BE #5@10'' EACH WAY CONTINUOUS, U.O.N. ON PLAN.
   - ——— INDICATES ADDITIONAL TOP REINFORCEMENT.
   - — — INDICATES ADDITIONAL BOTTOM REINFORCEMENT.
4. PROVIDE 3-#6 T&B CONTINUOUS AT EDGE OF SLAB. SEE TYPICAL DETAILS ON S-600 DRAWING SERIES.
5. BARS IN THE EAST-WEST DIRECTION SHALL BE PLACED IN THE LOWEST & TOP MOST LAYERS:



6. FOR COLUMN SIZE AND REINFORCEMENT, SEE COLUMN SCHEDULES ON DRAWINGS S-200 & S-201.
7. FOR SHEARWALL DETAILS & LINK BEAMS SCHEDULE, SEE S-202 DRAWING SERIES.
8. FOR TYPICAL SUPERSTRUCTURE DETAILS, SEE S-300 DRAWING SERIES.
9. (SRS) INDICATES SLAB PUNCHING SHEAR REINFORCEMENT AT THIS COLUMN, SEE S-203 FOR DETAIL.

DOBNOW JOB#:
BXXXXX-SX

ENGINEER:

JUST CONSULTING ENGINEERING PLLC
217-14 NORTHERN BLVD, SUITE 207
BAYSIDE, NY 11365
TEL: 929-303-3095
WEB: WWW.JCEPLLC.COM

ARCHITECT:

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# 2		
# 1		NOT FOR CONSTRUCTION
# 0	03/01/25	DOB SUBMISSION

Issued/Revised

PROJECT:

28-12 41 ST AVE, QUEENS

DRAWING TITLE:

2ND THRU 6TH FLOOR FRAMING PLAN

STATE OF NEW YORK
XIAOJUN WANG
No. 090417
LICENSED PROFESSIONAL ENGINEER

DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW

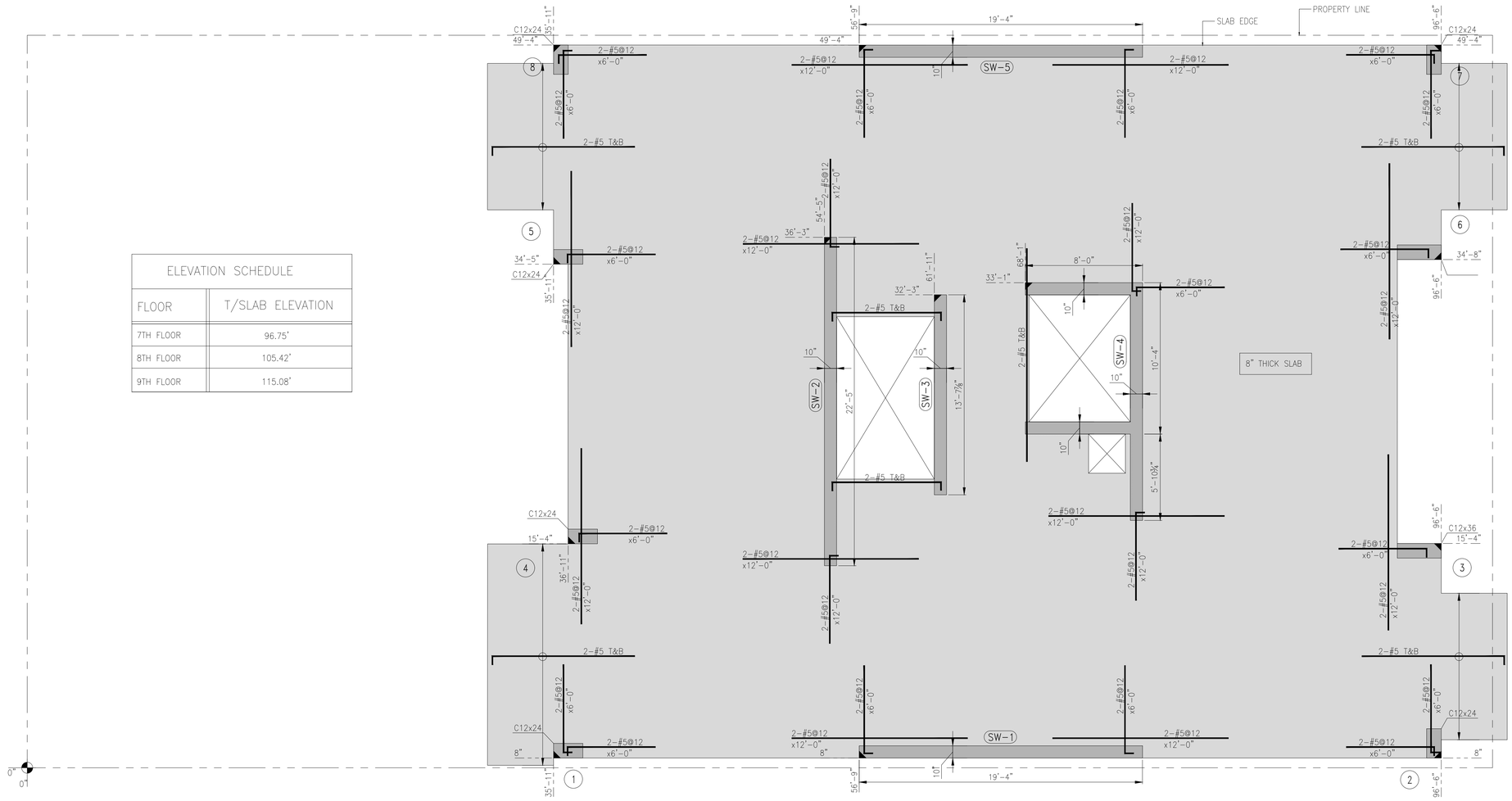
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S-102.00

SHEET NO:

3 OF 16

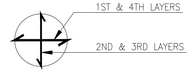
ELEVATION SCHEDULE	
FLOOR	T/SLAB ELEVATION
7TH FLOOR	96.75'
8TH FLOOR	105.42'
9TH FLOOR	115.08'



7TH THRU 9TH FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"

NOTES:

1. TOP OF SLAB ELEVATION, SEE SCHEDULE. CONTRACTOR TO CONFIRM ELEVATIONS WITH ARCH PLAN. FOR SLAB OPENINGS SIZES AND LOCATION, SEE ARCH& MECHANICAL PLAN
2. CONCRETE SLAB THICKNESS, SEE PLAN.
3. SLAB TOP AND BOTTOM MAT REINFORCEMENT SHALL BE #5@10'' EACH WAY CONTINUOUS, U.O.N. ON PLAN.
   - ——— INDICATES ADDITIONAL TOP REINFORCEMENT.
   - — — INDICATES ADDITIONAL BOTTOM REINFORCEMENT.
4. PROVIDE 3-#6 T&B CONTINUOUS AT EDGE OF SLAB. SEE TYPICAL DETAILS ON S-600 DRAWING SERIES.
5. BARS IN THE EAST-WEST DIRECTION SHALL BE PLACED IN THE LOWEST & TOP MOST LAYERS:



6. FOR COLUMN SIZE AND REINFORCEMENT, SEE COLUMN SCHEDULES ON DRAWINGS S-200 & S-201.
7. FOR SHEARWALL DETAILS & LINK BEAMS SCHEDULE, SEE S-202 DRAWING SERIES.
8. FOR TYPICAL SUPERSTRUCTURE DETAILS, SEE S-300 DRAWING SERIES.
9. (SRS) INDICATES SLAB PUNCHING SHEAR REINFORCEMENT AT THIS COLUMN, SEE S-203 FOR DETAIL.

DOBNOW JOB#:
BXXXXX-SX

ENGINEER:

JUST CONSULTING ENGINEERING PLLC
217-14 NORTHERN BLVD, SUITE 207
BAYSIDE, NY 11365
TEL: 929-303-3095
WEB: WWW.JCEPLLC.COM

ARCHITECT:

No	Date	Description
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PROJECT:

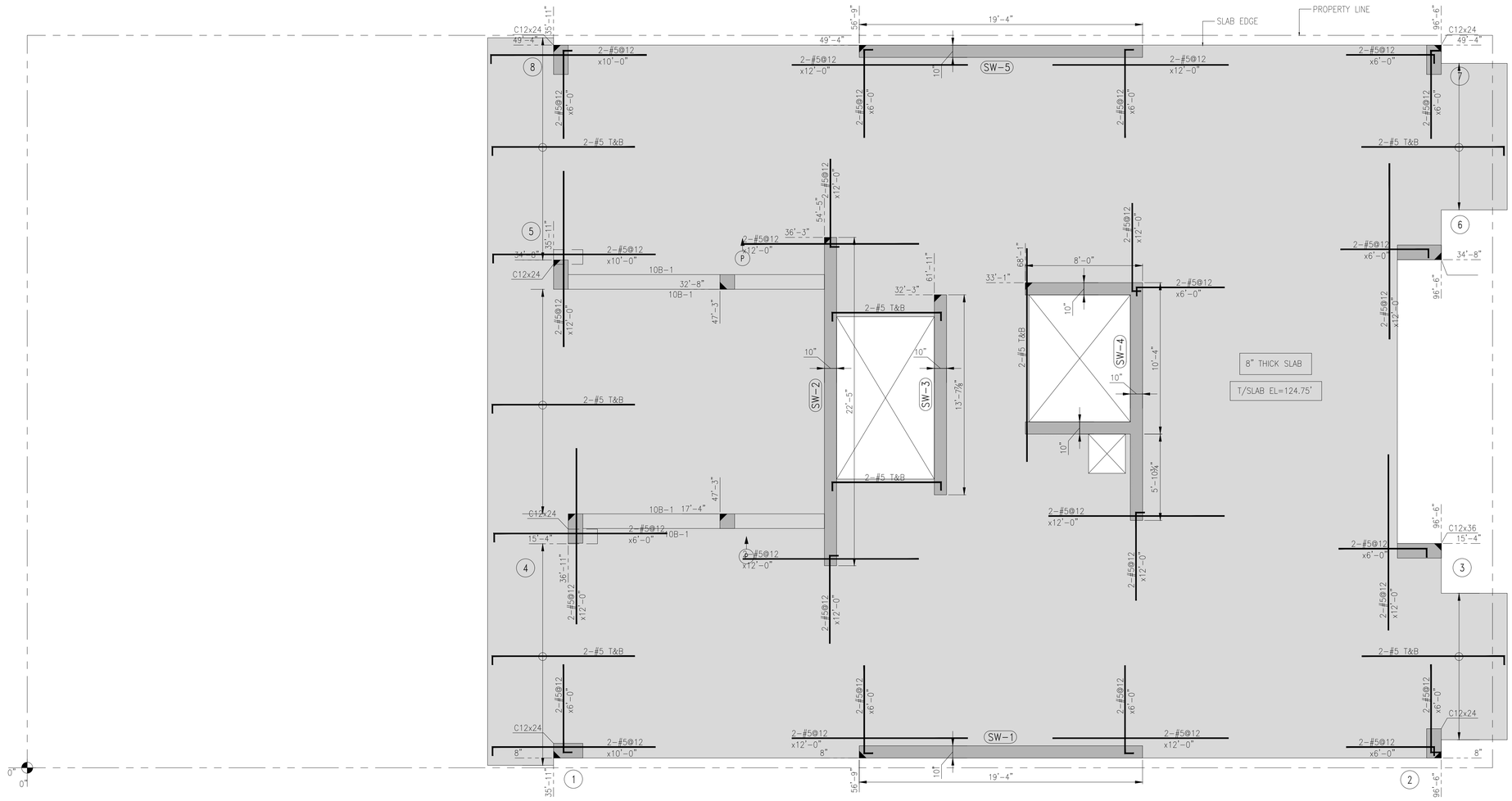
28-12 41 ST AVE, QUEENS

DRAWING TITLE:

7TH THRU 9TH FLOOR FRAMING PLAN



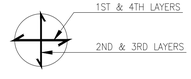
DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW
DRAWING NO.:	S-103.00
SHEET NO:	4 OF 16



10TH FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"

NOTES:

1. TOP OF SLAB ELEVATION, SEE SCHEDULE. CONTRACTOR TO CONFIRM ELEVATIONS WITH ARCH PLAN. FOR SLAB OPENINGS SIZES AND LOCATION, SEE ARCH& MECHANICAL PLAN
2. CONCRETE SLAB THICKNESS, SEE PLAN.
3. SLAB TOP AND BOTTOM MAT REINFORCEMENT SHALL BE #5@10'' EACH WAY CONTINUOUS, U.O.N. ON PLAN.
   ——— INDICATES ADDITIONAL TOP REINFORCEMENT.
   — — INDICATES ADDITIONAL BOTTOM REINFORCEMENT.
4. PROVIDE 3-#6 T&B CONTINUOUS AT EDGE OF SLAB. SEE TYPICAL DETAILS ON S-600 DRAWING SERIES.
5. BARS IN THE EAST-WEST DIRECTION SHALL BE PLACED IN THE LOWEST & TOP MOST LAYERS:



6. FOR COLUMN SIZE AND REINFORCEMENT, SEE COLUMN SCHEDULES ON DRAWINGS S-200 & S-201.
7. FOR SHEARWALL DETAILS & LINK BEAMS SCHEDULE, SEE S-202 DRAWING SERIES.
8. FOR TYPICAL SUPERSTRUCTURE DETAILS, SEE S-300 DRAWING SERIES.
9. (SRS) INDICATES SLAB PUNCHING SHEAR REINFORCEMENT AT THIS COLUMN, SEE S-203 FOR DETAIL.
10. (P1) INDICATED 12x12 COIUMN, W/8-#7 VERTICAL W/#3@10'' TIES

DOBNOW JOB#:
BXXXXX-SX

ENGINEER:

JUST CONSULTING ENGINEERING PLLC
217-14 NORTHERN BLVD, SUITE 207
BAYSIDE, NY 11365
TEL: 929-303-3095
WEB: WWW.JCEPLLC.COM

ARCHITECT:

No	Date	Issued/Revised
# 2		
# 1		NOT FOR CONSTRUCTION
# 0	03/01/25	DOB SUBMISSION

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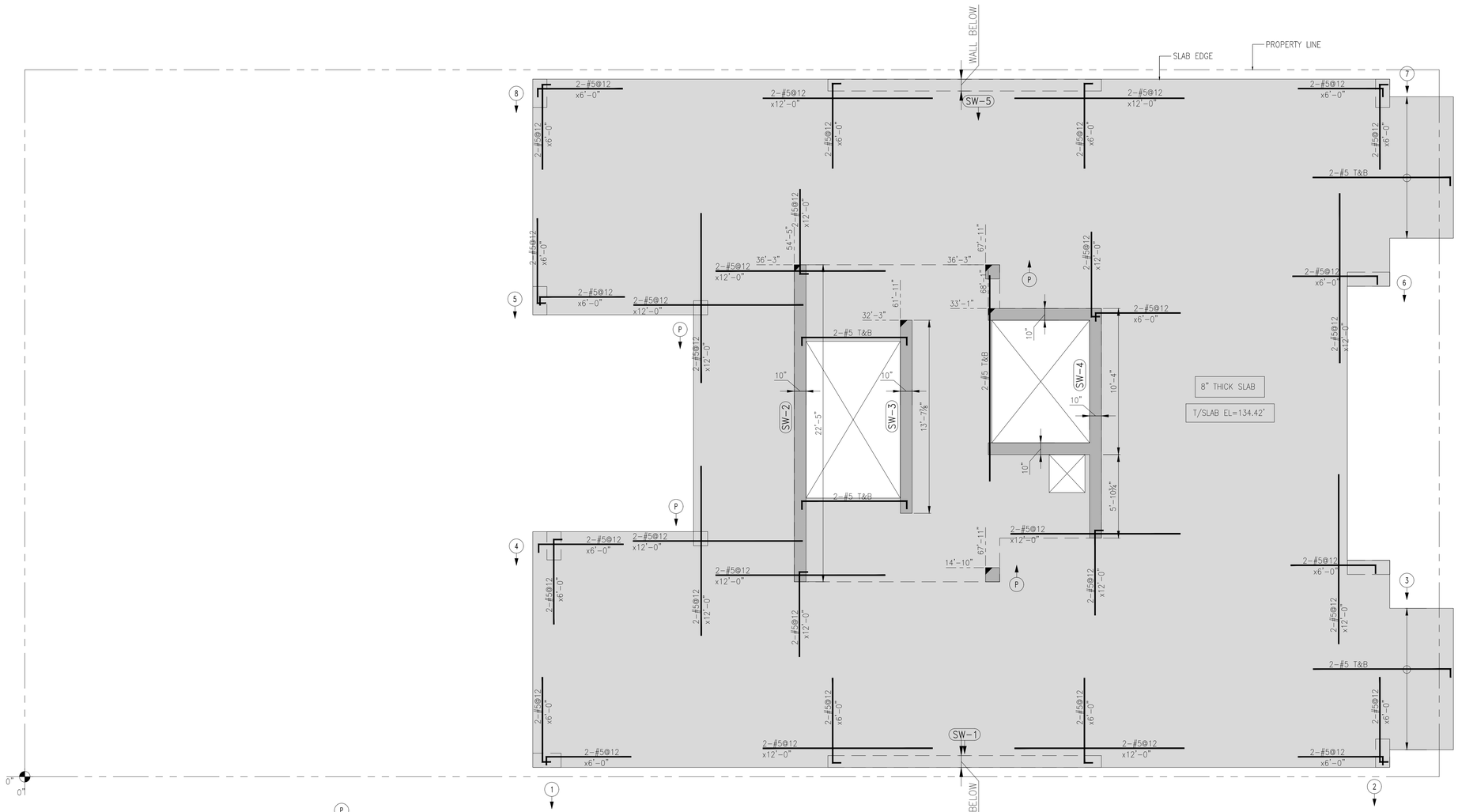
28-12 41 ST AVE, QUEENS

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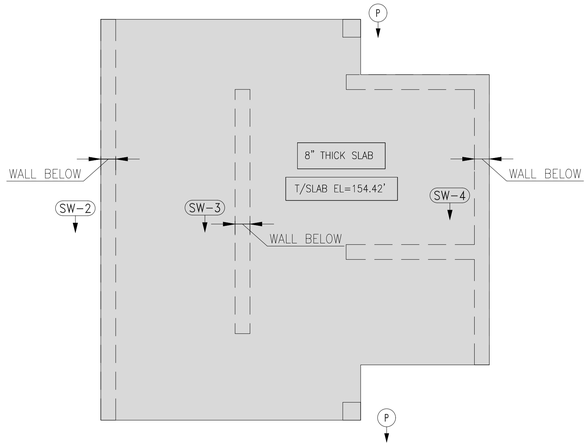
10TH FLOOR FRAMING PLAN



DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW
DRAWING NO.:	S-104.00
SHEET NO:	5 OF 16



ROOF FRAMING PLAN
SCALE: 1/4"=1'-0"



BULKHEAD ROOF FRAMING PLAN
SCALE: 1/4"=1'-0"

NOTES:

1. TOP OF SLAB ELEVATION, SEE SCHEDULE. CONTRACTOR TO CONFIRM ELEVATIONS WITH ARCH PLAN. FOR SLAB OPENINGS SIZES AND LOCATION, SEE ARCH& MECHANICAL PLAN
2. CONCRETE SLAB THICKNESS, SEE PLAN.
3. SLAB TOP AND BOTTOM MAT REINFORCEMENT SHALL BE #5@10'' EACH WAY CONTINUOUS, U.O.N. ON PLAN.
   - ——— INDICATES ADDITIONAL TOP REINFORCEMENT.
   - — — INDICATES ADDITIONAL BOTTOM REINFORCEMENT.
4. PROVIDE 3-#6 T&B CONTINUOUS AT EDGE OF SLAB. SEE TYPICAL DETAILS ON S-600 DRAWING SERIES.
5. BARS IN THE EAST-WEST DIRECTION SHALL BE PLACED IN THE LOWEST & TOP MOST LAYERS:



6. FOR COLUMN SIZE AND REINFORCEMENT, SEE COLUMN SCHEDULES ON DRAWINGS S-200 & S-201.
7. FOR SHEARWALL DETAILS & LINK BEAMS SCHEDULE, SEE S-202 DRAWING SERIES.
8. FOR TYPICAL SUPERSTRUCTURE DETAILS, SEE S-300 DRAWING SERIES.
9. (SRS) INDICATES SLAB PUNCHING SHEAR REINFORCEMENT AT THIS COLUMN, SEE S-203 FOR DETAIL.
10. (P1) INDICATED 12x12 COIUMN, W/8-#7 VERTICAL W/#3@10'' TIES

DOBNOW JOB#:
BXXXXX-SX

ENGINEER:

JUST CONSULTING ENGINEERING PLLC
217-14 NORTHERN BLVD, SUITE 207
BAYSIDE, NY 11365
TEL: 929-303-3095
WEB: WWW.JCEPLLC.COM

ARCHITECT:

# 2		
# 1		NOT FOR CONSTRUCTION
# 0	03/01/25	DOB SUBMISSION
No	Date	Description
Issued/Revised		

PROJECT:

28-12 41 ST AVE, QUEENS

DRAWING TITLE:

ROOF & BULKHEAD FRAMING PLAN

STATE OF NEW YORK
XIAOJUN WANG
LICENSED PROFESSIONAL ENGINEER
No. 090417

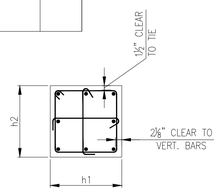
DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW
DRAWING NO.:	S-105.00
SHEET NO:	6 OF 16

COLUMN SCHEDULE

COL. NO. / FLOOR	1	2	3	4	5	6	7	8			
BULKHEAD											
ROOF											
10TH FLOOR	24x12 8-#9	12x24 8-#9	36x12 10-#9	24x12 8-#9	24x12 8-#9	36x12 10-#9	12x24 8-#9	12x24 8-#9			
9TH FLOOR	24x12 8-#9	12x24 8-#9	36x12 10-#9	24x12 8-#9	24x12 8-#9	36x12 10-#9	12x24 8-#9	12x24 8-#9			
8TH FLOOR	24x12 8-#9	12x24 8-#9	36x12 10-#9	24x12 8-#9	24x12 8-#9	36x12 10-#9	12x24 8-#9	12x24 8-#9			
7TH FLOOR	24x12 8-#9	12x24 8-#9	36x12 10-#9	24x12 8-#9	24x12 8-#9	36x12 10-#9	12x24 8-#9	68 12x24 8-#9			
6TH FLOOR	117 24x12 8-#9	65 12x24 8-#8	98 36x12 10-#9	113 24x12 8-#9	118 24x12 8-#9	103 36x12 10-#9	102 12x24 8-#8	176 12x24 8-#8			
5TH FLOOR	209 24x12 8-#9	119 12x24 8-#9	174 36x12 10-#9	203 24x12 8-#9	210 24x12 10-#9	185 36x12 10-#9	184 12x24 8-#9	261 12x24 8-#9			
4TH FLOOR	301 24x12 8-#9	174 12x24 8-#9	251 36x12 10-#9	293 24x12 8-#9	301 24x12 8-#9	266 36x12 10-#9	265 12x24 8-#9	346 12x24 8-#9			
3RD FLOOR	393 24x12 8-#9	228 12x24 8-#9	327 36x12 10-#9	382 24x12 8-#9	393 24x12 8-#9	348 36x12 10-#9	345 12x24 8-#9	430 12x24 8-#9			
2ND FLOOR	485 24x12 8-#9	282 12x24 8-#9	404 36x12 10-#9	471 24x12 8-#9	483 24x12 10-#9	428 36x12 10-#9	425 12x24 8-#9	514 12x24 8-#9			
1ST FLOOR	577 24x12 8-#9	338 12x24 8-#9	481 36x12 10-#9	561 24x12 8-#9	574 24x12 8-#9	509 36x12 10-#9	506 12x24 8-#9	599 12x24 8-#9			
CELLAR	670 24x12 8-#9	382 12x24 8-#9	559 36x12 10-#9	654 30x12 8-#9	667 24x12 8-#9	590 36x12 10-#9	587 12x24 8-#9	684 12x24 8-#9			
FOUNDATION											
(Service Load)	303	522	436	509	519	461	458	534	531	512	
FLOOR / COL. NO.	1	2	3	4	5	6	7	8			

NOTES & LEGEND:

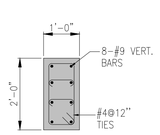
1. FIRST COLUMN DIMENSION SHOWN IS IN EAST – WEST DIRECTION.
2. COLUMN LOADS INDICATED IN SCHEDULE ARE ULTIMATE LOADS IN KIPS. EXCEPT FOUNDATION LOADS ARE GIVEN AS SERVICE LOAD IN KIPS.
3. INDICATES COLUMN BEING PICKED UP BY BEAM, SLAB, BRACKET OR SHEAR WALL..
4. " B " BEFORE COLUMN SIZE MEANS BUTTRESS.
5. " T " INDICATES TENSION SPLICE REBARS.
6. INDICATES CHANGE IN HELD POINT OF COLUMN.
7. COLUMN SIZES AND REINFORCEMENT ARE SHOWN ONLY WHERE SIZES OR REINFORCEMENT START AND STOP. BLANK SPACES IN BETWEEN INDICATES SAME SIZE OR SAME REINFORCEMENT AS INDICATED ABOVE AND BELOW.
8. HEAVY LINE AT TOP INDICATES TOP OF COLUMN.
9. FOR GENERAL NOTES, SEE DRAWING S-001.
10. FOR SHEAR WALL DETAILS, SEE DRAWING S-201.
11. HORIZONTAL TIES TO BE #4@12" O.C., U.O.N ON SCHEDULE.



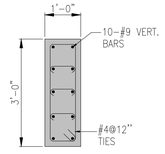
TYPICAL CONCRETE COLUMN DETAIL
SCALE: N.T.S.

TABLE 1 – COLUMN TIE SPACING		
VERTICAL BAR SIZE	TIES	REMARKS
#5	#3@10"	THE SPACING SHALL NOT EXCEED THE LEAST DIMENSION OF COLUMN.
#6, #7	#3@12"	
#8	#4@16"	
#9, #10	#4@18"	
#11	#4@18"	

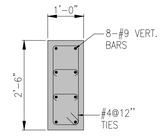
COLUMN DETAILS
SCALE:1/2"=1'-0"



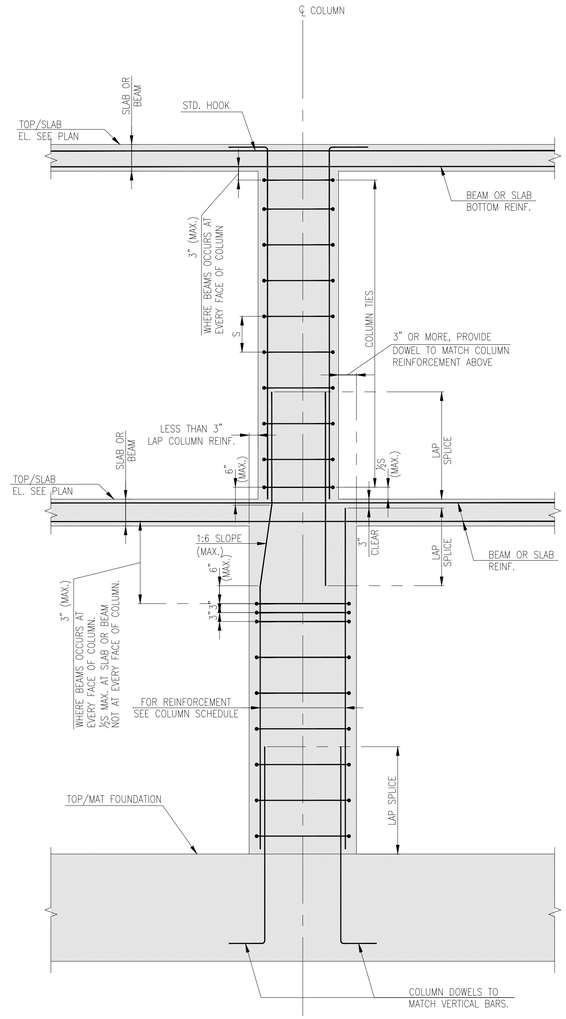
C12X24



C12X36



C12X30



ELEVATION

RECTANGULAR TIED COLUMN

NOTES:

1. EXPLANATION OF VERTICAL REINFORCING BAR ARRANGEMENT SHOWN IN COLUMN SCHEDULE:

   h1 x h2 – COLUMN SIZES (IN INCHES).
   FIRST DIMENSION IN E-W DIRECTION

   12-#11
   - SIZE OF BARS
   - TOTAL NUMBER OF BARS

2. ALL REBARS TO BE EQUALLY SPACED ALONG THE PERIMETER OF THE COLUMN.
3. REFER TO TABLE 1 FOR THE SIZE AND SPACING OF COLUMN TIES.
4. DOWELS FROM FOOTINGS (BEAM AND OTHER SUPPORTS) TO COLUMNS SHALL BE THE SAME SIZE AND NUMBER AS COLUMN VERTICALS UNLESS OTHERWISE NOTED.
5. WHERE THE NUMBER OF BARS IN A COLUMN IS GREATER THAN THE NUMBER IN THE LIFT BELOW, ADD DOWELS FOR THE DIFFERENCE. SIZE TO BE THE SAME AS THE LARGER OF THE BARS ABOVE OR BELOW.

DOBNOW JOB#:
BXXXXX-SX

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ARCHITECT:

# 2	
# 1	NOT FOR CONSTRUCTION
# 0 03/01/25	DOB SUBMISSION
No Date	Description
Issued/Revised	

PROJECT:

28-12 41 ST AVE, QUEENS

DRAWING TITLE:

COLUMN SCHEDULE

STATE OF NEW YORK
XIAOJUN WANG
LICENSED PROFESSIONAL ENGINEER
No. 104017

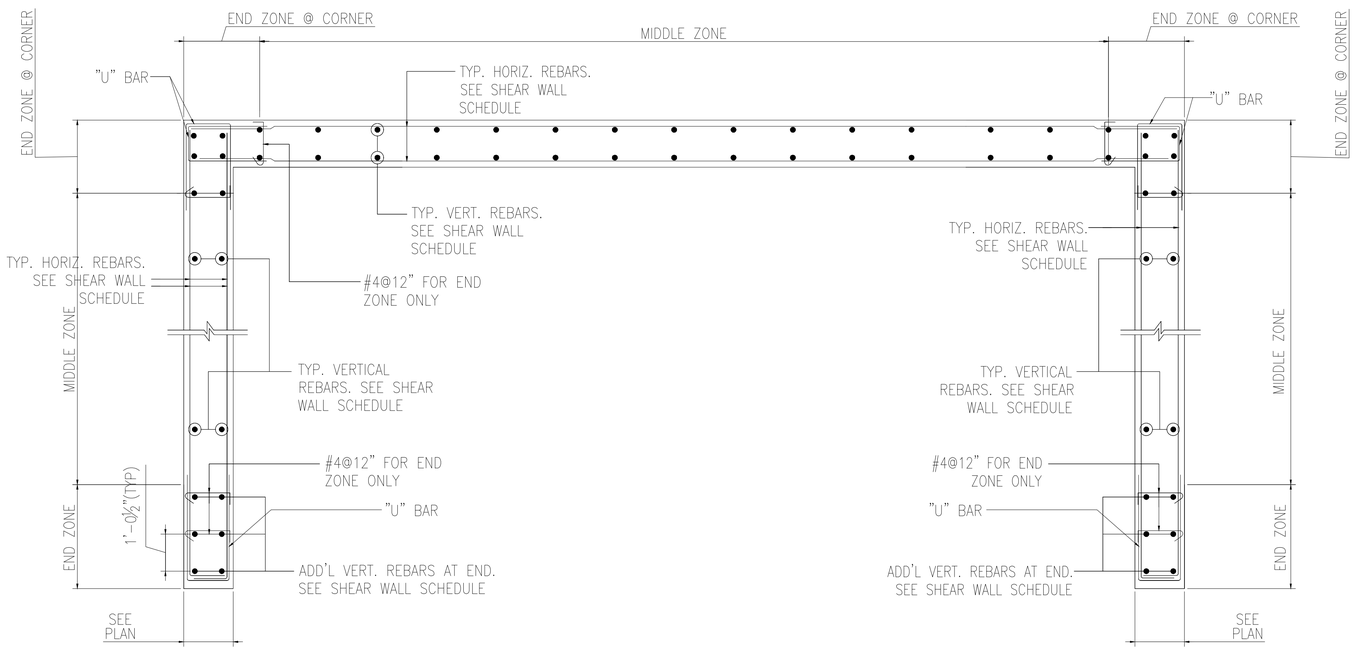
DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW
DRAWING NO.:	S-200.00
SHEET NO:	7 OF 16

SHEAR WALL SCHEDULE

SHEAR WALL DESIGNATION	FLOOR LEVEL	THICKNESS (IN)	VERT. REINF. @ EA. END	VERT. REINF TYPICAL	HORIZ. REINF TYPICAL	REMARKS
SW1	BASE TO ROOF	SEE PLAN	6-#7	#5@12 EA. FACE	#5@12 EA. FACE	
SW2	BASE TO BULKHEAD ROOF	SEE PLAN	6-#7	#5@12 EA. FACE	#5@12 EA. FACE	
SW3	BASE TO BULKHEAD ROOF	SEE PLAN	6-#7	#5@12 EA. FACE	#5@12 EA. FACE	
SW4	BASE TO BULKHEAD ROOF	SEE PLAN	6-#7	#5@12 EA. FACE	#5@12 EA. FACE	
SW5	BASE TO ROOF	SEE PLAN	6-#7	#5@12 EA. FACE	#5@12 EA. FACE	

NOTES:

1. SEE TYPICAL DETAIL ON THIS DWG. FOR SHEAR WALL TYPICAL REINFORCEMENT LAYOUT.
2. SEE PLAN FOR SHEAR WALL DESIGNATION.
3. SEE FOUNDATION DRAWINGS FOR FOUNDATION WALL REINFORCEMENT.
4 HORIZONTAL AND VERTICAL REINFORCEMENTS ARE FOR EACH FACE



TYPICAL SHEAR WALL REINFORCEMENT DETAIL

DOBNOW JOB#:
BXXXXX-SX

ENGINEER:

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ARCHITECT:

No	Date	Description
# 2		
# 1		NOT FOR CONSTRUCTION
# 0	03/01/25	DOB SUBMISSION

Issued/Revised

PROJECT:

28-12 41 ST AVE, QUEENS

DRAWING TITLE:

SHEAR WALL SCHEDULE



DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW

DRAWING NO.:

S-201.00

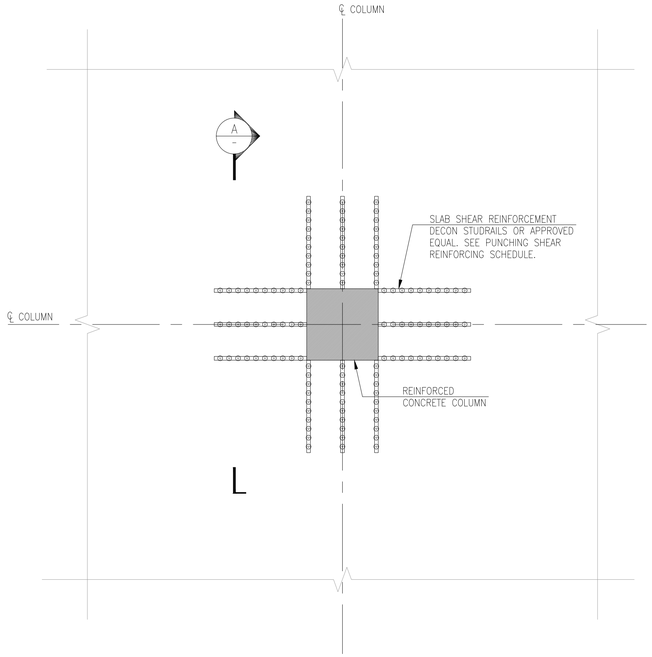
SHEET NO:

8 OF 16

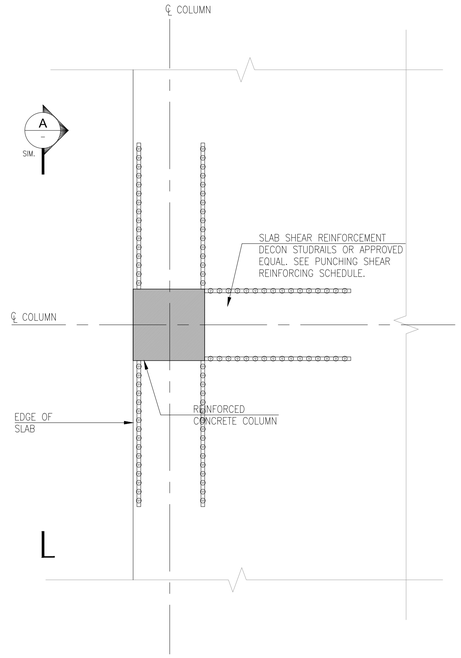
PUNCHING SHEAR – REINFORCING SCHEDULE										
FLOOR LEVEL	COLUMN LABEL	TYPE	# OF RAILS TOTAL PER COLUMN	# OF RAILS PER LONG FACE	# OF RAILS PER SHORT FACE	# OF STUDS PER RAIL	STUD SPACING	DISTANCE TO FIRST STUD FROM COLUMN FACE	STUD DIAMETER	REMARKS
1ST	3, 4	A	14	4	3	8	6"	4"	½"	8"SLAB
	5, 6	A	18	5	4	8	6"	4"	½"	8"SLAB
	1, 8	A	10	3	2	8	6"	4"	½"	8"SLAB
2ND TO 6TH	6, 8	A	12	4	3	8	6"	4"	½"	8"SLAB
7TH TO 9TH	4	A	10	3	2	6	6"	4"	½"	8"SLAB
	1, 6	C	7	4	3	8	4"	4"	½"	8"SLAB
	5	B	8	3	2	6	6"	4"	½"	8"SLAB
10TH	4, 5	A	14	4	3	8	6"	4"	½"	8"SLAB

NOTES:

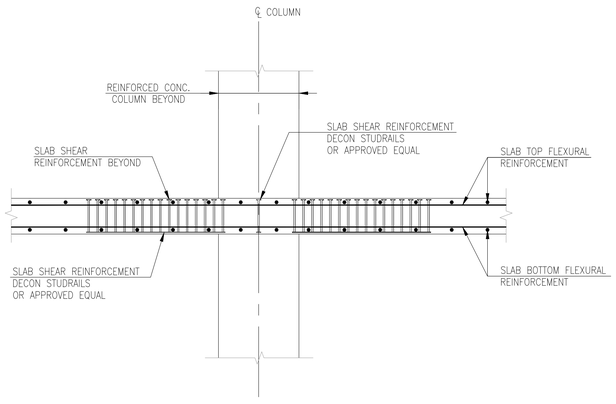
1. SHEAR REINFORCEMENT AT THE SLAB TO COLUMN CONNECTION AS SHOWN ON THE DRAWINGS AND DETAILS, SHALL BE STUDRAILS AS MANUFACTURED BY DECON AND DETAILED IN ICC ESR-2494. THE COMPLETE AND FINISHED STUDRAIL SHALL BE ICC ES EVALUATED AND WELDING HAS TO TAKE PLACE IN AN ICC ES AUDITED FACILITY. STUDRAILS SHALL CONFORM TO THE LATEST UPDATE OF ASTM A1044.
2. STUDRAIL TOP & BOTTOM CONCRETE COVER SHALL BE ¾".
3. STUDS TO BE PLACED A MINIMUM OF 2" FROM ALL SLAB EDGES.
4. FOR STUDRAIL LAYOUT, SEE STUDRAIL CONFIGURATION DETAILS ON THIS DRAWING.
5. THE SHEAR STUDS SHALL HAVE A MINIMUM YIELD STRENGTH OF 51 ksi AND TENSILE STRENGTH OF 65 ksi. THE AREA OF STUD HEAD SHALL BE 10 TIMES THE STEM AREA.
6. THE OVERALL HEIGHT OF STUDRAIL IS DEPENDENT ON THE SLAB THICKNESS AND THE REQUIRED CONCRETE COVER. THE BASE RAIL PROFILE SHALL BE AS SHOWN IN ASTM A1044.



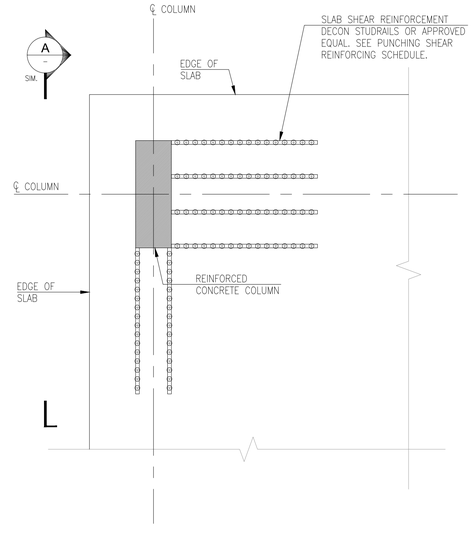
1 TYPE A – INTERIOR COLUMNS
FLAT PLATE & FLAT SLAB
"PUNCHING" SHEAR REINFORCEMENT
SCALE: N.T.S.



2 TYPE B – EDGE COLUMNS
FLAT PLATE & FLAT SLAB
"PUNCHING" SHEAR REINFORCEMENT
SCALE: N.T.S.



A SECTION
SCALE: N.T.S.



3 TYPE C – CORNER COLUMNS
FLAT PLATE & FLAT SLAB
"PUNCHING" SHEAR REINFORCEMENT
SCALE: N.T.S.

DOBNOW JOB#:
BXXXXX-SX

ENGINEER:

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ARCHITECT:

# 2		
# 1	NOT FOR CONSTRUCTION	
# 0	03/01/25	DOB SUBMISSION
No	Date	Description
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PROJECT:

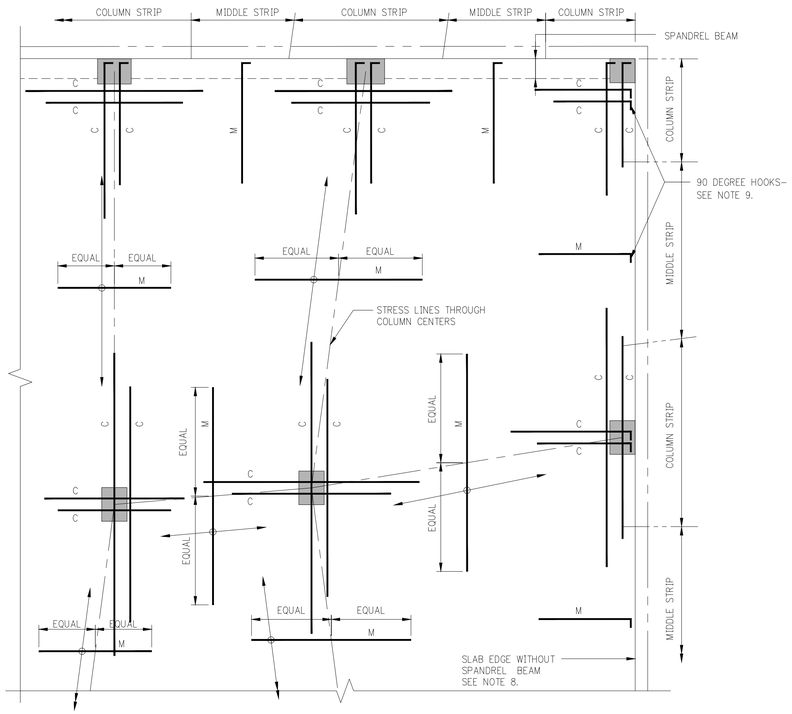
28-12 41 ST AVE, QUEENS

DRAWING TITLE:

SLAB PUNCHING SHEAR SCHEDULE

STATE OF NEW YORK
XIAOJUN WANG
LICENSED PROFESSIONAL ENGINEER
NO. 104178

DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW
DRAWING NO.:	S-202.00
SHEET NO:	9 OF 16

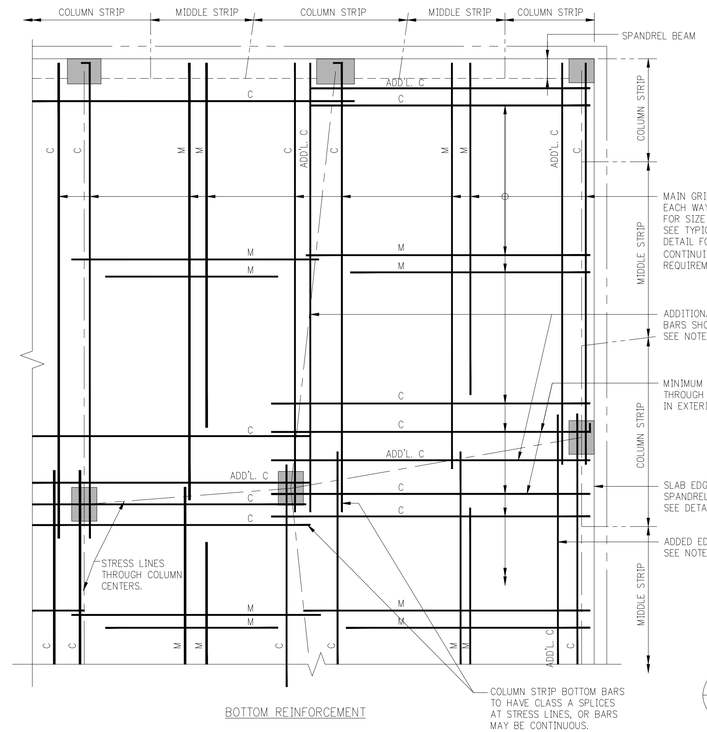


TOP REINFORCEMENT

NOTES FOR TOP REINFORCEMENT:

1. 'C' DENOTES COLUMN STRIP BARS (LONG AND SHORT BARS ARE ALTERNATED).

   'M' DENOTES MIDDLE STRIP BARS.
2. FOR SIZE, SPACING, NUMBER, ETC. OF REINFORCING BARS, SEE FRAMING PLANS.
3. WHERE COLUMN STRIP BAR LENGTHS ARE SHOWN ON FRAMING PLANS THEY ARE FOR LONGER BARS, WHICH ARE TO BE ALTERNATED WITH SHORTER BARS. SEE TYPICAL FLAT PLATE DETAIL.
4. COLUMN STRIP BARS ARE TO BE CENTERED OVER COLUMNS UNLESS OTHERWISE INDICATED ON PLANS.
5. MIDDLE STRIP BARS ARE TO BE CENTERED OVER STRESS LINES UNLESS OTHERWISE INDICATED ON PLANS.
6. MIDDLE STRIP BARS ARE TO BE SPACED AS SHOWN ON PLANS. FIRST BAR IS TO BE LOCATED A DISTANCE FROM LAST COLUMN STRIP BAR NOT TO EXCEED MIDDLE STRIP BAR SPACING.
7. COLUMN STRIP BARS PARALLEL TO SPANDREL BEAMS ARE TO HAVE FIRST BAR LOCATED AT ONE–HALF SCHEDULED SPACING FROM INSIDE FACE OF BEAM, SIX INCHES MAXIMUM.
8. AT SLAB EDGES WITHOUT SPANDREL BEAMS, SEE TYPICAL DETAIL FOR ADDITIONAL CONTINUOUS EDGE BARS AND FOR COLUMN STRIP BAR PLACEMENT PARALLEL TO SLAB EDGE.
9. PROVIDE 90 DEGREE HOOK AT EVERY DISCONTINUOUS TOP BAR, COLUMN AND MIDDLE STRIPS, AT EDGE OF SLAB, WITH OR WITHOUT SPANDREL BEAMS (2" CLEAR COVER TO HOOK).



BOTTOM REINFORCEMENT

NOTES FOR BOTTOM REINFORCEMENT:

1. 'C' DENOTES A COLUMN STRIP BAR, PART OF MAIN GRID. 'ADD'L. C' DENOTES COLUMN STRIP BARS ADDITIONAL TO MAIN GRID BARS.

   'M' DENOTES A MIDDLE STRIP BAR, PART OF MAIN GRID.
2. PLACE ADDITIONAL BARS BETWEEN MAIN GRID BARS. IN COLUMN STRIPS GROUP ABOUT STRESS LINE. IN MIDDLE STRIPS DISTRIBUTE THROUGHOUT STRIP.
3. IN EDGE STRIP WITHOUT SPANDREL BEAMS START ADDITIONAL BARS FOUR INCHES FROM CONTINUOUS EDGE BARS – SEE TYPICAL DETAIL AT EDGE OF SLAB.

A FLAT SLAB REINFORCEMENT DETAILS
SCALE: N.T.S.

REBAR EMBEDMENT AND SPLICE LENGTH
(BASED ON ACI318–11, SECTION 12.2.2)

PROPERTIES: f'c = 5000 psi; fy = 60000 psi; AGGREGATE: NORMAL; COATING: UNCOATED; WEIGHT; λ = 1; β = 1

BAR SIZE	BAR DIA. (INCHES)	COMPRESSION		TENSION							
		EMBEDMENT LENGTH	LAP SPLICE LENGTH	EMBEDMENT LENGTH				LAP SPLICE LENGTH (CLASS B)			
				CASE I		CASE II		CASE I		CASE II	
				TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS
#3	0.375	8	12	17	13	25	19	22	17	32	25
#4	0.500	9	15	22	17	33	25	29	22	43	33
#5	0.625	12	19	28	21	41	32	36	28	54	41
#6	0.750	14	23	33	25	50	38	43	33	65	50
#7	0.875	16	27	48	37	72	56	63	48	94	72
#8	1.000	18	30	55	42	83	64	72	55	108	83
#9	1.128	21	34	62	48	93	72	81	62	121	93
#10	1.270	23	39	70	54	105	81	91	70	137	105
#11	1.410	26	43	78	60	117	90	101	78	152	117

REBAR EMBEDMENT AND SPLICE LENGTH
(BASED ON ACI318–11, SECTION 12.2.2)

PROPERTIES: f'c = 6000 psi; fy = 60000 psi; AGGREGATE: NORMAL; COATING: UNCOATED; WEIGHT; λ = 1; β = 1

BAR SIZE	BAR DIA. (INCHES)	COMPRESSION		TENSION							
		EMBEDMENT LENGTH	LAP SPLICE LENGTH	EMBEDMENT LENGTH				LAP SPLICE LENGTH (CLASS B)			
				CASE I		CASE II		CASE I		CASE II	
				TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS
#3	0.375	8	12	15	12	23	17	20	15	29	23
#4	0.500	9	15	20	15	30	23	26	20	39	30
#5	0.625	12	19	25	19	38	29	33	25	49	38
#6	0.750	14	23	30	23	45	35	39	30	59	45
#7	0.875	16	27	44	34	66	51	57	44	86	66
#8	1.000	18	30	50	39	76	58	65	50	98	76
#9	1.128	21	34	57	44	85	66	74	57	111	85
#10	1.270	23	39	64	49	96	74	83	64	125	96
#11	1.410	26	43	71	55	106	82	92	71	138	106

REBAR EMBEDMENT AND SPLICE LENGTH
(BASED ON ACI318–11, SECTION 12.2.2)

PROPERTIES: f'c = 7000 psi; fy = 60000 psi; AGGREGATE: NORMAL; COATING: UNCOATED; WEIGHT; λ = 1; β = 1

BAR SIZE	BAR DIA. (INCHES)	COMPRESSION		TENSION							
		EMBEDMENT LENGTH	LAP SPLICE LENGTH	EMBEDMENT LENGTH				LAP SPLICE LENGTH (CLASS B)			
				CASE I		CASE II		CASE I		CASE II	
				TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS
#3	0.375	8	12	14	12	21	16	18	16	27	21
#4	0.500	9	15	19	14	28	22	24	19	36	28
#5	0.625	11	19	23	18	35	27	30	23	45	35
#6	0.750	14	23	28	22	42	32	36	28	55	42
#7	0.875	16	26	41	31	61	47	53	41	80	61
#8	1.000	18	30	47	36	70	54	61	47	91	70
#9	1.128	20	34	53	40	79	61	68	53	103	79
#10	1.270	23	38	59	46	89	68	77	59	115	89
#11	1.410	25	42	66	51	99	76	85	66	128	99

REBAR EMBEDMENT AND SPLICE LENGTH
(BASED ON ACI318–11, SECTION 12.2.2)

PROPERTIES: f'c = 8000 psi; fy = 60000 psi; AGGREGATE: NORMAL; COATING: UNCOATED; WEIGHT; λ = 1; β = 1

BAR SIZE	BAR DIA. (INCHES)	COMPRESSION		TENSION							
		EMBEDMENT LENGTH	LAP SPLICE LENGTH	EMBEDMENT LENGTH				LAP SPLICE LENGTH (CLASS B)			
				CASE I		CASE II		CASE I		CASE II	
				TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS
#3	0.375	8	12	13	10	20	15	17	13	26	20
#4	0.500	9	15	17	13	26	20	23	17	34	26
#5	0.625	12	19	22	17	33	25	28	22	43	33
#6	0.750	14	23	26	20	39	30	34	26	51	39
#7	0.875	16	27	38	29	57	44	50	38	74	57
#8	1.000	18	30	44	34	65	50	57	44	85	65
#9	1.128	21	34	49	38	74	57	64	49	96	74
#10	1.270	23	39	55	43	83	64	72	55	108	83
#11	1.410	26	43	61	47	92	71	80	61	120	92

NOTES:

CASE I FOR BEAMS AND COLUMNS, CONCRETE COVER >= db, C TO C BAR SPACING >=2db AND WITH STIRRUPS OR TIES THROUGHOUT L(D) NOT LESS THAN THE CODE MINIMUM. FOR OTHER ELEMENTS, CONCRETE COVER >= db AND C TO C BAR SPACING >= 3db.

CASE II FOR BEAMS AND COLUMNS, CONCRETE COVER < db AND C TO C BAR SPACING < 2db. FOR OTHER ELEMENTS, CONCRETE COVER < db OR C TO C BAR SPACING < 3db.

1 USE COMPRESSION SPLICE LENGTH AT ALL COLUMN SPLICE LOCATIONS NOT SPECIFICALLY DETAILED AND UNLESS INDICATED OTHERWISE ON THE PLANS OR DETAILS. USE TENSION SPLICE FOR ALL OTHER CASES.

2 THE STANDARD SPLICE (0.0005 x fy x D) IS USED FOR COMPRESSION ON SPLICES AND THE CLASS B SPLICE IS USED FOR TENSION SPLICES.

3 TOP BARS ARE HORIZONTAL BARS PLACED SO THAT MORE THAN 12 INCHES OF CONCRETE IS CASTED IN THE MEMBER BELOW THE REBAR. α IS THE REINFORCEMENT LOCATION FACTOR.

α = 1.3 FOR TOP BARS.
α = 1.0 FOR OTHER BARS.

4 TABULATED VALUES ABOVE MUST BE MULTIPLIED WITH THE FOLLOWING FACTORS:

β = 1.5 FOR EPOXY COATED BARS WITH COVER < 3db, OR CLEAR SPACING < 6db.
β = 1.2 FOR OTHER COVER AND CLEAR SPACING CONDITIONS OF EPOXY COATED BARS.
λ = 1.3 FOR LIGHT WEIGHT CONCRETE.
αβ = 1.7 MAXIMUM.

DOBNOW JOB#:
BXXXXX-SX

ENGINEER:

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ARCHITECT:

# 2		
# 1	NOT FOR CONSTRUCTION	
# 0	03/01/25	DOB SUBMISSION
No	Date	Description
Issued/Revised		

PROJECT:

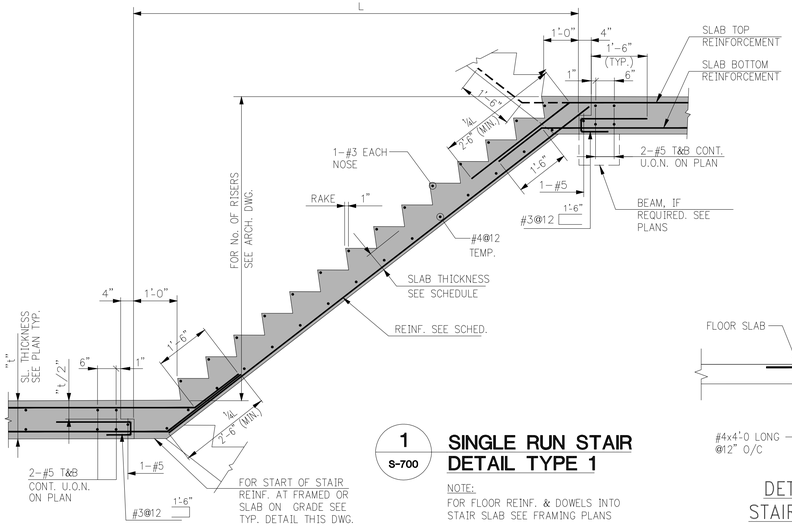
28-12 41 ST AVE, QUEENS

DRAWING TITLE:

TYPICAL DETAILS-1

STATE OF NEW YORK ★ XIAOJUN WANG ★ LICENSED PROFESSIONAL ENGINEER No. 090417

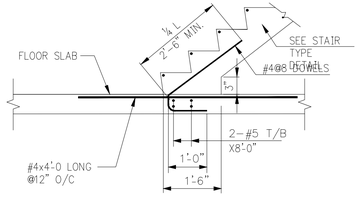
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PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW
DRAWING NO.:	S-301.00
SHEET NO:	10 OF 16



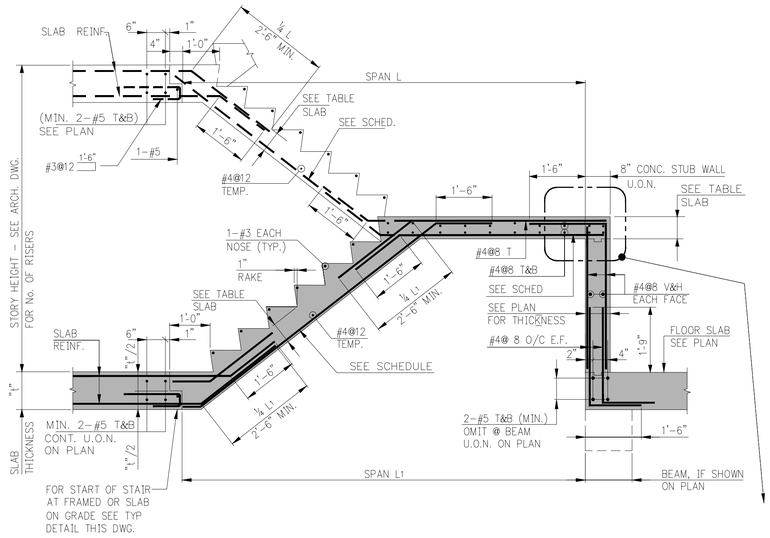
1 S-700 **SINGLE RUN STAIR DETAIL TYPE 1**

NOTE:
FOR FLOOR REINF. & DOWELS INTO STAIR SLAB SEE FRAMING PLANS

SINGLE RUN STAIR SCHEDULE DESIGN LL=100 psf			
MAX. SPAN L	SLAB THICKNESS	REINFORCING	
		ø	SPACING
10'-0"	7"	#4	10"
12'-0"	7"	#4	8"
14'-0"	7"	#4	6"
16'-0"	7"	#5	8"
18'-0"	8"	#5	6"
20'-0"	9"	#6	6"

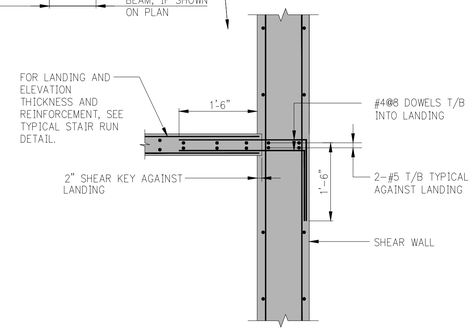


DETAIL AT START OF STAIR ON FRAMED SLAB

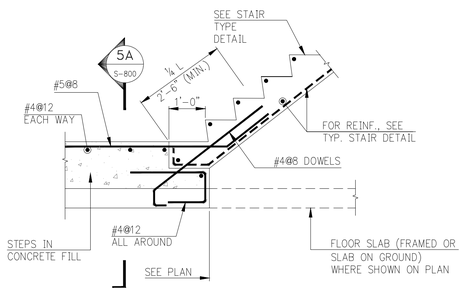


TWO RUN STAIR SCHEDULE DESIGN LL=100 psf			
MAX. SPAN L OR L1	SLAB THICKNESS	REINFORCING	
		ø	SPACING
10'-0"	7"	#4	10"
12'-0"	7"	#4	8"
14'-0"	7"	#4	6"
16'-0"	7"	#5	8"
18'-0"	8"	#5	6"
20'-0"	9"	#6	6"

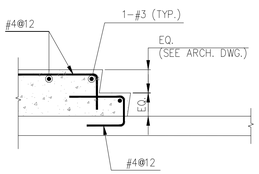
2 S-700 **TWO RUN STAIR DETAIL (PARALLEL RUNS) TYPE 2**



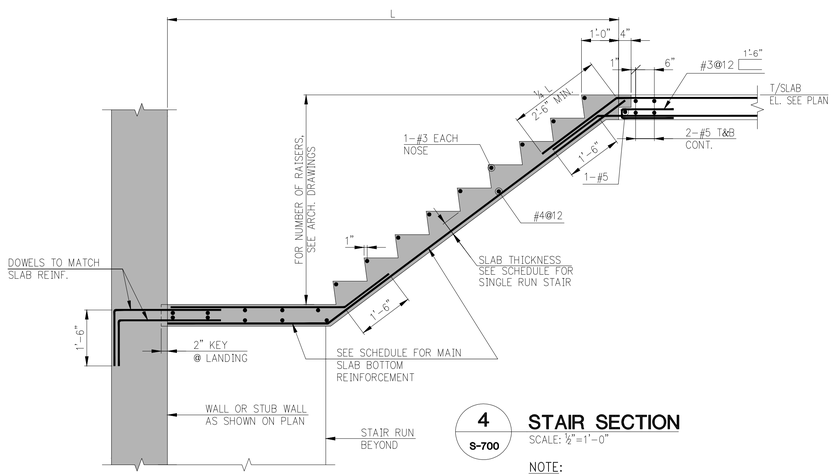
ALTERNATE DETAIL AT TWO RUN STAIR



5 S-700 **DETAIL AT START OF STAIR ON FILL**



5A S-700 **SECTION**



4 S-700 **STAIR SECTION**
SCALE: ½"=1'-0"

NOTE:
1. FOR BALANCE OF REINFORCEMENT, SEE TWO RUN AND SINGLE RUN STAIR DETAILS.

DOBNOW JOB#: BXXXXX-SX

ENGINEER:

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ARCHITECT:

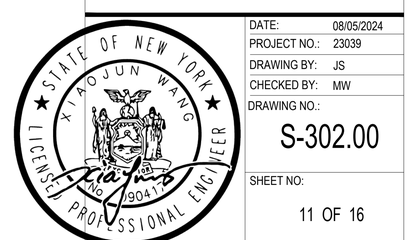
# 2		
# 1	NOT FOR CONSTRUCTION	
# 0	03/01/25	DOB SUBMISSION
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PROJECT:

28-12 41 ST AVE, QUEENS

DRAWING TITLE:

TYPICAL DETAILS-2



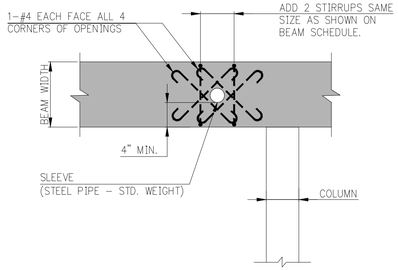
DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW

DRAWING NO.:

S-302.00

SHEET NO:

11 OF 16

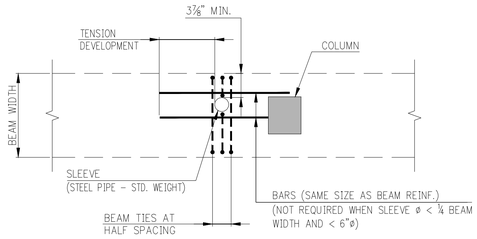


M S-603 ELEVATION HORIZ. HOLES IN BEAMS

SCALE: N.T.S.

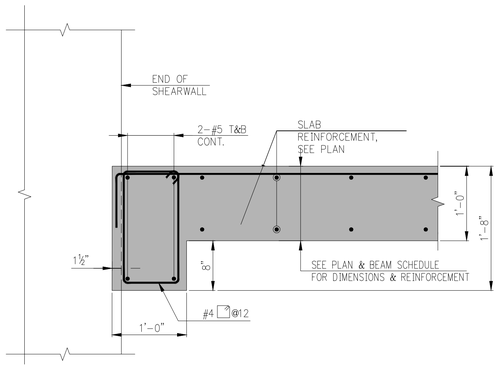
NOTE:

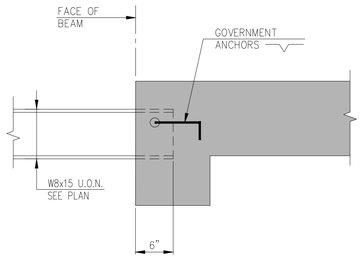
1. NO OPENINGS LARGER THAN 4"ø SHALL BE PERMITTED IN CONCRETE BEAMS UNLESS SPECIFICALLY INDICATED ON STRUCTURAL PLANS. ALL BEAM REINF. TO RUN THROUGH.



N S-603 PLAN – VERTICAL HOLES IN BEAMS

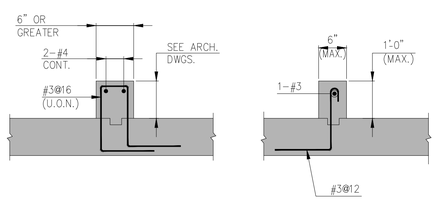
SCALE: N.T.S.





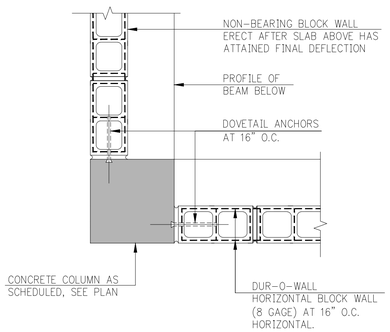
P S-603 TYPICAL ELEVATOR LEDGE

SCALE: N.T.S.



Q S-603 DETAIL OF ELEVATOR DIVIDER BEAM CONNECTION

SCALE: N.T.S.

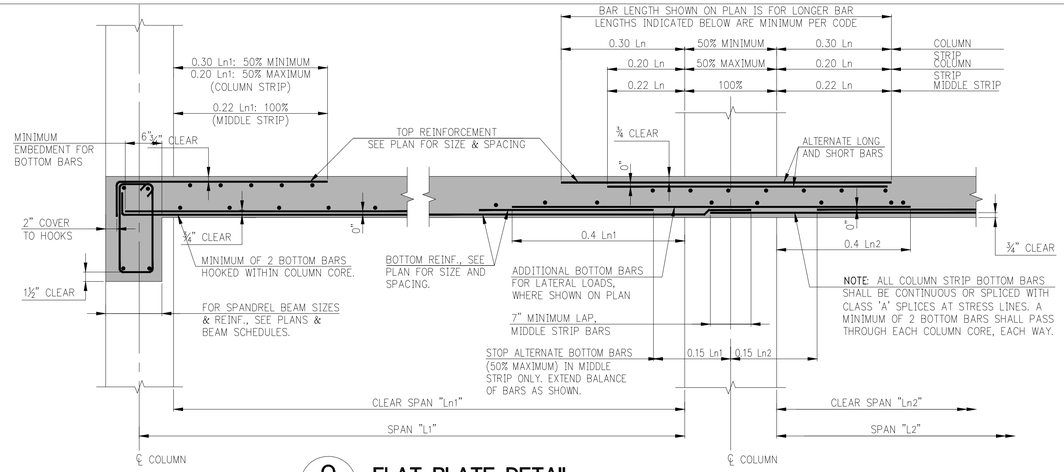


T S-603 TYPICAL CONCRETE CURB DETAILS

SCALE: N.T.S.

U S-603 TYPICAL NON BEARING BLOCK WALL CONNECTION DETAIL

SCALE: ¾"=1'–0"



EXTERIOR SUPPORT

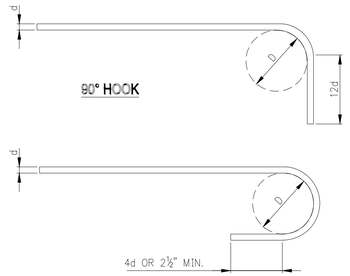
INTERIOR SUPPORT

O S-603 FLAT PLATE DETAIL

SCALE: N.T.S.

FOR DROP PANEL, SEE DETAIL AT INTERIOR SUPPORTS, USE LARGER OF Ln1 OR Ln2 FOR Ln.

BAR SIZE	D
#2	1½"
#3	2¼"
#4	3"
#5	3¾"
#6	4½"
#7	5¼"
#8	6"
#9	9"
#10	10¼"
#11	11¼"
#14	17"
#18	22½"



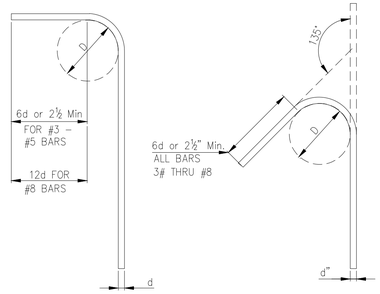
R S-603 TYPICAL STANDARD HOOK

SCALE: Y

NOTES:

1. IF LENGTH OF 90° HOOK IS LARGER THAN SLAB DEPTH MUST USE 180° HOOK.
2. "D" IS DIAMETER OF BEND, "d" IS DIAMETER OF BAR.

BAR SIZE	D
#2	1½"
#3	1½"
#4	2"
#5	2½"
#6	4½"
#7	5¼"
#8	6"

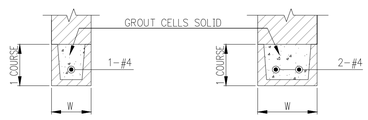


S S-603 TYPICAL STIRRUPS AND TIES

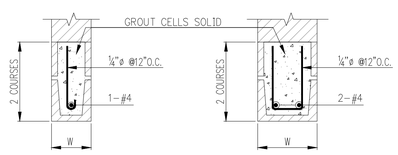
SCALE: N.T.S.

NOTES:

1. "D" INDICATES DIAMETER OF BEND.
2. "d" INDICATES DIAMETER OF BAR.



FOR CLEAR OPENINGS LESS THAN 5'-0" WIDE



FOR CLEAR OPENINGS 5'-0" WIDE TO 8'-0" MAX.

V S-603 TYPICAL REINFORCED BLOCK LINTEL DETAILS

SCALE: N.T.S.

NOTES:

1. PROVIDE BLOCK LINTELS FOR ALL OPENINGS IN INTERIOR BLOCK PARTITIONS, AND EXTERIOR WALLS FOR WHICH STEEL LINTELS ARE NOT SHOWN. REFER TO ARCH. DRAWINGS FOR SIZE AND LOCATION OF OPENINGS. PROVIDE 8" MIN. BEARING AT EACH END.
2. W AS PER TABLE (FIRST DIMENSION).

TYPE OF LOADING *	LINTEL SECTION NOMINAL SIZE (INCHES)	REQUIRED REINFORCING CLEAR SPAN							
		3'-4"	4'-0"	4'-8"	5'-4"	6'-0"	6'-8"	7'-4"	8'-0"
WALL LOADS	6x8	1–#3	1–#4	1–#4	2–#4	2–#5			
	6x16					1–#4	1–#4	1–#4	1–#4
FLOOR & ROOF LOADS	6x16	1–#4	1–#4	2–#3	1–#5	2–#4	2–#4	2–#5	2–#5
WALL LOADS	8x8	1–#3	2–#3	2–#3	2–#4	2–#4	2–#5	2–#6	
	8x16							2–#5	2–#5
FLOOR & ROOF LOADS	8x8	2–#4							
	8x16	2–#3	2–#3	2–#3	2–#4	2–#4	2–#4	2–#5	2–#5

(*) INCLUDES WEIGHT OF LINTEL

NOTES:

1. WALL LOADS ASSUMED 300 lbs. PER LINEAR FOOT.
2. FLOOR & ROOF LOADS INCLUDING WALL LOADS ASSUMED 1000lbs. PER LINEAR FOOT.
3. 8" LINTELS ASSUMED TO WEIGHT 50 lb/ft.
4. 16" LINTELS ASSUMED TO WEIGHT 100 lb/ft.

DOBNOW JOB#: BXXXXX-SX

ENGINEER:

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No	Date	Description
# 2		
# 1		NOT FOR CONSTRUCTION
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PROJECT:

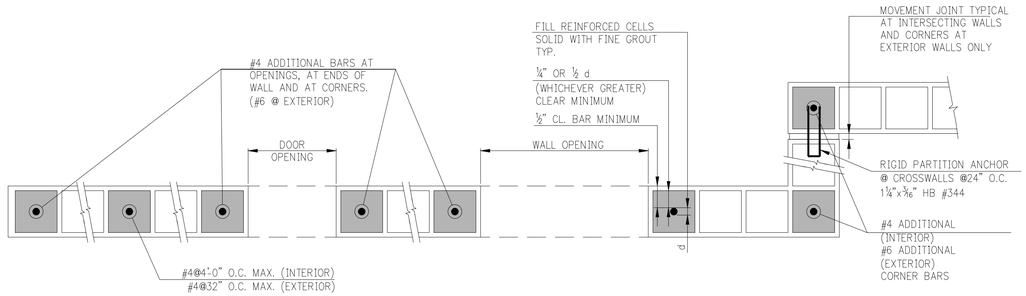
28-12 41 ST AVE, QUEENS

DRAWING TITLE:

TYPICAL DETAILS-3

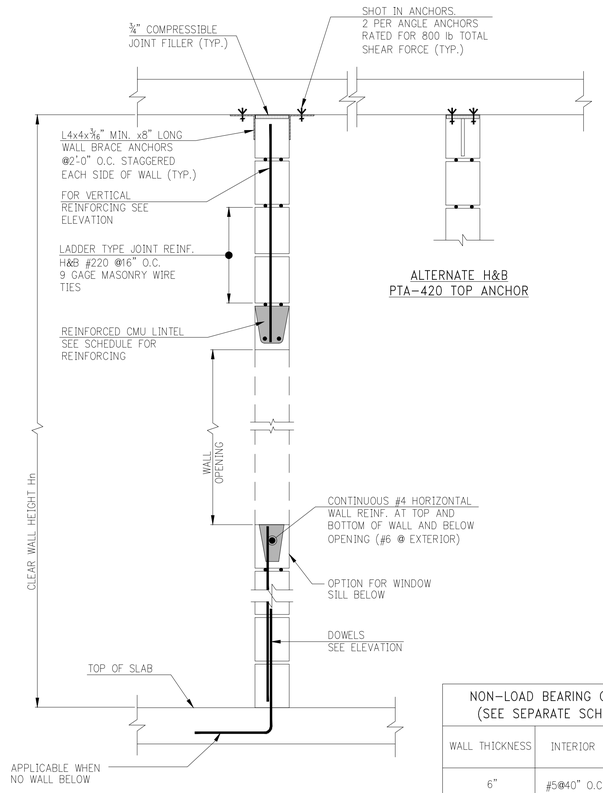


DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW
DRAWING NO.:	S-303.00
SHEET NO:	12 OF 16



W2 / S-604 — PLAN INTERIOR/ EXTERIOR SECTION TYPICAL CMU MASONRY WALL

SCALE: N.T.S.



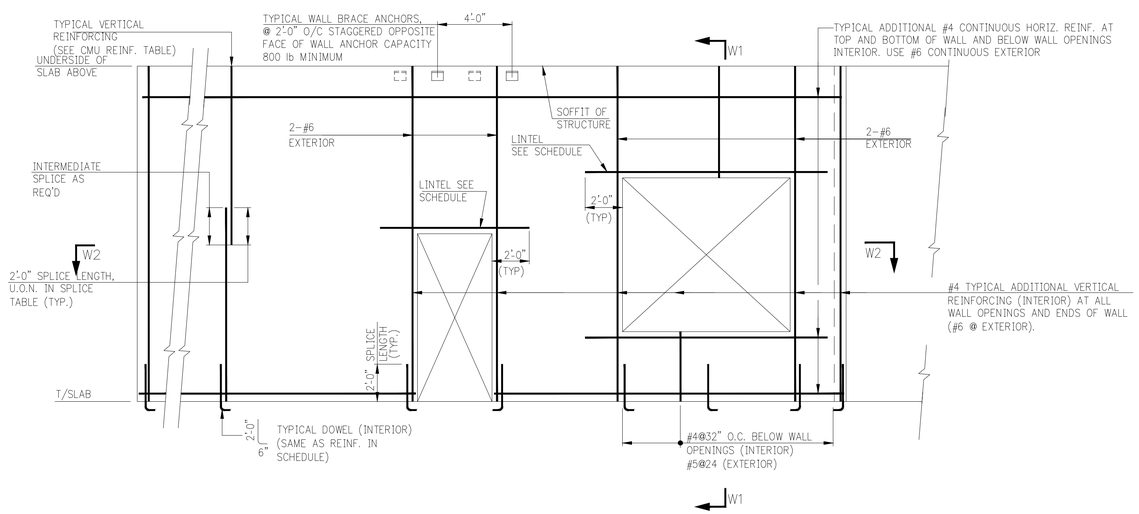
W1 / S-604 — SECTION

SCALE: N.T.S.

MASONRY REINFORCEMENT BAR SPLICE TABLE	
BAR DIAMETER	SPLICE LENGTH (IN)
#3	16
#4	24
#5	40
#6	56
#7	76

NOTE: SPLICE LENGTH SHOWN DEVELOPED PER ACI 530-2005.

NON-LOAD BEARING CMU WALL MINIMUM REINFORCING SCHEDULE (SEE SEPARATE SCHEDULE FOR BEARING WALL REINFORCMENT)				
WALL THICKNESS	INTERIOR	EXTERIOR	FIREWALL	MAX. UNBRACED LENGTH
6"	#5@40" O.C.	#5@16	N/A	14'-0"
8"	#5@48" O.C.	#5@24	#6@32" O.C.	15'-0"
10"	#5@48" O.C.	#5@24	#7@24	20'-0"
12"	#5@24/27	#5@8	#7@16	25'-0"



W / S-604 — TYPICAL INTERIOR/ EXTERIOR CMU WALL REINFORCEMENT ELEVATION - U.O.N.

SCALE: N.T.S.

NOTES:

1. ABOVE DETAIL APPLIES TO ALL MASONRY WALLS.
2. FOR MULTIWYTHE EXTERIOR WALLS ABOVE DETAIL APPLIES TO C.M.U. BACKUP WALL ONLY. SEE SECTION FOR ADDITIONAL INFORMATION.

ALTERNATE LINTEL SCHEDULE (CAST-IN-PLACE)					
WIDTH	HEIGHT	CLEAR SPAN IN FEET	REINFORCING		REMARKS
			TOP	BOTTOM	
8"	8"	UP TO 5'-11"	2-#4	2-#4	
8"	12"	6'-0" TO 8'-11"	2-#5	2-#5	#3 TIES @ 12" C/C
8"	16"	9'-0" TO 12'-0"	2-#6	2-#6	#3 TIES @ 6" C/C

NOTE:

1. PROVIDE 8" MIN. BEARING @ EA. END.

LOOSE LINTEL SCHEDULE	
MASONRY OPENING	L SIZE FOR EACH 4" THICKNESS OF MASONRY
3'-7" TO 6'-0"	L 4"X4"X5/16"
6'-1" TO 10'-0"	L 6"X4"X5/16"
10'-1" TO 12'-0"	L 7"X4"X5/16"

NOTES:

1. L.L. LENGTH = M.O. + 1'-4" (8" EACH END).
2. PROVIDE FIREPROOFING ON L.L. WHEN M.O. IS GREATER THAN 4'-0".
3. NO JOINTS ARE TO OCCUR OVER M.O.

DOBNOW JOB#: BXXXXX-SX

ENGINEER:

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# 1		NOT FOR CONSTRUCTION
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PROJECT:

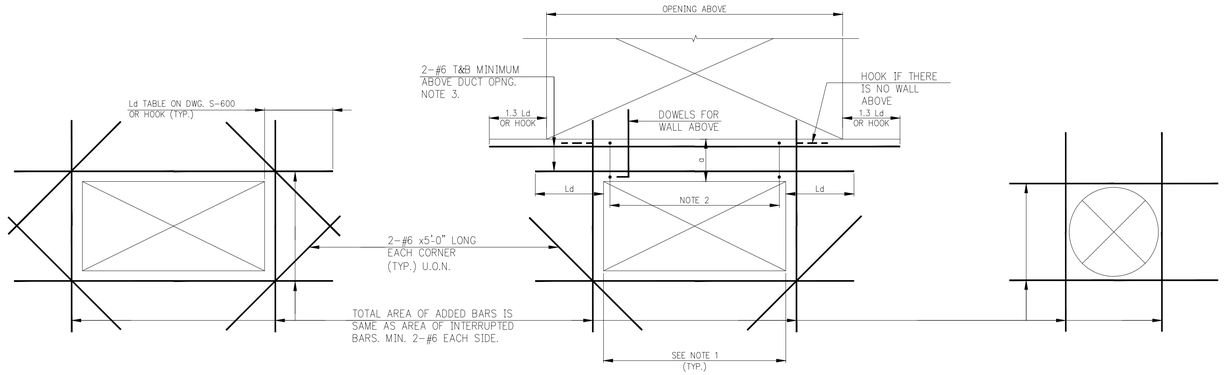
28-12 41 ST AVE, QUEENS

DRAWING TITLE:

TYPICAL DETAILS-4

STATE OF NEW YORK · XIAOJUN WANG · LICENSED PROFESSIONAL ENGINEER · 090417

DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW
DRAWING NO.:	S-304.00
SHEET NO:	13 OF 16

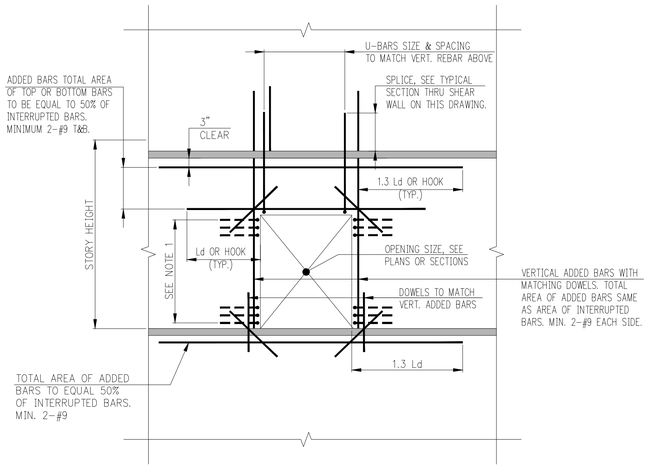


DETAILS OF DUCT, PIPE & ACCESS OPENINGS THRU SHEAR WALL

FOR BALANCE OF DETAILS, SEE TYPICAL DETAIL OF LINK BEAM.

NOTES:

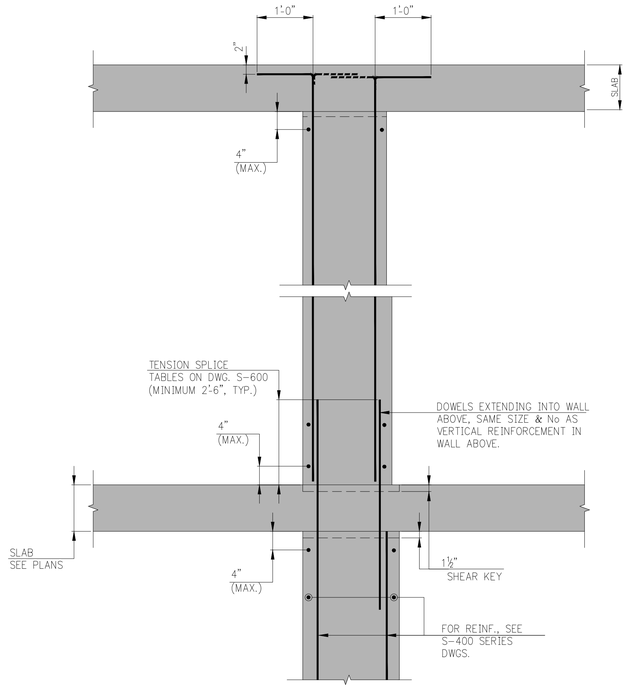
1. CONTRACTOR SHALL VERIFY DIMENSIONS AND LOCATIONS OF ALL DUCT OPENINGS, PIPE SLEEVES, ACCESS OPENINGS THROUGH SHEAR WALLS WITH MECH. AND ARCH. DRAWINGS SHOP DRAWINGS SHOWING ALL SHEAR WALL PENETRATIONS SHALL BE USED AFTER THEY ARE APPROVED BY THE ARCHITECT AND THE ENGINEER.
2. – USE #5@12 TIES WHERE a > 3'-0"
   – USE #5@10 TIES WHERE 2'-3"< a <3'-0", SEE NOTE 3
   – USE #4@8 TIES WHERE 1'-10"< a <2'-3".
3. USE THIS REINFORCEMENT ONLY WHEN LINK BEAM IS NOT SHOWN ON SHEARWALL PLAN DETAILS.



TYPICAL DETAIL OF REINFORCEMENT AT LARGE OPENING THRU SHEARWALL

NOTE:

1. FOR BALANCE OF INFO., SEE TYPICAL DETAIL OF LINK BEAM ON THIS DRAWING.



TYPICAL SECTION THRU SHEARWALL

DOBNOW JOB#: BXXXXX-SX

ENGINEER:

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ARCHITECT:

# 2		
# 1		NOT FOR CONSTRUCTION
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No	Date	Description
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PROJECT:

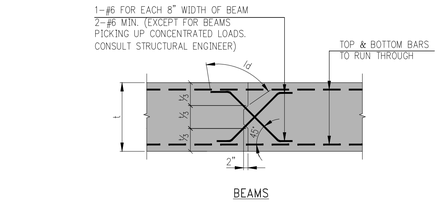
28-12 41 ST AVE, QUEENS

DRAWING TITLE:

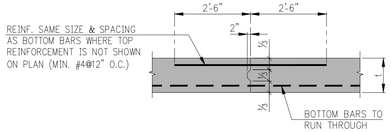
TYPICAL DETAILS-5

STATE OF NEW YORK ★ XIAOJUN WANG ★ LICENSED PROFESSIONAL ENGINEER NO. 104178

DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW
DRAWING NO.:	S-305.00
SHEET NO:	14 OF 16



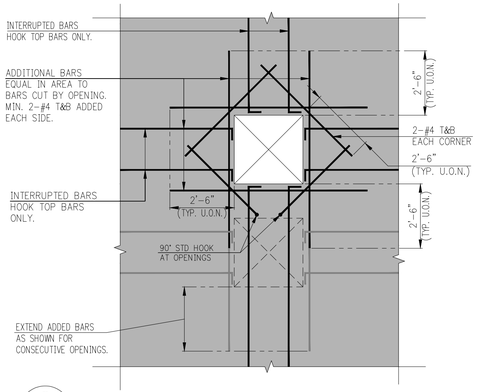
BEAMS



SLABS

B TYP. CONSTRUCTION JOINT DETAILS

SCALE: N.T.S.

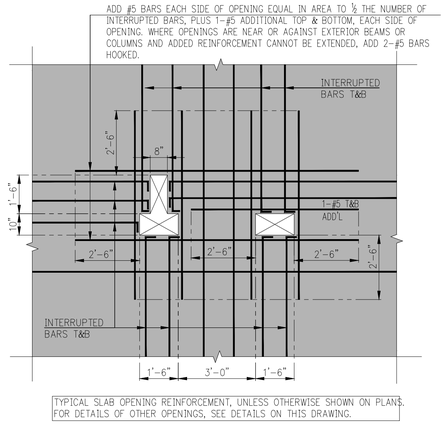


C TYPICAL SLAB OPENING DETAIL

SCALE: N.T.S.

NOTES:

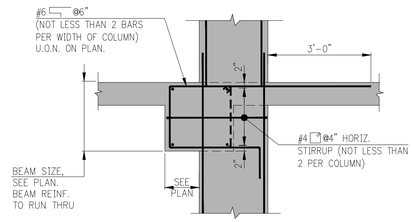
1. OMIT ADDED BARS FOR OPENINGS 10" OR LESS AND RUN NORMAL REINF. BY SIDE OF OPENING.
2. WHERE OPENINGS ARE NEAR OR AGAINST BEAMS OR COLUMNS ADDED REINF. CANNOT BE EXTENDED AS SHOWN, HOOK AFFECTED END.



TYPICAL SLAB OPENING REINFORCEMENT, UNLESS OTHERWISE SHOWN ON PLANS. FOR DETAILS OF OTHER OPENINGS, SEE DETAILS ON THIS DRAWING.

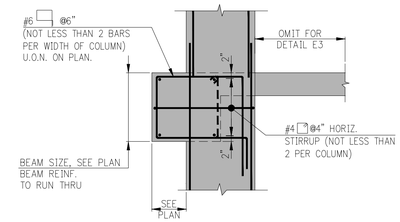
D TYPICAL DETAIL OF SLAB OPENINGS AT BATHROOM

SCALE: N.T.S.



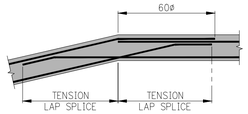
E1 DETAIL

SCALE: ½"=1'-0"

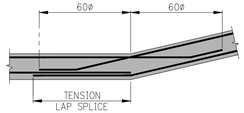


E2 E3 DETAILS

SCALE: ½"=1'-0"

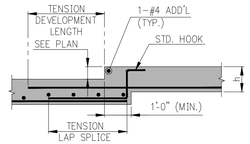


SLOPING DOWN

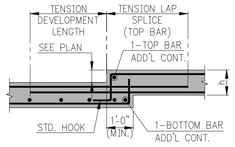


SLOPING UP

TYPICAL DETAILS–BEND IN SLAB



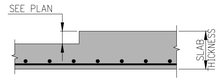
DROP BETWEEN SUPPORTS (POSITIVE MOMENT)



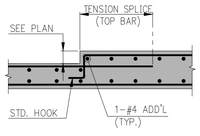
DROP AT SUPPORT (NEGATIVE MOMENT)

E TYPICAL BRACKET CONNECTION OF CONCRETE BEAMS TO COLUMNS

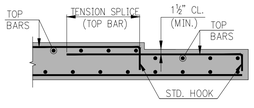
SCALE: N.T.S.



POSITIVE MOMENT

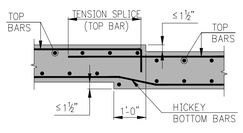


NEGATIVE MOMENT



TYPICAL TOP BARS AT DROPS IN BALCONIES

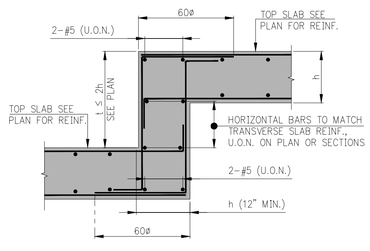
NOTE: DETAIL OF SPLIT BARS NOT SHOWN IN PLAN.



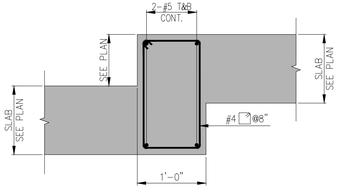
DROP = 1½" OR LESS

F TYPICAL DETAILS OF DROPS IN SLAB

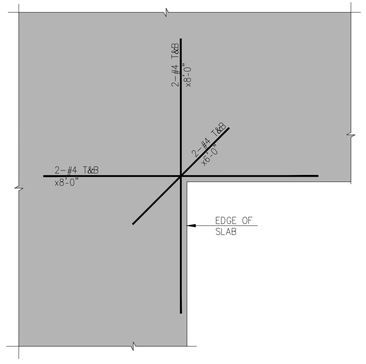
SCALE: N.T.S.



FOR "t" GREATER THAN "h" (BUT LESS THAN "2h")



TYPICAL DROP IN SLAB (AT FIRST FLOOR)



G PLAN DETAIL OF REBAR AT RE-ENTRANT CORNERS

SCALE: N.T.S.

DOBNOW JOB#: B[illegible]

ENGINEER:

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217-14 NORTHERN BLVD, SUITE 207
BAYSIDE, NY 11365
TEL: 929-303-3095
WEB: WWW.JCEPLLC.COM

ARCHITECT:

# 2		
# 1	NOT FOR CONSTRUCTION	
# 0	03/01/25	DOB SUBMISSION
No	Date	Description
Issued/Revised		

PROJECT:

28-12 41 ST AVE, QUEENS

DRAWING TITLE:

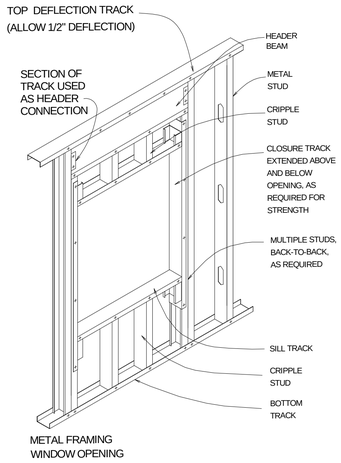
TYPICAL DETAILS-6



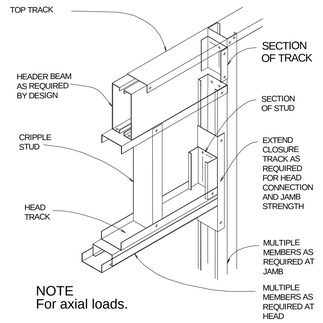
DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW
DRAWING NO.:	S-306.00
SHEET NO:	15 OF 16

COLD – FORMED STEEL STRUCTURAL FRAMING NOTES:

1. ALL COLD FORMED STEEL DESIGN AND INSTALLATION SHALL BE IN ACCORDANCE WITH AISI–S240 " NORTH AMERICAN STANDARD FOR COLD–FORMED STEEL STRUCTURAL FRAMING" LATEST EDITION.
2. STRUCTURAL STUD WALL PANEL CONTRACTOR MUST SUBMIT CALCULATIONS AND DRAWINGS, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW YORK, TO ARCHITECT / ENGINEER FOR REVIEW.
3. STRUCTURAL STUD WALL PANEL CONTRACTOR ALSO MUST SUBMIT CERTIFICATE, SIGNED AND SEALED BY THE SAME PROFESSIONAL ENGINEER, THAT ERECTION OF ALL STUDS, INCLUDING CONNECTIONS, WAS AS PER DRAWINGS AND CALCULATIONS.
4. PHYSICAL PROPERTIES AND ALLOWABLE LOAD CAPABILITIES OF ALL COLD FORMED STEEL STRUCTURAL MEMBERS (STUDS, JOISTS, AND RELATED ACCESSORIES) SHALL BE DEVELOPED IN ACCORDANCE WITH THE CURRENT EDITION OF NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS (AISI S100), AND NORTH AMERICAN STANDARD FOR COLD FORMED STEEL STRUCTURAL FRAMING (AISI S240) AS PUBLISHED BY AISI, AMERICAN IRON AND STEEL INSTITUTE.
5. SIZES OF ALL COLD FORMED STRUCTURAL STEEL MEMBERS (STUDS, JOISTS, AND RELATED ACCESSORIES) ARE FOR THOSE MANUFACTURED BY "MARINO/WARE". EQUIVALENT MEMBERS BY SOME OTHER MANUFACTURER MAY BE SUBSTITUTED IF APPROVED BY ARCHITECT/ENGINEER.
6. SSTEEL MATERIAL FOR ALL STUDS AND JOISTS SHALL CONFORM TO ASTM A1003/A1003M AS PER THE FOLLOWING STRENGTH REQUIREMENTS: Fy = 50KSI.
7. STUD RUNNERS (TRACK), BRACING AND BRIDGING SHALL BE MANUFACTURED PER ASTM C–955.
8. ALL STUDS, JOISTS, AND RELATED ACCESSORIES SHALL BE GALVANIZED WITH A MINIMUM OF G–60 COATING.
9. FOLLOW PROJECT AND "MARINO/WARE" (OR APPROVED EQUAL MANUF.) SPECIFICATIONS FOR GENERAL PRODUCTS AND EXECUTION REQUIREMENTS. IN CASES OF CONFLICT BETWEEN THE TWO SPECIFICATIONS, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.
10. APPLY SPRAYED–ON FIREPROOFING (SFRM) ON ROOF AND BULKHEAD JOISTS.
11. EXTERIOR WALL STUDS ARE TO BE DESIGNED BY CONTRACTORS ENGINEER FOR A MAXIMUM WIND DEFLECTION OF L/600 FOR BRICK VENEER LOCATIONS, AND L/360 FOR OTHER LOCATIONS, USING COMPONENTS & CLADDING WIND LOADS.

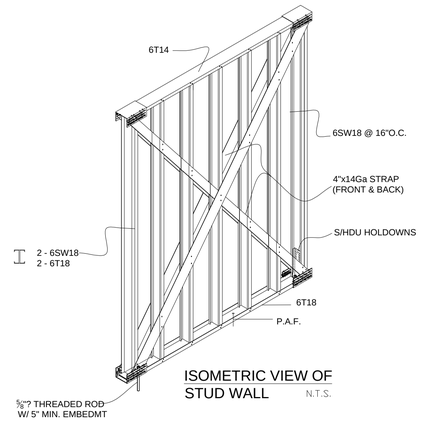


METAL FRAMING
WINDOW OPENING

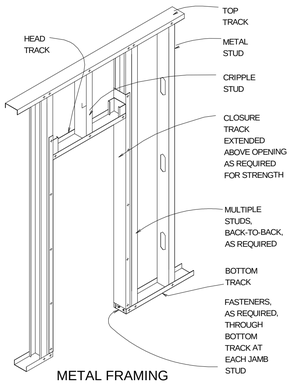


NOTE
For axial loads.

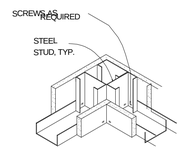
OPENING GREATER THAN OR EQUEL 4FEET



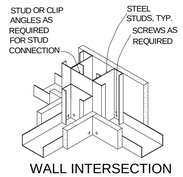
ISOMETRIC VIEW OF STUD WALL N.T.S.



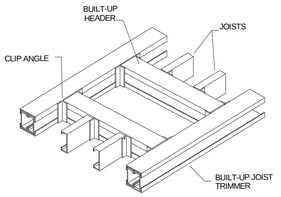
METAL FRAMING
DOOR OPENG



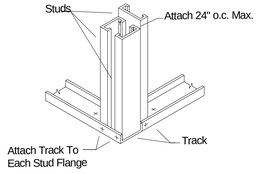
CORNER METAL FRAMING



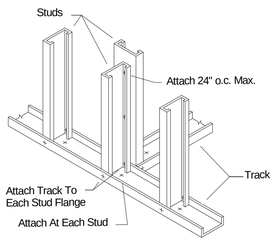
WALL INTERSECTION METAL FRAMING



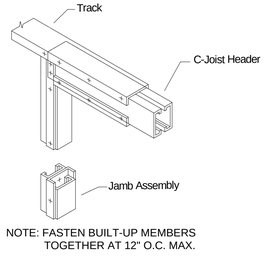
FLOOR FRAMING OPENING
(TYPICAL)



LOAD BEARING WALL -
THREE STUD CORNER

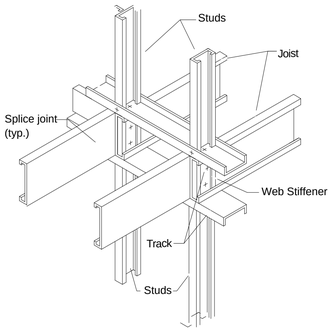


LOAD BEARING WALL -
PARTITION INTERSECTION

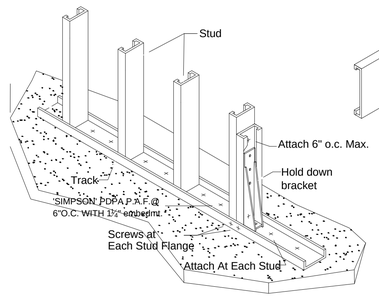


NOTE: FASTEN BUILT-UP MEMBERS TOGETHER AT 12" O.C. MAX.

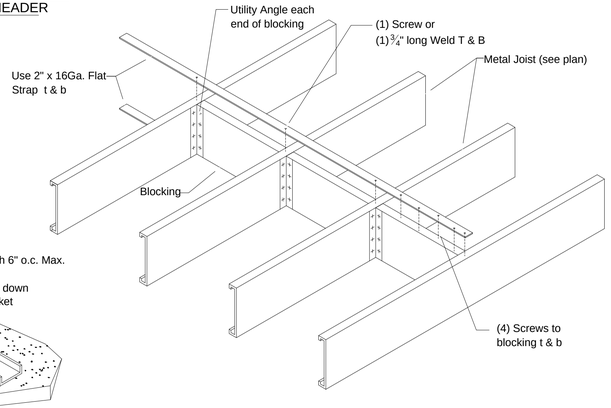
LOAD BEARING WALL -
BEARING HEADER



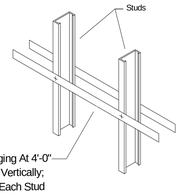
JOIST SPLICE AT LOAD BEARING WALL - STUDS IN PLACE



SHEAR WALL - DOUBLED STUDS EACH END
WITH HOLD DOWN BRACKET

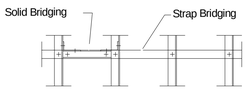


STRAP & BLOCKING DETAIL (TYPICAL)

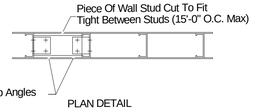


NOTE: BRIDGING TO BE INSTALLED PRIOR TO LOADING OF WALL

BRIDGING AND BRACING -
BEARING WALL BRIDGING



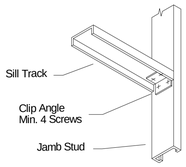
ELEVATION

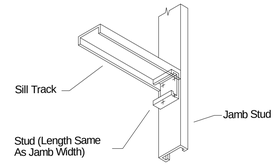


PLAN DETAIL

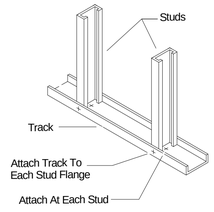
NOTE: STRAP BRIDGING AT 4'-0" O.C. MAX. VERTICALLY, ; ATTACH ENDS OF STRAP BRIDGING TO JAMB STUD, SOLID BRIDGING, OR BUILDING STRUCTURE.

BRIDGING AND BRACING -
BEARING WALL BRIDGING

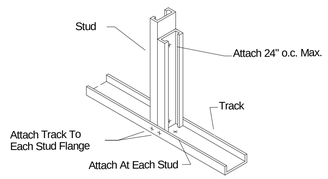




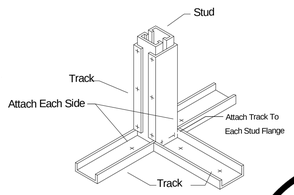
LOAD BEARING WALL - SILL



LOAD BEARING WALL - STUDS IN PLACE



LOAD BEARING WALL - DOUBLED STUDS



NOTE: FASTEN BUILT-UP MEMBER TOGETHER AT 12" O.C. MAX.

LOAD BEARING WALL - BUILT-UP POST
(AT CORNER)

DOBNOW JOB#:
BXXXXX-SX

ENGINEER:

JUST CONSULTING ENGINEERING PLLC
217-14 NORTHERN BLVD, SUITE 207
BAYSIDE, NY 11365
TEL: 929-303-3095
WEB: WWW.JCEPLLC.COM

ARCHITECT:

# 2		
# 1		NOT FOR CONSTRUCTION
# 0	03/01/25	DOB SUBMISSION
No	Date	Description
Issued/Revised		

PROJECT:

28-12 41 ST AVE, QUEENS

DRAWING TITLE:

TYPICAL DETAILS-7

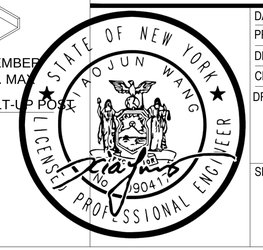
DATE:	08/05/2024
PROJECT NO.:	23039
DRAWING BY:	JS
CHECKED BY:	MW

DRAWING NO.:

S-307.00

SHEET NO:

16 OF 16



GENERAL NOTES

1. CONFORM TO CONTRACT SPECIFICATIONS, AND TO THE GENERAL NOTES, CONSTRUCTION SEQUENCE, AND ALL OTHER REQUIREMENTS OF THIS SUBMISSION

2. VERIFY THE LOCATION AND ELEVATIONS OF ALL UTILITIES. EXISTING FOUNDATIONS, ETC. PRIOR TO INSTALLING SOLDIER PILES.

3. REPORT LOCATIONS AND ELEVATIONS OF UTILITIES, STRUCTURES AND OBSTRUCTIONS WHICH CONFLICT WITH THE DESIGN LOCATIONS OF SOLDIER PILES, LAGGING, ANCHORS. ETC. SC THAT THE DESIGN CAN BE MODIFIED AS REQUIRED.

4. REPORT CHANGE IN CONTRACT DOCUMENTS, SUBSURFACE CONDITIONS, AND DESIGN ASSUMPTIONS TO JUST CONSULTING ENGINEERING PLLC, SO THE EXCAVATION SUPPORT SYSTEM DESIGN CAN BE MODIFIED ACCORDINGLY.

5. TOLERANCES FOR INSTALLATION OF STRUCTURAL ELEMENTS ARE AS FOLLOWS :
   - VERTICALITY OF SOLDIER PILES TO BE WITHIN TWO PERCENT OF PLUMB.
   - SOLDIER PILES SHALL BE WITHIN 3–INCHES OF PLAN LOCATION,

6. AT LEAST 24 HOURS WRITTEN NOTICE SHALL BE GIVEN TO THE DEPARMENT OF BUILDINGS BEFORE THE COMMENCEMENT OF ANY WORK FOR WHICH A WORK PERMIT HAS BEEN OBTAINED. ENGINEER SHALL BE NOTIFIED IN WRITING AT LEAST 24 HOURS BEFORE ANY REPAIR WORK COMMENCES.

7. WHEN PERMISSION TO ENTER ADJOINING PROPERTY HAS BEEN OBTAINED, A PHYSICAL EXAMINATION OF SUCH PROPERTY SHALL BE CONDUCTED BY THE PERSON INITIATING THE CONSTRUCTION OPERATIONS PRIOR TO COMMENCEMENT OF OPERATIONS.

8. QUALIFIED ENGINEER SHALL BE ON SITE FOR CONTROLLED INSPECTION THROUGHOUT THE ENTIRE CONSTRUCTION OF UNDEPINNING/EXCAVATION AS PER NYC BUILDING CODE.

EXCAVATION NOTES:

1. THE PERIMETER OF THE GENERAL EXCAVATION SHALL BE RETAINED BY A SOIL RETENTION SYSTEM (WHERE APPLICABLE). THE INSTALLATION, MAINTENANCE AND REMOVAL (WHERE REQUIRED) SHALL BE THE COMPLETE AND SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL PROVIDE ALL MEASURES AND PRECAUTIONS NECESSARY TO PREVENT DAMAGE AND MINIMIZE SETTLEMENT OF EXISTING OR NEW CONSTRUCTION INSIDE AND OUTSIDE THE PROJECT LIMITS. ANY DAMAGE TO NEW OR EXISTING CONSTRUCTION INSIDE OR OUTSIDE OF THE PROJECT LIMITS, CAUSED BY CONSTRUCTION TECHNIQUES OR MOVEMENTS OF THE SOIL RETENTION SYSTEM. IS THE RESPONSIBILITY OF THE CONTRACTOR. THE DESIGN OF THE SOIL RETENTION SYSTEM WILL BE PROVIDED BY THE OWNER. THE CONTRACTOR WILL ASSIST THE OWNER IN THE APPROVAL PROCESS FOR THE RETENTION SYSTEM IF SO REQUIRED. A SPECIAL SPECIAL INSPECTION AGENCY SHALL BE RETAINED BY THE OWNER TO PERFORM REQUIRED CONSTRUCTION INSPECTIONS PER NEW YORK CITY BUILDING CODE REQUIREMENT.

2. THE CONTRACTOR SHALL COORDINATE ALL ELEMENTS OF THE SOIL RETENTION SYSTEM WITH ALL ELEMENTS OF THE PERMANENT BUILDING.

3. PRIOR TO ANY EXCAVATION OR INSTALLATION OF ELEMENTS OF THE SOIL RETENTION SYSTEM, THE CONTRACTOR SHALL ESTABLISH SURVEY POINTS AROUND THE PERIMETER OF THE AREA TO BE EXCAVATED AND OTHER POINTS UP TO 200 FEET BEYOND THE PERIMETER. THESE POINTS SHALL BE SURVEYED FOR VERTICAL AND HORIZONTAL MOVEMENT AT FREQUENT INTERVALS DURING ACTUAL EXCAVATION AND CONTINUING DURING EACH SUBSEQUENT PHASE OF THE WORK AND SUBMITTED TO THE ARCHITECT FOR INFORMATION

4. ALL EXCAVATION SHALL BE BASED ON ENGINEERED DRAWINGS PREPARED BY THE CONTRACTOR INCLUDING PLANS AND SECTIONS OF EXCAVATION SEQUENCES. THE EXCAVATION SEQUENCES SHALL BE CONTROLLED TO MATCH THE REQUIREMENTS OF THE DESIGN OF THE SOIL RETENTION SYSTEM AND TO PERMIT MONITORING OF WALL AND GROUND MOVEMENTS.

5. THE GENERAL EXCAVATION ACROSS THE SITE SHALL NOT EXTEND DEEPER THAN THE SLAB–ON–GRADE SUBGRADE ELEVATION. THE EXCAVATIONS FOR FOOTINGS, GRADE BEAMS, PILE CAPS, MATS, PITS, SLABS, ETC. SHALL BE EXCAVATED ON AN INDIVIDUAL, LOCALIZED BASIS DOWN FROM THE SLAB–ON–GRADE SUBGRADE LEVEL.

6. ALL EXCAVATION BELOW THE SLAB LEVEL REQUIRED FOR PITS SHALL BE RETAINED BY LOCALIZED SOIL RETENTION SYSTEMS AS MAY BE NECESSARY BASED ON A DESIGN USING APPROPRIATED EARTH AND HYDRAULIC PRESSURES AND OTHER CONSTRUCTION LOADINGS.

7. THE CONTRACTOR SHALL PROVIDE POSITIVE PROTECTION (MAT/SHEET COVERINGS) FOR ALL EXCAVATION SLOPES TO PROTECT SLOPES FROM INSTABILITY AND DETERIORATION DUE TO RAIN, WND OR SNOW/ICE.

8. THE CONTRACTOR SHALL PROVIDE SURFACE DRAINAGE CHANNELS AND SUMPS AND SUMP PUMPS TO PROTECT ALL EXCAVATIONS FROM FLOODING. FLOODING OF ANY EXCAVATION AFTER APPROVAL OF THE SUBGRADE WILL BE CAUSE FOR COMPLETE REPREPARTION AND APPROVAL OF THE SUBGRADE.

9. PROVIDE A DRAINAGE PANEL AGAINST THE OUTSIDE FACE OF THE FOUNDATION WALL AT LOCATIONS INDICATED ON THE ARCHITECTURAL DRAWINGS.

10. THE OWNER'S SOIL TESTING LABORATORY SHALL REVIEW AND MONITOR THE EXCAVATION, DEWATERING AND SOIL RETENTION SYSTEMS. THE CONTRACTOR SHALL PROVIDE, INSTALL AND SURVEY: (A) VERTICAL AND HORIZONTAL MOVEMENTS OF THE TOP OF THE SOIL RETENTION SYSTEM: AND (B) BENCH MARKS ADJACENT TO AND AWAY FROM THE SITE PERIMETER FOR VERTICAL AND HORIZONTAL MOVEMENTS.

11. SEE PLUMBING AND ELECTRICAL DRAWINGS FOR UNDERFLOOR UTILITY AND GROUNDING REQUIREMENTS.

TIMBER LAGGING NOTES

1. TIMBER LAGGING SHALL BE MINIMUM THREE–INCH (FULL) THICKNESS. TIMBER LAGGING SHALL HAVE A MINIMUM ALLOWABLE BENDING STRESS OF 1200 PSI.

2. LAGGING SHALL BE INSTALLED SUCH THAT GAPS BETWEEN THE LAGGING BOARDS DO NOT EXCEED ONE INCH. VOIDS IN THE RETAINED EARTH BEHIND THE TIMBER LAGGING SHALL BE BACKFILLED WITH PEA GRAVEL (OR EQUIVALENT GRANULAR MATERIAL). AND THE GAPS BETWEEN THE TIMBER LAGGING SHALL BE PACKED WITH HAY AS REQUIRED TO PREVENT EROSION OF THE RETAINED SOIL BUT STILL ALLOW GROUNDWATER TO SEEP OUT.

3. THE MAXIMUM EXPOSED HEIGHT OF SOIL IN FRONT OF THE WALL SHALL NOT EXCEED 2FT PRIOR TO INSTALLING TIMBER LAGGING.

SOLDIER PILE AND WALE NOTES

1. ALL W–SHAPE SOLDIER PILES AND ALL WALE AND CORNER BRACING MATERIAL SHALL CONFORM TO ASTM A572 GR 50, FY= 50 KSI; ROUND PIPES SHALL CONFORM TO THE REQUIREMENTS OF API N80 WITH A MINIMUM YIELD STRENGTH OF 80KSI; PIPE PILES SHALL BE FILLED WITH GROUT WHICH SHOULD HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS AS SHOWN ON PLAN.

2. SOLDIER PILES TO BE INSTALLED BY DRILLING METHOD. THE CONTRACTOR SHALL MONITOR AND PROTECT ADJACENT STRUCTURES FROM DAMAGE.

3. IF SOLDIER PILES CANNOT BE INSTALLED TO THE MINIMUM TIP ELEVATIONS SHOWN HEREIN DUE TO DIFFICULT DRIVING CONDITIONS, CONTACT JUST CONSULTING ENGINEERING PLLC IMMEDIATELY.

4. SOLDIER PILES SHALL BE SPACED AT NO MORE THAN 6 FEET ON CENTER. LAYOUT AND LIMITS OF THE TEMPORARY EXCAVATION SUPPORT SYSTEM SHOWN HEREIN ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ACTUAL LAYOUT AND LIMITS IN THE FIELD PRIOR TO INSTALLING SOLDIER PILES.

5. WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION STEEL CONSTRUCTION MANUAL OR AWS DOCUMENTS. WELDING ELECTRODES TO BE E7018.

MONITORING

BEFORE THE COMMENCEMENT OF WORK SPECIFIED IN THIS PLAN, CONTRACTOR IS TO IMPLEMENT THE APPROVED MONITORING PLAN BASED ON INFORMATION SPECIFIED UNDER THESE DRAWINGS AT A MINIMUM. THE OWNER RESERVES THE RIGHT TO PERFORM ANY ADDITIONAL MONITORING OF ADJACENT STRUCTURES.

1. IT'S CONTRACTOR'S RESPONSIBILITY TO SURVEYING, MONITORING AND PROTECTING THE ADJACENT BUILDINGS DURING CONSTRUCTION.

2. SETTLEMENT, VIBRATION AND CRACK MONITORING SYSTEMS SHALL BE SPECIFIED AS PER CONSTRUCTION TYPE AND FIELD CONDITIONS.

3. VIBRATION MONITORING

I). VIBRATION MONITORS SHALL TAKE REAL TIME READINGS UNDER DIRECTIONS OF VIBRATION CONTRACTOR/CONSULTANT. VIBRATION MONITORS(SEISMOGRAPHS) SHALL BE PLACED ADJACENT TO AREAS WHERE WORK IS BEING PERFORMED.

II). IF THE THRESHOLD CRITERIA OF 0.5 IN/SEC (IPS) IS EXCEEDED IN ANY OF THE FIXED LOCATIONS WITHIN THE ADJACENT BUILDINGS, AS DESCRIBED ABOVE, ALL WORK PERFORMED AT THIS TIME SHALL CEASE AND THE STRUCTURES SHALL BE INSPECTED BY THE PROJECT ENGINEER OF RECORD.

4. SETTLEMENT MONITORING

I) OPTICAL SURVEY MONITORING POINTS ON THE SPECIFIED LOCATIONS (SHOWN ON PLAN) SHALL BE SET UP TO MONITOR ITS MOVEMENT IN BOTH VERTICAL AND HORIZONTAL DIRECTIONS. OPTICAL MONITORS SHALL BE PLACE AT MAXIMUM OF 50 FEET INTERVALS FOR VERTICAL AND HORIZON MOVEMENT

II) IF 1/4" MOVEMENT IS DETECTED IN EITHER DIRECTION, THE CONSTRUCTION MANAGER AND THE ENGINEER ON SITE SHALL BE INFORMED IMMEDIATELY FOR FURTHER INVESTIGATION AND PREVENTIVE WORK SHALL BE IMPLEMENTED

III) PERFORM OPTICAL SURVEYS AT LEAST ONCE PER DAY DURING INITIAL EXCAVATIONS AND UNDERPINNING. DURING GENERAL EXCAVATIONS, FREQUENCY SHALL BE AT LEAST ONCE PER WEEK. IF MOVEMENTS OCCUR, INCREASE THE FREQUENCY OF THE READING AS DIRECTED BY THE ENGINEER.

TR1 SPECIAL INSPECTION:

1. CONCRETE – CAST–IN–PLACE	BC 1705.3
2. CONSTRUCTION OPERATIONS INFLUENCING ADJACENT STRUCTURES	BC 1705.25.2
3. EXCAVATION–SHEETING, SHORING,AND BRACING	BC 1705.25.3
4. SUBGRADE INSPECTIONS	BC 1705.6

SCOPE OF WORK:

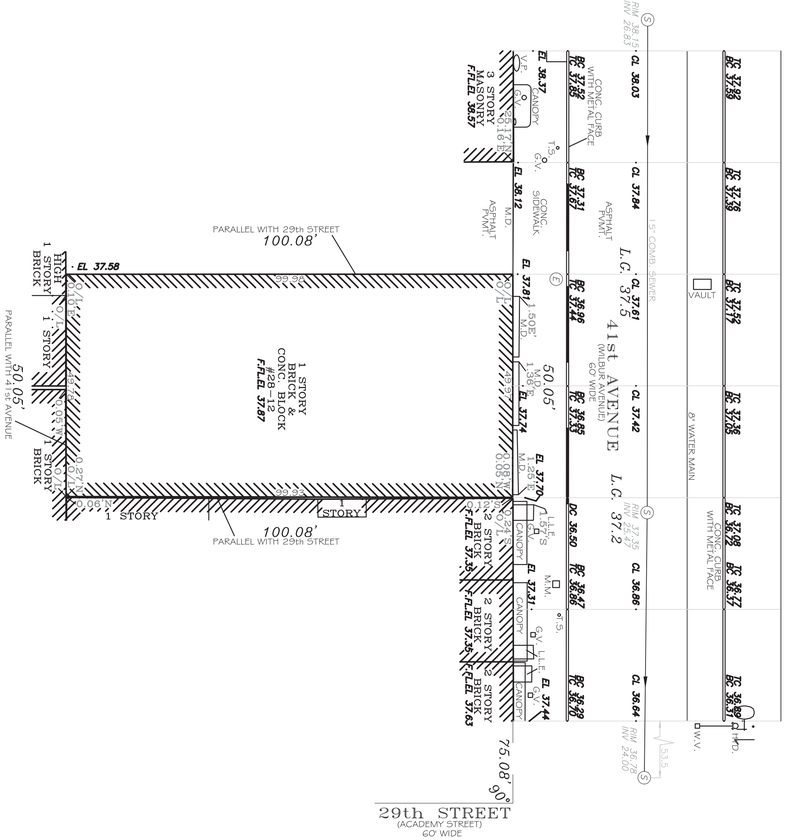
PROPOSED SUPPORT OF EXCAVATION FOR THE NEW 10–STORY BUILDING.

DRAWING INDEX:

1. SOE–001 GENERAL NOTES
2. SOE–002 TA NOTES
3. SOE–100 EXCAVATION AND SHORING PLAN
4. SOE–101 SHORING SECTIONS
5. SOE–102 SHORING SECTIONS

JOB UNDER SEPARATE FILING:

WORK TYPE	JOB #
GC	BXXXXXXXXX
FO	BXXXXXXXXX
ST	BXXXXXXXXX



PLOT PLAN
SCALE: N.T.S.

No.	DATE	DESCRIPTION
		NOT FOR CONSTRUCTION

PROJECT:

28-12 41ST AVE, QUEENS, NY 11101

DRAWING TITLE:

GENERAL NOTES

STRUCTURAL ENGINEER:

JUST CONSULTING ENGINEERING,PLLC

217-14 NORTHERN BLVD, SUITE 207,BAYSIDE, NY

Tel: (718) 308-6986, Email: xwang@jceplic.com

MEP ENGINEER:

■ SEAL & SIGNATURE:



DATE: 08/13/2025
PROJECT No.: 25036
DWG. No.:
DRAWN BY:
CHECKED BY:
CADD FILE No.:

SOE-001.00

1 OF 5

NYC DOB JOB NO. :

NYCT NOT FOR BENEFIT INSURANCE REQUIREMENTS

SECTION A. INSURANCE REQUIREMENTS:

THE PERMITTEE, AT ITS SOLE COST AND EXPENSE, SHALL OBTAIN AND MAINTAIN AT ALL TIMES DURING THE PERFORMANCE OF THE WORK SUCH POLICIES OF INSURANCE AS SET FORTH BELOW:

I. WORKERS COMPENSATION INSURANCE AS REQUIRED BY STATUTE IN THE STATE IN WHICH THE WORK WILL BE PERFORMED. EMPLOYER'S LIABILITY INSURANCE WITH LIMITS OF NOT LESS THAN $1,000,000 BODILY INJURY PER ACCIDENT; $1,000,000 BODILY INJURY PER DISEASE; AND $1,000,000 ANNUAL AGGREGATE. FOR WORK CONDUCTED OUTSIDE THE STATE OF NEW YORK, EMPLOYER'S LIABILITY INSURANCE REQUIRES LIMITS OF NOT LESS THAN $2,000,000 BODILY INJURY PER ACCIDENT; $2,000,000 BODILY INJURY PER DISEASE; AND $2,000,000 ANNUAL AGGREGATE AND MUST PROVIDE PROOF THAT ITS WORKERS COMPENSATION INSURANCE POLICY HAS BEEN ENDORSED TO INCLUDE OTHER STATES COVERAGE.:

IF THE REQUESTING PARTY LEASES ONE OR MORE EMPLOYEES THROUGH THE USE OF A PAYROLL EMPLOYEE MANAGEMENT, OR OTHER SIMILAR COMPANY, THEN THE PERMITTEE MUST PROCURE WORKER'S COMPENSATION INSURANCE WRITTEN ON AN "I" ANY POLICY FORM, INCLUDING AN ENDORSEMENT PROVIDING COVERAGE FOR ALTERNATE EMPLOYER/LEASED EMPLOYEE LIABILITY.

2. COMMERCIAL GENERAL LIABILITY ('CGL') INSURANCE, COVERING CLAIMS FOR PERSONAL AND ADVERTISING INJURY, BODILY INJURY (INCLUDING DEATH) AND PROPERTY DAMAGE ARISING OUT OF THE WORK AND IN A FORM PROVIDING COVERAGE NO LESS BROAD THAN THAT OF THE CURRENT ISO COMMERCIAL GENERAL LIABILITY INSURANCE POLICY (OCCURRENCE FORM, NUMBER CG 00 01). SUCH INSURANCE SHALL PROVIDE COVERAGE FOR ALL OPERATIONS INCLUDING THE PRODUCTS—COMPLETED OPERATIONS HAZARD, AND SHALL BE MAINTAINED FOR A PERIOD OF AT LEAST THREE (3) YEARS AFTER FINAL COMPLETION, SUBJECT TO THE LIMITATION OF ANY APPLICABLE STATUTE. THE LIMITS OF SUCH INSURANCE SHALL RENEW ANNUALLY AND NOT BE LESS THAN $2,000,000 EACH OCCURRENCE; $4,000,000 PRODUCTS AND COMPLETED OPERATIONS AGGREGATE; AND $4,000,000 PER PROJECT GENERAL AGGREGATE. THIS REQUIREMENT MAY BE SATISFIED BY A COMBINATION OF A PRIMARY CGL POLICY COVERAGE WITH LIMITS OF NOT LESS THAN $1,000,000 PER OCCURRENCE, AND FOLLOWING-FORM EXCESS OR UMBRELLA LIABILITY INSURANCE POLICY(IES) WHICH EQUAL THE TOTAL LIMITS REQUIRED ABOVE AND FOR EXCESS OR UMBRELLA LIABILITY INSURANCE IN SECTION 4 BELOW. THE CGL AND EXCESS OR UMBRELLA LIABILITY INSURANCE POLICIES MUST BE WRITTEN AN OCCURRENCE BASIS FORM, AND MUST COMPLY WITH THE FOLLOWING PROVISIONS:

- THE POLICY SHALL INCLUDE INDEPENDENT CONTRACTOR AND CONTRACTUAL LIABILITY COVERAGES;
- THE POLICY SHALL NOT CONTAIN ANY CONTRACTUAL EXCLUSION RELATIVE TO LABOR LAWS OR ANY OTHER EXCLUSIONS OR LIMITATIONS DIRECTED TOWARD ANY TYPES OF PROJECTS, MATERIALS OR PROCESSES INVOLVED IN THE WORK;
- THE POLICY SHALL NOT CONTAIN ANY OF THE FOLLOWING EXCLUSIONS: SUBCONTRACTOR'S EXCLUSION; CONSTRUCTION DEFECT EXCLUSION; LEASED WORKER EXCLUSION; CROSS LIABILITY EXCLUSION; CRANE EXCLUSION; AND DEMOLITION EXCLUSION OR EXPLOSION, COLLAPSE AND UNDERGROUND EXCLUSION;
- CONSTRUCTION WORK TAKING PLACE WITHIN 50 FEET OF A RAILROAD MUST INCLUDE: PRIMARY GENERAL LIABILITY LIMITS MAY BE SATISFIED BY UMBRELLA / EXCESS INSURANCE.
- CONTRACTUAL LIABILITY – RAILROADS CG 24 17 LISTING THE SCHEDULED RAILROAD AND DESIGNATED JOB SITE.
- COVERAGE FOR CLAIMS FOR BODILY INJURY ASSERTED BY A RAILROAD EMPLOYEE OF AN ADDITIONAL INSURED AND ANY EMPLOYER'S LIABILITY EXCLUSION WHICH MAY OTHERWISE OPERATE TO EXCLUDE SUCH COVERAGE SHALL BE REMOVED.

3. BUSINESS AUTOMOBILE LIABILITY INSURANCE, IF ANY OWNED, NON-OWNED OR HIRED VEHICLES ARE USED BY THE PERMITTEE WHETHER ON OR OFF-SITE, COVERING THE LIABILITY OF THE PERMITTEE ARISING OUT OF ANY VEHICLE THAT BEARS, OR IS REQUIRED TO BEAR, LICENSE PLATES ACCORDING TO THE LAWS OF THE JURISDICTION IN WHICH IT IS OPERATED, AND WHICH ARE NOT COVERED BY THE PERMITTEE'S COMMERCIAL GENERAL LIABILITY. SUCH INSURANCE SHALL PROVIDE COVERAGE AT LEAST AS BROAD AS THE STANDARD ISO COMPREHENSIVE AUTOMOBILE LIABILITY POLICY (CA 00 01, CA 00 05, CA 00 12, CA 00020), WITH LIMITS NOT LESS THAN $2,000,000 EACH ACCIDENT ON A COMBINED SINGLE BASIS. IF THE WORK INVOLVES TRANSPORTATION OF HAZARDOUS OR REGULATED SUBSTANCES, HAZARDOUS OR REGULATED WASTES, AND/OR HAZARDOUS OR REGULATED MATERIALS, THE PERMITTEE SHALL PROVIDE POLLUTION AUTO COVERAGE EQUIVALENT TO THAT PROVIDED UNDER THE ISO POLLUTION LIABILITY-BROADENED COVERAGE FOR COVERED AUTOS ENDORSEMENT (CA 99 48), AND THE MOTOR CARRIER ACT ENDORSEMENT (MCS 90). ANY STATUTORILY REQUIRED 'NO-FAULT' BENEFITS AND UNINSURED/UNDERINSURED MOTORIST COVERAGE SHALL BE INCLUDED.

4. UMBRELLA/EXCESS LIABILITY INSURANCE, WITH LIMITS NOT LESS THAN $3,000,000 PER OCCURRENCE IN EXCESS OF THE LIMITS FOR COMMERCIAL GENERAL LIABILITY, EMPLOYER'S LIABILITY, AND BUSINESS AUTOMOBILE LIABILITY INSURANCE WHICH IS AT LEAST AS BROAD AS EACH OF THE UNDERLYING POLICIES. THE UMBRELLA/EXCESS LIABILITY POLICIES SHALL BE WRITTEN ON A 'DROP-DOWN' AND FOLLOWING FORM BASIS, WITH ONLY SUCH EXCEPTIONS EXPRESSLY APPROVED BY THE AUTHORITY/MTA.

5. RAILROAD PROTECTIVE LIABILITY INSURANCE (ISO-RIMA OR EQUIVALENT FORM), IF ANY WORK WILL BE TAKING PLACE WITHIN 50 FEET OF A RAILROAD, SUBWAY OR SIMILAR TRACKED CONVEYANCE OR REQUIRES FLAG OR PROTECTIVE MEASURES BY THE AUTHORITY OR ITS AFFILIATES OR THEIR RESPECTIVE EMPLOYEES, COVERING THE WORK TO BE PERFORMED AT THE DESIGNATED JOB SITE AND AFFORDING PROTECTION FOR DAMAGES ARISING OUT OF BODILY INJURY OR DEATH, PHYSICAL DAMAGE TO OR DESTRUCTION OF PROPERTY, INCLUDING DAMAGE TO THE INSURED'S OWN PROPERTY AND CONFORMING TO THE FOLLOWING:

* THE POLICY SHALL BE ISSUED TO AND SHALL NAME AS THE 'NAMED INSUREDS EACH OF THE INDEMNIFIED PARTIES LISTED UNDER SECTION D BELOW.
* THE LIMIT OF LIABILITY SHALL BE NOT LESS THAN $2,000,000 PER OCCURRENCE, SUBJECT TO A $6,000,000 ANNUAL AGGREGATE;
* POLICY MUST BE ENDORSED TO PROVIDE COVERAGE FOR CLAIMS ARISING FROM INJURY TO EMPLOYEES COVERED BY FEDERAL EMPLOYER'S LIABILITY ACT (FELA), WHEN APPLICABLE.
* INDICATE THE NAME AND ADDRESS OF THE DESIGNATED CONTRACTOR, THE LOCATION OF THE WORK, THE CONTRACT DESCRIPTION AND CONTRACT NUMBER, IF APPLICABLE.

6. CONTRACTOR'S POLLUTION LIABILITY INSURANCE, IF DISPOSAL OF HAZARDOUS MATERIALS FROM THE DESIGNATED JOB SITE IS UNDERTAKEN OR IF THE WORK BEING PERFORMED IN THE IMPACT AREA INVOLVES ENVIRONMENTAL OR POLLUTION EXPOSURES, WITH LIMITS NOT LESS THAN $2,000,000 PER OCCURRENCE AND GENERAL AGGREGATE ON A PER PROJECT BASIS INCLUDING COMPLETED OPERATIONS COVERAGE TO BE MAINTAINED FOR AT LEAST THREE (3) YEARS AFTER COMPLETION OF THE WORK. POLICY SHALL COVER ENVIRONMENTAL DAMAGE RESULTING FROM POLLUTION CONDITIONS THAT ARISE FROM THE OPERATIONS OF THE PERMITTEE AND DESCRIBED UNDER THE SCOPE OF SERVICES OF THIS AGREEMENT. COVERAGE MUST APPLY TO SUDDEN AND NON-SUDDEN POLLUTION CONDITIONS INCLUDING DISPERSAL, RELEASE OR ESCAPE OF SMOKE, VAPORS, SOOT, FUMES, ACIDS, ALKALIS, TOXIC CHEMICALS, LIQUIDS OR GASES, WASTE MATERIALS OR OTHER IRRITANTS, CONTAMINANTS OR POLLUTANTS, SILT OR SEDIMENT INTO OR UPON LAND, THE ATMOSPHERE OR ANY WATERCOURSE OR BODY OF WATER, PROVIDED SUCH CONDITIONS ARE NOT NATURALLY PRESENT IN THE ENVIRONMENT IN THE CONCENTRATION OR AMOUNTS DISCOVERED UNLESS SUCH NATURAL CONDITION(S) ARE RELEASED OR DISPERSED AS A RESULT OF THE PERFORMANCE OF COVERED OPERATIONS. SUCH INSURANCE SHALL INCLUDE BUT NOT BE LIMITED TO:

A) BODILY INJURY, SICKNESS, DISEASE, MENTAL ANGUISH OR SHOCK SUSTAINED BY ANY PERSON, INCLUDING DEATH; MEDICAL MONITORING;
B) PHYSICAL INJURY TO OR DESTRUCTION OF TANGIBLE PROPERTY OF PARTIES OTHER THAN THE INSURED INCLUDING THE RESULTING LOSS OF USE AND DIMINUTION IN VALUE THEREOF; LOSS OF USE, BUT NOT DIMINUTION IN VALUE, OF TANGIBLE PROPERTY OF PARTIES OTHER THAN THE INSURED THAT HAS NOT BEEN PHYSICALLY INJURED OR DESTROYED;
C) NATURAL RESOURCE DAMAGES;
D) CLEANUP COSTS;
E) TRANSPORTATION AND NON-OWNED DISPOSAL SITE COVERAGE (WITH NO SUNSET CLAUSE/RESTRICTED COVERAGE TERM) IF THE PERMITTEE IS DISPOSING OF CONTAMINATED MATERIAL (S);
F) NO EXCLUSIONS FOR ASBESTOS, LEAD PAINT, SILICA OR MOLD/FUNGUS/LEGIONELLA;
G) DEFENSE INCLUDING COSTS, CHARGES AND EXPENSES INCURRED IN THE INVESTIGATION, ADJUSTMENT OR DEFENSE OF CLAIMS FOR SUCH COMPENSATORY DAMAGES;

SECTION B. GENERAL INSURANCE REQUIREMENTS:
THE FOLLOWING REQUIREMENTS ARE APPLICABLE TO ALL INSURANCE COVERAGES REQUIRED DURING THE PERFORMANCE OF THE WORK, EXCEPT TO THE EXTENT OTHERWISE INDICATED:

I. INSURER REQUIREMENTS. ALL POLICIES OF INSURANCE SHALL BE PLACED WITH INSURERS ACCEPTABLE TO THE AUTHORITY/MTA. THE INSURANCE UNDERWRITER(S) MUST BE DULY LICENSED OR APPROVED SURPLUS LINES INSURER TO DO BUSINESS IN THE STATE WHERE THE WORK IS TO BE PERFORMED AND MUST HAVE A FINANCIAL RATING OF A–/VII OR BETTER IN THE MOST RECENT EDITION OF BEST'S KEY RATING GUIDE OR OTHERWISE SATISFACTORY TO THE AUTHORITY/MTA.
II. RIGHT TO REQUEST ADDITIONAL INSURANCE. THE PERMITTEE SHALL INCREASE REQUIRED INSURANCE AMOUNTS UPON DIRECTION BY THE AUTHORITY/MTA.
III. ADDITIONAL INSUREDS. ALL INSURANCE REQUIRED UNDER SECTION A (EXCEPT FOR WORKERS COMPENSATION, PROFESSIONAL LIABILITY OR OTHERWISE NOTED), SHALL NAME THE PARTIES LISTED IN SECTION D AS ADDITIONAL INSUREDS AND SHALL INCLUDE THEIR RESPECTIVE SUBSIDIARY AND AFFILIATED COMPANIES, THEIR BOARDS OF DIRECTORS, OFFICERS, EMPLOYEES, REPRESENTATIVES, AND AGENTS (HEREINAFTER, COLLECTIVELY THE 'ADDITIONAL INSUREDS'). FOR COMMERCIAL GENERAL LIABILITY INSURANCE, ADDITIONAL INSURED COVERAGE MUST BE PROVIDED ON ISO FORMS OR THEIR EQUIVALENT AT LEAST AS BROAD AS CG 20 26. NO OTHER GENERAL LIABILITY ADDITIONAL INSURED ENDORSEMENT WILL BE ACCEPTED UNLESS APPROVED BY THE AUTHORITY/MTA.
IV. PRIMARY AND NON-CONTRIBUTORY. EACH POLICY REQUIRED IN SECTION A, INCLUDING PRIMARY, EXCESS, AND/OR UMBRELLA, SHALL PROVIDE THAT THE INSURANCE PROVIDED TO THE ADDITIONAL INSUREDS IS PRIMARY AND NON-CONTRIBUTORY, SUCH THAT NO OTHER INSURANCE OR SELF-INSURED RETENTION CARRIED OR HELD BY THE AUTHORITY /MTA SHALL BE CALLED UPON TO CONTRIBUTE TO A LOSS COVERED BY INSURANCE FOR THE NAMED INSUREDS.
V. WAIVER OF SUBROGATION. TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, THE AUTHORITY WILL REQUIRE ALL INSURANCE POLICIES REQUIRED IN SECTION A TO INCLUDE CLAUSES STATING EACH INSURER WILL WAIVE ALL RIGHTS OF RECOVERY. ALL WAIVERS PROVIDED HEREIN SHALL BE EFFECTIVE AS TO ANY INDIVIDUAL OR ENTITY EVEN IF SUCH INDIVIDUAL OR ENTITY (A) WOULD OTHERWISE HAVE A DUTY OF INDEMNIFICATION, CONTRACTUAL OR OTHERWISE, OR (B) DID NOT PAY THE INSURANCE PREMIUM DIRECTLY OR INDIRECTLY, AND WHETHER OR NOT SUCH INDIVIDUAL OR ENTITY HAS AN INSURABLE INTEREST IN ANY PROPERTY DAMAGED.
VI. SELF-INSURED RETENTIONS. NONE OF THE INSURANCE REQUIRED IN SECTION A SHALL BE SUBJECT TO ANY SELF-INSURED RETENTION GREATER THAN $100,000 WITHOUT THE AUTHORITY/MTA WRITTEN APPROVAL.
VII. SUBCONTRACT AGREEMENTS. THE PERMITTEE SHALL BY APPROPRIATE WRITTEN AGREEMENTS FLOW DOWN THE REQUIREMENTS FOR (A) THE WAIVER OF SUBROGATION FOR ALL REQUIRED INSURANCE, (B) ADDITIONAL INSURED COVERAGE FOR ALL REQUIRED INSURANCE, AND (C) OTHER REQUIREMENTS OF THIS SECTION TO ALL TIERS OF CONTRACTORS. FOR ALL INSURANCE REQUIRED OF SUCH CONTRACTORS BY THE PERMITTEE FOR THE WORK.
VIII. NO LIMITATION. NOTHING IN THIS SECTION SHALL BE CONSTRUED AS LIMITING IN ANY WAY THE EXTENT TO WHICH THE PERMITTEE MAY BE HELD RESPONSIBLE FOR PAYMENT OF DAMAGES RESULTING FROM THEIR OPERATIONS. THE PERMITTEE'S/CONTRACTOR'S OBLIGATIONS TO PROCURE INSURANCE ARE SEPARATE AND INDEPENDENT OF ALL AND SHALL NOT LIMIT THE PERMITTEE'S OBLIGATIONS, INDEMNITY AND DEFENSE OBLIGATIONS. THE AUTHORITY/MTA DOES NOT REPRESENT THAT COVERAGES AND LIMITS REQUIRED IN THIS ENTRY PERMIT WILL NECESSARILY BE ADEQUATE TO PROTECT THE PERMITTEE.
IX. NOTICE OF CANCELLATION OR NON-RENEWAL. THE PERMITTEE AGREES TO NOTIFY THE AUTHORITY/MTA THIRTY DAYS PRIOR TO ANY CANCELLATION, NON-RENEWAL OR MATERIAL CHANGE TO ANY INSURANCE POLICIES REQUIRED IN SECTION A. NOTICE SHALL BE SENT ELECTRONICALLY TO THE CONTRACT-SPECIFIC EMAIL ADDRESS PROVIDED FOR THE PERMITTEE VIA MTA CERTIFICATE OF INSURANCE MANAGEMENT SYSTEM (CIMS), COMPLIANZ'M.
X. NOTICE OF OCCURRENCE. THE PERMITTEE SHALL IMMEDIATELY FILE WITH THE AUTHORITY'S TORT DIVISION (WITH A COPY TO THE AUTHORITY'S ENGINEER), 130 LIVINGSTON STREET, 11TH FLOOR, BROOKLYN, NY11201, A NOTICE OF ANY OCCURRENCE LIKELY TO RESULT IN A CLAIM AGAINST THE AUTHORITY /MTA AND SHALL ALSO FILE WITH THE TORTS DIVISION DETAILED SWORN PROOF OF INTEREST AND LOSS WITH THE CLAIM. THIS PARAGRAPH SHALL SURVIVE THE EXPIRATION OR EARLIER TERMINATION OF THE PERMIT AGREEMENT/ENTRY PERMIT.
XI. INSURANCE NOT IN EFFECT. IF AT ANY TIME DURING THE PERFORMANCE OF THE WORK, INSURANCE AS REQUIRED IS NOT IN EFFECT OR PROOF THEREOF IS NOT PROVIDED, THE AUTHORITY /MTA SHALL HAVE THE OPTIONS TO: (A) DIRECT THE PERMITTEE TO SUSPEND WORK OR OPERATION WITH NO ADDITIONAL COST OR EXTENSION OF TIME DUE ON ACCOUNT THEREOF; OR (B) TERMINATE THE PERMISSION GIVEN TO THE PERMITTEE TO PERFORM THE WORK.
XII. CONFORMANCE TO LAW. IF APPLICABLE LAW LIMITS THE ENFORCEABILITY OF ANY OF THE FOREGOING REQUIREMENTS, THE PERMITTEE SHALL BE REQUIRED TO COMPLY WITH THE FOREGOING REQUIREMENTS TO THE FULLEST EXTENT OF COVERAGE AND LIMITS ALLOWED BY APPLICABLE LAW AND THE PROVISIONS OF INSURANCE SHALL BE LIMITED ONLY TO THE EXTENT REQUIRED TO CONFORM TO APPLICABLE LAW.

SECTION C. EVIDENCE OF INSURANCE:

1. SUBMISSION OF INSURANCE: THE PERMITTEE MUST SUBMIT EVIDENCE OF ALL REQUIRED INSURANCE TO THE MTA C&D EXTERNAL PARTNER PROGRAM VIA THE SITE PORTAL. ADDITIONAL INFORMATION AND PROCESS IS AVAILABLE AT:
HTTPS://NEW.MTA.INFO/AGENCY/CONSTRUCTION-AND-DEVELOPMENT/BUILDING-NEAR-TRANSIT/EXTERNAL-PARTNER-PROGRAM.

a. ACCEPTABLE FORMS OF INSURANCE:
- ACORD 25: CERTIFICATE OF INSURANCE
- ACORD 855: NY CONSTRUCTION CERTIFICATE OF LIABILITY ADDENDUM
- ACORD 28: CERTIFICATE OF COMMERCIAL PROPERTY INSURANCE
- ACORD BINDER OR INSURANCE POLICY

WORKERS COMPENSATION (ALTERNATIVE OPTIONS):
- –C–105.2 - CERTIFICATE OF WORKERS COMPENSATION INSURANCE; OR
- –SI–26.3 - CERTIFICATE OF WORKERS COMPENSATION FROM THE STATE INSURANCE FUND; OR
- –GSI–105/SI–12 - CERTIFICATE OF WORKERS COMPENSATION SELF INSURANCE; OR
- –CE–200 - ATTESTATION OF EXEMPTION WHEN CONTRACTOR MEETS THE REQUIREMENTS (E.G.) SOLE PROPRIETOR

b. CERTIFICATE OF INSURANCE – THE FOLLOWING MINIMUM DETAILS MUST BE REFERENCED ON THE CERTIFICATE:
- POLICY COVERAGE DETAILS (E.G.) POLICY TERM, PER OCCURRENCE/PER PROJECT; LIMITS/SUBLIMITS, AGGREGATE LIMITS, DEDUCTIBLES; SELF-INSURED RETENTIONS, AND INSURANCE CARRIER NAME AND CORRESPONDING NAIC #
- CONTRACT IDENTIFIER (E.G.) CONTRACT #, RFP #, OR ENTRY PERMIT #
- LOCATION AND DESCRIPTION OF WORK
- INDEMNIFIED PARTIES AS AN ADDITIONAL INSURED INCLUDING PRIMARY AND NONCONTRIBUTORY COVERAGE AND WAIVER OF SUBROGATION IN FAVOR OF THE MTA AGENCY
- CERTIFICATE HOLDER MUST LIST THE MTA AGENCY'S NAME AND ADDRESS
- CERTIFICATE OF INSURANCE MUST BE SIGNED BY AN AUTHORIZED INSURANCE REPRESENTATIVE

c. ENDORSEMENTS (WHERE APPLICABLE)
- GENERAL LIABILITY – ADDITIONAL INSURED (CG 20 26)
- GENERAL LIABILITY – PRIMARY AND NON-CONTRIBUTORY (CG 2001 OR EQUIVALENT
- GENERAL LIABILITY – PER PROJECT AGGREGATE, WHERE APPLICABLE
- GENERAL LIABILITY – INDEMNIFIED PARTY
- AUTOMOBILE LIABILITY – MCS 90 AND CA 99 48
- CONTRACTOR'S POLLUTION – NON-OWNED DISPOSAL SITE AND TRANSPORTATION COVERAGE
- WAIVER OF SUBROGATION (MOST RECENT NCO/ISO OR EQUIVALENT AS APPLICABLE)
- JOINT VENTURE (JV) - IF THE CONTRACTOR/CONSULTANT IS A JOINT VENTURE, GENERAL LIABILITY INSURANCE MUST BE PROVIDED IN THE NAME OF THE JOINT VENTURE. ALTERNATIVELY, A NAMED INSURED ENDORSEMENT LISTING THE JOINT VENTURE MAY BE ACCEPTED.

d. INSURANCE BINDER/POLICY (APPLICABLE TO RAILROAD PROTECTIVE LIABILITY AND BUILDER'S RISK/INSTALLATION FLOATER). IF A POLICY IS NOT SUBMITTED, THE INSURANCE BINDER MUST INCLUDE THE:

FOLLOWING MINIMUM DETAILS:
- POLICY COVERAGES AND DETAILS (E.G.) POLICY TERM, LIMITS/SUB-LIMITS, AGGREGATE LIMITS, DEDUCTIBLES, SELF-INSURED RETENTIONS, INSURANCE CARRIER NAME AND APPLICABLE NAIC #
- CONTRACT NUMBER OR IDENTIFIER (E.G.) CONTRACT #, RFP #, OR ENTRY PERMIT NUMBER; DESIGNATED LOCATION AND DESCRIPTION OF WORK
- INDEMNIFIED PARTIES AS EITHER A NAMED INSURED OR ADDITIONAL NAMED INSURED
- BINDER MUST BE ISSUED AND SIGNED BY THE AUTHORIZED INSURANCE COMPANY OR THEIR AUTHORIZED INSURANCE AGENT
- BINDER MAY BE ACCEPTED PENDING ISSUANCE OF THE POLICY. POLICY MUST BE SUBMITTED WITHIN 30 DAYS FROM BINDER EFFECTIVE DATE.

2. INSURANCE COMPLIANCE: THE PERMITTEE WILL BE NOTIFIED WHEN INSURANCE IS COMPLIANT THROUGH THE ASSIGNED 'CONTRACT SPECIFIC' EMAIL ADDRESS VIA THE MTA CERTIFICATE OF INSURANCE MANAGEMENT SYSTEM (CIMS) COMPLIANZ'M.

3. RENEWAL INSURANCE: THE PERMITTEE WILL BE NOTIFIED VIA CIMS TWO (2) WEEKS PRIOR TO THE EXPIRATION OF THEIR INSURANCE AND SHALL ENDEAVOR TO PROVIDE RENEWAL OR REPLACEMENT POLICIES OF INSURANCE WITH TERMS AND CONDITIONS NO LESS FAVORABLE THAN THE EXPIRING COVERAGES. THE PERMITTEE MUST SUBMIT EVIDENCE OF RENEWAL INSURANCE USING THE CONTRACT SPECIFIC EMAIL ADDRESS ASSIGNED TO THIS AGREEMENT.

DO NOT USE THE ASSIGNED 'CONTRACT SPECIFIC' EMAIL ADDRESS FOR OTHER AGREEMENTS. EACH INSURANCE SUBMISSION MUST BE SENT SEPARATELY AND MAY NOT BE COMBINED WITH OTHER AGREEMENTS.

4. FAILURE OF THE AUTHORITY/MTA TO DEMAND SUCH COS OR OTHER EVIDENCE OF FULL COMPLIANCE WITH THESE INSURANCE REQUIREMENTS, OR FAILURE OF THE AUTHORITY/MTA TO IDENTIFY A DEFICIENCY FROM EVIDENCE PROVIDED, WILL NOT BE CONSTRUED AS A WAIVER OF THE PERMITTEE'S OBLIGATION TO MAINTAIN SUCH INSURANCE. THE AUTHORITY/MTA ACCEPTANCE OF ANY COI EVIDENCING THE REQUIRED COVERAGES AND LIMITS DOES NOT CONSTITUTE APPROVAL OR AGREEMENT BY THE AUTHORITY/MTA THAT THE INSURANCE REQUIREMENTS HAVE BEEN MET OR THAT THE INSURANCE POLICIES SHOWN IN THE COI ARE IN COMPLIANCE WITH THE REQUIREMENTS.

5. THE AUTHORITY/MTA HAS THE RIGHT, BUT NOT THE OBLIGATION, OF PROHIBITING THE PERMITTEE FROM ENTERING THE AUTHORITY PROPERTY UNTIL THE AUTHORITY/MTA RECEIVES ALL COIS OR OTHER EVIDENCE THAT INSURANCE HAS BEEN PLACED IN COMPLETE COMPLIANCE WITH THESE REQUIREMENTS.

SECTION D. REQUIRED ADDITIONAL INSUREDS/INDEMNIFIED PARTIES:

THE NEW YORK CITY TRANSIT AUTHORITY ('NYCT'), THE MANHATTAN AND BRONX SURFACE TRANSIT OPERATING AUTHORITY ('MABSTOA'), THE STATEN ISLAND RAPID TRANSIT OPERATING AUTHORITY ('SIRTOA'), THE METROPOLITAN TRANSPORTATION AUTHORITY ('MTA') INCLUDING ITS SUBSIDIARIES AND AFFILIATES, MTA CONSTRUCTION & DEVELOPMENT COMPANY ('MTA C&D'), MTA BUS COMPANY ('MTA BUS'), AND THE CITY OF NEW YORK ('CITY AS OWNER') AND THE RESPECTIVE AFFILIATES AND SUBSIDIARIES EXISTING CURRENTLY OR IN THE FUTURE OF AND SUCCESSORS TO EACH INDEMNIFIED PARTIES LISTED HEREIN.

1. INSURANCE REQUIREMENTS:
REFER TO YOUR AGREEMENT FOR REQUIRED INSURANCE COVERAGES, LIMITS, AND ENDORSEMENTS AND REVIEW WITH YOUR AUTHORIZED INSURANCE BROKER FOR COMPLIANCE.
2. ACCEPTABLE FORMS OF INSURANCE:
- ACORD 25: CERTIFICATE OF INSURANCE
- ACORD 855: NY CONSTRUCTION CERTIFICATE OF LIABILITY ADDENDUM
- ACORD 28: CERTIFICATE OF COMMERCIAL PROPERTY INSURANCE
- ACORD BINDER OR INSURANCE POLICY

WORKERS COMPENSATION (ALTERNATIVE OPTIONS):
- C–105.2 - CERTIFICATE OF WORKERS COMPENSATION INSURANCE; OR
- U–26.3 - CERTIFICATE OF WORKERS COMPENSATION FROM THE STATE INSURANCE FUND; OR
- GSI–105/SI–12 - CERTIFICATE OF WORKERS COMPENSATION SELF INSURANCE; OR
- CE–200 - ATTESTATION OF EXEMPTION WHEN CONTRACTOR MEETS THE REQUIREMENTS (E.G.) SOLE PROPRIETOR

3. CERTIFICATE OF INSURANCE MUST INCLUDE AT A MINIMUM:
- POLICY COVERAGE DETAILS (E.G.) POLICY TERM, PER OCCURRENCE/PER PROJECT; LIMITS/SUB-LIMITS, AGGREGATE LIMITS, DEDUCTIBLES, SELF-INSURED RETENTIONS, AND INSURANCE CARRIER NAME AND CORRESPONDING NAIC # CONTRACT IDENTIFIER (E.G.) CONTRACT #, RFP #, OR ENTRY PERMIT #
- LOCATION AND DESCRIPTION OF WORK
- INDEMNIFIED PARTIES AS ADDITIONAL INSURED INCLUDING PRIMARY AND NONCONTRIBUTORY COVERAGE AND WAIVER OF SUBROGATION IN FAVOR OF THE MTA AGENCY
- CERTIFICATE HOLDER MUST LIST THE MTA AGENCY'S NAME AND ADDRESS
- CERTIFICATE OF INSURANCE MUST BE SIGNED BY AN AUTHORIZED INSURANCE REPRESENTATIVE

4. INSURANCE BINDER / POLICY MUST INCLUDE AT A MINIMUM:
(APPLICABLE FOR RAILROAD PROTECTIVE LIABILITY AND BUILDER'S RISK/INSTALLATION FLOATER)
- POLICY COVERAGES AND DETAILS (E.G.) POLICY TERM, LIMITS/SUB-LIMITS, AGGREGATE LIMITS, DEDUCTIBLES, SELF-INSURED RETENTIONS, INSURANCE CARRIER NAME AND APPLICABLE NAIC #
- CONTRACT NUMBER OR ENTRY PERMIT NUMBER; DESIGNATED CONTRACTOR; LOCATION AND DESCRIPTION OF WORK
- INDEMNIFIED PARTIES AS EITHER A NAMED INSURED OR ADDITIONAL NAMED INSURED
- BINDER MUST BE ISSUED AND SIGNED BY THE AUTHORIZED INSURANCE COMPANY OR THEIR AUTHORIZED INSURANCE AGENT

5. SUBMISSION OF INSURANCE:
(EVIDENCE OF ALL REQUIRED INSURANCE MUST BE SENT TO YOUR AGENCY OR PROCUREMENT REPRESENTATIVE)
ACORD CERTIFICATE OF INSURANCE
- ADDITIONAL INSURED ENDORSEMENTS (E.G.) CG 20 26
- PRIMARY AND NON-CONTRIBUTORY ENDORSEMENTS
- WAIVER OF SUBROGATION ENDORSEMENTS
- ENVIRONMENTAL ENDORSEMENTS (E.G.) MCS 90 AND CA 99 48, AND OR MOSL WHEN APPLICABLE
- INSURANCE POLICY – A BINDER MAY BE ACCEPTED PENDING ISSUANCE OF THE POLICY. POLICY MUST BE SUBMITTED WITHIN 30 DAYS FROM BINDER EFFECTIVE DATE.
- JOINT VENTURE (JV) - IF THE CONTRACTOR/CONSULTANT IS A JOINT VENTURE, GENERAL LIABILITY INSURANCE MUST BE PROVIDED IN THE NAME OF THE JOINT VENTURE. ALTERNATIVELY, A NAMED INSURED ENDORSEMENT LISTING THE JOINT VENTURE MAY BE ACCEPTED.

6. INSURANCE COMPLIANCE.
THE PERMITTEE WILL BE NOTIFIED WHEN INSURANCE IS COMPLIANT THROUGH THE ASSIGNED 'CONTRACT SPECIFIC' EMAIL ADDRESS.

NEW YORK CITY TRANSIT GENERAL NOTES

NOTE: THE APPROPRIATE NOTES ARE TO BE MADE PART OF THE PROJECT'S CONTRACT DRAWINGS.

1. THE NYC TRANSIT (NYCT) RESERVES THE RIGHT TO PLACE INSPECTORS, FLAGMEN OR OTHER PERSONNEL IN THE SUBWAY STRUCTURES DURING CONSTRUCTION IN THE VICINITY OF ANY TELEPHONE SYSTEM, IF DEEMED NECESSARY, TO OBSERVE THE EFFECTS OF THE CONSTRUCTION ON THE TRANSIT FACILITIES. NYCT FURTHER RESERVES THE RIGHT TO PLACE SUCH PERSONNEL WHENEVER, IN ITS OPINION, THE PROJECT CONDITIONS WARRANT SUCH PLACEMENT, REGARDLESS OF DISTANCE. THE COST OF SUCH PERSONNEL, TELEPHONE INSTALLATION AND ANY RE-ROUTES, REMOVAL OF SERVICE, WORK TRAINS, ETC., MADE NECESSARY BY THE PROJECT, MUST BE BORNE BY THE PROJECT OR THE RESPONSIBLE NEW YORK CITY/STATE AGENCY..

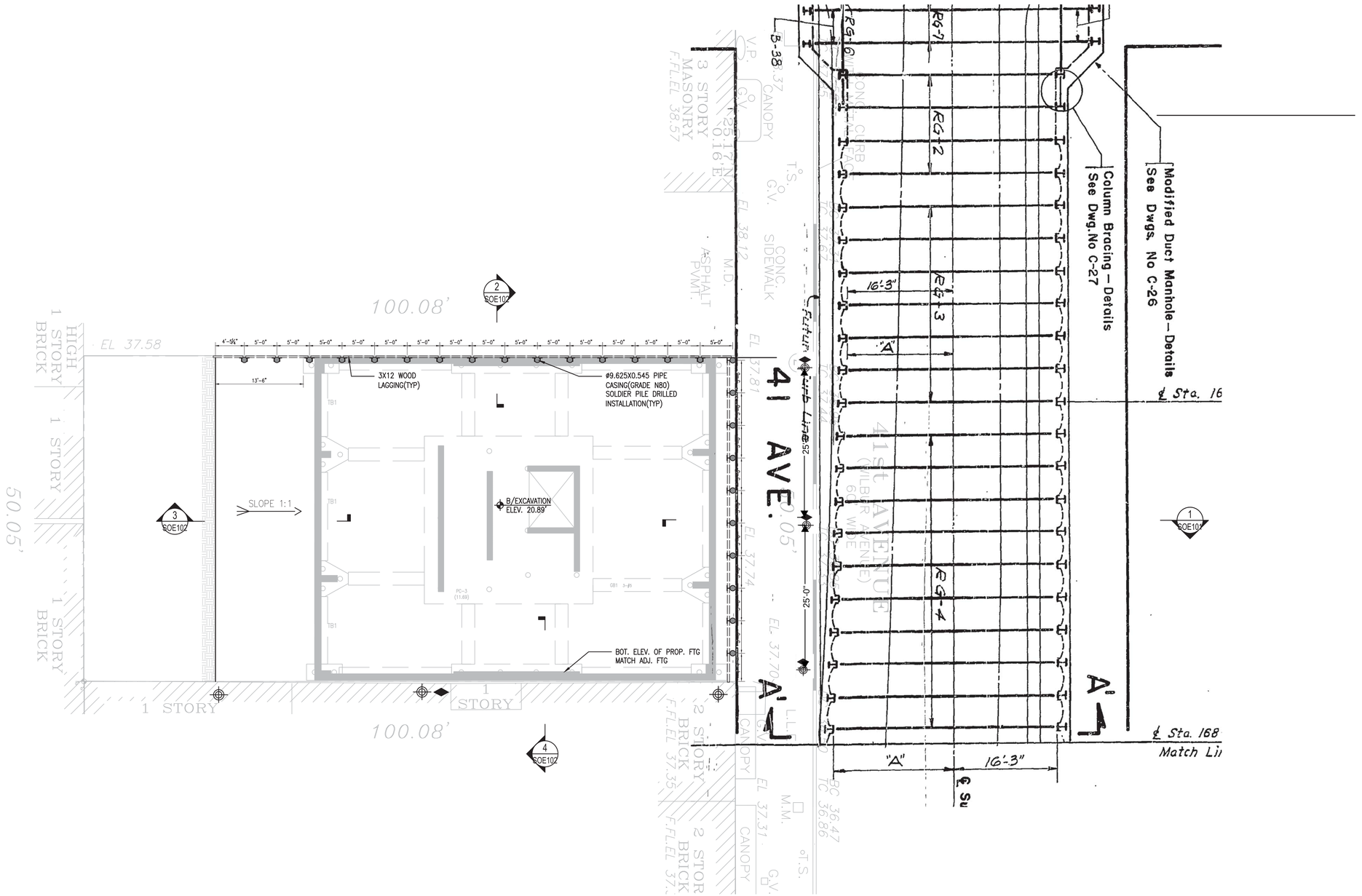
2. ALL ROCK EXCAVATION ADJACENT TO THE TRANSIT STRUCTURE IS TO BE CHANNEL DRILLED TWO FEET BELOW SUBGRADE.

3. IF TOP OF ROCK IS FOUND BELOW SUBWAY STRUCTURE, THE SUBWAY STRUCTURE MUST BE UNDERPINNED IN ACCORDANCE WITH DRAWINGS TO BE SUBMITTED TO NYCT FOR APPROVAL. UNDERPINNING DRAWINGS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW YORK.

4. IF THE ROCK STRATUM QUALITY IS SOFT OR SEAMY, LATERAL SUPPORTS SHALL BE PROVIDED BEFORE THE SUBWAY STRUCTURE IS EXCAVATED WITH DRAWINGS AND CALCULATIONS SUBMITTED TO NYCT FOR REVIEW AND APPROVAL. LATERAL SUPPORT SYSTEM DRAWINGS AND CALCULATIONS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW YORK.

5. BLASTING WITH LIGHT CHARGES ONLY SHALL BE PERMITTED SUBJECT TO THE APPROVAL OF NYCT'S ENGINEER AND IN ACCORDANCE WITH THE REGULATIONS OF THE FIRE DEPARTMENT. THE CONTRACTOR SHALL PROVIDE A DETAILED MONITORING PLAN, PROVIDING FOR MEASUREMENTS OF BOTH PARTICLE VELOCITY AND DISPLACEMENTS AT CRITICAL LOCATIONS OF THE NYCT STRUCTURE. THE MONITORING PLAN SHALL INCLUDE THRESHOLD AND UPSET LEVELS OF BOTH PARTICLE VELOCITY AND SETTLEMENT TOGETHER WITH AN ACTION PLAN FOR THEIR IMPLEMENTATION. THE CONTRACTOR SHALL SECURE AN APPROVED SEISMOLOGIST TO INSTALL AND OPERATE SUITABLE VELOCITY GAUGES TO CONTINUOUSLY MONITOR PARTICLE VELOCITY AND AN INDEPENDENT LICENSED SURVEYOR TO MONITOR DISPLACEMENTS. A QUALIFIED TEC

No.	DATE	DESCRIPTION
		NOT FOR CONSTRUCTION



EXCAVATION AND SHORING PLAN

SCALE: 1/8"=1'

PROJECT:

28-12 41ST AVE, QUEENS, NY 11101

DRAWING TITLE:

EXCAVATION AND SHORING PLAN

STRUCTURAL ENGINEER:

JUST CONSULTING ENGINEERING,PLLC
217-14 NORTHERN BLVD, SUITE 207,BAYSIDE, NY
Tel: (718) 308-6986, Email: xwang@jcepllc.com

MEP ENGINEER:

SEAL & SIGNATURE:

STATE OF NEW YORK · HAOJUN WANG · LICENSED PROFESSIONAL ENGINEER · 090417

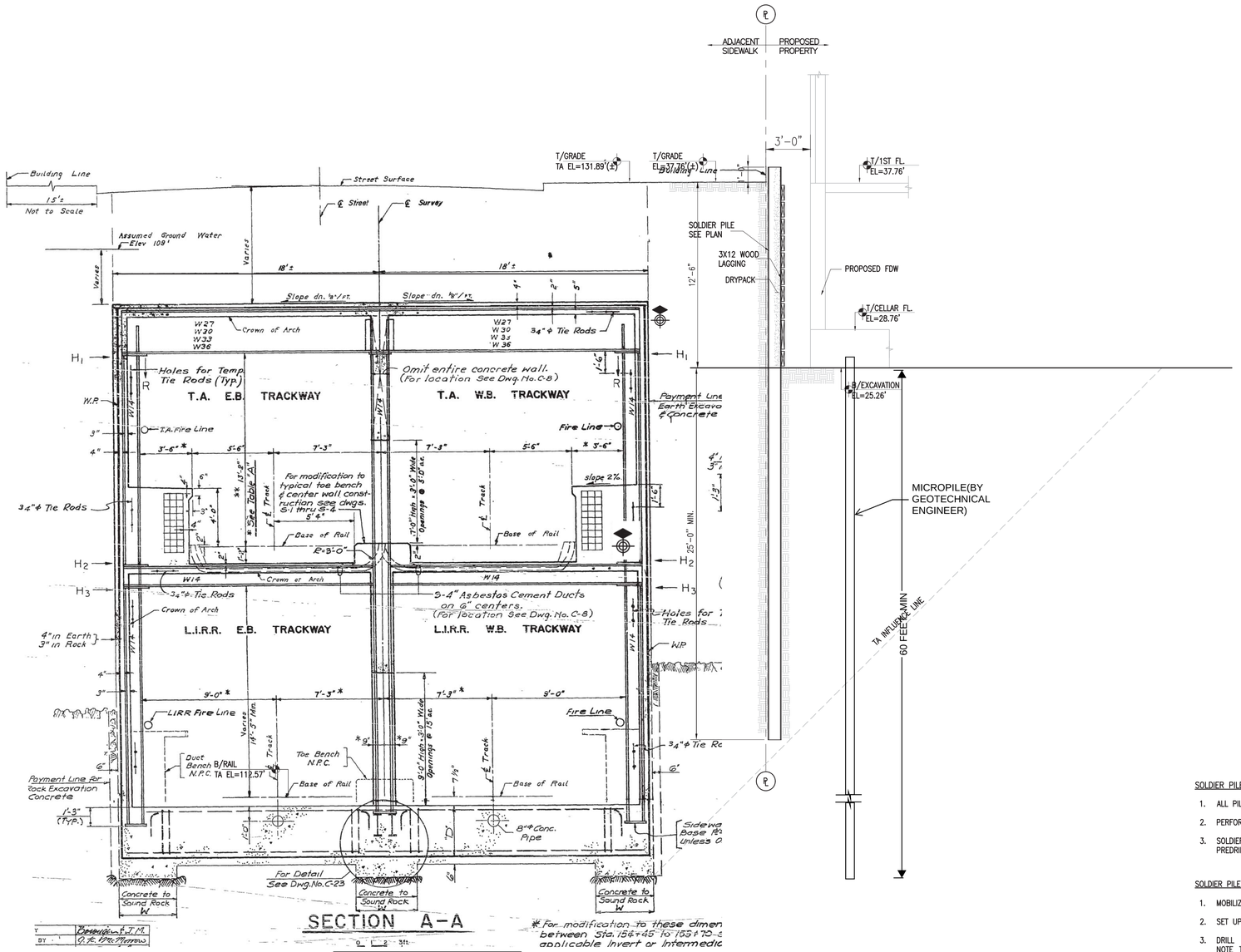
DATE: 08/13/2025
PROJECT No.: 25036
DRAWN BY:
CHECKED BY:
CADD FILE No.:

DWG. No.: SOE-100.00

3 OF 5

NYC DOB JOB NO. :

No.	DATE	DESCRIPTION
		NOT FOR CONSTRUCTION



MTA REFERENCE:
ROUTE NO.07 SECTION NO.9
MARCY AVE– BROOKLYN
MYRTEL–WILLOUGHBY AVE STATION
STA. 1064+40 TO STA. 1068+70
STRUCTURAL PLANS
SECTIONS
FILE NO: 6409
DWG NO. 324

1 SOE-101 SECTION
SCALE: 1/4" = 1'-0"

NOTE:
1) CONTRACTOR TO VERIFY THE FIELD CONDITION
2) REFER TO ARCH DWG FOR WATERPROOFING

SOLDIER PILE INSTALLATION NOTES:

1. ALL PILES SHALL BE INSTALLED IN THE LOCATION SHOWN ON THESE DRAWINGS.
2. PERFORM UTILITY IDENTIFICATION AND EXPLORATION AS NECESSARY.
3. SOLDIER PILES SHALL BE DRILLED AND SHALL BE INSTALLED USING A CASING PREDRILLED AT EACH LOCATION.

SOLDIER PILE INSTALLATION PROCEDURE:

1. MOBILIZATION TO SITE.
2. SET UP RIG ON PROPER LOCATION AND PLUMB MAST.
3. DRILL IN PILES USING DUPLEX DRILLING METHODS. FLUSH WITH WATER ONLY. NOTE THAT OUTSIDE CASING TO BE ADVANCED 2–DIAMETERS OR 2 FOOT MIN. PRIOR TO CLEANING.
4. SPECIFIED CASING IS DRILLED INTO THE TIP ELEVATION OF THE SOLDIER PILE AS INDICATED ON THE PLAN.
5. FLUSH HOLE CLEAN OF SPOILS. IF PILE TIP IS BELOW THE GWT. FLUID LEVEL INSIDE CASING TO BE MAINTAINED AT THE TOP OF THE PILE DURING CLEAN OUT. A BUCKET OR AUGER MAY BE USED TO CLEAN HOLE.
6. PLACE PIPE SOLDIER PILE INSIDE CASING UP TO TIP ELEVATION AS INDICATED ON THE PLAN.
7. PLACE ¾" DIAMETER PVC GROUT TUBE TO WITHIN 2FT OF BOTTOM OF CASING. AND GROUT THE PILE FROM THE BOTTOM–UP SURROUNDING THE SOLDIER PILE WITH A MIXTURE OF CEMENT AND SAND FOLLOWING STRENGTH INDICATED ON THE PLAN. CONTINUE GROUTING UNTIL GOOD GROUT FLOWS OUT THE TOP OF THE PILE.
8. THE INSTALLATION OF ADDITIONAL PILES IN THE SAME CAP SHALL NOT BE INSTALLED UNTIL GROUT HAS CURED FOR AT LEAST 24 HOURS.C.

PROJECT:

28-12 41ST AVE, QUEENS, NY 11101

DRAWING TITLE:

SHORING SECTIONS

STRUCTURAL ENGINEER:

JUST CONSULTING ENGINEERING,PLLC
217-14 NORTHERN BLVD, SUITE 207,BAYSIDE, NY
Tel: (718) 308-6986, Email: xwang@jceplic.com

MEP ENGINEER:

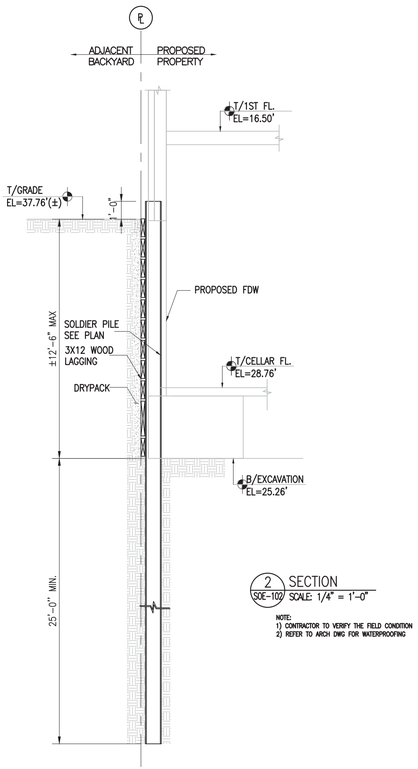
■ SEAL & SIGNATURE:

STATE OF NEW YORK
XIAOJUN WANG
LICENSED PROFESSIONAL ENGINEER
No. 104.5

DATE: 08/13/2025
PROJECT No.: 25036
DRAWN BY:
CHECKED BY:
CADD FILE No.:
DWG. No.: SOE-101.00
4 OF 5

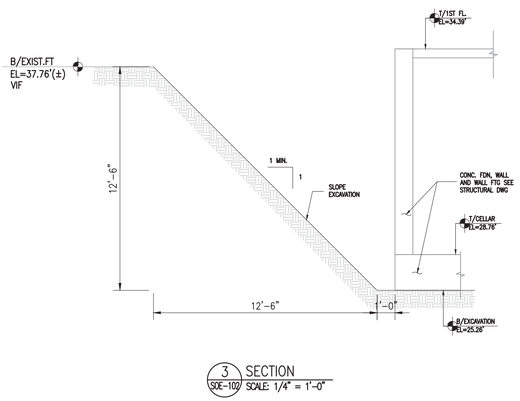
NYC DOB JOB NO. :

No.	DATE	DESCRIPTION
		NOT FOR CONSTRUCTION

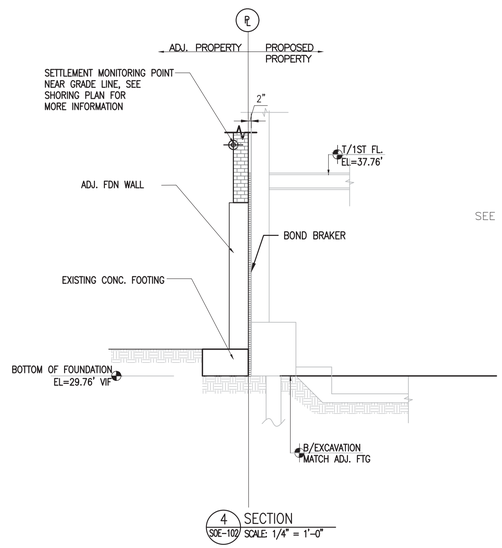


2 SECTION
SOE-102 SCALE: 1/4" = 1'-0"

NOTE:
1) CONTRACTOR TO VERIFY THE FIELD CONDITION
2) REFER TO ARCH DWG FOR WATERPROOFING

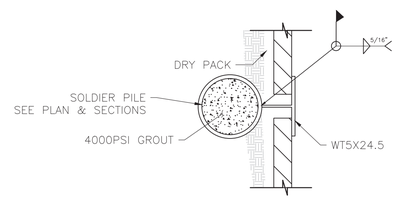


3 SECTION
SOE-102 SCALE: 1/4" = 1'-0"



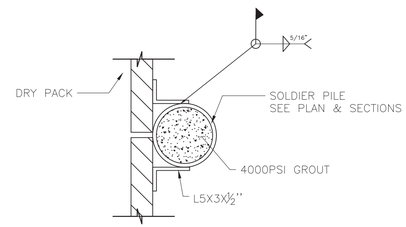
4 SECTION
SOE-102 SCALE: 1/4" = 1'-0"

NOTE: SEE ARCH FOR WATERPROOFING



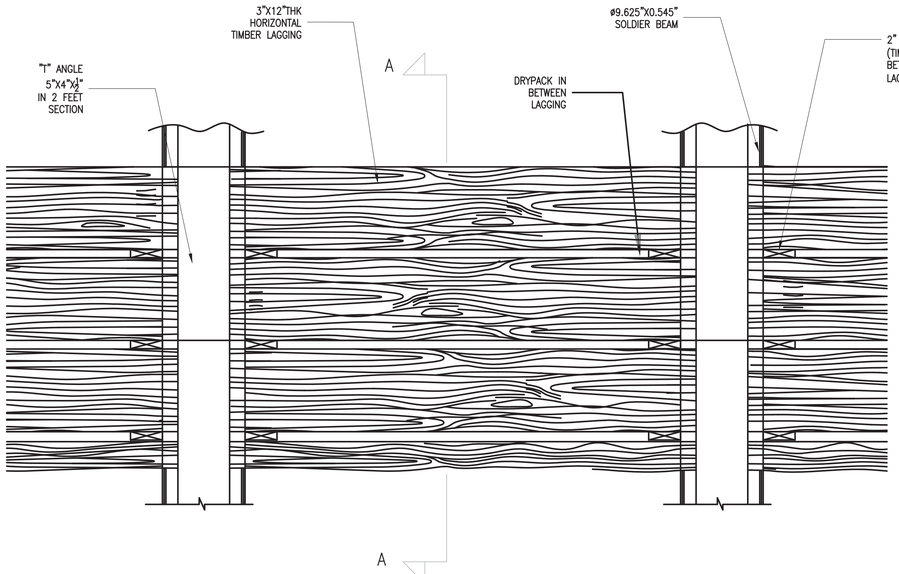
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NOT TO SCALE

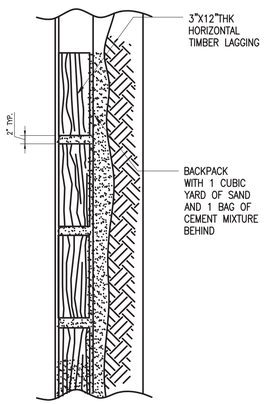


B SOE102 LAGGING DETAILS– 2

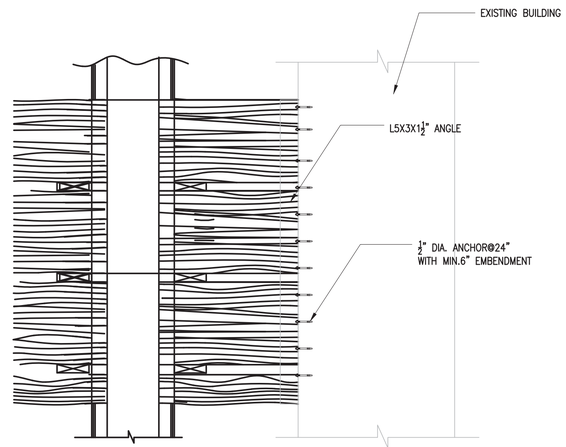
NOT TO SCALE



SHORING LAGGING
DETAILS SECTION (TYP)
SCALE: 1/8" = 1'-0"



SECTION A–A
SCALE: 1/8" = 1'-0"



SHORING LAGGING AT ADJ. BUILDING
SCALE: 1/8" = 1'-0"

PROJECT:

28-12 41ST AVE, QUEENS, NY 11101

DRAWING TITLE:

SHORING SECTIONS

STRUCTURAL ENGINEER:

JUST CONSULTING ENGINEERING,PLLC
217-14 NORTHERN BLVD, SUITE 207,BAYSIDE, NY
Tel: (718) 308-6986, Email: xwang@jceplic.com

MEP ENGINEER:

■ SEAL & SIGNATURE:

STATE OF NEW YORK · JUNJUN WANG · LICENSED PROFESSIONAL ENGINEER · 104

DATE:	08/13/2025
PROJECT No.:	25036
DRAWN BY:	
CHECKED BY:	
CADD FILE No.:	

DWG. No.: SOE-102.00

5 OF 5

NYC DOB JOB NO. :

APPENDIX D
Construction Health and Safety Plan

HALEY & ALDRICH, INC.
SITE-SPECIFIC SAFETY PLAN

FOR

28-12 41st Ave Development

28-12 41st Avenue

Project/File No. 0214374

Gensuite EZ Scan®

BI - Developers

Prepared By: Ali Reach	**Date: 11/4/2025**
Approvals: The following signatures constitute approval of this Health & Safety Plan.	
	
Field Safety Manager: Luke J. McCartney, P.G.	**Date: 11/16/2025**
	
Project Manager: Luke J. McCartney, P.G.	**Date: 11/16/2025**
HASP Valid Through: 12/31/2026	

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Note: This HASP has been developed for Haley & Aldrich purposes only and is not for use by others.

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Note: This HASP is developed for Haley & Aldrich purposes only and not for use by others.

STOP WORK AUTHORITY

In accordance with Haley & Aldrich (Haley & Aldrich) Stop Work Authority Operating Procedure (OP1035), any individual has the right to refuse to perform work that he or she believes to be unsafe without fear of retaliation. He or she also has the authority, obligation, and responsibility to stop others from working in an unsafe manner.

STOP Work Authority is the stop work policy for all personnel and subcontractors on the Site. When work has been stopped due to an unsafe condition, Haley & Aldrich site management (e.g., Project Manager [PM], Site Health & Safety Officer [SHSO], etc.) and the Haley & Aldrich Senior Project Manager (SPM) will be notified immediately.

Reasons for issuing a stop work order include, but are not limited to:

- The belief/perception that injury to personnel or accident causing significant damage to property or equipment is imminent.
- An Haley & Aldrich subcontractor is in breach of site safety requirements and/or their own site HASP.
- Identifying a substandard condition (e.g., severe weather) or activity that creates an unacceptable safety risk as determined by a qualified person.

Work will not resume until the unsafe act has been stopped OR sufficient safety precautions have been taken to remove or mitigate the risk to an acceptable degree. Stop work orders will be documented as part of an on-site stop work log, on daily field reports to include the activity/activities stopped, the duration, person stopping work, person in-charge of stopped activity/activities, and the corrective action agreed to and/or taken. Once work has been stopped, only the Haley & Aldrich SPM or SHSO can give the order to resume work. Haley & Aldrich senior management is committed to support anyone who exercises his or her “Stop Work” authority.

Note: This HASP has been developed for Haley & Aldrich purposes only and is not for use by others.

ISSUANCE AND COMPLIANCE

This HASP has been prepared in accordance with Occupational Safety and Health Administration (OSHA) regulations (CFR 29, Parts 1904, 1910, and 1926) if such are applicable.

The specific requirements of this HASP include precautions for hazards that exist during this project and may be revised as new information is received or as site conditions change.

- This HASP must be signed by all Haley & Aldrich personnel involved in implementation of the SOW (Section 2 of this HASP).
- This HASP, or a current signed copy, must be retained at all times when Haley & Aldrich staff are present.
- Revisions to this HASP must be outlined within the contents of the HASP. If immediate or minor changes are necessary, the Field Safety Manager (FSM), Haley & Aldrich, SSO and/or Project Manager (PM) may use Attachment 1 (HASP Amendment Form), presented at the end of this HASP. Any revision to the HASP requires employees and subcontractors to be informed of the changes so that they understand the requirements of the change.
- Deviations from this HASP are permitted with approval from the Haley & Aldrich FSM, PM, or Senior Health & Safety Manager (SHSM). Unauthorized deviations may constitute a violation of Haley & Aldrich company procedures/policies and may result in disciplinary action.
- This HASP will be relied upon by Haley & Aldrich's subcontractors and visitors to the site. Haley & Aldrich's subcontractors must have their own HASP which will address hazards specific to their trade that is not included in this HASP. This HASP will be made available for review to Haley & Aldrich's subcontractors and other interested parties (e.g. Facility personnel and regulatory agencies) to ensure that Haley & Aldrich has properly informed our subcontractors and others of the potential hazards associated with the implementation of the SOW to the extent that Haley &Aldrich is aware.

This site-specific HASP provides only site-specific descriptions and work procedures. General safety and health compliance programs in support of this HASP (e.g., injury reporting, medical surveillance, personal protective equipment (PPE) selection, etc.) are described in detail in the Haley &Aldrich Corporate Health and Safety Program Manual and within Haley & Aldrich's Standard Operating Procedures Both the manual and SOPs can be located on the Haley & Aldrich's Company Intranet. When appropriate, users of this HASP should always refer to these resources and incorporate to the extent possible. The manual and SOPs are available to clients and regulators upon request.

Note: This HASP is developed for Haley & Aldrich purposes only and not for use by others.

EMERGENCY EVENT PROCEDURES

1 - ASSESS THE SCENE

- **STOP WORK**
- Review the situation and ascertain if it's safe to enter the area.
- Evacuate the site if the conditions are unsafe.

2 - EVALUATE THE EMERGENCY

- **Call 911, or designated emergency number, if required.**
- **Provide first aid for the victim if qualified and safe to do so.**
  - First aid will be addressed using the onsite first aid kit. *
    - If providing first aid, remember to use proper first aid universal precautions if blood or bodily fluids are present.
- **If exposure to hazardous substance is suspected, immediately vacate the contaminated area.**
  - Remove any contaminated clothing and/or equipment.
  - Wash any affected dermal/ocular area(s) with water for at least 15 minutes.
  - Seek immediate medical assistance if any exposure symptoms are present.

** Note: Haley & Aldrich employees are not required or expected to administer first aid / CPR to any Haley & Aldrich staff member, Contractor, or Civilian personnel at any time; it is Haley & Aldrich´s position that those who do are doing so on their own behalf and not as a function of their job.*

3 - SECURE THE AREA

- **Cordon off the incident area, if possible.**
  - Notify any security personnel, if required.
  - Escort all non-essential personnel out of the area, if able.

4 - REPORT ON-SITE ACCIDENTS / INCIDENTS TO PM / SSO

- **Notify the PM and SSO as soon as it is safe to do so.**
  - Assist PM and SSO in completing any additional tasks, as required.

5 - INVESTIGATE / REPORT THE INCIDENT

- **Record details of the incident for input to the Gensuite.**
  - Complete any additional forms as requested by the PM and SSO.

6 - TAKE CORRECTIVE ACTION

- **Implement corrective actions per the PM following root cause analysis.**
  - Complete Lessons Learned form.

Note: This HASP is developed for Haley & Aldrich purposes only and not for use by others.

PROJECT INFORMATION AND CONTACTS	
Project Name: 28-12 41st Ave Development	**Haley & Aldrich File No.:** 0214374
Location: 28-12 41st Avenue, Long Island City, Queens, NY	
Client/Site Contact: Phone Number:	Aditya Shah 929-333-1997
Haley & Aldrich Field Representative: Phone Number: Emergency Phone Number:	Joseph Mastro 914-960-5599 914-960-5599
Haley & Aldrich Project Manager: Phone Number: Emergency Phone Number:	Luke McCartney 646.568.9357 551.655.7720
Field Safety Manager: Phone Number: Emergency Phone Number:	Luke McCartney 646.568.9357 551.655.7720
Subcontractor Project Manager: Phone Number:	Enter Name Enter Phone Number
Nearest Hospital: Address: (see map on next page) Phone Number:	N New York – Presbyterian/Weill Cornell Medical Center 525 E 68th Street, New York, NY 10065 212-746-5026
Nearest Occ. Health Clinic: http://www.talispoint.com/liberty/ext/ Address: (see map on next page) Phone Number:	**CALL ACUITY** **1-888-397-8099**
Liberty Mutual Claim Policy	**WC6Z11254100036**
ACUITY HOTLINE	**1-888-397-8099**
Emergency Response Number:	**911**
Other Local Emergency Response Number:	N/A
Other Ambulance, Fire, Police, or Environmental Emergency Resources:	911

Note: This HASP is developed for Haley & Aldrich purposes only and not for use by others.

DIRECTIONS TO THE NEAREST HOSPITAL

Liberty Mutual Medical Location Directory



Directions to the Nearest Hospital:

16 min (2.6 miles)

via Ed Koch Queensboro Bridge Lower Roadway

Fastest route now due to traffic conditions

⚠ This route has tolls.

28-12 41st Ave
Long Island City, NY 11101

> Take 29th St and 28th St to Bridge Plaza N/Queens Plaza N
>
> 3 min (0.4 mi)

> Take Ed Koch Queensboro Bridge Lower Roadway and 1st Ave to E 68th St in Manhattan
>
> 7 min (2.0 mi)

↱ Turn right onto E 68th St

ⓘ Destination will be on the right

3 min (0.2 mi)

NewYork-Presbyterian/Weill Cornell Medical Center
525 E 68th St, New York, NY 10065

Note: This HASP is developed for Haley & Aldrich purposes only and not for use by others.

DIRECTIONS TO THE NEAREST URGENT CARE

Liberty Mutual Medical Location Directory

CALL ACUITY HOTLINE:
1-888-397-8099

Note: This HASP is developed for Haley & Aldrich purposes only and not for use by others.

1. WORK SCOPE

This Site-Specific Health and Safety Plan addresses the health and safety practices and procedures that will be exercised by all Haley & Aldrich employees participating in all work on the Project Site. This plan is based on an assessment of the site-specific health and safety risks available to Haley & Aldrich and Haley & Aldrich's experience with other similar project sites. The scope of work includes the following:

Site mobilization involving site walks, equipment mobilization and utility mark outs (GPR). Remedial oversight and soil sampling. Screening of soil cored during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.

Project Task Breakdown

Task No.	Task Description	Employee(s) Assigned	Work Date(s) or Duration
1	Site Walk	Owen Hennigan	1 day
2	Remedial Oversight	Owen Hennigan	6 months
3	Soil Sampling	Owen Hennigan	6 months

Subcontractor(s) Tasks

Firm Name	Work Activity	Work Date(s) or Duration
Enter name.	Enter task description.	Enter dates/duration.

Projected Start Date: 3/2/2026

Projected Completion Date: 9/2/2026

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2. SITE OVERVIEW / DESCRIPTION

Site Classification

Industrial & Manufacturing

Site Description

The Site, located in the Long Island City neighborhood of Queens, is identified as Block 417 Lot 20 on the New York City tax map. The Site is approximately 5,000 square feet (sq ft) (0.11 acres) and is currently improved with a one-story, slab-on-grade warehouse used for parking and storage. The Site has been assigned an E-designation (E-104, CEQR 00DCP055Q) for hazardous materials as part of the Long Island City District rezoning.

Background and Historic Site Usage

Historical operations at the Site, which was developed as early as the late 1800s as dwellings, later operated as various commercial and manufacturing uses, including a metal works, dry cleaner, laundry facility with two oil storage tanks, printer, and auto repair from 1971 to present day. The latest use was a laundry facility with the operation of two oil storage tanks (installed in 2007).

Site Status

Indicate current activity status and describe operations at the site:

Inactive

Vacant warehouse

Site Plan

Is a site plan or sketch available? Yes

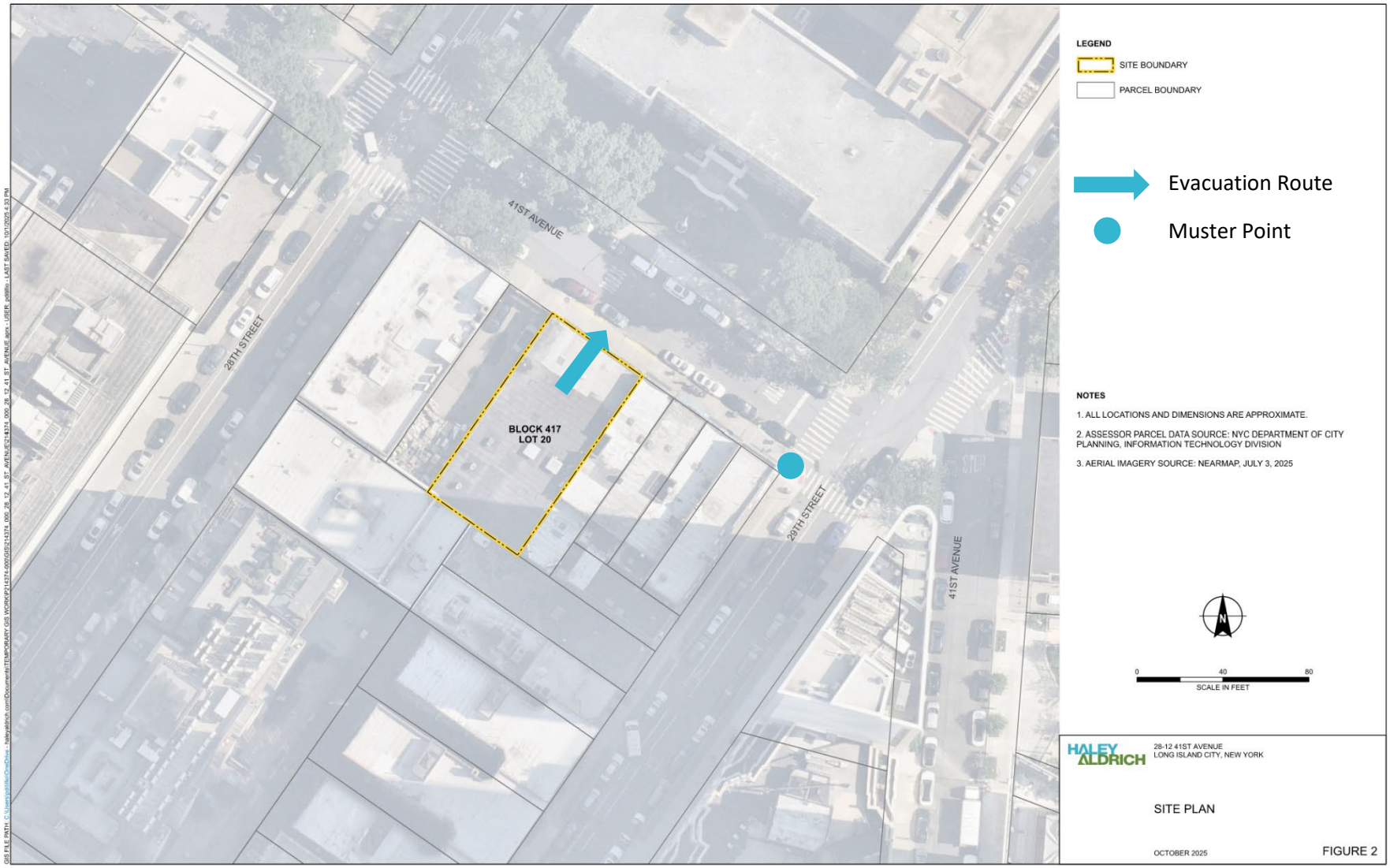
Work Areas

List and identify each specific work areas(s) on the job site and indicate its location(s) on the site plan:

Entire Site

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Site Plan



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3. HAZARD ASSESSMENT

Indicate all hazards that may be present at the site and for each task. If any of these potential hazards are checked, it is the Project Manager's responsibility to determine how to eliminate / minimize the hazard to protect onsite personnel.

Site Chemical Hazards

Is this Site impacted with chemical contamination? Yes

Source of information about contaminants: Previous Investigation

Contaminant of Concern	Location/Media	Concentration	Units
Tetrachloroethylene	**Soil**	**5.5**	**mg/kg**
Benzo(a)pyrene	**Soil**	**26**	**mg/kg**
Benzo(a)anthracene	**Soil**	**24**	**mg/kg**
Benzo(b)fluoranthene	**Soil**	**30**	**mg/kg**
Chrysene	**Soil**	**23**	**mg/kg**
Dibenzo(a,h)anthracene	**Soil**	**3.8**	**mg/kg**
Indeno(1,2,3-cd)pyrene	**Soil**	**10**	**mg/kg**
Organochlorine Pesticides	**Soil**	**0.03**	**mg/kg**
Arsenic	**Soil**	**25.7**	**mg/kg**
Barium	**Soil**	**537**	**mg/kg**
Copper	**Soil**	**204**	**mg/kg**
Lead	**Soil**	**1,210**	**mg/kg**
Mercury	**Soil**	**2.87**	**mg/kg**
Selenium	**Soil**	**4.26**	**mg/kg**
Zinc	**Soil**	**850**	**mg/kg**
Polychlorinated biphenyls (PCBs)	**Soil**	**0.242**	**mg/kg**
Benzo(a)pyrene	**Groundwater**	**0.05**	**ug/L**

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Benzo(a)anthracene	**Groundwater**	**0.09**	**ug/L**
Benzo(b)fluoranthene	**Groundwater**	**0.07**	**ug/L**
Chrysene	**Groundwater**	**0.05**	**ug/L**
Indeno(1,2,3-cd)pyrene	**Groundwater**	**0.04**	**ug/L**
Lead	**Groundwater**	**102.6**	**ug/L**
PFOA	**Groundwater**	**164**	Select Units**ppt**
PFOS	**Groundwater**	**95.2**	Select Units**ppt**
Trichloroethylene	**Soil Vapor**	**37.9**	**ug/m3**
Tetrachloroethylene	**Soil Vapor**	**11,500**	**ug/m3**
1,1,1-trichloroethane	**Soil Vapor**	**141**	**ug/m3**

Polycyclic aromatic hydrocarbons (PAHs): are a class of chemicals that occur naturally in coal, crude oil, and gasoline. They also are produced when coal, oil, gas, wood, garbage, and tobacco are burned. PAHs generated from these sources can bind to or form small particles in the air. High-temperature cooking will form PAHs in meat and in other foods. Naphthalene is a PAH that is produced commercially in the United States to make other chemicals and mothballs. Cigarette smoke contains many PAHs.

VOCs: include all organic compounds (substances made up of predominantly carbon and hydrogen) with boiling temperatures in the range of 50-260 degrees C, excluding pesticides. This means that they are likely to be present as a vapor or gas in normal ambient temperatures. Substances which are included in the VOC category include aliphatic hydrocarbons (such as hexane), aldehydes, aromatic hydrocarbons (such as benzene, toluene, and the xylenes or BTEX), and oxygenated compounds (such as acetone and similar ketones). The term VOC often is used in a legal or regulatory context and in such cases the precise definition is a matter of law.

VOCs are released from oil and gasoline refining, storage and combustion as well as from a wide range of industrial processes. Processes involving fuels, solvents, paints or the use of chemicals are the most significant sources. VOCs may also be emitted from cleaning products, degreasing products, fabrics, carpets, plastic products, glues, printed material, varnishes, wax, disinfectants, and cosmetics.

Typically, VOCs are present in gas or vapor and will enter the body by breathing contaminated air. Higher concentrations of VOCs may occur in areas of poor ventilation.

Arsenic: The Occupational Safety and Health Administration has set limits of 10 microgram arsenic per cubic meter of workplace air (10 µg/m3) for 8 hour shifts and 40 hour work weeks. Several studies have shown that inorganic arsenic can increase the risk of lung cancer, skin cancer, bladder cancer, liver cancer, kidney cancer, and prostate cancer. The World Health Organization (WHO), the Department of

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Health and Human Services (DHHS), and the EPA have determined that inorganic arsenic is a human carcinogen.

Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs. Ingesting high levels of inorganic arsenic can result in death. Lower levels of arsenic can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet.

Barium: is a soft, silvery metal that rapidly tarnishes in air and reacts with water. It is mostly used in drilling fluids for oil and gas wells and used in paint and in glassmaking. All barium compounds are toxic; however, barium sulfate is insoluble and so can be safely swallowed. A suspension of barium sulfate is sometimes given to patients suffering from digestive disorders.

Barium has no known biological role, although barium sulfate has been found in one type of algae. Barium is toxic, as are its water- or acid-soluble compounds. Barium occurs only in combination with other elements. The major ores are barite (barium sulfate) and witherite (barium carbonate). Barium metal can be prepared by electrolysis of molten barium chloride, or by heating barium oxide with aluminum powder.

Lead: The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system. Long-term exposure to lead can result in decreased performance in some tests measuring functions of the nervous system in adults. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys and ultimately cause death.

Mercury: is an odorless, silver metallic liquid. It can be inhaled or absorbed through the skin. Contact may cause irritation to the skin or eyes. Toxic if ingested. Fume inhalation may cause irritation in the nose, throat or lungs. This is a corrosive chemical. Symptoms of poisoning include, muscle tremors, loss of appetite, and nausea. Long-term exposure may have effects on the central nervous system and kidneys. The PEL is 0.1 mg/m^3 averaged over an 8 hour shift.

Selenium: is a nonmetallic element found in either a red powder form, black glassy form or sometimes as a metallic gray crystalline. It has similarities to sulfur, tellurium, and arsenic. While Selenium in small doses can be beneficial for health, high doses can cause nausea, vomiting, nail changes, loss of energy and overall irritability.

Zinc: is an odorless, bluish-white powder. It is typically used in paints and can be mixed with other metals to make bass and other types of alloys. Zinc can produce flammable gases when in contact with water, sometimes creating vigorous or explosive reactions. It can also create gaseous hydrogen in contact with water or moist air. Inhalation will cause irritation to eyes and respiratory system. Exposures cause flu-like symptoms, called “metal fume fever”, which can sometimes be delayed up to 48 hours after initial exposure.

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Polychlorinated biphenyls (PCBs): are a group of manufactured organic chemicals that contain 209 individual chlorinated chemicals. PCBs are either oily liquids or solids and are colorless to light yellow in color. They have no known smell or taste. There are no known natural sources of PCBs. Some commercial PCB mixtures are known in the United States by their industrial trade name e.g. Aroclor.

Polycyclic aromatic hydrocarbons (PAHs): are a class of chemicals that occur naturally in coal, crude oil, and gasoline. They also are produced when coal, oil, gas, wood, garbage, and tobacco are burned. PAHs generated from these sources can bind to or form small particles in the air. High-temperature cooking will form PAHs in meat and in other foods. Naphthalene is a PAH that is produced commercially in the United States to make other chemicals and mothballs. Cigarette smoke contains many PAHs.

Organochlorine Pesticides: are chlorinated hydrocarbons used extensively from the 1940s through the 1960s in agriculture and mosquito control. Representative compounds include DDT, methoxychlor, dieldrin, chlordane, toxaphene, mirex, kepone, lindane, and benzene hexachloride. As neurotoxicants, many organochlorine pesticides were banned in the United States, few are still registered for use.

People can be exposed to organochlorine pesticides through accidental inhalation exposure if in an area where they were recently applied. The chemicals can also be ingested in fish, dairy products, and other fatty foods that are contaminated. Organochlorine pesticides accumulate in the environment and are very persistent and move long distances in surface runoff or groundwater.

Exposure to these chemicals over a short period may produce convulsions, headache, dizziness, nausea, vomiting, tremors, confusion, muscle weakness, slurred speech, salivation and sweating. Long-term exposure may damage the liver, kidney, central nervous system, thyroid and bladder. Many of these pesticides have been linked to elevated rates of liver or kidney cancer in animals. There is some evidence indicating that organochlorine pesticides may also cause cancer in humans.

Trichloroethylene: is a nonflammable colorless liquid with a sweet odor. Trichloroethylene vapor is heavier than air and is found in low lying areas.

Tetrachloroethylene: is a colorless liquid with a sharp sweet odor. Tetrachloroethylene vapor is heavier than air and will be found in low lying areas.

Per- and Polyfluoroalkyl Substances: Per- and polyfluoroalkyl substances (PFAS) are a group of chemicals used in some industries and consumer products. Per- and polyfluoroalkyl substances (PFAS) are a group of over 14,000 synthetic chemicals that have been used in industry and consumer products, worldwide, for over 70 years. This includes compounds such as perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), and Hexafluoropropylene Oxide Dimer Acid (also known as "GenX"). PFAS as a class have a wide variety of distinct chemical properties and toxicities; for example, some PFAS can bioaccumulate and persist in the human body and the environment, while others transform relatively quickly. The PFAS that do transform, however, will become one or more other PFAS because the carbon–fluorine bond they contain does not break naturally. It is for this reason that PFAS are termed “forever chemicals.” A large number of studies have examined possible relationships between levels of PFAS in blood and harmful health effects in people. Long term exposure may have reproductive, immune system, kidney, testicular, and metabolic effects. NIOSH have been conducting studies since 2004, focusing on occupational exposures to PFAS, including toxicological assessments and health impacts in workers. Current research include assessing exposure to various sectors, such as

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manufacturing and firefighting, and developing analytical methods for measuring PFAS exposure in the workplace.

Site Hazards Checklist			
Weather			
High Winds	Cold Temperatures	Hot Temperatures	Lightning Storms

High Winds

While high winds are commonly associated with severe thunderstorms and hurricanes they may also occur as a result of differences in air pressures, such as when a cold front passes across the area. They can cause downed trees and power lines, and flying debris (such as dust or larger debris), which adds additional risks and could lead to power outages, transportation disruptions, damage to buildings and vehicles, and serious injury.

Wind Advisory are issued for sustained winds 25 to 39 mph and/or gusts to 57 mph. High Wind warnings are issued by the National Weather Service when high wind speeds may pose a hazard or is life threatening. The criteria for this warning will varies by state. The Beaufort Wind Scale is a helpful tool to when dealing with high winds.

Cold Temperatures

Cold stress may occur at any time work is being performed at low ambient temperatures and high velocity winds. Because cold stress is common and has potentially serious illnesses associated with outdoor work during cold seasons, regular monitoring and other preventative measures are vital.

Refer to OP1003-Cold Stress for additional information and mitigation controls.

Hot Temperatures

Heat stress may occur at any time work is being performed at elevated ambient temperatures. Because heat stress is one of the most common and potentially serious illnesses associated with outdoor work during hot seasons, regular monitoring and other preventative measures are vital. Site workers must learn to recognize and treat the various forms of heat stress. The best approach is preventative heat stress management.

H&A employees and their subcontractors should be aware of potential health effects and/or physical hazards of working when there are hot temperatures or a high heat index. Refer OP1015-Heat Stress for a discussion on hot weather hazards.

Lightning Storms

Where the threat of electrical storms and the hazard of lightning exist staff shall ensure site procedures exist to: (1) detect when lightning is in the near vicinity and when there is a potential for lightning and

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(2) to notify appropriate site personnel of these conditions and (3) implement protocols to stop work and seek shelter.

The 30-30 Rule states that if time between seeing the lightning and hearing the thunder is less than 30 seconds, you are in danger and must seek shelter. You must also stay indoors for more than 30 minutes after hearing the last clap of thunder.

Biological			
Stinging Insects	Large/Small Mammals	Mosquitoes	Choose an item.

Stinging Insects

Stinging Insects fall into two major groups: Apidae (honeybees and bumblebees) and vespids (wasps, yellow jackets, and hornets). Apidae are docile and usually do not sting unless provoked. The stinger of the honeybee has multiple barbs, which usually detach after a sting. Vespids have few barbs and can inflict multiple stings.

There are several kinds of stinging insects that might be encountered on the project site. Most stings will only result in a temporary injury. However, sometimes the effects can be more severe, even life-threatening depending on where you are stung and what allergies you have. Being stung in the throat area of the neck may cause edema (swelling caused by fluid build-up in the tissues) around the throat and may make breathing difficult.

In rare cases, a severe allergic reaction can occur. This can cause "anaphylaxis" or anaphylactic shock with symptoms appearing immediately or up to 30 minutes later. Symptoms include; Hives, itching and swelling in areas other than the sting site, swollen eyes/eyelids, wheezing, chest tightness, difficulty breathing, hoarse voice, swelling of the tongue, dizziness or sharp drop in blood pressure, shock, unconsciousness or cardiac arrest. Reactions can occur the first time you are stung or with subsequent stings. If you see any signs of reaction, or are unsure, call or have a co-worker call emergency medical services (e.g., 911) right away. Get medical help for stings near the eyes, nose or throat. Stay with the person who has been stung to monitor their reaction.

Staff who are allergic to bee stings are encouraged to inform their staff/project manager. If staff member carries an Epi-pen (i.e., epinephrine autoinjector) they are encouraged to inform their colleagues in case they are stung and are incapable of administering the injection. Examine site for any signs of activity or a hive/nest. If you see several insects flying around, see if they are entering/exiting from the same place. Most will not sting unless startled or attacked. Do not swat, let insects fly away on their own. If you must, walk away slowly or gently "blow" them away. If a nest is disturbed and you hear "wild" buzzing, protect your face with your hands and run from the area immediately. Wear long sleeves, long pants, and closed-toed boots. Wear light colored clothes such as khakis. Avoid brightly colored, patterned, or black clothing. Tie back long hair to avoid bees or wasps from entanglement. Do not wear perfumes, colognes or scented soaps as they contain fragrances that are attractive. If bee or wasp is found in your car, stop and leave windows open.

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Small Mammals

Rodents, are the most abundant order of mammals. There are hundreds of species of rats; the most common are the black and brown rat. Other rodents you may encounter are mice, beavers, squirrels, guinea pigs, capybaras and coypu.

The Brown Rat has small ears, blunt nose, and short hair. It is approximately 14-18" long (with tail). They frequently infest garbage/rubbish, slaughterhouses, domestic dwellings, warehouses, and supermarkets. They also frequent any space with an easy meal and potential nesting sites. The Black Rat is identified by its tail, that is always longer than the length from the head to the body. It is also slimmer and more agile than the Brown rat. Its size varies according to its environment and food supply.

The House Mouse has the amazing ability to adapt and can frequently be found in human dwellings. In buildings, mice will live anywhere and difficult to keep out. Mice are omnivorous, they will eat anything. Rats and mice often become a serious problem in cold winter months when they seek food and warmth inside buildings. They may suddenly appear in large numbers when excavation work disturbs their in-ground nesting locations or their food source is changed.

Some major problems caused by rats and mice are contaminating the food they eat with urine and excrement. Gnawing into materials such as paper, wood, or upholstery, to use as nest material. Also gnawing plastic, cement, soft metals such as lead and aluminum, and wiring, which may cause a fire hazard. Occasionally biting people and may kill small animals. They, or the parasites they carry, like fleas, mites and worms, spread many diseases such as salmonella, trichinosis, rat bite fever, hantavirus, Weil's disease, and bubonic plague. They damage ornamental plants by burrowing among the roots or feeding on new growth. They also eat garden vegetables, such as corn and squash. These rodents have been a problem for centuries, because of their incredible ability to survive and are so difficult to eliminate. In addition, they are extremely compatible with human behavior and needs.

Avoid contact with rodents, if possible. Avoid contact with rodent excrement. Do not eat food or water that may have encountered rodent excrement. If exposed, wash hands and avoid touching your face with your hands.

Mosquitos

Work outdoors with temperatures above freezing will likely bring staff into contact with mosquitos. There are a variety of mosquito species that can transmit a range of diseases. Birds act as reservoirs for the viruses that can be collected by the mosquito and transmitted to a person. Majority of mosquitos are mainly a nuisance but staff need to take appropriate precautions to minimize the potential transmission of a virus that can result in one of the following diseases: West Nile, Eastern Equine Encephalitides and Western Encephalitides. Knowing some key steps that can minimize the risk of mosquito bites is, therefore, important in reducing the risks. Workers working outdoors should be aware that the use of PPE techniques is essential to preventing mosquito bites especially when working at sites where mosquitoes may be active and biting.

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Use repellents containing DEET, picaridin, IR3535, and some oil of lemon eucalyptus and para-menthane-diol products provide longer-lasting protection. To optimize safety and effectiveness, repellents should be used according to the label instructions. Cover as much of your skin as possible by wearing shirts with long-sleeves, long pants, and socks whenever possible. Avoid use of perfumes and colognes when working outdoors during peak times when mosquitoes may be active; mosquitoes may be more attracted to individuals wearing perfumes and colognes.

Location/Terrain			
Slip/Trip/Falls	Public Rd/Right of Way	SIMOPS	Economically Depressed

Slips, Trips & Falls

Slip and trip injuries are the most frequent injuries to workers. Statistics show most falls happen on the same level resulting from slips and trips. Both slips and trips result from unintended or unexpected change in the contact between the feet and the ground or walking surface. Good housekeeping, quality of walking surfaces (flooring), awareness of surroundings, selection of proper footwear, and appropriate pace of walking are critical for preventing fall accidents.

Site workers will be walking on a variety of irregular surfaces, that may affect their balance. Extra care must be taken to walk cautiously near rivers because the bottom of the riverbed maybe slick and may not be visible. Rocks, gradient changes, sandy bottoms, and debris may be present but not observable.

Take your time and pay attention to where you are going. Adjust your stride to a pace that is suitable for the walking surface and the tasks you are doing. Check the work area to identify hazards - beware of trip hazards such as wet floors, slippery floors, and uneven surfaces or terrain. Establish and utilize a pathway free of slip and trip hazards. Choose a safer walking route. Carry loads you can see over. Keep work areas clean and free of clutter. Communicate hazards to on-site personnel and remove hazards as appropriate.

Public Right of Way

H&A staff and their subcontractors conducting work on public roads and/or right of ways can be exposed to vehicular traffic and expose the public to the hazards of the job site. Where a hazard exists to site workers because of traffic or haulage conditions at work sites that encroach public streets or highways, a system of traffic controls in conformance with the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), or state program, is required. A Temporary Traffic Control Plan (TCP) describes traffic controls to be used for facilitating vehicle and pedestrian traffic through a temporary traffic control zone TCPs are required to provide for worker protection and safe passage of traffic through and around job sites with as little inconvenience and delay as possible.

The plan may range in scope from being very detailed, to merely referencing typical drawings contained in the MUTCD. The degree of detail in the TCP depends entirely on the complexity of the situation, and TCP's should be prepared by persons knowledgeable about the fundamental principles of temporary traffic control and the work activities to be performed.

H&A Project Managers or their subcontractors need to establish appropriate control measures and

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obtain any permits when project work is on or encroaches public roadways. You may need flaggers or police details. Cease work and notify the field supervisor immediately if any conditions are such that safety is jeopardized. Utilize protective vehicles whenever appropriate or position equipment so in between the work and oncoming traffic.

SIMOPS

SIMOPS are described as the potential class of activities which could bring about an undesired event or set of circumstances, e.g., safety, environment, damage to assets, schedule, commercial, financial, etc. SIMOPS are defined as performing two or more operations concurrently.

SIMOPS should be identified at an early stage before operations commence to understand issues such as schedule and physical clashes, maintenance activities, failure impacts, interferences between vessels, contracts and third part interfaces and environmental impacts.

Coordinate project with site activities. Identify and understand the hazards associated with the host and client's activities. Integrate site emergency response protocols where appropriate and communicate to all project staff. Integrate site communication protocols and communicate to all project staff.

Economically Depressed Areas

Economically depressed areas may have high crime rates. Projects involving work in and around inactive industrial sites may bring staff into contact with indigent and homeless persons. Staff could be subjected to crime that includes but may not be limited to thievery, vandalism, and violence. Prior to the start of work staff need to understand the work locations and the potential for exposure to low level crime.

Staff members should never work alone in these areas. A buddy system is required. Conduct during daylight hours. Secure equipment and vehicles. If warranted, contact the local police department for a security detail. Leave the work area immediately and contact the local authorities if staff members feel threatened or are threatened.

Miscellaneous			
Extended Shift	Night Work	Choose an item.	Choose an item.

Extended Shift

An extended shift can include extending a workday beyond eight hours. Extended or unusual work shifts may be more stressful physically, mentally, and emotionally. Non-traditional shifts and extended work hours may disrupt the body's regular schedule, leading to increased fatigue, stress, and lack of concentration. This leads to an increased risk of operator error, injuries and/or accidents. The degree to which an individual is exposed to fatigue risk factors depends upon the work schedule. As both the duration of the workday and the number of days worked increase so does the fatigue risk factors. Staff Managers need to be aware of the fatigue risk factors and ensure projects are structured to mitigate these factors. Staff Members also have a responsibility to manage the personal fatigue risk factors that they can control outside of work (e.g, duration and quality of sleep, diet, drugs, and alcohol)

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Fatigue is a message to the body to rest and can be eliminated with proper rest. However, if rest is not possible, fatigue can increase and becomes distressing and eventually debilitating. Fatigue symptoms, both mental and physical, vary and depend on the person and degree of overexertion. Examples include: weariness, sleepiness, irritability, reduced alertness, lack of memory, concentration and motivation, increased susceptibility to illness, depression, headache, loss of appetite, and digestive problems.

When possible, managers should limit use of extended shifts and increase the number of days worked. Working shifts longer than 8 hours generally result in reduced productivity and alertness. Additional breaks and meals should be provided when working extended shift periods. Tasks requiring heavy physical labor or intense concentration should be performed at the beginning of the shift if possible. This is an important consideration for pre-emergency planning.

Make efforts, when feasible, to ensure that unavoidable extended work shifts and shift changes allow affected employees time for adequate rest and recovery. Project Managers need to plan to have an adequate number of personnel available to enable workers to take breaks, eat meals, relax, and sleep.

Plan for regular and frequent breaks throughout the work shift. If at remote sites, ensure if possible, that there is a quiet, secluded area designated for rest and recuperation. In addition to formal breaks such as lunch or dinner, encourage use of micro breaks to change positions, move about, and shift concentration. Personnel should look to obtain an adequate quantity and quality of sleep.

Night Work

The way work is planned and scheduled can increase the risk of fatigue. Scheduling work in a way that fails to allow staff members enough time for travel to and from work and/or allow for sufficient time for sleep can cause fatigue. Working at times when staff members are biologically programmed to sleep and working for long periods of time can also produce fatigue. Working night shift, including the number of consecutive nights can be a significant fatigue risk factor if not managed properly.

Night shifts may be more stressful physically, mentally, and emotionally. They can disrupt the body's regular schedule, leading to increased fatigue, stress, and lack of concentration. These effects lead to an increased risk of operator error, injuries and/or accidents. The degree which an individual is exposed to fatigue risk factors depends upon the work schedule. As both the duration of the workday and number of days worked increase so does the exposure to fatigue risk factors. Staff Managers need to be aware of the fatigue risk factors and ensure projects are structured to mitigate these risk factors.

Employers must ensure that employees are not exposed to hazardous chemicals or other agents in excess of health standards. Working extended shifts may involve prolonged exposures to hazards which exceed established standards. Employers should implement measures to monitor and limit exposures. Controls may include limiting time employees may remain at the project site; having clean locations for employee rest areas; or rest areas located sufficiently up wind of contaminated sites.

Minimize or redesign routine administrative tasks to ensure staff members can focus on core duties during their night work. Limit consecutive night shifts worked. If a project requiring staff to work beyond four nights requires a fatigue management plan. Ensure that rosters allow for at least two full

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night's sleep after the last night shift before returning to day shift. Regular and frequent breaks are needed. Comprehensive training on fatigue risk factors for the staff members assigned to the project. Optimal sleeping conditions during the day (e.g., dark/quiet rooms, minimize distractions, light meal prior to sleep).

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Task Hazard Summary

Task 1 - Site Walk

General hazards associated with site walk-throughs and site surveys include the following: • Exposure to irritant and toxic plants such as poison ivy and sticker bushes may cause allergic reactions to personnel. • Surfaces covered with heavy vegetation and undergrowth create a tripping hazard. • Back strain due to carrying equipment, tools, and instruments. • Native wildlife such as rodents, ticks, and snakes present the possibility of insect bites and associated diseases such as Lyme disease
Driving vehicles on uneven or unsafe surfaces can result in accidents such as overturned vehicles or flat tires. • Heat stress/cold stress exposure.

HAZARD PREVENTION • Wear long-sleeved clothing and slacks to minimize contact with irritant and toxic plants and to protect against insect bites. Appropriate first aid for individuals' known allergic reactions. • Be alert and observe terrain while walking to minimize slips and falls. • Use proper lifting techniques to prevent back strain. • Avoid wildlife when possible. In case of an animal bite, perform first aid and capture the animal, if possible, for rabies testing. Perform a tick check after leaving a wooded or vegetated area. • Ensure all maintenance is performed on vehicles before going to the field. A site surveillance on foot might be required to choose clear driving paths. • Implement heat stress management techniques such as shifting work hours, fluid intake, and monitoring employees, especially high risk workers.

Task 2a – Excavation/Trenching (Remedial Oversight)

There are multiple hazards associated with working in and around excavations and trenches including cave-ins, potential running soils, dislodged excavated soils, lack of proper access and egress. Nonfatal, and even fatal, injuries may occur in association with excavation and trenching activities with a greater frequency than one might expect. Causes of bodily injury, illness, or death include asphyxiation, internal injuries due to physical crushing, falling objects and toxic exposures.

Excavations five (5) feet deep or greater require a protective system unless the excavation is made entirely in stable rock. If the depth is less than five (5) feet deep, a competent person may determine that a protective system is not required. Trenches 20 feet deep or greater require that the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/or approved by a registered professional.

H&A Staff Members shall not enter a trench that is five feet deep or greater unless a protective system is used or the soil(s) have been characterized and benched and/or sloped appropriately.

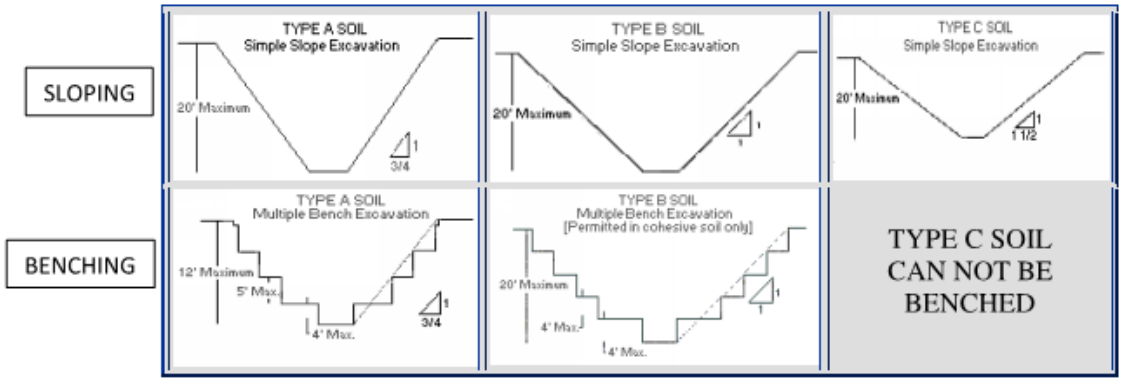
The following are list identifies the types of protective measures that can be used in the event a staff member is required to enter an excavation or trench.

- **Sloping** involves cutting back the trench wall at an angle inclined away from the excavation.

- **Benching** means a method of protecting workers from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near vertical

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surfaces between levels. Benching cannot be done in Type C soil. Below is a diagram indicating the appropriate slope angle for both sloping and benching.



- **Shoring** requires installing aluminum hydraulic or other types of supports to prevent soil movement and cave-ins.
- **Shielding** protects workers by using trench boxes or other types of supports to prevent soil cave-ins.

Designing a protective system can be complex because you must consider many factors: soil classification, depth of cut, water content of soil, changes caused by weather or climate, surcharge loads (e.g., spoil, other materials to be used in the trench) and other operations in the vicinity.

See OP 1001 Excavation and Trenching Safety for more information.

Task 2b - Hauling Soils Off-site (Remedial Oversight)

Hauling Soils Off-site is conducted for a range of services that can include but are not limited to: building, foundation, utility excavation and environmental cleanup. Familiarity with basic heavy construction safety is an essential component of all hauling projects. Potential hazards related to hauling soils off-site operations include, but are not limited to encountering underground or overhead utilities, traffic and heavy equipment, generated waste, and the use or unexpected encountering of toxic or hazardous substances. While staff members do not operate heavy equipment, they may work in close proximity to the equipment and may be exposed to many of the same hazards as the Contractor. Care should be taken during loading of truck/container that the staff is not in the line of fire of the loading equipment (swing radius/traffic pattern) or of the falling spoils/soil from the loading bucket or truck bed. The staff should be aware at all times of subsurface stability as a truck may tip during truck loading and unloading due items such as but not limited to uneven surface, poorly or uncompacted subsurface, thawing soils, saturated soils and proximity to excavation. It is imperative that staff are aware of emergency / communication protocols with the Contractor prior to the start of work.

Task 2c – Stockpiling (Remedial Oversight)

Stockpiling of soils is conducted for a range of services that can include but are not limited to: building, foundation, utility excavation, drilling spoils containment and environmental cleanup. Familiarity with basic heavy construction safety is an essential component of all hauling projects. Potential hazards related to stockpiling operations include, but are not limited to encountering underground or overhead

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utilities, traffic and heavy equipment, and the use or unexpected encountering of toxic or hazardous substances. While staff members do not operate heavy equipment, they may work in close proximity to the equipment and may be exposed to many of the same hazards as the Contractor. Care should be taken during material stockpiling that the staff is not in the line of fire of the loading equipment (swing radius/traffic pattern). The staff should be aware of any setback requirements of stockpile surcharges near trenches and excavations.

Task 3 – Soil Sampling

Soil sampling by H&A staff on active construction sites can be conducted in conjunction with a wide range activities such as building construction, earthwork and soil management related activities. These activities can include, but are not limited to: drill spoil characterization and management during building foundation element installation, characterization of excavated soils for management/disposal/reuse during earthwork activities, and as part of environmental remedial activities such as delineation and confirmation sampling. Familiarity with basic heavy construction safety, site conditions (geotechnical and environmental), and potential soil contaminants are essential components of soil sampling performed on active sites. Potential hazards related to soil sampling at construction sites include, but are not limited to: encountering site vehicle traffic and heavy equipment operations, manual lifting, generated waste, contact or exposure to impacted soil, and encountering unknown toxic or hazardous substances. Although soil sampling is commonly performed within active excavations, from stockpiles, or within trench excavations, sampling locations and situations will vary depending on site conditions. Care should be taken while entering and exiting excavations or trenches, and when accessing (climbing up or down) soil stockpiles, ensuring that the sampling area is not being actively accessed by construction equipment. Care should also be taken with handling of potentially environmentally impacted soil during sampling, with appropriate PPE identified and used. At no time during classification activities are personnel to reach for debris near machinery that is in operation, place any samples in their mouth, or come in contact with the soils without the use of gloves. Staff will have to carry and use a variety of sampling tools, equipment, containers, and potentially heavy sample bags. It is imperative that staff are aware of emergency / communication protocols with the Contractor prior to the start of work.

Potential Task Hazards	Task 1	Task 2	Task 3
	Site Walk	Remedial Oversight	Soil Sampling
Congested Area	☐	☒	☒
Compressed Gas	☐	☒	☒
Ergonomics	☒	☒	☒
Energized Equipment	☐	☒	☐
Excavation/Trenching	☐	☒	☒
Generated Wastes	☐	☒	☒

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Ground Disturbance	☐	☒	☐
Hand/Power Tools	☐	☒	☒
Heavy Equipment	☐	☒	☐
Line of Fire	☐	☒	☒
Manual Lifting	☒	☒	☒
Noise	☐	☒	☐
Overhead Utilities	☐	☒	☐
Repetitive Motion	☒	☒	☒
Slippery Surfaces	☒	☒	☒
Sharp Objects	☐	☒	☒
Traffic	☒	☒	☐
Underground Utilities	☐	☒	☒
Other: Specify	☐	☐	☐

Summary of Physical Hazards & Controls

Compressed Gas

Hazards associated with compressed gases include oxygen displacement, fires, explosions, and toxic gas exposures, as well as the physical hazards associated with pressurized containers. In most instances, accidents are caused by improper application, misuse of the gas, or its container by inadequately trained personnel. Special storage, use, and handling precautions are necessary to minimize accidents and control these hazards above.

See OP 1048 Compressed Gas Safety for more information.

Controls

- Visually inspect the cylinder prior to and after use for any damage. Report any damage to the vendor for direction.
- Ensure that cylinders are clearly identified. Labels must not be defaced or removed.
- Leave valve protection caps in place (if provided) until cylinders are secured and connected for use.
- Keep cylinder valves closed except when the cylinder is being used.
- When opening a cylinder valve, stand so the valve outlet is pointed away from yourself and all other employees. Open valves slowly.
- Replace protective caps and outlet caps or plugs before returning empty cylinders to the supplier.
- Never tamper with or alter cylinders, valves, or safety relief devices.
- Do not tighten connections or leaking fittings or attempt repairs while the system is under pressure.

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- Do not subject cylinders to artificially low temperatures or temperatures above 125 F. Do not place them next to heat sources or allow a flame to contact any part of the cylinder.
- Avoid dragging or sliding cylinders. Do not lift cylinders by the caps.
- Firmly secure the cylinder and move with a suitable hand truck, lift truck, or crane with a cradle or platform.

Storage

- Provide adequate space or segregate by partitions and post a conspicuous sign that identifies the gas or hazard class.
- Storage areas should be dry, well-drained, ventilated, and fire resistant.
- Cylinders can be stored in the open, but they should be protected from the ground or continuous dampness to prevent rusting.
- Cylinders can usually be stored in the sun; but, cylinders must not exceed temperatures >125 F.
- Always refer to the manufacturers' storage requirements and SDSs.
- Storage areas should protect cylinders from damage. Do not store on unprotected platform edges or obstruct walkways or exits.
- Use brackets, chains, or straps around the upper third of the cylinder to secure cylinders in storage or in use.

Transport

- Cylinders must be stored upright, firmly secured, and be capped during transport.

Congested Areas

Working in congested areas can expose both workers and the public to a wide range of hazards depending upon the specific activities taking place. Staff Members need to understand the work scope, work areas, equipment on-site, and internal traffic patterns to minimize or eliminate exposure potential.

Controls

- Provide barricades, fencing, warning signs/signals and adequate lighting to protect people while working in or around congested areas.
- Vehicles and heavy equipment with restricted views to the rear should have functioning back-up alarms that are audible above the surrounding noise levels. Whenever possible, use a signaler to assist heavy equipment operators and/or drivers in backing up or maneuvering in congested areas.
- Lay out traffic control patterns to eliminate excessive congestion.
- Workers in congested areas should always wear high visibility clothing.
- Be aware of Line of Fire hazards when performing work activities in congested areas.
- Hazards associated with SIMOPs should be discussed daily at Tailgate Safety Meetings.

Ergonomics

Most Work-related Musculoskeletal Disorders (WMSDs) are caused by Ergonomic Stressors. Ergonomic Stressors are caused by poor workplace practices and/or insufficient design, which may present ergonomic risk factors. These stressors include, but not limited to, repetition, force, extreme postures, static postures, quick motions, contact pressure, vibration, and cold temperatures.

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WMSDs are injuries to the musculoskeletal system, which involves bones, muscles, tendons, ligaments, and other tissues in the system. Symptoms may include numbness, tightness, tingling, swelling, pain, stiffness, fatigue, and/or redness. WMSD are usually caused by one or more Ergonomic Stressors. There may be individual differences in susceptibility and symptoms among employees performing similar tasks. Any symptoms are to be taken seriously and reported immediately.

See OP1053 Ergonomics for more information.

Controls

- Ensure workstations are ergonomically correct so bad posture is not required to complete tasks.
- Take periodic breaks over the course of the day.
- Stretch during break times.
- Break up tasks that require repetitive motion.
- Contact Corporate H&S with any ergonomic concerns

Energized Equipment

Energy sources including electrical, mechanical, hydraulic, pneumatic, or other sources in machines and equipment can be hazardous to workers. During servicing and maintenance of machines and equipment, the unexpected startup or release of stored energy can result in serious injury or death to workers.

Staff members that are required to work on energized equipment must first ensure that the source of energy is isolated and/or de-energized. In addition, any stored energy must also be released. Staff must ensure that the process to de-energize and isolate energy sources is documented and communicated to those who are working on the equipment. Staff must be trained on and understand the procedure.

See OP 1032 Control of Hazardous Energy for more information.

Controls

- Document process to de-energize or isolate energy sources.
- Ensure staff are appropriately trained to conduct work requiring LOTO.
- Affix log or tag to equipment to ensure improper start-up or release of energy.
- Execute an Energy Isolation Permit.

Excavation & Trenches

There are multiple hazards associated with working in and around excavations and trenches including cave-ins, potential running soils, dislodged excavated soils, lack of proper access and egress. Nonfatal, and even fatal, injuries may occur in association with excavation and trenching activities with a greater frequency than one might expect. Causes of bodily injury, illness, or death include asphyxiation, internal injuries due to physical crushing, falling objects and toxic exposures.

See OP1001 Excavation and Trenching Safety for more information.

Controls

- Do not enter an exaction unless it has been inspected and has appropriate protective measures in place: shoring, benching, or sloping.
    - Protective measures are required for excavations that are 5 feet or deeper.

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- If entry is required verify with the on-site competent person that:
    - no atmospheric hazards exist or have the potential to exist
    - there is no standing water or water removal operations are in place
    - the daily inspection has occurred
    - spoil piles, equipment or other is at least 2 feet from the edge
    - There is safe access and egress to the excavation which can include ladders, steps, ramps or other safe means. The means of access and egress shall be no more than 25' away.
- If there is any doubt about the safety of the excavation personnel will not enter the excavation or trench and will contact the PM and the Regional Safety Manager.
- Do not stand on the long side of the cut. If required ensure there are no tension cracks.

Generated Waste

Activities on environmental sites may generate waste that requires regulated handling and disposal. Excess sample solids, decontamination materials, poly sheeting, used PPE, etc. that are determined to be free of contamination through field or laboratory screening can usually be disposed into client-approved, on-site trash receptacles. Uncontaminated wash water may be discarded onto the ground surface away from surface water bodies in areas where infiltration can occur. Contaminated materials must be segregated into liquids or solids and drummed separately for off-site disposal.

Controls

- Manage waste properly through good work practices.
- Collect, store, containerize waste, and dispose of it properly.
- All wastes generated shall be containerized in an appropriate container (i.e. open or closed top 55-gallon drum, roll-off container, poly tote, cardboard box, etc.) as directed by the PM.
- Containers should be inspected for damages or defects
- Waste containers should be appropriately labeled indicating the contents, date the container was filled, owner of the material (including address) and any unique identification number, if necessary.
- Upon completion of filling the waste container, the container should be inspected for leaks and an appropriate seal.

Ground Disturbance

Ground disturbance is defined as any activity disturbing the ground. Ground disturbance activities include, but are not limited to, excavating, trenching, drilling (either mechanically or by hand), digging, plowing, grading, tunneling and pounding posts or stakes.

Because of the potential hazards associated with striking an underground utility or structure, the operating procedure for underground utility clearance shall be followed prior to performing any ground disturbance activities.

See OP1020 Working Near Utilities

Controls

Prior to performing ground disturbance activities, the following requirements should be applied:

- Confirm all approvals and agreements (as applicable) either verbal or written have been obtained.
- Request for line location has been registered with the applicable One-Call or Dial Before You Dig organization, when applicable.

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    - Whenever possible, ground disturbance areas should be adequately marked or staked prior to the utility locators site visit.
- Notification to underground facility operator/owner(s) that may not be associated with any known public notification systems such as the One-Call Program regarding the intent to cause ground disturbance within the search zone.
- Notifications to landowners and/or tenant, where deemed reasonable and practicable.
- Proximity and Common Right of Way Agreements shall be checked if the line locator information is inconclusive.

Hand and Power Tools

Hand and power tools can expose staff to a wide range of hazards depending upon the tool used. Hazards can include but are not limited to: falling, flying, abrasive, and splashing objects, or harmful dusts, fumes, mists, vapors, or gases.

Serious accidents often occur before steps are taken to evaluate and avoid or eliminate tool-related hazards. Staff must recognize the hazards associated with the different types of tools and the safety precautions necessary to prevent those hazards.

See OP 1026 Hand and Power Tools for more information.

Controls

- Keep all tools in good condition with regular maintenance.
- Use the right tool for the job. Do not use a tool for a task which it was not designed for.
- Examine each tool for damage before use and do not use damaged tools.
- For tools that are damaged or defective, red tag the tool and take out of service.
- Operate tools per the manufacturers' instructions.
- Use the appropriate personal protective equipment.
- All electrically powered tools will be connected through a ground fault circuit interrupter (GFCI).
- All personnel must be trained on the use of the tool they are utilizing.

Heavy Equipment

Staff must be careful and alert when working around heavy equipment, failure or breakage and limited visibility can lead to accidents and worker injury. Heavy equipment such as cranes, drills, haul trucks, or other can fail during operation increasing chances of worker injury. Equipment of this nature shall be visually inspected and checked for proper working order prior to commencement of field work. Those operating heavy equipment must meet all requirements to operate the equipment. Haley & Aldrich, Inc. staff that supervise projects or are associated with high risk projects that involve digging or drilling should use due diligence when working with a construction firm.

See OP1052 Heavy Equipment for additional information.

Controls

- Only approach equipment once you have confirmed contact with the operator (e.g., operator places the bucket on the ground).
- Always maintain visual contact with operators and keep out of the strike zone whenever possible.
- Always be alert to the position of the equipment around you.

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- Always approach heavy equipment with an awareness of the swing radius and traffic routes of all equipment and never go beneath a hoisted load.
- Avoid fumes created by heavy equipment exhaust.

Line of Fire

Line of fire refers to the path an object will travel. Examples of line of fire situations typically observed on project sites include lifting/hoisting, lines under tension, objects that can fall or roll, pressurized objects or lines, springs or stored energy, work overhead, vehicles and heavy equipment.

Controls

- Never walk under a suspended load.
- Be aware and stay clear of tensioned lines such as cable, chain and rope.
- Be cautious of torque stresses that drilling equipment and truck augers can generate. Equipment can rotate unexpectedly long after applied torque force has been stopped.
- Springs and other items can release tremendous energy if compressed and suddenly released
- Items under tension and pressure can release tremendous energy if it is suddenly released.
- Not all objects may be overhead; be especially mindful of top-heavy items and items being transported by forklift or flatbed.
- Secure objects that can roll such as tools, cylinders, and pipes.
- Stay clear of soil cuttings or soil stockpiles generated during drilling operations and excavations, be aware that chunks of soil, rocks, and debris can fall or roll.

Manual Lifting/Moving

Most materials associated with investigation, remedial, or construction-related activities are moved by hand. The human body is subject to damage in the forms of back injury, muscle strains, and hernia if caution is not observed in the handling process.

Controls

- Under no circumstances should any one person lift more than 49 pounds unassisted.
- Always push, not pull, the object when possible.
- Size up the load before lifting. If it is heavy or clumsy, get a mechanical aid or help from a worker.
- Bend the knees; it is the single most important aspect of lifting.
- When performing the lift:
    - Place your feet close to the object and center yourself over the load.
    - Get a good handhold.
    - Lift straight up, smoothly and let your legs do the work, not your back!
    - Avoid overreaching or stretching to pick up or set down a load.
    - Do not twist or turn your body once you have made the lift.
    - Make sure beforehand that you have a clear path to carry the load.
    - Set the load down properly.

Noise

Working around heavy equipment (drill rigs, excavators, etc.) often creates excessive noise. The effects of noise include physical damage to the ear, pain, and temporary and/or permanent hearing loss. Workers can also be startled, annoyed, or distracted by noise during critical activities. Noise monitoring

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data that indicates that working within 25 feet of operating heavy equipment result in exposure to hazardous levels of noise (levels greater than 85 dBA).

See OP 1031 Hearing Conservation for additional information.

Controls

- Personnel are required to use hearing protection (earplugs or earmuffs) within 25 feet of any operating piece of heavy equipment.
- Limit the amount of time spent at a noise source.
- Move to a quiet area to gain relief from hazardous noise sources.
- Increase the distance from the noise source to reduce exposure.

Overhead Utilities

When work is undertaken near overhead electrical lines, the distance maintained from those lines shall also meet the minimum distances for electrical hazards as defined in Table 1 below. Note: utilities other than overhead electrical utilities need to be considered when performing work.

Table 1 Minimal Radial Clearance Distances *

Normal System Voltage Kilovolts (kV)	Required Minimal Radial Clearance Distance (feet/meters)
0 – 50	10/3.05
51 – 100	12/3.66
101 – 200	15/4.57
201 – 300	10/6.1
301 – 500	25/7.62
501 – 750	35/10.67
750 - 1000	45/13.72

* For those locations where the utility has specified more stringent safe distances, those distances shall be observed.

Controls

- To prevent damage, guy wires shall be visibly marked and work barriers or spotters provided in those areas where work is being conducted.
    - When working around guy wires, the minimum radial clearance distances for electrical power shall be observed.
- The PM shall research and determine if the local, responsible utility or client has more restrictive requirements than those stated in Table 1.
- If equipment cannot be positioned in accordance with the requirements established in Table 1 the lines need to be de-energized.

Repetitive Motion

Repetitive Motion or Strain Injuries are injuries effecting muscles, nerves, and tendons by repetitive movement and overuse. Almost any kind of awkward or repetitive motion you make could lead to an injury over time. Actions like bending or twisting of the wrists, reaching for materials, working with your

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hands above shoulder level, or grasping objects can increase wear and tear on the body. The condition mostly effects the upper body.

Controls

- Arrange your work zone, supplies and tools as much as possible to avoid reaching, leaning, bending and twisting your waist or wrists.
- During rest breaks, use stretches to loosen up your body.
- Vary tasks if you can so that you are not making the same movement repeatedly over for a long period.

Sharp Objects

Workers who handle sharp edged objects like sheets of steel or glass are at risk of cuts. Workers who handle sharp edged objects are also at risk of cuts. Injuries may occur to hands, fingers, or legs when they are in the way of the blade, when the blade slips, or if an open blade is handled unexpectedly. Other hazards at job sites include stepping on sharp objects (e.g. wooden boards with protruding nails, sharp work-tools, chisels, etc.) and colliding with sharp and/or protruding objects.

Controls

Always be alert when handling sharps. Never look away or become distracted while handling sharp objects. Use caution when working with tools; use right tool for the job. Keep tools sharp, dull blades are a safety hazard, requiring more force to make cuts which can lead to tool slippage. Wear appropriate PPE and do not handle sharp objects (i.e., broken glass) with bare hands. Use mechanical devices, when possible. Stay away from building debris; avoid handling site debris or placing your hand where you cannot see. Watch out for barbed wire and electrical fences; cover with a car mat or equivalent to cross or walk around; use the buddy system to avoid entanglement; wear gloves. Do not leave unprotected sharps unattended. Use protective shields, cases, styrofoam blocks, etc. Pass a sharp by handing it over carefully by the handle with the blade down or retracted. Fixed open blades are prohibited. Always cut away from the body, making several passes when cutting thicker materials. Make sure blades are fitted properly into the knife. Never cut items with a blade or other sharp object on your lap. Never try to catch a blade or cutting tool that is falling.

Slippery Surfaces

Both slips and trips result from unintended or unexpected change in the contact between the feet and ground or walking surface. Good housekeeping, quality of walking surfaces, selection of proper footwear, and appropriate pace of walking are critical for preventing fall accidents. Slips happen where there is too little friction or traction between the footwear and walking surface.

Common causes of slips are wet or oily surfaces, spills, weather hazards, loose unanchored rugs or mats and flooring or other walking surfaces that do not have same degree of traction in all areas.

Weather-related slips and falls become a serious hazard as winter conditions often make for wet or icy surfaces outdoors. Even wet organic material or mud can create hazardous walking conditions. Spills and leaks can also lead to slips and falls.

Controls

- Evaluate the work area to identify any conditions that may pose a slip hazard.
- Address any spills, drips or leaks immediately.

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- Mark areas where slippery conditions exist.
- Select proper footwear or enhance traction with additional PPE.
- Where conditions are uncertain or environmental conditions result in slippery surfaces walk slowly, take small steps, and slide feet on wet or slippery surfaces.

Traffic

To ensure worker protection and the safe passage of traffic through and around job sites, Site Traffic Control procedures may need to be implemented on project sites. Job zone control and traffic management are necessary when Simultaneous Operations (SIMOPS) or third parties could be at risk of injury by entering the work zone, or when the work crew is at risk of injury by other operations.

Traffic patterns shall be evaluated. Conditions such as high pedestrian traffic, peak periods, daily deliveries or SIMOPS known, Heavy equipment traffic volume and light duty traffic volume shall be evaluated

Early identification and planning for site operations that require job zone control and traffic management, including SIMOPS, is the responsibility of the Project Manager and primary contractor manager. Traffic control plans shall be consistent with the Manual on Uniform Traffic Control Devices.

See OP1025 Signs, Signals, and Barricades and/or OP1043 Site Traffic Control for more information.

Controls

- Alternate walkways where possible.
- Use of the local police to direct traffic.
- Use of an air horn to alert drivers or other workers.
- Maintain good housekeeping and clean the area as work is completed.
- Use the ‘buddy’ or ‘watchperson’ system while performing work.
- Use a spotter for backing, tight maneuvers and bin/tank/equipment drop-offs.
- Use traffic control devices, field vehicles and barricades and avoid the use of caution tape.
- Park all vehicles (with wheels in a safe direction away from work) to block traffic with a flashing yellow light. Park so that access to the vehicle is away from oncoming traffic while working.
- When parking a vehicle and equipment, utilize a ‘first move forward’ driving practice.
- Work in an upright position, face traffic and make eye contact with drivers when possible.
- Minimize work time in traffic.
- Establish a ‘Stop Work’ hand signal.
- Personnel shall always wear high visibility vest

If public sites, such as public roads, bicycle paths or footpaths, are closed or rerouted, local and regulatory requirements shall be followed and traffic control permits shall be put in place. Proper traffic guiding equipment includes stop/slow paddle signs, flaggers, flashing lights and directional signs.

All personnel on-site should be aware of the plan of the day and the Traffic Control Plan should be communicated with all parties involved during the pre-shift meeting.

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Underground Utilities

Various forms of underground/overhead utility lines or conveyance pipes may be encountered during site activities. Prior to the start of intrusive operations, utility clearance is mandated, as well as obtaining authorization from all concerned public utility department offices. Should intrusive operations cause equipment to come into contact with utility lines, the SHSO, Project Manager, and Regional H&S Manager shall be notified immediately. Work will be suspended until the client and applicable utility agency is contacted and the appropriate actions for the situation can be addressed.

See OP1020 Work Near Utilities for complete information.

Controls

- Obtain as-built drawings for the areas being investigated from the property owner;
- Visually review each proposed soil boring locations with the property owner or knowledgeable site representative;
- Perform a geophysical survey to locate utilities;
- Hire a private line locating firm to determine location of utility lines that are present at the property;
- Identifying a no-drill or dig zone;
- Hand dig or use vacuum excavation in the proposed ground disturbance locations if insufficient data is unavailable to accurately determine the location of the utility lines.

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4. PROTECTIVE MEASURES

The personal protective equipment and safety equipment (if listed) is specific to the associated task. The required PPE and equipment listed must be onsite during the task being performed. Work shall not commence unless the required PPE or Safety Equipment is present.

Required Safety & Personal Protective Equipment

Required Personal Protective Equipment (PPE)	**Task 1**	**Task 2**	**Task 3**	
	Site Walk	Remedial Oversight	Soil Sampling	Enter task description.
Hard hat	☒	☒	☒	☐
Safety Glasses	☒	☒	☒	☐
Safety Toed Shoes	☒	☒	☒	☐
Class 2 Safety Vest	☒	☒	☒	☐
Hearing Protection	☐	☒	☒	☐
Nitrile Gloves	☐	☐	☒	☐
Cut Resistant Gloves	☒	☒	☒	☐
Level of protection required	D	D	D	Select
Required Safety Equipment				
First Aid Kit	☒	☒	☒	☐

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5. TRAINING REQUIREMENTS

The table below lists the training requirements staff must have respective to their assigned tasks and that are required to access the Site.

Site Specific Training Requirements
HAZWOPER - 40 Hour (Initial)
HAZWOPER - 8 Hour (Annual Refresher)
Site Specific Orientation
40 Hour SST

Task Specific Training Requirements				
Required Training Type	**Task 1**	**Task 2**	**Task 3**	**Task 4**
	Site Walk	Remedial Oversight	Soil Sampling	Enter task description.
Hazard Communication	☒	☒	☒	☐
RCRA Haz Waste Generator	☐	☒	☐	☐

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6. AIR MONITORING PLAN AND EQUIPMENT

Exposures to airborne substances shall be fully characterized throughout project operations to ensure that exposure controls are effectively selected and modified as needed.

Is air/exposure monitoring required at this work site for personal protection? Yes

Is perimeter monitoring required for community protection? Yes

Air monitoring plan not applicable No

Air Monitoring/Screening Equipment Requirements

Photo-Ionization Detector (PID) 10.6eV

Dust Monitor (DustTrak)

The required equipment listed above must be on site. Work shall not commence unless the equipment is present and in working order.

Monitoring Plans

Parameter/ Contaminant	Equipment	Action Level	Response Activity
VOCs	PID 10.6 eV	< 10 ppm	Continue work and monitoring.
		>10 ppm for 5 minutes	Clear Instrument and Re-Monitor the Area. Implement PPE upgrades
		>10 ppm for >5 minutes	Evacuate the area and call the FSM and/or PM for further guidance. Implement engineering controls.

Zone Location and Monitoring Interval
Breathing zone and edge of Exclusion Zone.

See RAWP for CAMP requirements and Special CAMP requirements.

***If chemical does not have an action level use TLV or REL, whichever is lowest, to be used as an action level. If TLV or REL are the same as PEL, cut the PEL in half for an action level.**

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7. DECONTAMINATION & DISPOSAL METHODS

All possible and necessary steps shall be taken to reduce or minimize contact with chemicals and contaminated/impacted materials while performing field activities (e.g., avoid sitting or leaning on, walking through, dragging equipment through or over, tracking, or splashing potential or known contaminated/impacted materials.)

Personal Hygiene Safeguards

The following minimum personal hygiene safeguards shall be adhered to:

1. No smoking or tobacco products in any project work areas.
2. No eating or drinking in the exclusion zone.
3. It is required that personnel present on site wash hands before eating, smoking, taking medication, chewing gum/tobacco, using the restroom, or applying cosmetics and before leaving the site for the day.

It is recommended that personnel present on site shower or bathe at home at the end of each day of working on the site.

Decontamination Supplies

All decontamination should be conducted at the project site in designated zones or as dictated by Client requirements. Decontamination should not be performed on Haley & Aldrich owned or leased premises.

☐ Acetone	☒ Distilled Water	☐ Polyethylene Sheeting
☒ Alconox Soap	☐ Drums	☐ Pressure/Steam Cleaner
☒ Brushes	☐ Hexane	☒ Tap Water
☒ Disposal Bags	☐ Methanol	☐ Wash tubs
☐ 5 Gallon Buckets	☒ Paper Towels	☐ Other: Specify

Location of Decontamination Station

To be communicated during Site kick-off meeting.

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Standard Personal Decontamination Procedures

Outer gloves and boots should be decontaminated periodically as necessary and at the end of the day. Brush off solids with a hard brush and clean with soap and water or other appropriate cleaner whenever possible. Remove inner gloves carefully by turning them inside out during removal. Wash hands and forearms frequently. It is good practice to wear work-designated clothing while on-site which can be removed as soon as possible. Non-disposable overalls and outer work clothing should be bagged onsite prior to laundering. If gross contamination is encountered on-site contact the Project Manager and Field Safety Manager to discuss proper decontamination procedures.

The steps required for decontamination will depend upon the degree and type of contamination but will generally follow the sequence below.

1. Remove and wipe clean hard hat
2. Rinse boots and gloves of gross contamination
3. Scrub boots and gloves clean
4. Rinse boots and gloves
5. Remove outer boots (if applicable)
6. Remove outer gloves (if applicable)
7. Remove Tyvek coverall (if applicable)
8. Remove respirator, wipe clean and store (if applicable)
9. Remove inner gloves (if outer gloves were used)

PPE that is not grossly contaminated can be bagged and disposed in regular trash receptacles.

Small Equipment Decontamination

Pretreatment of heavily contaminated equipment may be conducted as necessary:

1. Remove gross contamination using a brush or wiping with a paper towel
2. Soak in a solution of Alconox and water (if possible)
3. Wipe off excess contamination with a paper towel

Standard decontamination procedure:

4. Wash using a solution of Alconox and water
5. Rinse with potable water
6. Rinse with methanol (or equivalent)
7. Rinse with distilled/deionized water

Inspect the equipment for any remaining contamination and repeat as necessary.

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Disposal Methods

Procedures for disposal of contaminated materials, decontamination waste, and single use personal protective equipment shall meet applicable client, locate, State, and Federal requirements.

Disposal of Single Use Personal Protective Equipment

PPE that is not grossly contaminated can be bagged and disposed in regular trash receptacles. PPE that is grossly contaminated must be bagged (sealed and field personnel should communicate with the Project Manager to determine proper disposal.

Standard Disposal Methods for Contaminated Materials

- Excess sample solids, decontamination materials, rags, brushes, poly-sheeting, etc. that are determined to be free of contamination through field screening can usually be disposed into client-approved, on-site trash receptacles.
- Uncontaminated wash water may be discarded onto the ground surface away from surface water bodies in areas where infiltration can occur.
- Contaminated materials must be segregated into liquids or solids and containerized separately for offsite disposal.

Disposal Method for Contaminated Soil

- Contaminated soil cuttings and spoils must be containerized for disposal off-site unless otherwise specifically directed.
- Soil cuttings and spoils determined to be free of contamination through field screening can usually be returned to the boreholes or excavations from which they came.

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8. SITE CONTROL

The overall purpose of site control is to minimize potential contamination of workers, protect the public from the site's hazards, and prevent vandalism. Site control is especially important in emergency situations. The degree of site control necessary depends on site characteristics, site size, and the surrounding community. The following information identifies the elements used to control the activities and movements of people and equipment at the project site.

Communication

Internal
Haley & Aldrich site personnel will communicate with other Haley & Aldrich staff member and/or subcontractors or contractors with:

Face to Face Communication

External
H&S site personnel will use the following means to communicate with off-site personnel or emergency services.

Cellular Phones

Visitors

Project Site
Will visitors be required to check-in prior to accessing the project site?

Yes

Visitor Access
Authorized visitors that require access to the project site need to be provided with known information with respect to the site operations and hazards as applicable to the purpose of their site visit. Authorized visitors must have the required PPE and appropriate training to access the project site.

Site Safety Officer is responsible for facilitating authorized visitor access.

Zoning

Work Zone
The work zone will be clearly delineated to ensure that the general public or unauthorized worker access is prevented. The following will be used:

Cones
Barricades
Temporary Fencing

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9. SITE SPECIFIC EMERGENCY RESPONSE PLAN

The Emergency Response Plan addresses potential emergencies at this site, procedures for responding to these emergencies, roles, responsibilities during emergency response, and training. This section also describes the provisions this project has made to coordinate its emergency response with other contractors onsite and with offsite emergency response organizations (as applicable).

During the development of this emergency response plan, local, state, and federal agency disaster, fire, and emergency response organizations were consulted (if required) to ensure that this plan is compatible and integrated with plans of those organizations. Documentation of the dates of these consultations are the names of individuals contacted is kept on file and available upon request.

The site has been evaluated for potential emergency occurrences, based on site hazards, and the major categories of emergencies that could occur during project work are:

- Fire(s)/Combustion
- Hazardous Material Event
- Medical Emergency
- Natural Disaster

A detailed list of emergency types and response actions are summarized in Table 9-2 below. Prior to the start of work, the SSO will update the table with any additional site-specific information regarding evacuations, muster points, or additional emergency procedures. The SSO will establish evacuation routes and assembly areas for the Site. All personnel entering the Site will be informed of these routes and assembly areas.

Pre-Emergency Planning

Before the start of field activities, the Project Manager will ensure preparation has been made in anticipation of emergencies. Preparatory actions include the following:

Meeting with the subcontractor/and or client concerning the emergency procedures in the event a person is injured. Appropriate actions for specific scenarios will be reviewed. These scenarios will be discussed, and responses determined before the sampling event commences. A form of emergency communication (i.e.; Cell phone, Air horn, etc.) between the Project Manager and subcontractor and/or client will be agreed on before the work commences.

A training session (i.e., “safety meeting”) given by the Project Manager or their designee informing all field personnel of emergency procedures, locations of emergency equipment and their use, and proper evacuation procedures.

Ensuring field personnel are aware of the existence of the emergency response HASP and ensuring a copy of the HASP accompanies the field team(s).

Onsite Emergency Response Equipment

Emergency procedures may require specialized equipment to facilitate work rescue, contamination control and reduction or post-emergency cleanup. Emergency response equipment stocked

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Table 9.1 Emergency Equipment and Emergency PPE			
Emergency Equipment	**Specific Type**	**Quantity Stocked**	**Location Stored**
First Aid Kit	ANSI	1 Kit	With Haley & Aldrich staff
Emergency PPE	**Specific Type**	**Quantity Stocked**	**Location Stored**
Gloves	Nitrile	1 box	With Haley & Aldrich staff

EVACUATION ALARM
Will be communicated during the Onsite Kickoff Meeting
EVACUATION ROUTES
See Site Plan in this HASP for Evacuation Routes
EVACUATION MUSTER POINT(S)/ SHELTER AREA(S)
See Site Plan in this HASP for Muster Point and Shelter Area
EVACUTION RESPONSE DRILLS
The Site relies on outside emergency responders and a drill is not required.

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Table 9-2 – Emergency Planning

Emergency Type	Notification	Response Action	Evacuation Plan/Route
Chemical Exposure	Report event to SSO immediately	Refer to Safety Data Sheet for required actions	Remove personnel from work zone
Fire - Small	Notify SSO and contact 911	Use fire extinguisher if safe and qualified to do so	Mobilize to *Muster Point*
Fire – Large/Explosion	Notify SSO and contact 911	Evacuate immediately	Mobilize to *Muster Point*
Hazardous Material – Spill/Release	Notify SSO; SSO will contact PM to determine if additional agency notification is	If practicable don PPE and use spill kit and applicable procedures to contain the release	See Evacuation Map for route, move at least 100 ft upwind of spill location
Medical – Bloodborne Pathogen	Notify SSO	If qualified dispose in container or call client or city to notify for further instruction.	None Anticipated
Medical – First Aid	Notify SSO	If qualified perform first aid duties	None Anticipated
Medical – Trauma	If life threatening or transport is required call 911, immediately	Wait at site entrance for ambulance	Noe Anticipated
Security Threat	Notify SSO who will call 911 as warranted	Keep all valuables out of site and work zones delineated.	None Anticipated
Weather – Earthquake/Tsunami's	STOP WORK and evacuate Site upon any earthquake	Turn off equipment and evacuate as soon as is safe to do so	Mobilize to *Shelter Location*
Weather – Lightning Storm	STOP WORK	Work may resume 30 minutes after the last observed lightning.	None Anticipated
Weather – Tornadoes/Hurricanes	Monitor weather conditions STOP WORK and evacuate the site	Evacuate to shelter location or shelter in place immediately	Mobilize to *Shelter Location*
MUSTER POINT Will be communicated during the Onsite Kickoff Meeting		*SHELTER LOCATION* Will be communicated during the Onsite Kickoff Meeting	
In case of site emergencies, site personnel shall be evacuated per this table and will not participate in emergency response activities. Site emergencies shall be reported to local, state, and federal governmental agencies as required.			

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10. HASP ACKNOWLEDGEMENT FORM

All Haley & Aldrich employees onsite must sign this form prior to entering the site.

I hereby acknowledge receipt of, and briefing on, this HASP prior to the start of on-site work. I declare that I understand and agree to follow the provisions, processes, and procedures set forth herein at all times while working on this site.

Printed Name	Signature	Date

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ATTACHMENT A
HASP AMENDMENT FORM

Note: This HASP has been developed for Haley & Aldrich purposes only and is not for use by others.

HASP AMENDMENT FORM

This form is to be used whenever there is an immediate change in the project scope that will require an amendment to the HASP. For project scope changes associated with "add-on" tasks, the changes must be made in the body of the HASP. Before changes can be made, a review of the potential hazards must be initiated by the Haley & Aldrich Project Manager.

This original form must remain on site with the original HASP. If additional copies of this HASP have been distributed, it is the Project Manager's responsibility to forward a signed copy of this amendment to those who have copies.

Amendment No.	
Site Name	
Work Assignment No.	
Date	
Type of Amendment	
Reason for Amendment	
Alternate Safeguard Procedures	
Required Changes in PPE	

Project Manager Name (Print)	Project Manager Signature	Date

Health & Safety Approver Name (Print)	Health & Safety Approver Signature	Date

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ATTACHMENT B
TRAINING REQUIREMENTS

Note: This HASP has been developed for Haley & Aldrich purposes only and is not for use by others.

TRAINING REQUIREMENTS

Health and Safety Training Requirements

Personnel will not be permitted to supervise or participate in field activities until they have been trained to a level required by their job function and responsibility. Haley & Aldrich staff members, contractors, subcontractors, and consultants who have the potential to be exposed to contaminated materials or physical hazards must complete the training described in the following sections.

The Haley & Aldrich Project Manager/FSM will be responsible for maintaining and providing to the client/site manager documentation of Haley & Aldrich staff members' compliance with required training as requested. Records shall be maintained per OSHA requirements.

40-Hour Health and Safety Training

The 40-Hour Health and Safety Training course provides instruction on the nature of hazardous waste work, protective measures, proper use of personal protective equipment, recognition of signs and symptoms which might indicate exposure to hazardous substances, and decontamination procedures. It is required for all personnel working on-site, such as equipment operators, general laborers, and supervisors, who may be potentially exposed to hazardous substances, health hazards, or safety hazards consistent with 29 CFR 1910.120.

8-hour Annual Refresher Training

Personnel who complete the 40-hour health and safety training are subsequently required to attend an annual 8-hour refresher course to remain current in their training. When required, site personnel must be able to show proof of completion (i.e., certification) at an 8-hour refresher training course within the past 12 months.

8-Hour Supervisor Training

On-site managers and supervisors directly responsible for, or who supervise staff members engaged in hazardous waste operations, should have eight additional hours of Supervisor training in accordance with 29 CFR 1910.120. Supervisor Training includes, but is not limited to, accident reporting/investigation, regulatory compliance, work practice observations, auditing, and emergency response procedures.

Additional Training for Specific Projects

Haley & Aldrich personnel will ensure their personnel have received additional training on specific instrumentation, equipment, confined space entry, construction hazards, etc., as necessary to perform their duties. This specialized training will be provided to personnel before engaging in the specific work activities including:

- Client specific training or orientation
- Competent person excavations
- Confined space entry (entrant, supervisor, and attendant)
- Heavy equipment including aerial lifts and forklifts
- First aid/ CPR
- Use of fall protection
- Use of nuclear density gauges
- Asbestos awareness

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ATTACHMENT C
ROLES AND RESPONSIBILITIES

Note: This HASP has been developed for Haley & Aldrich purposes only and is not for use by others.

SITE ROLES AND RESPONSIBILITIES

Haley & Aldrich Personnel

Field Safety Manager (FSM)

The Haley & Aldrich FSM is a full-time Haley & Aldrich staff member, trained as a safety and health professional, who is responsible for the interpretation and approval of this Safety Plan. Modifications to this Safety Plan cannot be undertaken by the PM or the SSO without the approval of the FSM.

Specific duties of the FSM include:

- Approving and amending the Safety Plan for this project
- Advising the PM and SHSOs on matter relating to health and safety
- Recommending appropriate personal protective equipment (PPE) and air monitoring instrumentation
- Maintaining regular contact with the PM and SSO to evaluate the conditions at the property and new information which might require modifications to the HASP and
- Reviewing and approving JSAs developed for the site-specific hazards.

Project Manager (PM)

The Haley & Aldrich PM is responsible for ensuring that the requirements of this HASP are implemented at that project location. Some of the PM´s specific responsibilities include:

- Assuring that all personnel to whom this HASP applies have received a copy of it;
- Providing the FSM with updated information regarding environmental conditions at the site and the scope of site work;
- Providing adequate authority and resources to the on-site SHSO to allow for the successful implementation of all necessary safety procedures;
- Supporting the decisions made by the SHSO;
- Maintaining regular communications with the SHSO and, if necessary, the FSM;
- Coordinating the activities of all subcontractors and ensuring that they are aware of the pertinent health and safety requirements for this project;
- Providing project scheduling and planning activities; and
- Providing guidance to field personnel in the development of appropriate Job Safety Analysis (JSA) relative to the site conditions and hazard assessment.

Site Health & Safety Officer (SHSO)

The SHSO is responsible for field implementation of this HASP and enforcement of safety rules and regulations. SHSO functions may include some or all of the following:

- Act as Haley & Aldrich´s liaison for health and safety issues with client, staff, subcontractors, and agencies.
- Verify that utility clearance has been performed by Haley & Aldrich subcontractors.
- Oversee day-to-day implementation of the Safety Plan by Haley & Aldrich personnel on site.

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- Interact with subcontractor project personnel on health and safety matters.
- Verify use of required PPE as outlined in the safety plan.
- Inspect and maintain Haley & Aldrich safety equipment, including calibration of air monitoring instrumentation used by Haley & Aldrich.
- Perform changes to HASP and document in Appendix A of the HASP as needed and notify appropriate persons of changes.
- Investigate and report on-site accidents and incidents involving Haley & Aldrich and its subcontractors.
- Verify that site personnel are familiar with site safety requirements (e.g., the hospital route and emergency contact numbers).
- Report accidents, injuries, and near misses to the Haley & Aldrich PM and FSM as needed.

The SHSO will conduct initial site safety orientations with site personnel (including subcontractors) and conduct toolbox and safety meetings thereafter with Haley & Aldrich employees and Haley & Aldrich subcontractors at regular intervals and in accordance with Haley & Aldrich policy and contractual obligations. The SHSO will track the attendance of site personnel at Haley & Aldrich orientations, toolbox talks, and safety meetings.

Field Personnel

Haley & Aldrich personnel are responsible for following the health and safety procedures specified in this HASP and for performing their work in a safe and responsible manner. Some of the specific responsibilities of the field personnel are as follows:

- Reading the HASP in its entirety prior to the start of on-site work;
- Submitting a completed Safety Plan Acceptance Form and documentation of medical surveillance and training to the SHSO prior to the start of work;
- Attending the pre-entry briefing prior to beginning on-site work;
- Bringing forth any questions or concerns regarding the content of the Safety Plan to the PM or the SHSO prior to the start of work;
- Stopping work when it is not believed it can be performed safely;
- Reporting all accidents, injuries and illnesses, regardless of their severity, to the SHSO;
- Complying with the requirements of this safety plan and the requests of the SHSO; and
- Reviewing the established JSAs for the site-specific hazards on a daily basis and prior to each shift change, if applicable.

Visitors

Authorized visitors (e.g., Client Representatives, Regulators, Haley & Aldrich management staff, etc.) requiring entry to any work location on the site will be briefed by the Site Supervisor on the hazards present at that location. Visitors will be escorted at all times at the work location and will be responsible for compliance with their employer´s health and safety policies. In addition, this safety plan specifies the minimum acceptable qualifications, training and personal protective equipment which are required for entry to any controlled work area; visitors must comply with these

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requirements at all times. Unauthorized visitors, and visitors not meeting the specified qualifications, will not be permitted within established controlled work areas.

SUBCONTRACTOR PERSONNEL

Subcontractor Site Representative

Each contractor and subcontractor shall designate a Contractor Site Representative. The Contractor Site Representative will interface directly with Insert Staff Name Here, the Subcontractor Site Safety Manager, with regards to all areas that relate to this safety plan and safety performance of work conducted by the contractor and/or subcontractor workforce. Contractor Site Representatives for this site are listed in the Contact Summary Table at the beginning of the Safety Plan.

Subcontractor Site Safety Manager

Each contractor / subcontractor will provide a qualified representative who will act as their Site Safety Manager (Sub-SSM). This person will be responsible for the planning, coordination, and safe execution of subcontractor tasks, including preparation of job hazard analyses (JHA), performing daily safety planning, and coordinating directly with the Haley & Aldrich SHSO for other site safety activities. This person will play a lead role in safety planning for Subcontractor tasks, and in ensuring that all their employees and lower tier subcontractors are in adherence with applicable local, state, and/or federal regulations, and/or industry and project specific safety standards or best management practices.

General contractors / subcontractors are responsible for preparing a site-specific HASP and/or other task specific safety documents (e.g., JHAs), which are, at a minimum, in compliance with local, state, and/or federal other regulations, and/or industry and project specific safety standards or best management practices. The contractor(s)/subcontractor(s) safety documentation will be at least as stringent as the health and safety requirements of the Haley & Aldrich Project specific HASP.

Safety requirements include, but are not limited to: legal requirements, contractual obligations and industry best practices. Contractors/subcontractors will identify a site safety representative during times when contractor/subcontractor personnel are on the Site. All contractor/subcontractor personnel will undergo a field safety orientation conducted by the Haley & Aldrich SHSO and/or PM prior to commencing site work activities. All contractors / subcontractors will participate in Haley & Aldrich site safety meetings and their personnel will be subject to training and monitoring requirements identified in this Safety Plan. If the contractors / subcontractors means and methods deviate from the scope of work described in Section 1 of this Safety Plan, the alternate means and methods must be submitted, reviewed and approved by the Haley & Aldrich SHSO and/or PM prior to the commencement of the work task. Once approved by the Haley & Aldrich SHSO and/or PM, the alternate means and methods submittal will be attached to this Safety Plan as an Addendum.

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ATTACHMENT D
JOB SAFETY ANALYSES

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Safety
in everything we do

28-12 41ST AVE DEVELOPMENT

KEY TASK Tasks 1 through 3:		
Subtask Category	**Potential Hazards**	**Controls**
Site Walk	Slips, Trips, and Falls	• Take your time and pay attention to where you are going • Adjust your stride to a pace that is suitable for the walking surface and tasks you are doing • Check the work area to identify hazards – beware of trip hazards such as wet floors, slippery floors, and uneven surfaces or terrain • Establish and utilize a pathway free of slip and trip hazards • Choose a safer walking route · Carry loads you can see over • Keep work areas clean and free of clutter • Communicate hazards to on-site personnel – remove hazards as appropriate
Site Walk	Work site access and controls	• Observe all work site access and controls before entering work area • Use only routes that are designated for personnel • Do not change or alter established work site access or controls
Site Walk	General site hazards	• Be mindful of moving vehicles and where you are walking • Notify field team of any observed hazards • Complete tailgate and discuss site hazards
Site Walk	Vehicle traffic/safety	• Watch out for vehicular traffic in and around work area • Access work area along routes that are the least bus

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Remedial Oversight	Heavy equipment	• Personal protective equipment, licensed excavator/machine operators • Maintain a safe distance from moving equipment and observe equipment swing radii
Remedial Oversight	Noise reduction	• Personal protective equipment, ear plugs or ear muffs
Remedial Oversight	Vehicle traffic/safety	• Watch out for vehicular traffic in and around work area • Access work area along routes that are the least busy
Remedial Oversight	Weather-related hazards	• Avoid slippery surfaces as a result of weather • Seek shelter in the event of a lightning storm and stay clear of potential lightning receptors
Soil Sampling	Tool/Equipment Use	• Inspect any tools or equipment before you use them • Ensure that any cords or plugs are not frayed or damaged • Only use tools/equipment for the purpose they are meant to be used – tools/equipment are not toys to be played with • Think of the steps in which you will use the tools/equipment before using them • Handle all tools/equipment in a safe manner • If unsure how to use a tool/equipment, be sure to receive proper training or instruction prior to using them • Use tools/equipment at a safe pace • Do not force tools/equipment to work

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ATTACHMENT E
PROJECT SITE FORMS

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Subsurface Clearance Field Checklist

PROJECT INFORMATION

Site Name:		Project Manager:	
Location:		Client Leader/LSRP:	
Client Name:		Scope of Work:	
Project Number:		Date of SSC Event:	

PROJECT BASICS (Completed prior to the start of field activities)

Site Contact Person Identified? Circle one: Yes No			
Contact Person/Company Name/Phone Number:			
Subcontractor & On-Site Representatives:			
Have the subsurface activities been explained to the subcontractor? Circle one: Yes No			
Public utility mark-out completed? Circle one: Yes No			
Public Mark-out/called in by Company/Representative:		Date:	
Ticket Number:		Utilities Notified and Response received:	

PRE-CLEARANCE (Completed prior to breaking ground or determining final locations)

Private Utility Mark-out completed? Circle one: Yes No		Date:	
Work area and each intrusive location scanned for all utilities? Circle one: Yes No			
Private Mark-out completed by Subcontractor & Representative:			
Depth of accuracy (feet):		Limitations:	
Type of equipment used:			

Utility Identified & Marked-out	Depth (ft)	Yes	No	Utility Identified & Marked-out	Depth (ft)	Yes	No
Electricity (Red)				Sewer (Green)			
Gas (Yellow)				Telephone Data (Orange)			
Water (Blue)				Fuel/Oil			
Reclaimed H_2O/Irrigation (Purple)				Proposed excavation (white)			

SCOPE OF WORK

Scope of Work provided to subcontractors? Circle one: Yes No					
Number of intrusive locations:		Targeted depth (feet):		Diameter of Borehole (inches):	
Proposed intrusive locations within 10 feet of marked and/or known utility? Circle one: Yes No					
Final locations confirmed at least 10 feet away from all utilities? Circle one: Yes No					

FIELD OBSERVATIONS

Other Utilities & Visual Clues Observed	Yes	No	Other Utilities & Visual Clues Observed	Yes	No
Natural gas meters			Fire suppression		
Water meters			Fire hydrants		
Cable markers			Fire sprinkler lines		
Sewer drains/cleanouts			Sprinkler/irrigation systems		
Overhead lines (give 15' x 15' of clearance)			Utility poles with conduit leading to the ground		
Pipeline and pipeline markers			Utility boxes		
Underground storage tank (UST)			Manholes		
UST fill ports and vent pipes			Pavement scarring		
Lights			Remote buildings with no visible utilities		
Signage			Other (specify):		
Steam lines			Other (specify):		

Any mitigations taken if points cannot be obtained or site type was not listed:_____

_____

Mitigations taken by whom: _____

Subsurface Clearance Field Checklist

Utility Point System: Gain points to protect against utility strike

Site Description	Minimum Points Needed
Combination of 2 or more Site Types	5
Commercial/Office Park	5
Downtown/Urban Development	5
Manufacturing/Active	5
Manufacturing/Non-Active	5
Mine	5
Rail	5
Residential	5
Roadway (right-of-way, highway, and secondary routes)	5
Roadway (right-of-way, rural route)	5
Universities/Government Campus/Airports	5
Abandoned/Non-Active/Vacant	3
Remote (field, woods, undisturbed)	2
Work over water	2
Site Type Not Listed Above	Consult with the PM, Utility Specialist, and Project Team
Cannot Gain Minimum Points	Perform hand clearing/soft dig/vacuum excavation

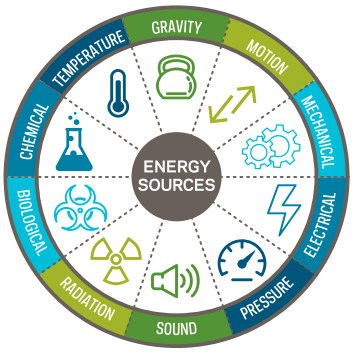
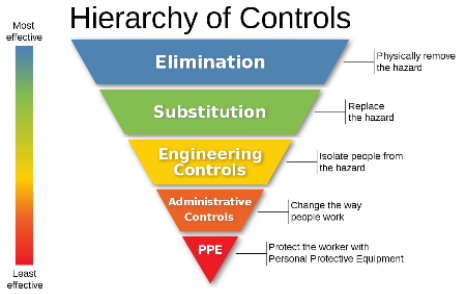
1 Point Value (2 Maximum from this Category)
Facility/contact supplied information (GIS figure with photo overlay; extensive client records and drawings)
The utilities have been marked using GPS or surveyed (with minimum accuracy of 0.1 foot)
A review of the work scope with a knowledgeable site contact (client contact, site manager, maintenance manager or other site personnel) about the site's history and utility locations/conditions (with a utility site drawing). **A knowledgeable site contact is someone who has regular responsibilities for managing site infrastructure, construction activities, and/or retaining site drawings/figures.**
A visual inspection of the site to verify that the utilities match the drawings and figures (completed after the State One Call Subsurface Clearance Checklist)
Confirmation of the low density of subsurface utilities (based on site maps, previous private utility locates)
Shallow boring advancement (<2 feet below ground surface (bgs) with non-mechanical drilling techniques)

2 Point Values
As-built drawings (plot plans, as-builts, pipeline or facilities maps, and/or lease drawings), reviewed and verified by client for updated changes
Confirmation that utilities cut off at street and align with drawings and figures
Drawing/figure (measured to scale, shows site utilities as visually verified during site walk); includes any new or repaired lines that match site (e.g., pavement scarring); depth and diameter of utilities; and recent (includes any new construction activity)
Survey data and figures produced by Haley & Aldrich and/or Haley & Aldrich site utility experience with additional site inspection
Site drawing and figures from prior private utility locate created by Haley & Aldrich (drawing must include GPS coordinates and utilities are to scale)
GPR/EM Cable location by private utility locate directly above proposed ground disturbance/borehole location

3 Point Values	3 Point Values (Open Excavations Only)
Hand Clearing/Soft Dig/Vacuum Excavation to 5 feet bgs using the following soft dig clearance methods listed from least invasive to most: • Probing • Hand Digging • Hand Auguring • Vacuum Extraction • Air/Water Knife with Vacuum Extraction	Hand Clearing/Soft Dig/Vacuum Excavation using the following soft dig clearance methods to confirm location of known utilities prior to using mechanical excavation: • Probing • Hand Digging • Vacuum Extraction

HEALTH & SAFETY TAILGATE MEETING FORM

Staff members at meeting:	Click or tap here to enter text.	**Meeting date:** Click or tap to enter a date.

What tasks are being performed today? *List the tasks being performed today and review JHAs. Do JHAs correspond with tasks? Are any subcontractors performing the work we are responsible for?*	Click or tap here to enter text.
What hazards do you anticipate today?  *Consider not just the hazards of tasks you are performing, but also the hazards present around you (e.g., weather, simultaneous operations, ticks or insects, slips, trips, falls, repetitive motion, etc.).*	Click or tap here to enter text.
What risk do these hazards present? *How likely are the hazards you have identified to impact you? What do you need to be most concerned about today? Have these hazards changed since you performed work yesterday?*	Click or tap here to enter text.
What controls are you using?  *Discuss how you are mitigating the hazards you have identified. Use your JHA as a resource, but ensure you have mitigated changed conditions (e.g., weather, SIMOPS, etc.) that were not identified in the original plans.*	Click or tap here to enter text.

Everyone has Stop Work Authority	Use identified PPE from JHAs	Review emergency procedures	Share experiences through reporting

APPENDIX E
NYSDEC Request to Import Reuse 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

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:

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

Revised April 2023

APPENDIX F
Citizen Participation Plan

NEW YORK STATE | Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan

for

28-12 41st Avenue Site

28-12 41st Avenue

November 2025

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: **28 12 41ST Ave LLC ("Applicant")**
Site Name: **28-12 41st Avenue Site**
Site Address: **28-12 41st Avenue, Queens, NY 11101**
Site County: **Queens County**
Site Number: **C241300**

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) which 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 web site. 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;
- 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, at a minimum, that 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

Note: The table identifying the citizen participation activities related to the site's investigation and cleanup program follows on the next page:

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.

Based on the analytical results of the Remedial Investigation, the primary contaminants of concern for the Site are semi-volatile organic compounds (SVOCs; specifically polycyclic aromatic hydrocarbons [PAHs]), heavy metals, pesticides, and polychlorinated biphenyls (PCBs) in soil. These contaminants are characteristic of historical fill material commonly found throughout the New York City area. Shallow soils impacted with elevated concentrations of PCE, with localized detections at RIB-05_0-2 and RIB-08_0-2. Lead, SVOCs (specifically PAHs), and per- and polyfluoroalkyl substances (PFAS) were the primary contaminants of concern in groundwater. The elevated concentrations of PAHs and lead in Site groundwater appear limited to the southeast corner of the Site and may have been introduced from Site-wide contaminated fill and historical Site operations. Lead identified in groundwater were noted at concentrations consistently found through the New York City area. PFAS contamination in the groundwater at the Site, encountered within the central and southern portions of the Site, are likely the result of an off-Site source, as PFOS and PFOA were not identified in soils above any SCO or guidance values. Chlorinated VOCs (CVOCs) were identified in soil vapor, specifically tetrachloroethene (PCE), in shallow soil (0-2 ft bgs), intermediate soil (10 ft bgs), and soil above the groundwater (20 ft bgs) table, with the highest concentrations of PCE appearing to be present in the central and southern portions of the Site. CVOC contamination in soil vapor at the Site may potentially be a result of historical Site uses, including metal works, dry cleaning, a laundry facility with two storage tanks, printing, and auto repair operations. However, CVOC impacts in soil vapor may be the result of off-Site sources, as an on-Site source in groundwater was not identified during previous investigations.

The Site is located within a potential 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 politics.

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.

Because there is a large Hispanic-American population near the Site, all future fact sheets will be translated into Spanish.

4. Site Information

Appendix C contains a map identifying the location of the site.

Site Description

The Site, addressed 28-12 41st Avenue, located in the Long Island City neighborhood of Queens, is identified as Block 417 Lot 20 on the New York City tax map. The Site is approximately 5,000 square feet (sq ft) (0.115 acres) and is currently improved with a one-story, slab-on-grade warehouse used for parking and storage. The Site is bounded to the north by 41st Avenue and ATLAS High School; to the east by a two-story mixed-use residential and commercial building; to the south by a two-story commercial building and a two-story mixed-use residential and commercial building; and to the west by a commercial parking lot followed by Gotham Tech High School (Q417).

History of Site Use, Investigation, and Cleanup

The Site was first developed as early as 1898 with two one-story garage buildings. By 1915, the northern half of the Site was occupied by two residential buildings. Between 1936-1950, two shed buildings were added on the southern portion of the Site. Around 1971, the current commercial warehouse was constructed and has been utilized for commercial uses including metal works, dry cleaning, and laundry facility with two oil storage tanks, printing, and auto repair through present day. The property has been occupied by Federal Express Corp in 1976, Perfect Auto Repair in 1991, Anco Transmissions Corp and Redline Auto Repair from 1991 to 2004, CP Trading and locksmith in 2005, Max Cleaners Inc. in 2007, Max JDJ Cleaners in 2008 (registered dry cleaner site), and Walnut Printing and A Roofing in 2014 and 2017. The Site is currently improved with a one-story, slab-on-grade, vacant warehouse and was most recently used for parking and storage.

A Phase I Environmental Site Assessment conducted in 2021 identified three Recognized Environmental Conditions including 1) the site has historically been used for metal works, dry cleaning, and auto repair; 2) a metal rimmed object identified in the sidewalk can potentially be associated with a underground storage tank (UST) under the sidewalk which was used for storing heating oil prior to the Site's conversion to natural gas heat; and 3) the site is listed as an E-Designation site (E-104) for Hazardous Materials with Phase I and Phase II testing protocol required.

Based on results of limited subsurface investigations conducted in 2021, it was determined that geophysical investigation did not identify a UST, historic fill impacted with elevated levels of SVOCs and metals were observed up to 7 feet below grade and soil vapor impacted with PCE

may be associated with an on-site source of contamination and potentially associated with the Site's historical uses.

Based on the results of a Remedial Investigation conducted in 2025 for the New York City Office of Environmental Remediation (NYC OER), it was determined that elevated concentrations of SVOCs, pesticides, metals and constituents of PFAS were identified in soil; SVOCs, metals, and constituents of PFAS were identified in groundwater and petroleum-related VOCs and CVOCs were identified in soil vapor.

5. Investigation and Cleanup Process

Application

The Applicant has applied for the 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 onsite, 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-Residential purposes.

To achieve this goal, the Applicant has conducted an investigation at the site. 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 has conducted an investigation of the site officially called a "remedial investigation" (RI). This investigation was performed with NYSDEC oversight. Prior to the implementation of the investigation, the Applicant developed a remedial investigation workplan, which is subject 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 submitted a draft "Remedial Investigation Work Plan" to NYSDEC for review and approval. NYSDEC made the draft plan available to the public review during a 30-day public comment period.

After completing the investigation, the Applicant prepared and submitted a report that summarizes the results. This report also recommends 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 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 final engineering report. 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, soil vapor extraction systems, 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 or soil vapor. 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):

Shawn Roberts
Project Manager
NYSDEC
Division of Environmental
Remediation
625 Broadway
Albany, NY 12233-5060
(518) 402-9799
Shawn.Roberts@dec.ny.gov

New York State Department of Health (NYSDOH):

Christopher Budd
Public Health Specialist
NYSDOH
Bureau of Environmental Exposure
Investigation
Empire State Plaza, Corning Tower, Room
1787
Albany, NY 12203
(518) 402-1769
Christopher.Budd@health.ny.gov

NYSDEC InfoTracker
https://extapps.dec.ny.gov/data/DecDocs/C241300/

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

Queens Public Library – Hunters Point Branch
47-40 Center Blvd.
Long Island City, NY 11109
Phone: 718.707.9944
Email: Eunyoung.Abalmasov@queenslibrary.org
Attn: Euni (Eun Young) Abalmasov, Managing Librarian
Hours:
Monday – 9 a.m. to 8 p.m.
Tuesday – 1 p.m. to 6 p.m.
Wednesday – 10 a.m. to 6 p.m.
Thursday – 12 p.m. to 8 p.m.
Friday – 10 a.m. to 6 p.m.
Saturday – Closed
Sunday – 12 p.m. to 5 p.m.

Queens Public Library – Long Island City Branch
37-44 21 Street
Long Island City, NY 11101
Phone: 718.752.3700
Email: Abigail.goldberg@queenslibrary.org
Attn: Abigail Goldberg, Managing Librarian
Hours:
Monday – 10 a.m. to 6 p.m.
Tuesday – 1 p.m. to 6 p.m.
Wednesday – 10 a.m. to 6 p.m.
Thursday – 12 p.m. to 8 p.m.
Friday – 10 a.m. to 6 p.m.
Saturday – 10 a.m. to 5 p.m.
Sunday – Closed

Queens Community Board 1
45-02 Ditmars Boulevard
LL Suite 1025
Astoria, NY 11105
Phone: 718.626.1024
Email: Qn01@cb.nyc.gov
Attn: Florence Koulouris, District Manager
Hours:
Monday through Friday – 9 a.m. to 5 p.m.

Appendix B - Site Contact List

Owners, Residents, Occupants:

The Site is currently vacant.

Owner	Contact Name	Phone	Mailing Address	Email
28 12 41ST AVE LLC	Adtiya Ajaykumar Shah	929-333-1997	222-25 Jamaica Avenue Suite 301, Queens Village, NY 11428	Aditya.shah@edevelopmentinc.com

Executive

Role	Name	Phone	Mailing Address	Email / Contact
NYC Mayor	Mayor Eric Adams	212-NEW-YORK	City Hall New York, NY 10007	https://www1.nyc.gov/office-of-the-mayor/mayor-contact.page
NYC Department of City Planning Chairperson	Marisa Lago	212-720-3300	120 Broadway 31st Floor New York. NY 10271	https://www1.nyc.gov/site/planning/about/email-the-director.page
Queens Borough President	Donovan Richards	718-286-3000	120-55 Queens Blvd., Kew Gardens NY, 11424	info@queensbp.nyc.gov
Queens Community Board 1 District Manager	Florence Koulouris	718-626-1021	45-02 Ditmars Boulevard LL Suite 1025 Astoria, NY 11105	qn01@cb.nyc.gov
New York City Council District 26	Julie Won	718-383-9566	37-04 Queens Boulevard, Suite 205 Long Island City, NY 11101	District26@council.ny.gov
NY Senate District 59 Senator	Kristen Gonzalez	718-765-6674	801 2nd Ave Suite #303 New York, NY 10017	gonzalez@nysenate.gov
NY State Assembly District 36 Member	Zohran Mamdani	718-545-3889	24-08 32nd St Suite 1002A Astoria, NY 11102	mamdaniz@nyassembly.gov
NYC Department of Health and Mental Hygiene (DOHMH)	Ashwin Vasan, M.D., PhD Commissioner	212-639-9675	42-09 28th Street, Queens, NY 11101	opmc@health.ny.gov

Adjacent Properties

Owner/Entity Name	Contact Name	Site Use	Property Address	Owner Mailing Address
Don's Corporation	N/A	Mixed Residential & Commercial Buildings	28-14 41st Avenue	N/A
41-14 29th Street, LLC	N/A	Industrial & Manufacturing	41-14 29th Street	N/A
H & L 41-11 Realty INC	N/A	Industrial & Manufacturing	41-11 28th Street	N/A
H & L 28-08 Holding Corp	N/A	Parking Facilities	28-08 41st Avenue	N/A
NYC Department of Education	N/A	ATLAS Public High School	28-01 41st Avenue, Long Island City, Queens, NY 11101	N/A

Local News and Media:

Owner/Entity Name	Type	Address	Phone	Website
The Queens Daily Eagle	Online & Print Newspaper	8900 Sutphin Blvd, LL2, Jamaica, NY 11435	718-422-7409	https://queenseagle.com/
The Queens Chronicle	Online & Print Newspaper	71-19 80th Street, Suite 8-201 Glendale, NY 11385	(718) 205-8000	https://www.qchron.com/

Public Water Supply:

Public water supply is a shared responsibility between the New York City Department of Environmental Protection (NYCDEP) and the Municipal Water Finance Authority.

Owner/Entity Name	Contact	Address	Phone	Email
NYCDEP	Vincent Sapienza - Commissioner	59-17 Junction Blvd. Flushing, NY 11373	718-595-6565	ltcp@dep.nyc.gov
NYC Municipal Water Finance Authority	Olga Chernat- Executive Director	255 Greenwich Street 6th Floor, New York, NY 10007	212-788-5889	Not Available

School or Day Care Located on or Proximal to the Site

Following schools or day care facilities are located within ½-mile radius to the Site:

School/Day Care Name	Approximate distance from Site in feet and direction	Administrator	Phone	Address
Q575 Academy of American Studies	~480 ft (north of site)	Shermila Bharat, Principal	(929) 487-1910	40-11 28th Street, Astoria, NY 11101
ATLAS High School	~150 ft (north of site)	Elizabeth Messmann, Principal	(718) 937-6005	28-01 41st Avenue, Long Island City,

				Queens, NY 11101
Gotham Tech High School	~50 ft (west of site)	Luis Familia, Principal	(718) 433-2660	28-02 41st Avenue Long Island City Queens, NY 11101
Q575 Academy of American Studies	~540ft (northwest of site)	Shermila Bharat, Principal	(929) 487-1910	40-11 28th St, Astoria, NY 11101
Playhouse Daycare	~750 (southeast of site)	N/A	(718) 392-2783	29-22 Northern Blvd 2nd floor, Long Island City, NY 11101
Bright Horizons at Long Island City	~630 (southwest of site)	N/A	(848) 230-3594	42-09 28th St, Long Island City, NY 11101
Growing Up Green I Charter School - Elementary School - Long Island City	~500 ft (north of site)	Tomi Okuyemi, Chief Academic Officer	(347) 642-4306	39-27 28th St, Long Island City, NY 11101

Document Repositories

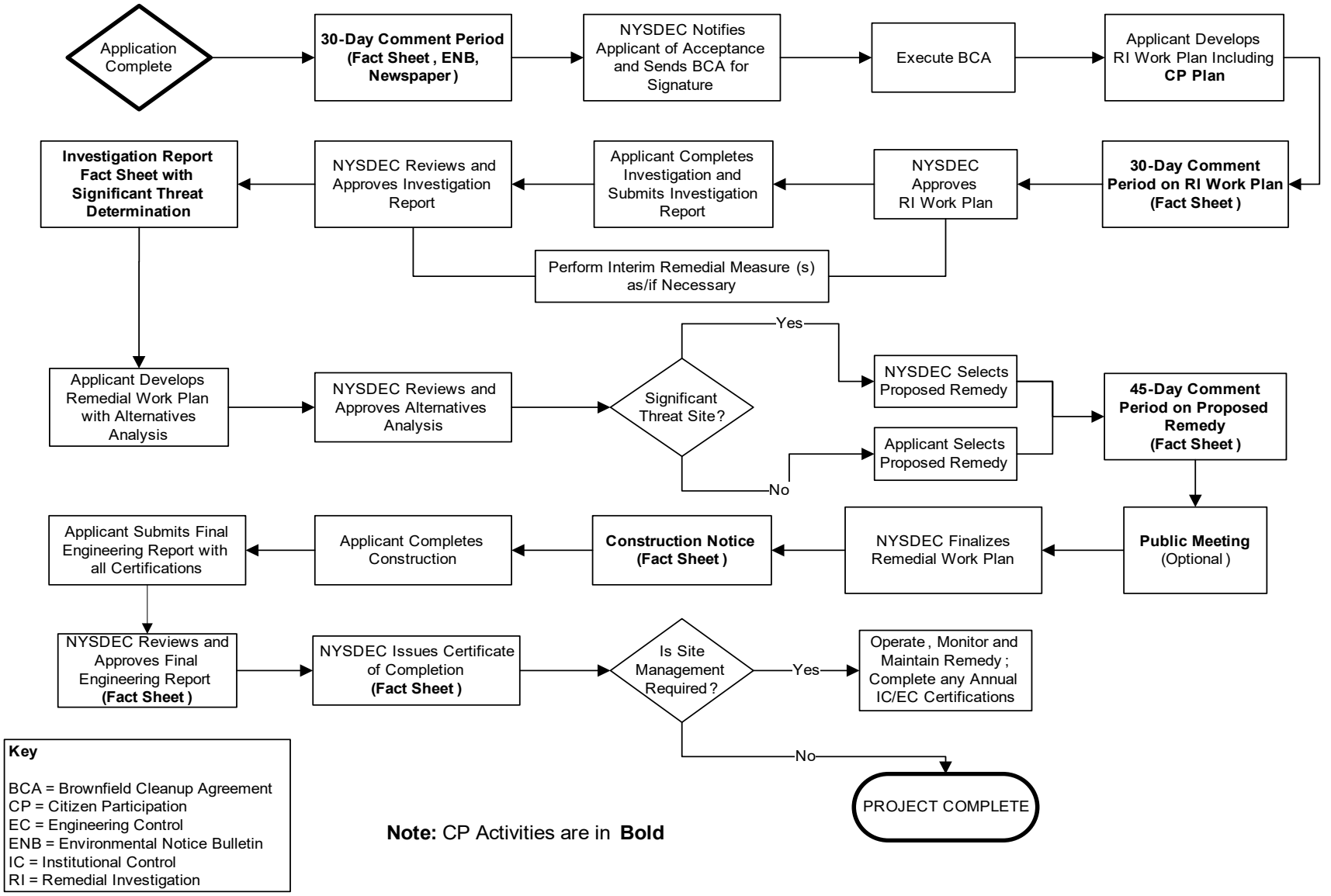
Owner/Entity Name	**Contact**	**Address**	**Phone**	**Email**
The Queens Public Library – Long Island City Branch	Abigail Goldberg	37-44 21st St, Long Island City, NY 11101	(718)-752-3700	Abigail.Goldberg@queenslibrary.org
Queens Community Board 1	Florence Koulouris	45-02 Ditmars Blvd # 1025, Astoria, NY 11105	(718)-628-8400	qn01@cb.nyc.gov
Queens Public Library – Hunters Point Branch	Eunyoung Abalmasov	47-40 Center Boulevard, Long Island City, NY 11109	(718)-707-9944	Eunyoung.abalmasov@queenslibrary.org

Appendix C - Site Location Map



- Site Boundary

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**

Division of Environmental Remediation

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.

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.
- The Scoping Sheet may be prepared by DEC or a remedial party, but must be reviewed and approved by the DER site project manager or his/her designee.

Instructions for Numbered Parts

Consider the bulleted issues and questions below and any others that may be unique or appropriate to the site and the community to help complete the five Parts of this Scoping Sheet. Identify 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 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 people, properties, natural resources, etc.?
- Are 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?
- Does 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 to the Community.

- Specific site investigation or remediation activities currently underway, or that will begin in the near future.
- 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. In its remedial programs, DER seeks to integrate, and be consistent with, environmental justice principles set forth in *DEC Commissioner Policy 29 on Environmental Justice* and *DER 23 – Citizen Participation Handbook for Remedial Programs*. Is the site and/or affected community wholly or partly in an Environmental Justice (EJ) Area? Use the Search feature on DEC's public web site for "environmental justice". DEC's EJ pages define an EJ area, and link to county maps to help determine if the site and/or community are in an EJ area.

h. 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 to select and conduct 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

Division of Environmental Remediation

Remedial Programs
Scoping Sheet for Major Issues of Public Concern (see instructions)

Site Name: 28-12 41st Avenue Site

Site Number: C241300

Site Address and County: 28-12 41st Avenue, Queens, NY

Remedial Party(ies): 28 12 41ST AVE LLC

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 information needs. **Use this information as an aid to prepare or update the Major Issues of Public Concern section of the site Citizen Participation Plan.**

1. Contaminants of concern for the Site are VOCs in soil vapor, SVOCs (specifically PAHs), metals, pesticides, and PCBs in soil, and metals, SVOCs, and PFAS in groundwater.

2. 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.

How were these issues and/or information needs identified?
A Phase I Environmental Site Assessment (ESA) dated April 2021 and Limited Phase II Environmental Site Investigation Report dated May 2021 were completed by P.W. Grosser Consulting, Inc. (PWGC), A NYCOER Remedial Investigation Report (RIR) was completed by GEI dated July 2025, and a Remedial investigation conducted in October 2025 by Haley & Aldrich.

Part 2. List important information needed **from** the community, if applicable. Identify individuals, groups, organizations, businesses and/or units of government related to the information needed.
N/A

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.
The remedial action will be in accordance with all applicable regulations and upon RAWP approval and implementation, and additional communications will be made to the public as necessary.

How were these issues and/or information needs identified?
These issues were identified through review of the project schedule, site background and contaminants of concern.

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 at and around site:
☒ **Residential** ☐ **Agricultural** ☐ **Recreational** ☒ **Commercial** ☒ **Industrial**

b. Residential type around site:
☒ **Urban** ☐ **Suburban** ☐ **Rural**

c. Population density around site:
☒ **High** ☐ **Medium** ☐ **Low**

d. Water supply of nearby residences:
☒ **Public** ☐ **Private Wells** ☐ **Mixed**

e. Is part or all of the water supply of the affected/interested community currently impacted by the site?
☐ **Yes** ☒ **No**

Provide details if appropriate:
Click here to enter text.

f. Other environmental issues significantly impacted/impacting the affected community?
☐ **Yes** ☒ **No**

Provide details if appropriate:
Click here to enter text.

g. Is the site and/or the affected/interested community wholly or partly in an Environmental Justice Area?
☒ **Yes** ☐ **No**

h. Special considerations:
☒ **Language** ☐ **Age** ☐ **Transportation** ☐ **Other**

Explain any marked categories in **h:**
Spanish

Part 5. The site contact list must include, at a minimum, the individuals, groups, and organizations identified in Part 2. of the Citizen Participation Plan under 'Site Contact List'. 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: NYC Mayor, NYC Department of City Planning Chairperson, Queens Borough President., Queens Community Board 1 District Manager, NY City Council District 26, NY State Assembly District 36 Member, NYC Department of Health and Mental Hygiene (DOHMH)**

☒ **Media:** The Queens Daily Eagle, The Queens Chronicle

☒ **Business/Commercial Interests:** 28 12 41ST AVE LLC

☐ **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):** The Queens Public Library – Long Island City Branch, Queens Community Board 1

☐ **Recreational Group(s):** Click here to enter text.

☐ **Other(s):** Click here to enter text.

Prepared/Updated By: Ali Reach **Date:** 11/10/25

Reviewed/Approved By: Luke J. McCartney, P.G. **Date:** 11/26/2025

APPENDIX G
Environmental Footprint Analysis and Climate Screening Checklist

H & A OF NEW YORK ENGINEERING
AND GEOLOGY, LLP
213 W. 35th Street
7th Floor
New York, NY 10001
646.277.5685

November 4, 2025
File No. 0214373

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233

Attention: Mr. Shawn Roberts

Subject: Green Site Remediation
NYSDEC Site No. C241300
28-12 41st Avenue
Long Island City, New York

H & A of New York Engineering and Geology, LLP (Haley & Aldrich of New York) presents the following environmental footprint analysis[1] in accordance with EPA 542-R-12-002 for the preferred Track 2 Remedy of the above-referenced site at 28-12 41st Avenue, Long Island City, New York (Site).

TBD REMEDY – TRACK 2 CLEANUP

The preferred remedy will result in estimated totals of:

- 1376.25 Metric Million British Thermal Unit (MMBtus) of energy used;
- 109.48 tons of total greenhouse gas emissions (CO2e [includes consideration of carbon dioxide, methane, and nitrous oxide emissions]);
- 1528.26 pounds (lbs) of nitrogen oxides (NOx) + sulfur oxides (SOx) + particulate matter (PM) emissions; and
- 15.79 lbs of hazardous air pollutant (HAP) emissions.

Energy

- 1,024.15 MMBtus used for on-site activities, such as excavation;
- 0.52 MMBtus used for grid electricity generation;
- 61.32 MMBtus used for transportation of personnel, remedy materials, and waste disposal; and
- 290.26 MMBtus used for off-site activities.

[1] *Spreadsheets for Environmental Footprint Analysis (SEFA) Version 3.0, November 2019.*

Greenhouse Gas Emissions (CO2e)

- 163,823.26 lbs of CO2e are estimated to be produced from on-site activities, such as excavation;
- 26.25 lbs of CO2e are estimated to be produced from grid electricity generation;
- 9,910.62 lbs of CO2e are estimated to be produced from transportation of personnel, remedy materials, and waste disposal; and
- 45,195.51 lbs are estimated to be produced from off-site activities.

Water Usage

- 780 gallons of water are estimated to be used to wash down trucks and tires on an imported gravel truck wash pad and for grout production for monitoring well decommissioning.

The preferred Track 2 remedy will save an estimated 1575 MMBtus, 127.2 tons of CO2e, 2200 lbs of NOx, SOx, and PM emissions, and 13.6 lbs of HAP emissions compared to the Alternative I - Track 1 remedy.

The majority of energy use and CO2e generation will originate from onsite activities for the Track 2 Remedy. Off-site energy use is expected to comprise 21.09% of all energy use and off-site greenhouse gas emissions are expected to comprise 20.64% of all emissions for the Track 2 Remedy. Transportation of personnel and materials are expected to comprise less than 5% of the of energy use and greenhouse gas emissions for the remedy.

Sincerely yours,
H & A OF NEW YORK ENGINEERING AND GEOLOGY, LLP

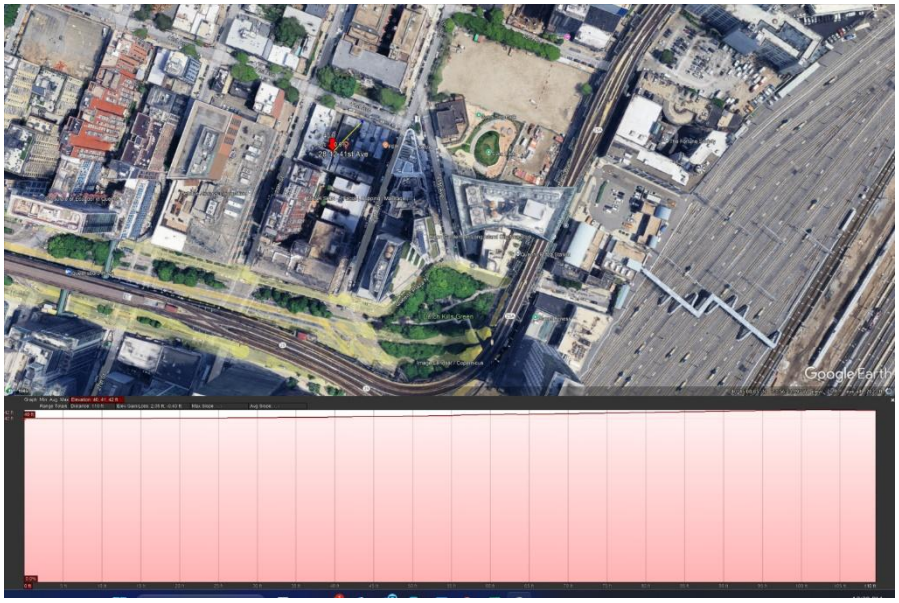
Luke J. McCartney, P.G.
Senior Project Manager

Zhan P. Shu, Ph.D., P.E.
Remedial Engineer

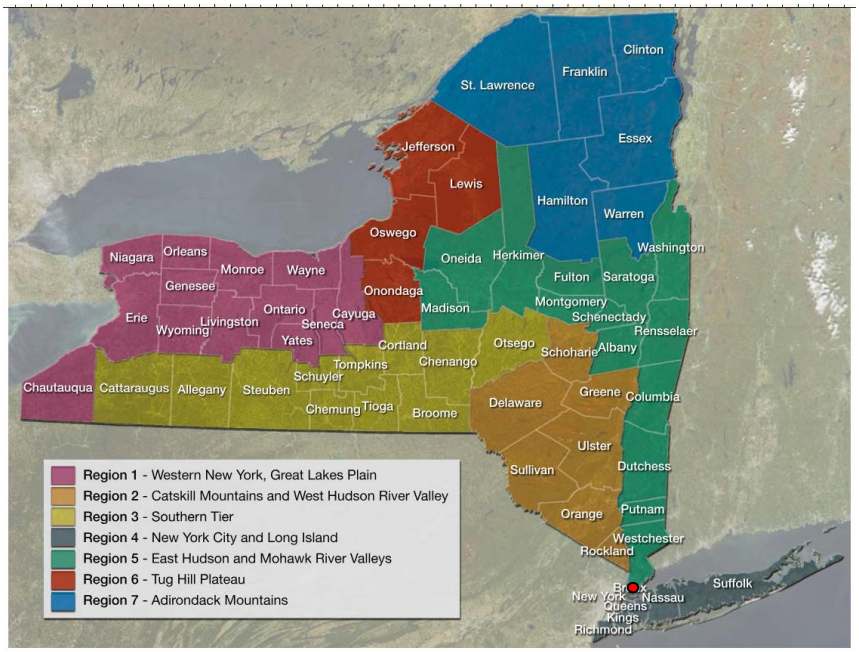
Climate Screening Checklist

Background Information

- Project Manager: Luke J. McCartney, P.G.
- Site Name: 28-12 41st Avenue Development Site (the "Site")
- Site Number: Pending
- Site Location: 28-12 41st Avenue, Long Island City, New York
- Site Elevation (average above sea level): Approximately 31 feet above sea level (July 2025 NYC OER RI)



- ClimAID Region (Responding Climate Change in New York State (ClimAID) - NYSERDA): Region 4 – New York City and Long Island



- Remedial Stage/Site Classification: Remediation.
- Contamination - Media Impacted/ Contaminants of Concern: Semi-volatile organic compounds (SVOCs) specifically polycyclic aromatic hydrocarbons (PAHs), one pesticide, metals including lead, and emerging contaminants in soil; SVOCs, metals, and emerging contaminants in groundwater; and chlorinated VOCs (CVOCs) and petroleum-related VOCs (benzene, toluene, ethylbenzene, and xylenes [BTEX]) in soil vapor.
- Proposed/Current Remedy: Track 2 remedy – the proposed remedy will consist of excavation, stockpiling, off-Site transport, and disposal of contaminated historical fill material and contaminated soil to 2 feet below ground surface (ft bgs) sitewide with additional hotspot excavation to 14 ft bgs centered on RI-SB-07. This remedy will also include the installation of a composite cover system and an active sub-slab depressurization system (SSDS) to mitigate the potential for soil vapor intrusion into the proposed building.
- What is the predicted timeframe of the remedy? Will components of the remedy still be in place in 10+ years? The predicted timeframe of the proposed remedy is approximately four months. Engineering controls (ECs) that may be in place for 10+ years under the Track 2 remedy include an active SSDS and Site-wide cover system. As part of this remedy, an Environmental Easement (EE), as defined in Article 71 Title 36 of the Environmental Conservation Law, approved by the New York State Department of Environmental Conservation (NYSDEC), will be filed and recorded with the Kings County Office of the City Register. Adherence to ECs for the Site is mandated by the EE (an Institutional Control [IC]) and will be implemented under a Site Management Plan.
- Is the site in proximity to any sensitive receptors? (e.g., wetlands, waterbodies, residential properties, hospitals, schools, drinking water supplies, etc.) There are five sensitive receptors within a 500-ft radius of the Site: Gotham Tech High School (Q417) located at 28-02 41st Avenue, ATLAS High School located at 28-01 41st Avenue, Sven Park located at 29-59 Northern Blvd, Q575 Academy of American Studies located at 40-02 29th Street, and the Dutch Kills Green located Queens Plaza, Queensboro Bridge Greenway, Long Island City, New York 11101.

Is the site in a disadvantaged community (DAC) or potential environmental justice area (PEJA) (Use DECinfolocator: DECinfo Locator (ny.gov))?

X Yes ☐ No



If the site is in a DAC or PEJA, will climate impacts be magnified? If yes, list how and why.

☐ Yes X No

Should thresholds of concern be lowered to account for magnification of impacts? If yes, indicate how lower thresholds will be used in the screening.

☐ Yes X No

Climate Screening Table*

Potential Climate Hazards	**Relevant to the Site Location** (Y/N/NA)[1]	**Projected Change** (Resilience Analysis and Planning Tool (RAPT)/arcgis.com[3]	**Potential to Impact Remedy** (Y/N)	**Is remedy/site already resilient?** (Y/N)[4]
Precipitation	N	N/A	N/A	N/A
Temperature[2] (Extreme Heat or Cold Weather Impacts)	Y	Y (Resilience Analysis and Planning Tool-RAPT)	N	N/A
Sea Level Rise	N	N/A (NOAA Relative Sea Level Trends	N/A	N/A
Flooding	N	N/A (FEMA FloodMapper)	N/A	N/A
Storm Surge	N	N/A (NWS Storm Surge Hazard Map)	N/A	N/A
Wildfire	N	N/A (NYSDEC Fire Danger Map)	N/A	N/A
Drought	N	N/A (NYSDEC Drought Condition Map)	N/A	N/A
Storm Severity	Y	N/A (Resilience Analysis and Planning Tool-RAPT)	N	N/A
Landslides	N	N/A	N/A	N/A
Other Hazards:	N/A	N/A	N/A	N/A

* Links to potential data sources can be found on the following page

[1] If the first column is N --> The rest of the columns will be N/A, the hazard is not applicable to the site.

[2] Extreme Heat: periods of three or more days above 90°F- Extreme Cold: Individual days with minimum temperatures at or below 0 degrees F (NYSERDA ClimAID report)

[3] List the projected change in specific terms or units e.g. inches of rainfall, feet of sea level rise, etc.

[4] If final column is Y, provide reasoning, if the final column is N --> Climate Vulnerability Assessment (CVA) required.

Required Next Steps (If no further action is required, provide justification):

Conduct severe weather storm inspections during the active remedy. Inspect dewatering systems prior to anticipated storm events that could result in a power outage, and after storm events.

Potential Data Sources (not an exhaustive list)- from Superfund Climate Resilience: Vulnerability Assessment | US EPA

NYSERDA ClimAID report- Responding Climate Change in New York State (ClimAID) - NYSERDA

FEMA- National Flood Hazard Layer | FEMA.gov

NOAA- National Storm Surge Risk Maps - Version 3 (noaa.gov)

Department of Agriculture Forest Service Wildfire Risk to Communities

EPA Climate Change Indicators in the United States

EPA Climate Resilience Evaluation & Awareness Tool (CREAT) | U.S. Climate Resilience Toolkit

EPA National Stormwater Calculator

National Integrated Drought Information System U.S. Drought Portal

National Interagency Coordination Center National Interagency Fire Center

National Oceanic and Atmospheric Administration Coastal Services Digital Coast

- Resources to help communities assess coastal hazards, such as the Sea Level Rise Viewer for visualizing community-level impacts of flooding or sea level rise and downloadable LIDAR data

National Oceanic and Atmospheric Administration National Centers for Environmental Information website

National Oceanic and Atmospheric Administration Sea Level Trends

National Weather Service Climate Prediction Center

National Weather Service National Hurricane Center

National Weather Service Sea, Lake, and Overland Surges from Hurricanes (SLOSH)

National Weather Service Storm Surge Hazard Maps

U.S. Federal Government Climate Resilience Toolkit: The Climate Explorer

U.S. Army Corps of Engineers Climate Preparedness and Resilience

U.S. Geological Survey Coastal Change Hazards Portal

U.S. Geological Survey Landslide Hazards Program

U.S. Geological Survey National Ground-water Monitoring Network Data Portal

U.S. Geological Survey National Climate Change Viewer

U.S. Geological Survey National Water Dashboard

U.S. Geological Survey StreamStats

NYS Department of State- Assess | Department of State (ny.gov)

NYSERDA NY Costal Floodplain Mapper- Home Page (ny.gov)

NYSDEC Coastal Erosion Hazards- Coastal Areas Regulated By The CEHA Permit Program - NYDEC

NYSDOH Heat Index- health.ny.gov/environmental/weather/vulnerability_index/county_maps.htm

Environmental Footprint Summary

Core Element	Metric		Unit of Measure	Footprint						
				Alternative I - Track 1 Remedy	Alternative II - Track 2 Remedy	Alternative III - Track 4 Remedy				Total
Materials & Waste	M&W-1	Refined materials used on-site	Tons	453.0	386.3	382.5	0.0	0.0	0.0	1,221.8
	M&W-2	% of refined materials from recycled or reused material	%	2.8%	1.0%	0.0%				1.4%
	M&W-3	Unrefined materials used on-site	Tons	0.000	0.000	0.000	0.000	0.000	0.000	0.0
	M&W-4	% of unrefined materials from recycled or reused material	%							
	M&W-5	On-site hazardous waste disposed of off-site	Tons	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M&W-6	On-site non-hazardous waste disposed of off-site	Tons	2,252.5	733.0	655.0	0.0	0.0	0.0	3,640.5
	M&W-7	Recycled or reused waste	Tons	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M&W-8	% of total potential waste recycled or reused	%	0.0%	0.0%	0.0%				0.0%
Water (used on-site)	W-1	Public water use	MG	0.0162	0.0008	0.0	0.0	0.0	0.0	0.0177
	W-2	Groundwater use	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	W-3	Surface water use	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	W-4	Reclaimed water use	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	W-5	Storm water use	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	W-6	User-defined water resource #1	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	W-7	User-defined water resource #2	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	W-8	Wastewater generated	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Energy	E-1	Total energy used (on-site and off-site)	MMBtu	2,950.9	1,376.2	852.9	0.0	0.0	0.0	5,180.1
	E-2	Energy voluntarily derived from renewable resources								
	E-2A	On-site renewable energy generation or use + on-site biodiesel use + biodiesel and other renewable resource use for transportation	MMBtu	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	E-2B	Voluntary purchase of renewable electricity	MWh	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	E-3	Voluntary purchase of RECs	MWh	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	E-4	On-site grid electricity use	MWh	0.129	0.075	0.037	0.000	0.000	0.000	0.2
Air	A-1	On-site NOx, SOx, and PM emissions	Pounds	1,444.7	811.2	455.7	0.0	0.0	0.0	2,711.7
	A-2	On-site HAP emissions	Pounds	0.5	0.3	0.2	0.0	0.0	0.0	1.0
	A-3	Total NOx, SOx, and PM emissions	Pounds	3,727.7	1,528.3	1,054.2	0.0	0.0	0.0	6,310.2
	A-3A	Total NOx emissions	Pounds	2,298.7	985.4	622.3	0.0	0.0	0.0	3,906.4
	A-3B	Total SOx emissions	Pounds	359.7	160.0	117.3	0.0	0.0	0.0	637.1
	A-3C	Total PM emissions	Pounds	1,069.3	382.9	314.6	0.0	0.0	0.0	1,766.7
	A-4	Total HAP emissions	Pounds	29.4	15.8	10.1	0.0	0.0	0.0	55.3
	A-5	Total greenhouse gas emissions	Tons CO2e*	236.6	109.5	67.3	0.0	0.0	0.0	413.4
Land & Ecosystems		Qualitative Description								

** Total greenhouse gases emissions (in CO2e) include consideration of CO2, CH4, and N2O (Nitrous oxide) emissions.*
"MMBtu" = millions of Btus
"MG" = millions of gallons
"CO2e" = carbon dioxide equivalents of global warming potential
"MWh" = megawatt hours (i.e., thousands of kilowatt-hours or millions of Watt-hours)
"Tons" = short tons (2,000 pounds)

The above metrics are consistent with EPA's Methodology for Understanding and Reducing a Project's Environmental Footprint (EPA 542-R-12-002), February 2012

Notes:

Alternative I - Track 1 Remedy - Energy & Air Compiled Results

Category	Total Energy	GHG	NOx	SOx	PM	NOx + SOx + PM	HAPs
	MMbtus	lbs CO2e	lbs	lbs	lbs	lbs	lbs
On-site (Scope 1)	**1,824**	**291,750**	**1,325**	**2**	**118**	**1,445**	**1**
Grid Electricity Generation (Scope 2)	**0.891**	**145**	**0**	**1**	**0**	**1**	**0**
Transportation (Scope 3a)	**445**	**72,021**	**536**	**17**	**11**	**564**	**0**
Other Off-Site (Scope 3b)	**681**	**109,372**	**438**	**340**	**940**	**1,718**	**28**
Remedy Totals	**2,951**	**473,287**	**2,299**	**360**	**1,069**	**3,728**	**29**

G289

Values that are forwarded to the "Summary" tab are indicated in orange.

61.80686347

23.10897374

Voluntary Renewable Energy Use	Unit	Quantity
On-site renewable energy generation or use	MMBtu	**0**
On-site biodiesel use	MMBtu	**0**
Biodiesel and other renewable resource use for transportation	MMBtu	**0**
On-site renewable energy generation or use + on-site biodiesel use + biodiesel and other renewable resource use for transportation	MMBtu	**0**
Voluntary purchase of renewable electricity	MWh	**0**
Voluntary purchase of RECs	MWh	**0**

(This value is the sum of the three rows above)

This worksheet is not intended for user input. Values on this worksheet are obtained from the following file: SEFA_calculations_(121718).xlsx

Alternative II - Track 2 Remedy - Energy & Air Compiled Results

Category	Total Energy	GHG	NOx	SOx	PM	NOx + SOx + PM	HAPs
	MMbtus	lbs CO2e	lbs	lbs	lbs	lbs	lbs
On-site (Scope 1)	**1,024**	**163,823**	**744**	**1**	**66**	**811**	**0**
Grid Electricity Generation (Scope 2)	**1**	**26**	**0**	**0**	**0**	**0**	**0**
Transportation (Scope 3a)	**61**	**9,911**	**69**	**2**	**1**	**72**	**0**
Other Off-Site (Scope 3b)	**290**	**45,196**	**172**	**157**	**315**	**644**	**15**
Remedy Totals	**1,376**	**218,956**	**985**	**160**	**383**	**1,528**	**16**

Values that are forwarded to the "Summary" tab are indicated in orange.

Voluntary Renewable Energy Use	Unit	Quantity	
On-site renewable energy generation or use	MMBtu	**0**	
On-site biodiesel use	MMBtu	**0**	
Biodiesel and other renewable resource use for transportation	MMBtu	**0**	
On-site renewable energy generation or use + on-site biodiesel use + biodiesel and other renewable resource use for transportation	MMBtu	**0**	*(This value is the sum of the three rows above)*
Voluntary purchase of renewable electricity	MWh	**0**	
Voluntary purchase of RECs	MWh	**0**	

This worksheet is not intended for user input. Values on this worksheet are obtained from the following file: SEFA_calculations_(121718).xlsx

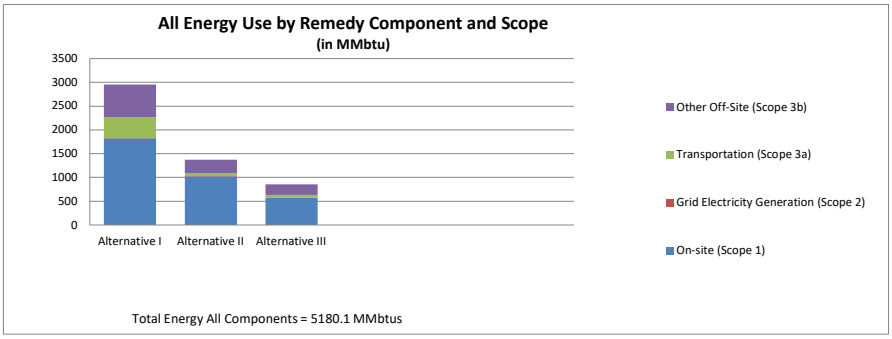
Alternative III - Track 4 Remedy - Energy & Air Compiled Results

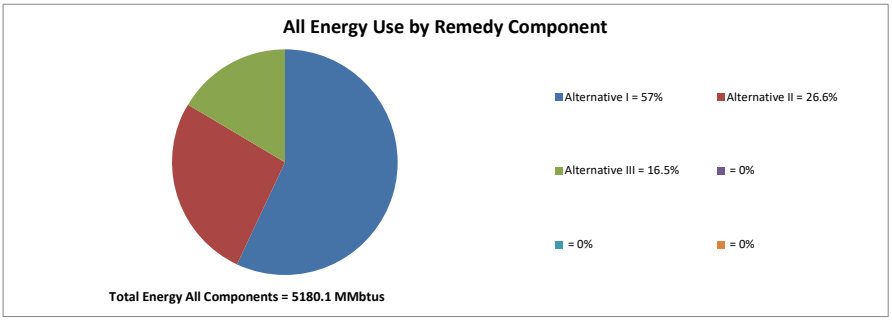
Category	Total Energy	GHG	NOx	SOx	PM	NOx + SOx + PM	HAPs
	MMbtus	lbs CO2e	lbs	lbs	lbs	lbs	lbs
On-site (Scope 1)	**575**	**92,030**	**418**	**1**	**37**	**456**	**0**
Grid Electricity Generation (Scope 2)	**0**	**13**	**0**	**0**	**0**	**0**	**0**
Transportation (Scope 3a)	**58**	**9,415**	**66**	**2**	**1**	**70**	**0**
Other Off-Site (Scope 3b)	**219**	**33,046**	**138**	**115**	**276**	**528**	**10**
Remedy Totals	**853**	**134,504**	**622**	**117**	**315**	**1,054**	**10**

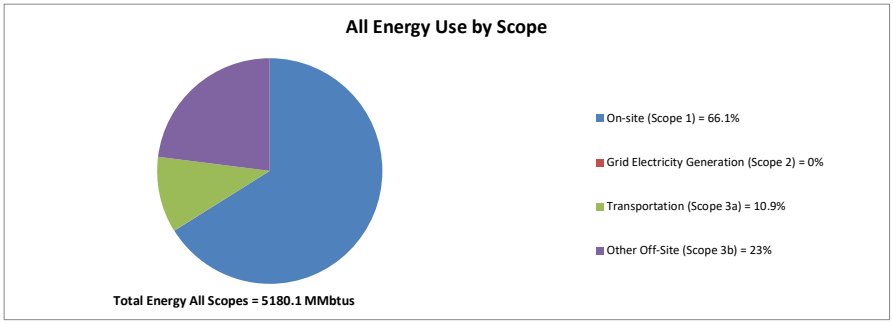
Values that are forwarded to the "Summary" tab are indicated in orange.

Voluntary Renewable Energy Use	Unit	Quantity	
On-site renewable energy generation or use	MMBtu	**0**	
On-site biodiesel use	MMBtu	**0**	
Biodiesel and other renewable resource use for transportation	MMBtu	**0**	
On-site renewable energy generation or use + on-site biodiesel use + biodiesel and other renewable resource use for transportation	MMBtu	**0**	*(This value is the sum of the three rows above)*
Voluntary purchase of renewable electricity	MWh	**0**	
Voluntary purchase of RECs	MWh	**0**	

This worksheet is not intended for user input. Values on this worksheet are obtained from the following file: SEFA_calculations_(121718).xlsx


All Energy Use by Remedy Component and Scope
(in MMbtu)
3500
3000
2500
2000
1500
1000
500
0
Alternative I
Alternative II
Alternative III
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
Total Energy All Components = 5180.1 MMbtus


All Energy Use by Remedy Component
Alternative I = 57%
Alternative II = 26.6%
Alternative III = 16.5%
= 0%
= 0%
= 0%
Total Energy All Components = 5180.1 MMbtus

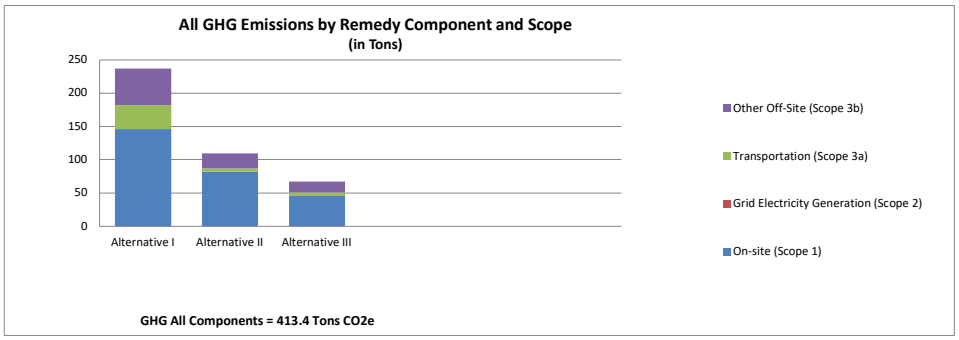

All Energy Use by Scope
On-site (Scope 1) = 66.1%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 10.9%
Other Off-Site (Scope 3b) = 23%
Total Energy All Scopes = 5180.1 MMbtus

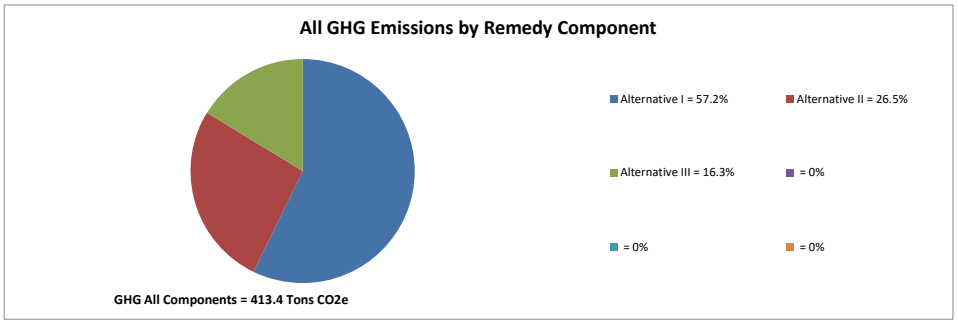
	Total Energy MMbtus							
	Alternative I	Alternative II	Alternative III					Total
On-site (Scope 1)	1,823.9	1,024.1	575.3	0.0	0.0	0.0		3,423.3
Grid Electricity Generation (Scope 2)	0.9	0.5	0.3	0.0	0.0	0.0		1.7
Transportation (Scope 3a)	445.1	61.3	58.2	0.0	0.0	0.0		564.6
Other Off-Site (Scope 3b)	681.1	290.3	219.1	0.0	0.0	0.0		1,190.4
Total	2,950.9	1,376.2	852.9	0.0	0.0	0.0		5,180.1

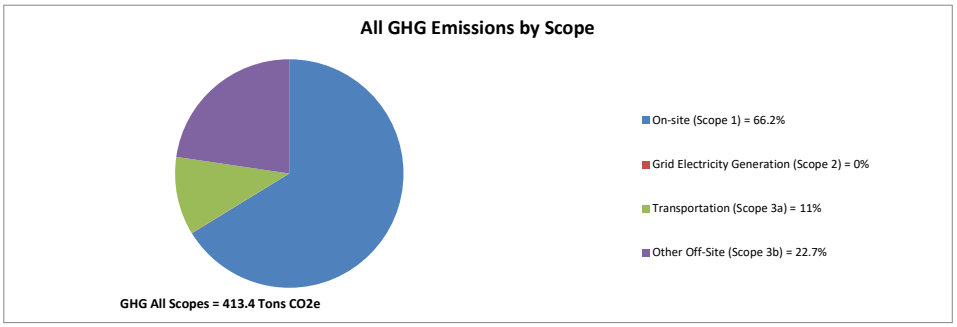
Alternative I = 57%
Alternative II = 26.6%
Alternative III = 16.5%
= 0%
= 0%
= 0%

On-site (Scope 1) = 66.1%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 10.9%
Other Off-Site (Scope 3b) = 23%

Total Energy All Components = 5180.1 MMbtus
Total Energy All Scopes = 5180.1 MMbtus


All GHG Emissions by Remedy Component and Scope
(in Tons)
250
200
150
100
50
0
Alternative I
Alternative II
Alternative III
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
GHG All Components = 413.4 Tons CO2e


All GHG Emissions by Remedy Component
Alternative I = 57.2%
Alternative II = 26.5%
Alternative III = 16.3%
= 0%
= 0%
= 0%
GHG All Components = 413.4 Tons CO2e

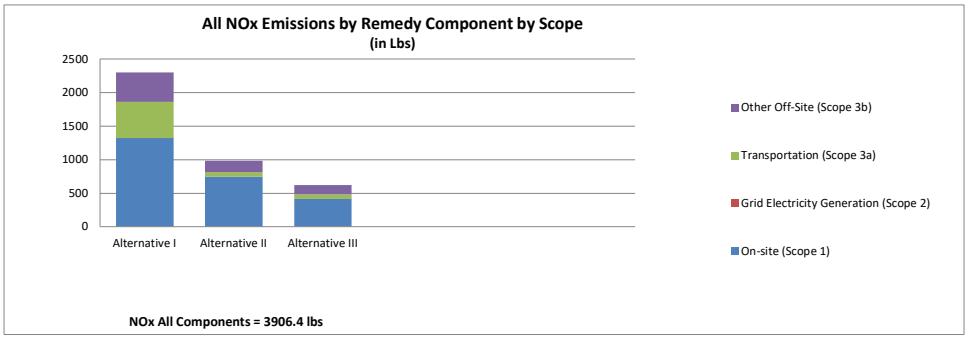

All GHG Emissions by Scope
On-site (Scope 1) = 66.2%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 11%
Other Off-Site (Scope 3b) = 22.7%
GHG All Scopes = 413.4 Tons CO2e

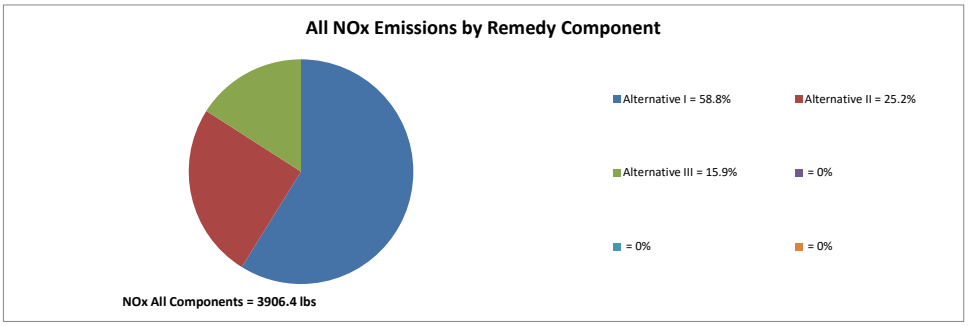
GHG Tons CO2e	Alternative I	Alternative II	Alternative III						Total
On-site (Scope 1)	145.9	81.9	46.0	0.0			0.0	0.0	273.8
Grid Electricity Generation (Scope 2)	0.1	0.0	0.0	0.0			0.0	0.0	0.1
Transportation (Scope 3a)	36.0	5.0	4.7	0.0			0.0	0.0	45.7
Other Off-Site (Scope 3b)	54.7	22.6	16.5	0.0			0.0	0.0	93.8
Total	236.6	109.5	67.3	0.0			0.0	0.0	413.4

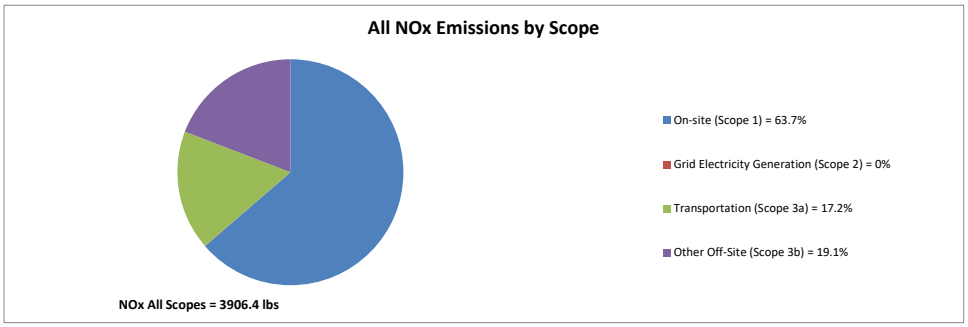
Alternative I = 57.2%
Alternative II = 26.5%
Alternative III = 16.3%
= 0%
= 0%
= 0%

On-site (Scope 1) = 66.2%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 11%
Other Off-Site (Scope 3b) = 22.7%

GHG All Components = 413.4 Tons CO2e
GHG All Scopes = 413.4 Tons CO2e


All NOx Emissions by Remedy Component by Scope
(in Lbs)
2500
2000
1500
1000
500
0
Alternative I
Alternative II
Alternative III
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
NOx All Components = 3906.4 lbs


All NOx Emissions by Remedy Component
Alternative I = 58.8%
Alternative II = 25.2%
Alternative III = 15.9%
= 0%
= 0%
= 0%
NOx All Components = 3906.4 lbs


All NOx Emissions by Scope
On-site (Scope 1) = 63.7%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 17.2%
Other Off-Site (Scope 3b) = 19.1%
NOx All Scopes = 3906.4 lbs

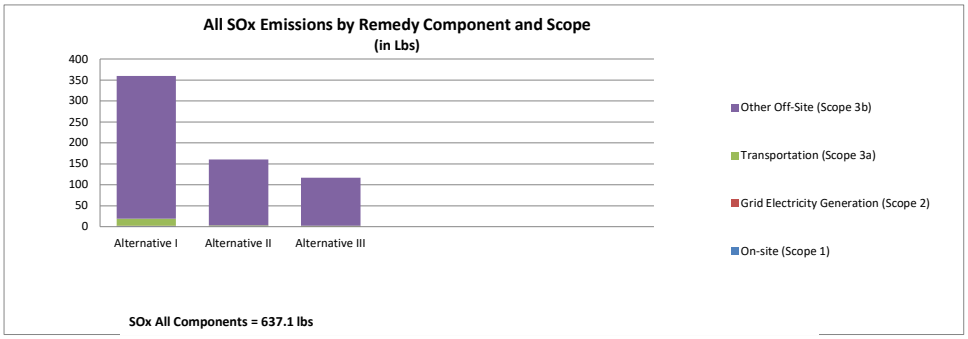
NOx
lbs

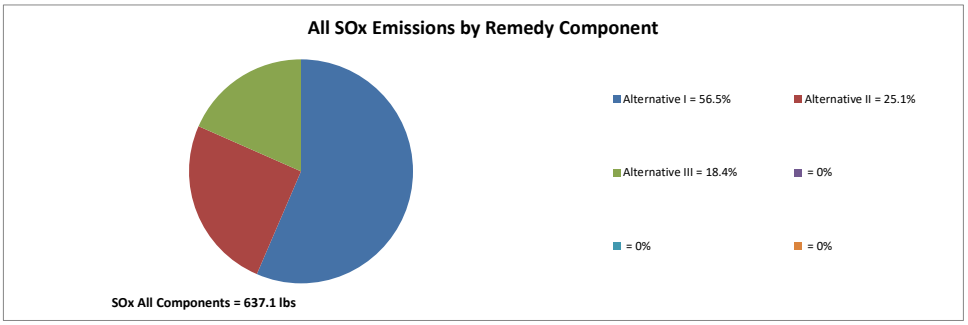
	Alternative I	Alternative II	Alternative III					Total
On-site (Scope 1)	1,324.9	744.0	417.9	0.0	0.0	0.0		2,486.9
Grid Electricity Generation (Scope 2)	0.3	0.1	0.1	0.0	0.0	0.0		0.5
Transportation (Scope 3a)	536.0	68.8	66.5	0.0	0.0	0.0		671.3
Other Off-Site (Scope 3b)	437.5	172.4	137.8	0.0	0.0	0.0		747.8
Total	2,298.7	985.4	622.3	0.0	0.0	0.0		3,906.4

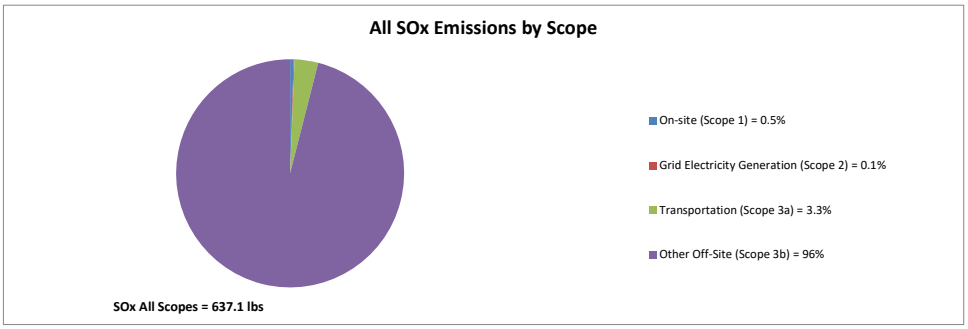
Alternative I = 58.8%
Alternative II = 25.2%
Alternative III = 15.9%
= 0%
= 0%
= 0%

On-site (Scope 1) = 63.7%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 17.2%
Other Off-Site (Scope 3b) = 19.1%

NOx All Components = 3906.4 lbs
NOx All Scopes = 3906.4 lbs


All SOx Emissions by Remedy Component and Scope
(in Lbs)
400
350
300
250
200
150
100
50
0
Alternative I
Alternative II
Alternative III
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
SOx All Components = 637.1 lbs


All SOx Emissions by Remedy Component
Alternative I = 56.5%
Alternative II = 25.1%
Alternative III = 18.4%
= 0%
= 0%
= 0%
SOx All Components = 637.1 lbs

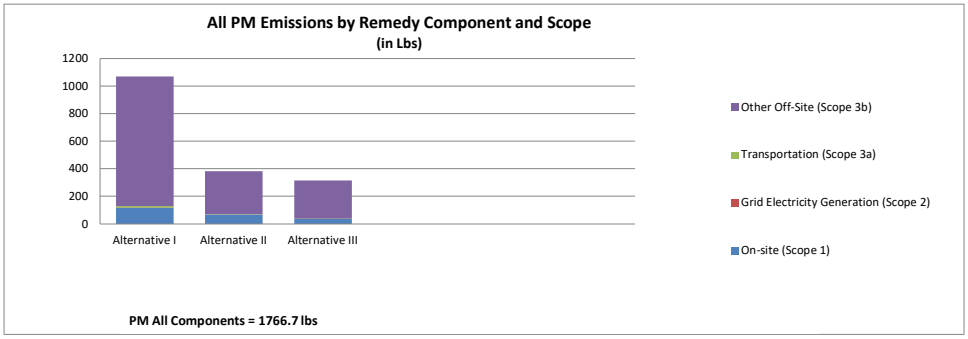

All SOx Emissions by Scope
On-site (Scope 1) = 0.5%
Grid Electricity Generation (Scope 2) = 0.1%
Transportation (Scope 3a) = 3.3%
Other Off-Site (Scope 3b) = 96%
SOx All Scopes = 637.1 lbs

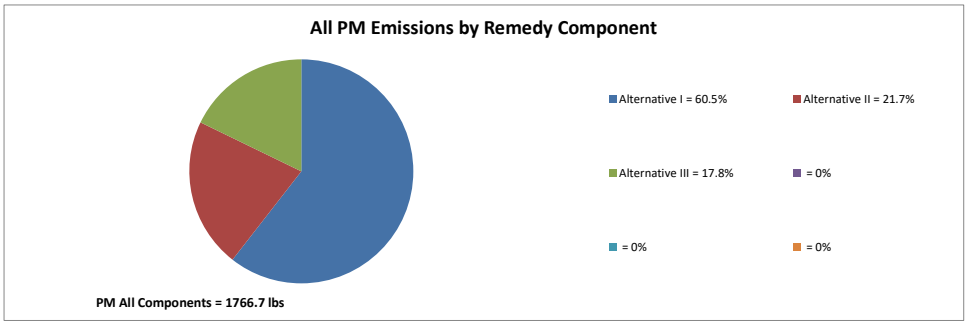
	SOx lbs								
	Alternative I	Alternative II	Alternative III						Total
On-site (Scope 1)	1.7	1.0	0.5	0.0		0.0	0.0		3.2
Grid Electricity Generation (Scope 2)	0.6	0.1	0.1	0.0		0.0	0.0		0.8
Transportation (Scope 3a)	17.0	2.2	2.1	0.0		0.0	0.0		21.2
Other Off-Site (Scope 3b)	340.4	156.8	114.6	0.0		0.0	0.0		611.9
Total	359.7	160.0	117.3	0.0		0.0	0.0		637.1

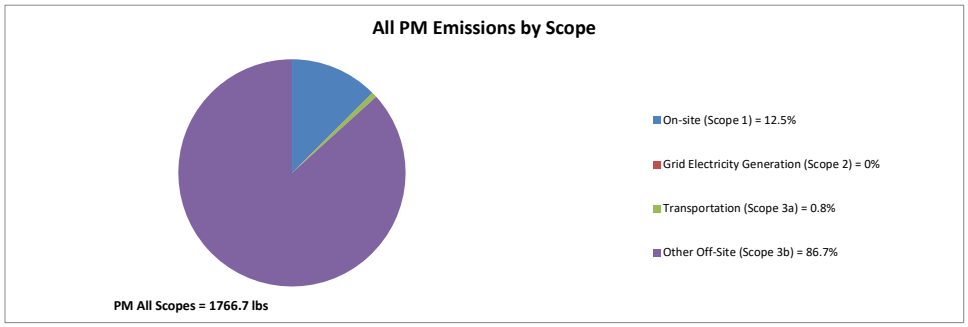
Alternative I = 56.5%
Alternative II = 25.1%
Alternative III = 18.4%
= 0%
= 0%
= 0%

On-site (Scope 1) = 0.5%
Grid Electricity Generation (Scope 2) = 0.1%
Transportation (Scope 3a) = 3.3%
Other Off-Site (Scope 3b) = 96%

SOx All Components = 637.1 lbs
SOx All Scopes = 637.1 lbs


All PM Emissions by Remedy Component and Scope
(in Lbs)
1200
1000
800
600
400
200
0
Alternative I
Alternative II
Alternative III
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
PM All Components = 1766.7 lbs


All PM Emissions by Remedy Component
Alternative I = 60.5%
Alternative II = 21.7%
Alternative III = 17.8%
= 0%
= 0%
= 0%
PM All Components = 1766.7 lbs


All PM Emissions by Scope
On-site (Scope 1) = 12.5%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 0.8%
Other Off-Site (Scope 3b) = 86.7%
PM All Scopes = 1766.7 lbs

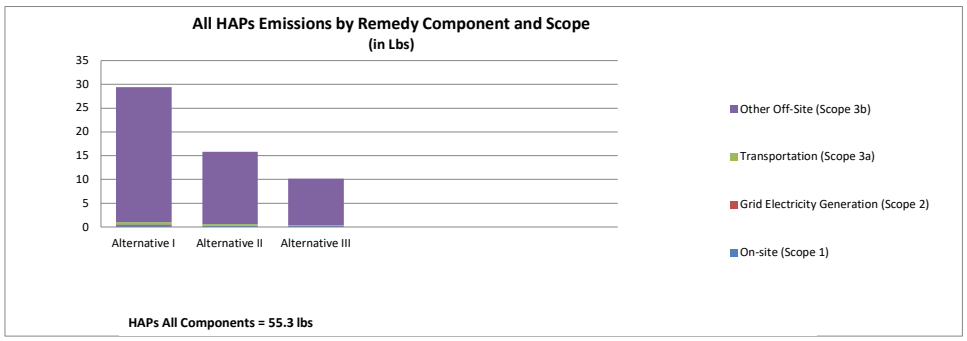
PM
lbs

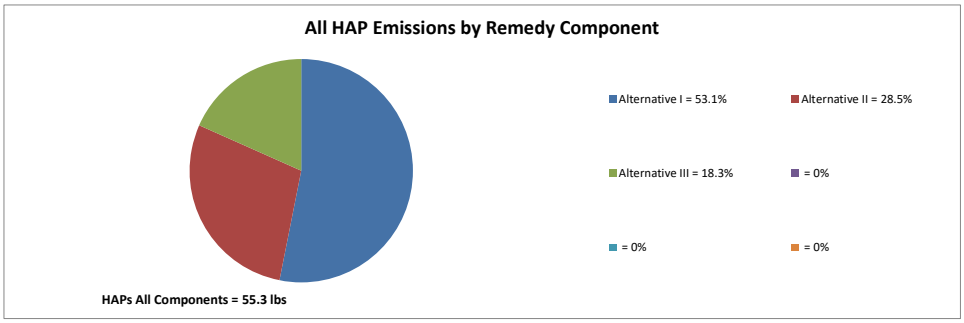
	Alternative I	Alternative II	Alternative III					Total
On-site (Scope 1)	118.1	66.3	37.2	0.0	0.0	0.0		221.6
Grid Electricity Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Transportation (Scope 3a)	10.9	1.5	1.4	0.0	0.0	0.0		13.8
Other Off-Site (Scope 3b)	940.3	315.1	275.9	0.0	0.0	0.0		1,531.3
Total	1,069.3	382.9	314.6	0.0	0.0	0.0		1,766.7

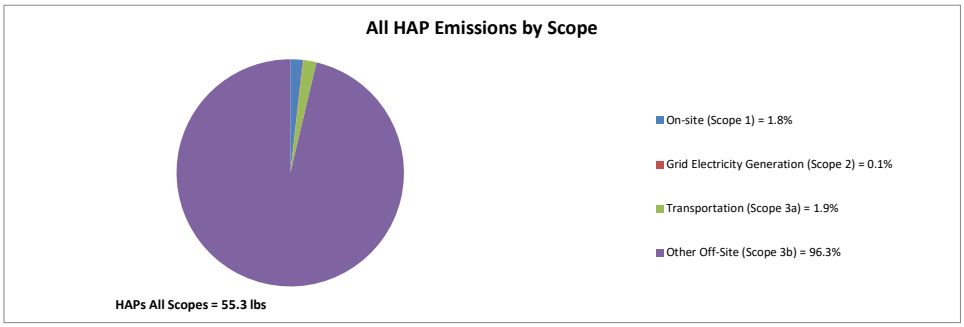
Alternative I = 60.5%
Alternative II = 21.7%
Alternative III = 17.8%
= 0%
= 0%
= 0%

On-site (Scope 1) = 12.5%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 0.8%
Other Off-Site (Scope 3b) = 86.7%

PM All Components = 1766.7 lbs
PM All Scopes = 1766.7 lbs


All HAPs Emissions by Remedy Component and Scope
(in Lbs)
35
30
25
20
15
10
5
0
Alternative I
Alternative II
Alternative III
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
HAPs All Components = 55.3 lbs


All HAP Emissions by Remedy Component
Alternative I = 53.1%
Alternative II = 28.5%
Alternative III = 18.3%
= 0%
= 0%
= 0%
HAPs All Components = 55.3 lbs


All HAP Emissions by Scope
On-site (Scope 1) = 1.8%
Grid Electricity Generation (Scope 2) = 0.1%
Transportation (Scope 3a) = 1.9%
Other Off-Site (Scope 3b) = 96.3%
HAPs All Scopes = 55.3 lbs

HAPs
lbs

	Alternative I	Alternative II	Alternative III				Total
On-site (Scope 1)	0.5	0.3	0.2	0.0	0.0	0.0	1.0
Grid Electricity Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation (Scope 3a)	0.5	0.3	0.3	0.0	0.0	0.0	1.1
Other Off-Site (Scope 3b)	28.4	15.2	9.7	0.0	0.0	0.0	53.3
Total	29.4	15.8	10.1	0.0	0.0	0.0	55.3

Alternative I = 53.1%
Alternative II = 28.5%
Alternative III = 18.3%
= 0%
= 0%
= 0%

On-site (Scope 1) = 1.8%
Grid Electricity Generation (Scope 2) = 0.1%
Transportation (Scope 3a) = 1.9%
Other Off-Site (Scope 3b) = 96.3%

HAPs All Components = 55.3 lbs
HAPs All Scopes = 55.3 lbs

APPENDIX H
Quality Assurance Project Plan

HALEY ALDRICH

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QUALITY ASSURANCE PROJECT PLAN
28-12 41ST AVENUE SITE
28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK
NYSDEC BCP SITE NO. TBD

by
H & A of New York Engineering and Geology, LLP
New York, New York

for
28-12 41st Ave LLC
Long Island City, New York

File No. 0214374
May 2026



Executive Summary

This Quality Assurance Project Plan outlines the scope of the quality assurance and quality control activities associated with the site monitoring activities associated with the Remedial Action Work Plan (RAWP) for 28-12 41st Avenue in Long Island City, New York (Site).

Protocols for sample collection, sample handling and storage, chain-of-custody procedures, and laboratory and field analyses are described herein or specifically referenced to related project documents.

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1. Project Description

This Quality Assurance Project Plan (QAPP) has been prepared as a component of the Remedial Action Work Plan (RAWP) for 28-12 41st Avenue, Long Island City, New York (Site).

1.1 PROJECT OBJECTIVES

The primary objective for data collection is to collect sufficient data necessary to characterize the subsurface conditions at the Site and determine the nature and extent of contamination.

1.2 SITE DESCRIPTION AND HISTORY

The general Site description and Site history is provided in the Site Description and History Summary that accompanies the RAWP for the Site and incorporated herein by reference.

1.3 LABORATORY PARAMETERS

The laboratory parameters for soil include:

- Target Compound List volatile organic compounds (VOCs) using EPA method 8260C
- Target Compound List semi-volatile organic compounds (SVOCs) using EPA method 8270D
- Total Analyte List (TAL) Metals using EPA method 6010D
- TCL Pesticides using EPA method 8081B
- Polychlorinated biphenyls (PCBs) using EPA method 8082A
- Per- and polyfluoroalkyl substances (PFAS) using EPA method 1633A
- 1,4-Dioxane using EPA method 8270SIM

Note: PFAS will be collected in accordance with the NYSDEC, Division of Environmental Remediation, Sampling, Analysis and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) under NYSDEC Part 375 Remedial Program, April 2023. The PFAS analyte list, laboratory SOP, and detailed sampling procedures for PFAS are included in the April 2023 guidance in Appendix E of the Remedial Investigation Work Plan.

The analytical laboratory parameters for air samples include:

- VOCs using EPA method TO-15

Laboratory parameters for disposal samples will be determined by the disposal facility after an approved facility has been determined.

1.4 SAMPLING LOCATIONS

The RAWP provides the locations of remedial excavation confirmation sample locations that will be sampled (as applicable). Soil vapor extraction system air samples may be collected as part of system commissioning.

2. Project Organization and Responsibilities

This section defines the roles and responsibilities of the individuals who will perform the RAWP monitoring activities. A NYSDOH certified analytical laboratory will perform the analyses of environmental samples collected at the Site.

2.1 PROJECT TEAM

The following project personnel are anticipated for oversight of the RAWP implementation. Project team resumes are included in Attachment A.

NYSDEC Case Manager	Shawn Roberts
NYSDOH Case Manager	Christopher Budd
Qualified Environmental Professional	James M. Bellew
Project Manager	Luke J. McCartney, P.G.
Haley & Aldrich Health & Safety Director	Brian Fitzpatrick, CHMM
Health & Safety Officer	Brian Ferguson
Quality Assurance Officer	Katherine Miller
Data Validation / DUSR Preparer	Santa McKenna

2.2 MANAGEMENT RESPONSIBILITIES

The Project Manager is responsible for managing the implementation of the RAWP and monitoring and coordinating the collection of data. The Project Manager is responsible for technical quality control (QC) and project oversight. The Project Manager responsibilities include the following:

- Acquire and apply technical and corporate resources as needed to ensure performance within budget and schedule restraints;
- Review work performed to ensure quality, responsiveness, and timeliness;
- Communicate with the client point of contact concerning the progress of the monitoring activities;
- Assure corrective actions are taken for deficiencies cited during audits of RAWP monitoring activities; and,
- Assure compliance with Site health and safety plan.

2.3 QUALITY ASSURANCE RESPONSIBILITIES

The Quality Assurance (QA) team will consist of a QA Officer and the Data Validation Staff. QA responsibilities are described as follows:

2.3.1 Quality Assurance Officer

The QA Officer reports directly to the Project Manager and will be responsible for overseeing the review of field and laboratory data. Additional responsibilities include the following:

- Assure the application and effectiveness of the QAPP by the analytical laboratory and the project staff;
- Provide input to the Project Manager as to corrective actions that may be required as a result of the above-mentioned evaluations; and,
- Prepare and/or review data validation and audit reports.

The QA Officer will be assisted by the Data Validation staff in the evaluation and validation of field and laboratory generated data.

2.3.2 Data Validation Staff

The Data Validation Staff will be independent of the laboratory and familiar with the analytical procedures performed. The validation will include a review of each validation criterion as prescribed by the guidelines presented in Section 9.2 of this document and be presented in a Data Usability Summary Report (DUSR) for submittal to the QA Officer.

2.4 LABORATORY RESPONSIBILITIES

The ELAP approved laboratory to be used will be Pace Analytical Services, LLC (Pace), located in Westborough, Massachusetts. Laboratory services in support of the RAWP monitoring include the following personnel:

2.4.1 Laboratory Project Manager

The Laboratory Project Manager will report directly to the QA Officer and Project Manager and will be responsible for ensuring all resources of the laboratory are available on an as-required basis. The Laboratory Project Manager will also be responsible for the approval of the final analytical reports.

2.4.2 Laboratory Operations Manager

The Laboratory Operations Manager will report to the Laboratory Project Manager and will be responsible for coordinating laboratory analysis, supervising in-house chain-of-custody reports, scheduling sample analyses, overseeing data review and overseeing preparation of analytical reports.

2.4.3 Laboratory QA Officer

The Laboratory QA Officer will have sole responsibility for review and validation of the analytical laboratory data. The Laboratory QA Officer will provide Case Narrative descriptions of any data quality issues encountered during the analyses conducted by the laboratory. The QA Officer will also define appropriate QA procedures, overseeing QA/QC documentation.

2.4.4 Laboratory Sample Custodian

The Laboratory Sample Custodian will report to the Laboratory Operations Manager and will be responsible for the following:

- Receive and inspect the incoming sample containers;
- Record the condition of the incoming sample containers;

- Sign appropriate documents;
- Verify chain-of-custody and its correctness;
- Notify the Project Manager and Operations Manager of sample receipt and inspection;
- Assign a unique identification number and enter each into the sample receiving log;
- Initiate transfer of samples to laboratory analytical sections; and,
- Control and monitor access/storage of samples and extracts.

2.4.5 Laboratory Technical Personnel

The Laboratory Technical Personnel will have the primary responsibility in the performance of sample analysis and the execution of the QA procedures developed to determine the data quality. These activities will include the proper preparation and analysis of the project samples in accordance with the laboratory's Quality Assurance Manual (QAM) and associated Standard Operating Procedures (SOP).

2.5 FIELD RESPONSIBILITIES

2.5.1 Field Coordinator

The Field Coordinator is responsible for the overall operation of the field team and reports directly to the Project Manager. The Field Coordinator works with the project Health & Safety Officer (HSO) to conduct operations in compliance with the project Health & Safety Plan (HASP). The Field Coordinator will facilitate communication and coordinate efforts between the Project Manager and the field team members.

Other responsibilities include the following:

- Develop and implement field-related work plans, ensuring schedule compliance, and adhering to management-developed project requirements;
- Coordinate and manage field staff;
- Perform field system audits;
- Oversee QC for technical data provided by the field staff;
- Prepare and approve text and graphics required for field team efforts;
- Coordinate and oversee technical efforts of subcontractors assisting the field team;
- Identify problems in the field; resolve difficulties in consultation with the Project QAO, and Project Manager; implement and document corrective action procedures; and,
- Participate in preparation of the final reports.

2.5.2 Field Team Personnel

Field Team Personnel will be responsible for the following:

- Perform field activities as detailed in the RAWP and in compliance with the Field Sampling Plan (FSP; Appendix B of the RIWP) and QAPP.
- Immediately report any accidents and/or unsafe conditions to the Site HSO and take reasonable precautions to prevent injury.

3. Sampling Procedures

The FSP in Appendix B of the RIWP provides the SOPs for sampling required by the AWP. Sampling will be conducted in general accordance with the NYSDEC Technical Guidance for Site Investigation and Remediation (DER-10) and the Sampling, Analysis and Assessment of PFAS under NYSDEC Part 375 Remedial Program (April 2023) when applicable. Proposed sample locations are shown on Figure 1.

3.1 SAMPLE CONTAINERS

Sample containers for each sampling task will be provided by the laboratory performing the analysis. The containers will be cleaned by the manufacturer to meet or exceed the analyte specifications established in the USEPA, "Specifications and Guidance for Obtaining Contaminant-Free Sample Containers", April 1992, OSWER Directive #9240.0-0.5A. Certificates of analysis for each lot of sample containers used will be maintained by the laboratory.

The appropriate sample containers, preservation method, maximum holding times, and handling requirements for each sampling task are provided in Table I.

3.1.1 PFAS-Specific Container Requirements for Soil Samples

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633A. The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned samples containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

3.2 SAMPLE LABELING

Each sample will be labeled with a unique sample identifier that will facilitate tracking and cross-referencing of sample information. Field blanks and field duplicate samples also will be numbered with a unique sample identifier to prevent analytical bias of field QC samples.

Refer to the FSP (Appendix B of the RIWP) for the sample labeling procedures.

3.3 FIELD QC SAMPLE COLLECTION

3.3.1 Field Duplicate Sample Collection

3.3.1.1 Soil Samples

Soil field duplicates will be collected as specified in the following procedure:

1. Soils will be sampled directly from acetate liners.
2. Soil for VOC analysis will be removed from the sampling device as specified in the FSP provided as Appendix B of the RIWP.
3. Soil for non-VOC analysis will be removed from the sampling device and collected into clean laboratory provided containers.

3.4 GENERAL DECONTAMINATION PROCEDURES

Care must be taken to minimize the potential for transfer of contaminated materials to the ground or onto other materials. Regardless of the size or nature of the equipment being decontaminated, the process will utilize a series of steps that involve removal of gross material (dirt, grease, oil etc.), washing with a detergent, and multiple rinsing steps. In lieu of a series of washes and rinse steps, steam cleaning with low-volume, high-pressure equipment (i.e., steam cleaner) is acceptable.

Exploration equipment, and all monitoring equipment in contact with the sampling media must be decontaminated prior to initiating site activities, in between exploration locations to minimize cross-contamination, and prior to mobilizing off site after completion of site work.

The following specific decontamination procedure is recommended for sampling equipment and tools:

- Brush loose material off equipment;
- Wash equipment with laboratory grade detergent (i.e., Alconox or equivalent);
- Rinse with tap water;
- Rinse equipment with distilled water;
- Allow water to evaporate before reusing equipment; and
- Wrap equipment in aluminum foil when not being used.

4. Custody Procedures

Sample custody is addressed in three parts: field sample collection, laboratory analysis and final project files. Custody of a sample begins when it is collected by or transferred to an individual and ends when that individual relinquishes or disposes of the sample.

A sample is under custody if:

1. The item is in the actual possession of a person;
2. The item is in the view of the person after being in actual possession of the person;
3. The item was in actual possession and subsequently stored to prevent tampering; or
4. The item is in a designated and identified secure area.

4.1 FIELD CUSTODY PROCEDURES

Field personnel will keep written records of field activities on applicable preprinted field forms or in a bound field notebook to record data collecting activities. These records will be written legibly in ink and will contain pertinent field data and observations. Entry errors or changes will be crossed out with a single line, dated, and initialed by the person making the correction. The Field Coordinator will periodically review field forms and notebooks.

The beginning of each entry in the logbook or preprinted field form will contain the following information:

- Date;
- Start time;
- Weather;
- Names of field personnel (including subcontractors);
- Level of personal protection used at the Site; and,
- Names of all visitors and the purpose of their visit.

For each measurement and sample collected, the following information will be recorded:

- Detailed description of sample location;
- Equipment used to collect sample or make measurement, and the date equipment was calibrated;
- Time sample was collected;
- Description of the sample conditions;
- Depth sample was collected (if applicable);
- Volume and number of containers filled with the sample; and,
- Sampler's identification.

4.1.1 Field Procedures

The following procedure describes the process to maintain the integrity of the samples:

- Upon collection samples are placed in the proper containers. In general, samples collected for organic analysis will be placed in pre-cleaned glass containers and samples collected for inorganic analysis will be placed in pre-cleaned plastic (polyethylene) bottles. Refer to the FSP in Appendix B of the RIWP for sample packaging procedures.

- Samples will be assigned a unique sample number and will be affixed to a sample label. Refer to the FSP in Appendix B of the RIWP for sample labeling procedures.

- Samples will be properly and appropriately preserved by field personnel in order to minimize loss of the constituent(s) of interest due to physical, chemical, or biological mechanisms.

- Appropriate volumes will be collected to ensure that the appropriate reporting limits can be successfully achieved and that the required QC sample analyses can be performed.

4.1.2 Transfer of Custody and Shipment Procedures

- A chain-of-custody (COC) record will be completed at the time of sample collection and will accompany each shipment of project samples to the laboratory. The field personnel collecting the samples will be responsible for the custody of the samples until the samples are relinquished to the laboratory. Sample transfer will require the individuals relinquishing and receiving the samples to sign, date and note the time of sample transfer on the COC record.

- Samples will be shipped or delivered in a timely fashion to the laboratory so that holding times and/or analysis times as prescribed by the methodology can be met.

- Samples will be transported in containers (coolers) which will maintain the refrigeration temperature for those parameters for which refrigeration is required in the prescribed preservation protocols.

- Samples will be placed in an upright position and limited to one layer of samples per cooler. Additional bubble wrap or packaging material will be added to fill the cooler. Shipping containers will be secured with strapping tape and custody tape for shipment to the laboratory.

- When samples are split with the NYSDEC representatives, a separate chain-of-custody will be prepared and marked to indicate with whom the samples are shared. The person relinquishing the samples will require the representative's signature acknowledging sample receipt.

- If samples are sent by a commercial carrier, a bill of lading will be used. A copy of the bill of lading will be retained as part of the permanent record. Commercial carriers will not sign the custody record as long as the custody record is sealed inside the sample cooler and the custody tape remains intact.

- Samples will be picked up by a laboratory courier or transported to the laboratory the same day they are collected unless collected on a weekend or holiday. In these cases, the samples will be

stored in a secure location until delivery to the laboratory. Additional ice will be added to the cooler as needed to maintain proper preservation temperatures.

4.2 LABORATORY CHAIN-OF-CUSTODY PROCEDURES

A sample custodian will be designated by the laboratory and will have the responsibility to receive all incoming samples. Once received, the custodian will document if the sample is received in good condition (i.e., unbroken, cooled, etc.) and that the associated paperwork, such as chain-of-custody forms have been completed. The custodian will sign the chain-of-custody forms.

The custodian will also document if sufficient sample volume has been received to complete the analytical program. The sample custodian will then place the samples into secure, limited access storage (refrigerated storage, if required). The sample custodian will assign a unique number to each incoming sample for use in the laboratory. The unique number will then be entered into the sample-receiving log with the verified time and date of receipt also noted.

Consistent with the analyses requested on the chain-of-custody form, analyses by the laboratory's analysts will begin in accordance with the appropriate methodologies. Samples will be removed from secure storage with internal chain-of-custody sign-out procedures followed.

4.3 STORAGE OF SAMPLES

Empty sample bottles will be returned to secure and limited access storage after the available volume has been consumed by the analysis. Upon completion of the entire analytical work effort, samples will be disposed of by the sample custodian. The length of time that samples are held will be at least thirty (30) days after reports have been submitted. Disposal of remaining samples will be completed in compliance with all Federal, State, and local requirements.

4.4 FINAL PROJECT FILES CUSTODY PROCEDURES

The final project files will be the central repository for all documents with information relevant to sampling and analysis activities as described in this QAPP. The Haley & Aldrich Project Manager will be the custodian of the project file. The project files including all relevant records, reports, logs, field notebooks, pictures, subcontractor reports and data reviews will be maintained in a secured, limited access area and under custody of the Project Director or his designee.

The final project file will include the following:

- Project plans and drawings;
- Field data records;
- Sample identification documents and soil boring/monitoring well logs;
- All chain-of-custody documentation;
- Correspondence;
- References, literature;
- Laboratory data deliverables;
- Data validation and assessment reports;
- Progress reports, QA reports; and,
- A final report.

The laboratory will be responsible for maintaining analytical logbooks, laboratory data and sample chain of custody documents. Raw laboratory data files and copies of hard copy reports will be inventoried and maintained by the laboratory for a period of six years at which time the laboratory will contact the Haley & Aldrich Project Manager regarding the disposition of the project related files.

5. Calibration Procedures and Frequency

5.1 FIELD INSTRUMENT CALIBRATION PROCEDURES

Several field instruments will be used for both on-site screening of samples and for health and safety monitoring, as described in the HASP. On-site air monitoring for health and safety purposes may be accomplished using a vapor detection device, such as a Photo-ionization Detector (PID).

Field instruments will be calibrated at the beginning of each day and checked during field activities to verify performance. Instrument specific calibration procedures will be performed in accordance with the instrument manufacturer's requirements.

5.2 LABORATORY INSTRUMENT CALIBRATION PROCEDURES

Reference materials of known purity and quality will be utilized for the analysis of environmental samples. The laboratory will carefully monitor the preparation and use of reference materials including solutions, standards, and reagents through well-documented procedures.

All solid chemicals and acids/bases used by the laboratory will be rated as "reagent grade" or better. All gases will be "high" purity or better. All Standard Reference Materials (SRMs) or Performance Evaluation (PE) materials will be obtained from approved vendors of the National Institute of Standards and Technology (formerly National Bureau of Standards), the U.S. EPA Environmental Monitoring Support Laboratories (EMSL), or reliable Cooperative Research and Development Agreement (CRADA) certified commercial sources.

6. Analytical Procedures

Analytical procedures to be utilized for analysis of environmental samples will be based on referenced USEPA analytical protocols and/or project specific SOPs.

6.1 FIELD ANALYTICAL PROCEDURES

Field analytical procedures include the qualitative measurement of VOC during the collection of soil samples.

6.2 LABORATORY ANALYTICAL PROCEDURES

Laboratory analyses will be based on the USEPA methodology requirements promulgated in:

- "Test Methods for Evaluating Solid Waste," SW-846 EPA, Office of Solid Waste, and promulgated updates, 1986.

6.2.1 List of Project Target Compounds and Laboratory Detection Limits

The method detection limits (MDLs) studies are performed by the laboratories in accordance with the procedures established in the Code of Federal Register, Title 40, Part 136.

Laboratory parameters for soil samples are listed in the RAWP. Laboratory parameters for disposal samples will be determined by the disposal facility after an approved facility has been determined.

6.2.2 List of Method Specific Quality Control Criteria

The laboratory SOPs include a section that presents the minimum QC requirements for the project analyses. Section 7.0 references the frequency of the associated QC samples for each sampling effort and matrix.

7. Internal Quality Control Checks

This section presents the internal QC checks that will be employed for field and laboratory measurements.

7.1 FIELD QUALITY CONTROL

7.1.1 Field Blanks

Internal QC checks will include analysis of field blanks to validate equipment cleanliness. Whenever possible, dedicated equipment will be employed to reduce the possibility of cross-contamination of samples.

7.1.2 Trip Blanks

Trip blanks samples will be prepared by the project laboratory using ASTM Type II or equivalent water placed within pre-cleaned 40 milliliter (ml) VOC vials equipped with Teflon septa. Trip blanks will accompany each sample delivery group (SDG) of environmental samples collected for analysis of VOCs.

Trip blank samples will be placed in each cooler that stores and transports project samples that are to be analyzed for VOCs.

7.2 LABORATORY PROCEDURES

Procedures which contribute to maintenance of overall laboratory quality assurance and control include appropriately cleaned sample containers, proper sample identification and logging, applicable sample preservation, storage, and analysis within prescribed holding times, and use of controlled materials.

7.2.1 Field Duplicate Samples

The precision or reproducibility of the data generated will be monitored through the use of field duplicate samples. Field duplicate analysis will be performed at a frequency of 1 in 20 project samples.

Precision will be measured in terms of the absolute value of the relative percent difference (RPD) as expressed by the following equation:

$$RPD = [|R1-R2|/[(R1+R2)/2]] \; X \; 100\%$$

Acceptance criteria for duplicate analyses performed on solid matrices will be 100% and aqueous matrices will be 35% (or the absolute difference rule was satisfied if detects were less than 5 times the RL for solid and aqueous matrices only). RPD values outside these limits will require an evaluation of the sampling and/or analysis procedures by the project QA Officer and/or Laboratory QA Director. Corrective actions may include re-analysis of additional sample aliquots and/or qualification of the data for use.

7.2.2 Matrix Spike Samples

Ten percent of each project sample matrix for each analytical method performed will be spiked with known concentrations of the specific target compounds/analytes.

The amount of the compound recovered from the sample compared to the amount added will be expressed as a percent recovery. The percent recovery of an analyte is an indication of the accuracy of an analysis within the site-specific sample matrix. Percent recovery will be calculated for matrix spike and matrix spike duplicate (MS/MSD) samples using the following equation.

$$\%\ Recovery = \frac{Spiked\ Sample - Background}{Known\ Value\ of\ Spike} x100\%$$

If the QC value falls outside the control limits (UCL or LCL) due to sample matrix effects, the results will be reported with appropriate data qualifiers. To determine the effect a non-compliant MS recovery has on the reported results, the recovery data will be evaluated as part of the validation process.

7.2.3 Laboratory Control Sample Analyses

The laboratory will perform Laboratory Control Sample (LCS) analyses prepared from SRMs. The SRMs will be supplied from an independent manufacturer and traceable to NIST materials with known concentrations of each target analyte to be determined by the analytical methods performed. In cases where an independently supplied SRM is not available, the LCS may be prepared by the laboratory from a reagent lot other than that used for instrument calibration.

The laboratory will evaluate LCS analyses in terms of percent recovery using the most recent laboratory generated control limits.

LCS recoveries that do not meet acceptance criteria will be deemed invalid. Analysis of project samples will cease until an acceptable LCS analysis has been performed. If sample analysis is performed in association with an out-of-control LCS sample analysis, the data will be deemed invalid.

Corrective actions will be initiated by the Haley & Aldrich QA Officer and/or Laboratory QA Officer to investigate the problem. After the problem has been identified and corrected, the solution will be noted in the instrument run logbook and re-analysis of project samples will be performed, if possible.

The analytical anomaly will be noted in the sample delivery group (SDG) Case Narrative and reviewed by the data validator. The data validator will confirm that appropriate corrective actions were implemented and recommend the applicable use of the affected data.

7.2.4 Surrogate Compound/Internal Standard Recoveries

For VOCs, surrogates will be added to each sample prior to analysis to establish purge and trap efficiency. Quantitation will be accomplished via internal standardization techniques.

The recovery of surrogate compounds and internal standards will be monitored by laboratory personnel to assess possible site-specific matrix effects on instrument performance.

For SVOC analyses, surrogates will be added to the raw sample to assess extraction efficiency. Internal standards will be added to all sample extracts and instrument calibration standard immediately before analysis for quantitation via internal standardization techniques.

Method specific QC limits are provided in the attached laboratory method SOPs. Surrogate compound/internal standard recoveries that do not fall within accepted QC limits for the analytical methodology performed will have the analytical results flagged with data qualifiers as appropriate by the laboratory and will not be noted in the laboratory report Case Narrative.

To ascertain the effect non-compliant surrogate compound/internal standard recoveries may have on the reported results, the recovery data will be evaluated as part of the validation process. The data validator will provide recommendations for corrective actions including but not limited to additional data qualification.

7.2.5 Calibration Verification Standards

Calibration verification (CV) standards will be utilized to confirm instrument calibrations and performance throughout the analytical process. CV standards will be prepared as prescribed by the respective analytical protocols. Continuing calibration will be verified by compliance with method-specific criteria prior to additional analysis of project samples.

Non-compliant analysis of CV standards will require immediate corrective action by the project laboratory QA officer and/or designated personnel. Corrective action may include re-analysis of each affected project sample, a detailed description of the problem, the corrective action undertaken, the person who performed the action, and the resolution of the problem.

7.2.6 Laboratory Method Blank Analyses

Method blank sample analysis will be performed as part of each analytical batch for each methodology performed. If target compounds are detected in the method blank samples, the reported results will be flagged by the laboratory in accordance with standard operating procedures. The data validator will provide recommendations for corrective actions including but not limited to additional data qualification.

8. Data Quality Objectives

Sampling that will be performed as described in the RIWP is designed to produce data of the quality necessary to achieve the minimum standard requirements of the field and laboratory analytical objectives described below. These data are being obtained with the primary objective to assess levels of contaminants of concern associated with the Site.

The overall project data quality objective (DQO) is to implement procedures for field data collection, sample collection, handling, and laboratory analysis and reporting that achieve the project objectives. The following section is a general discussion of the criteria that will be used to measure achievement of the project DQO.

8.1 PRECISION

8.1.1 Definition

Precision is defined as a quantitative measure of the degree to which two or more measurements are in agreement. Precision will be determined by collecting and analyzing field duplicate samples and by creating and analyzing laboratory duplicates from one or more of the field samples. The overall precision of measurement data is a mixture of sampling and analytical factors. The analytical results from the field duplicate samples will provide data on sampling precision. The results from duplicate samples created by the laboratory will provide data on analytical precision. The measurement of precision will be stated in terms of RPD. RPD is defined as the absolute difference of duplicate measurements divided by the mean of these analyses normalized to percentage.

8.1.2 Field Precision Sample Objectives

Field precision will be assessed through collection and measurement of field duplicate samples at a rate of 1 duplicate per 20 investigative samples. The RPD criteria for the project field duplicate samples will be +/- 100% for soil, +/- 35 % for groundwater for parameters of analysis detected at concentrations greater than 5 times (5X) the laboratory RL.

8.1.3 Laboratory Precision Sample Objectives

Laboratory precision will be assessed through the analysis of LCS and laboratory control duplicate samples (LCS/LCSD) and MS/MSD samples for soil samples.

8.2 ACCURACY

8.2.1 Definition

Accuracy relates to the bias in a measurement system. Bias is the difference between the observed and the "true" value. Sources of error are the sampling process, field contamination, preservation techniques, sample handling, sample matrix, sample preparation and analytical procedure limitations.

8.2.2 Field Accuracy Objectives

Sampling bias will be assessed by evaluating the results of field equipment rinse and trip blanks. Equipment rinse and trip blanks will be collected as appropriate based on sampling and analytical methods for each sampling effort.

If non-dedicated sampling equipment is used, equipment rinse blanks will be collected by passing ASTM Type II water over and/or through the respective sampling equipment utilized during each sampling effort. One equipment rinse blank will be collected for each type of non-dedicated sampling equipment used for the sampling effort. Equipment rinse blanks will be analyzed for each target parameter for the respective sampling effort for which environmental media have been collected. (Note: If dedicated or disposable sampling equipment is used, equipment rinse samples will not be collected as part of that field effort.)

Trip blank samples will be prepared by the laboratory and provided with each shipping container that includes containers for the collection of groundwater samples for the analysis of VOC. Trip blank samples will be analyzed for each VOC for which groundwater samples have been collected for analysis.

8.3 LABORATORY ACCURACY OBJECTIVES

Analytical bias will be assessed through the use of laboratory control samples (LCS) and Site-specific matrix spike (MS) sample analyses. LCS analyses will be performed with each analytical batch of project samples to determine the accuracy of the analytical system.

One set of MS/MSD analyses will be performed with each batch of 20 project samples collected for analysis to assess the accuracy of the identification and quantification of analytes within the Site-specific sample matrices. Additional sample volume will be collected at sample locations selected for the preparation of MS/MSD samples so that the standard laboratory RLs are achieved.

The accuracy of analyses that include a sample extraction procedure will be evaluated through the use of system monitoring or surrogate compounds. Surrogate compounds will be added to each sample, standard, blank, and QC sample prior to sample preparation and analysis. Surrogate compound percent recoveries will provide information on the effect of the sample matrix on the accuracy of the analyses.

8.4 REPRESENTATIVENESS

8.4.1 Definition

Representativeness expresses the degree to which sample data represent a characteristic of a population, a parameter variation at a sampling point or an environmental condition. Representativeness is a qualitative parameter that is dependent upon the design of the sampling program. The representativeness criterion is satisfied through the proper selection of sampling locations, the quantity of samples and the use of appropriate procedures to collect and analyze the samples.

8.4.2 Measures to Ensure Representativeness of Field Data

Representativeness will be addressed by prescribing sampling techniques and the rationale used to select sampling locations. Sampling locations may be biased (based on existing data, instrument surveys, observations, etc.) or unbiased (completely random or stratified-random approaches).

8.5 COMPLETENESS

8.5.1 Definition

Completeness is a measure of the amount of valid (usable) data obtained from a measuring system compared to the total amount of the anticipated to be obtained. The completeness goal for all data uses is that a sufficient amount of valid data be generated so that determinations can be made related to the intended data use with a sufficient degree of confidence. Valid data is determined by independent confirmation of compliance with method-specific and project-specific data quality objectives. The calculation of data set completeness will be performed by the following equation.

$$\frac{Number\ of\ Valid\ Sample\ Results}{Total\ Number\ of\ Samples\ Planned} X\ 100 = \%\ Complete$$

8.5.2 Field Completeness Objectives

Completeness is a measure of the amount of valid measurements obtained from measurements taken in this project versus the number planned. Field completeness objective for this project will be greater than (>) 90%.

8.5.3 Laboratory Completeness Objectives

Laboratory data completeness objective is a measure of the amount of valid data obtained from laboratory measurements. The evaluation of the data completeness will be performed at the conclusion of each sampling and analysis effort.

The completeness of the data generated will be determined by comparing the amount of valid data, based on independent validation, with the total laboratory data set. The completeness goal will be >90%.

8.6 COMPARABILITY

8.6.1 Definition

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another.

8.6.2 Measures to Ensure Comparability of Laboratory Data

Comparability of laboratory data will be measured from the analysis of SRM obtained from either EPA Cooperative Research and Development Agreement (CRADA) suppliers or the National Institute of Standards and Technology (NIST). The reported analytical data will also be presented in standard units of mass of contaminant within a known volume of environmental media. The standard units for various sample matrices are as follows:

- Solid Matrices – micrograms per kilogram (µg/kg) for PFAS analyses, milligrams per kilogram (mg/kg) of media (Dry Weight).

8.7 LEVEL OF QUALITY CONTROL EFFORT

If non-dedicated sampling equipment is used, equipment rinse blanks will be prepared by field personnel and submitted for analysis of target parameters. Equipment rinse blank samples will be analyzed to check for potential cross-contamination between sampling locations that may be introduced during the investigation. One equipment rinse blank will be collected per sampling event to the extent that non-dedicated sampling equipment is used.

If necessary, a separate equipment rinse blank sample will be collected for PFAS using the sample collection procedure described in Section 8.1.1 of the NYSDEC-approved Avangrid Field Sampling Plan. (Note: If dedicated or disposable sampling equipment is used, equipment rinse samples will not be collected as part of that field effort.)

Trip blanks will be used to assess the potential for contamination during sample storage and shipment. Trip blanks will be provided with the sample containers to be used for the collection of groundwater samples for the analysis of VOC. Trip blanks will be preserved and handled in the same manner as the project samples. One trip blank will be included along with each shipping container containing project samples to be analyzed for VOC.

Method blank samples will be prepared by the laboratory and analyzed concurrently with all project samples to assess potential contamination introduced during the analytical process.

Field duplicate samples will be collected and analyzed to determine sampling and analytical reproducibility. One field duplicate will be collected for every 20 or fewer investigative samples collected for off-Site laboratory analysis.

Matrix spikes will provide information to assess the precision and accuracy of the analysis of the target parameters within the environmental media collected. One MS/MSD will be collected for every 20 or fewer investigative samples per sample matrix.

(Note: Soil MS/MSD samples require triple sample volume for VOC only.)

9. Data Reduction, Validation and Reporting

Data generated by the laboratory operation will be reduced and validated prior to reporting in accordance with the following procedures:

9.1 DATA REDUCTION

9.1.1 Field Data Reduction Procedures

Field data reduction procedures will be minimal in scope compared to those implemented in the laboratory setting. The pH, conductivity, temperature, turbidity, DO, ORP and breathing zone VOC readings collected in the field will be generated from direct read instruments. The data will be written into field logbooks immediately after measurements are taken. If errors are made, data will be legibly crossed out, initialed and dated by the field member, and corrected in a space adjacent to the original entry.

9.1.2 Laboratory Data Reduction Procedures

Laboratory data reduction procedures are provided by the appropriate chapter of USEPA, “Test Methods for Evaluating Solid Waste,” SW-846, Third Edition. Errors will be noted; corrections made with the original notations crossed out legibly. Analytical results for soil samples will be calculated and reported on a dry weight basis.

9.1.3 Quality Control Data

QC data (e.g., laboratory duplicates, surrogates, matrix spike, and matrix spike duplicates) will be compared to the method acceptance criteria. Data determined to be acceptable will be entered into the laboratory information management system.

Unacceptable data will be appropriately qualified in the project report. Case narratives will be prepared which will include information concerning data that fell outside acceptance limits and any other anomalous conditions encountered during sample analysis.

9.2 DATA VALIDATION

Data validation procedures of the analytical data will be performed by the Haley & Aldrich QA Officer or designee using the following documents as guidance for the review process:

- "U.S. EPA National Functional Guidelines for Organic Data Review”, "Analysis of Volatile Organic Compounds in Air Contained in Canisters by Method TO-15", "Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances Under NYSDEC’s Part 375 Remedial Programs", and the "U.S. EPA National Functional Guidelines for Inorganic Data Review".

- The specific data qualifiers used will be applied to the reported results as presented and defined in the EPA National Functional Guidelines. Validation will be performed by qualified personnel at

the direction of the Haley & Aldrich QAO. Tier 1 data validation (the equivalent of USEPA's Stage 2A validation) will be performed to evaluate data quality.

- The completeness of each data package will be evaluated by the Data Validator. Completeness checks will be administered on all data to determine that the deliverables are consistent with the NYSDEC ASP Category A and Category B data package requirements. The validator will determine whether the required items are present and request copies of missing deliverables (if necessary) from the laboratory.

9.3 DATA REPORTING

Data reporting procedures will be carried out for field and laboratory operations as indicated below:

- Field Data Reporting: Field data reporting will be conducted principally through the transmission of report sheets containing tabulated results of measurements made in the field and documentation of field calibration activities.

- Laboratory Data Reporting: The laboratory data reporting package will enable data validation based on the protocols described above. The final laboratory data report format will include the QA/QC sample analysis deliverables to enable the development of a data usability summary report (DUSR) based on Department DER-10 Appendix 2B.

10. Performance and System Audits

A performance audit is an independent quantitative comparison with data routinely obtained in the field or the laboratory. Performance audits include two separate, independent parts: internal and external audits.

10.1 FIELD PERFORMANCE AND SYSTEM AUDITS

10.1.1 Internal Field Audit Responsibilities

Internal audits of field activities will be initiated at the discretion of the Project Manager and will include the review of sampling and field measurements. The audits will verify that all procedures are being followed. Internal field audits will be conducted periodically during the project. The audits will include examination of the following:

- Field sampling records, screening results, instrument operating records;
- Sample collection;
- Handling and packaging in compliance with procedures;
- Maintenance of QA procedures; and,
- Chain-of-custody reports.

10.1.2 External Field Audit Responsibilities

External audits may be conducted by the Project Coordinator at any time during the field operations. These audits may or may not be announced and are at the discretion of the NYSDEC. The external field audits can include (but are not limited to) the following:

- Sampling equipment decontamination procedures;
- Sample bottle preparation procedures;
- Sampling procedures;
- Examination of health and safety plans;
- Procedures for verification of field duplicates; and,
- Field screening practices.

10.2 LABORATORY PERFORMANCE AND SYSTEM AUDITS

10.2.1 Internal Laboratory Audit Responsibilities

The laboratory system audits are typically conducted by the laboratory QA Officer or designee on an annual basis. The system audit will include an examination of laboratory documentation including sample receiving logs, sample storage, chain-of-custody procedures, sample preparation and analysis and instrument operating records.

At the conclusion of internal system audits, reports will be provided to the laboratory's operating divisions for appropriate comment and remedial/corrective action where necessary. Records of audits and corrective actions will be maintained by the Laboratory QA Officer.

10.2.2 External Laboratory Audit Responsibilities

External audits will be conducted as required, by the NYSDOH or designee. External audits may include any of the following:

- Review of laboratory analytical procedures;
- Laboratory on-site visits; and,
- Submission of performance evaluation samples for analysis.

Failure of any of the above audit procedures can lead to laboratory de-certification. An audit may consist of but not limited to:

- Sample receipt procedures;
- Custody, sample security and log-in procedures;
- Review of instrument calibration logs;
- Review of QA procedures;
- Review of log books;
- Review of analytical SOPs; and,
- Personnel interviews.

A review of a data package from samples recently analyzed by the laboratory can include (but not be limited to) the following:

- Comparison of resulting data to the SOP or method;
- Verification of initial and continuing calibrations within control limits;
- Verification of surrogate recoveries and instrument timing results;
- Review of extended quantitation reports for comparisons of library spectra to instrument spectra, where applicable; and,
- Assurance that samples are run within holding times.

11. Preventive Maintenance

11.1 FIELD INSTRUMENT PREVENTIVE MAINTENANCE

The field equipment preventive maintenance program is designed to ensure the effective completion of the sampling effort and to minimize equipment down time. Program implementation is concentrated in three areas:

- Maintenance responsibilities;
- Maintenance schedules; and,
- Inventory of critical spare parts and equipment.

The maintenance responsibilities for field equipment will be assigned to the task leaders in charge of specific field operations. Field personnel will be responsible for daily field checks and calibrations and for reporting any problems with the equipment. The maintenance schedule will follow the manufacturer's recommendations. In addition, the field personnel will be responsible for determining that an inventory of spare parts will be maintained with the field equipment. The inventory will primarily contain parts that are subject to frequent failure, have limited useful lifetimes and/or cannot be obtained in a timely manner.

11.2 LABORATORY INSTRUMENT PREVENTIVE MAINTENANCE

Analytical instruments at the laboratory will undergo routine and/or preventive maintenance. The extent of the preventive maintenance will be a function of the complexity of the equipment.

Generally, annual preventive maintenance service will involve cleaning, adjusting, inspecting, and testing procedures designed to deduce instrument failure and/or extend useful instrument life. Between visits, routine operator maintenance and cleaning will be performed according to manufacturer's specifications by laboratory personnel.

12. Specific Routine Procedures Used to Address Data Precision, Accuracy, and Completeness

12.1 FIELD MEASUREMENTS

Field-generated information will be reviewed by the Field Coordinator and typically include evaluation of bound logbooks/forms, data entry and calculation checks. Field data will be assessed by the Project Coordinator who will review the field results for compliance with the established QC criteria that are specified in Sections 7.0 and 8.0 of this QAPP. The accuracy of pH and specific conductance will be assessed using daily instrument calibration, calibration check, and blank data. Accuracy will be measured by determining the percent recovery (% R) of calibration check standards. Precision of the pH and specific conductance measurements will be assessed on the basis of the reproducibility of duplicate readings of a field sample and will be measured by determining the RPD. Accuracy and precision of the soil VOC screening will be determined using duplicate readings of calibration checks. Field data completeness will be calculated using the following equation:

$$\text{Completeness} = \frac{\text{Valid (usable) Data Obtained}}{\text{Total Data Planned}} \text{ X } 100$$

12.2 LABORATORY DATA

Laboratory data will be assessed by the Haley & Aldrich QA Officer or designee who will review the laboratory results for compliance with the established QC criteria that are specified in Sections 7.0 and 8.0 of this QAPP.

13. Quality Assurance Reports

Critically important to the successful implementation of the QA Plan is a reporting system that provides the means by which the program can be reviewed, problems identified, and programmatic changes made to improve the plan.

QA reports to management can include:

- Audit reports, internal and external audits with responses;
- Performance evaluation sample results; internal and external sources; and
- Daily QA/QC exception reports/corrective actions.

QA/QC corrective action reports will be prepared by the Haley & Aldrich QA Officer when appropriate and presented to the project and/or laboratory management personnel so that performance criteria can be monitored for all analyses from each analytical department. The updated trend/QA charts prepared by the laboratory QA personnel will be distributed and reviewed by various levels of laboratory management.

References

1. United States Environmental Protection Agency, (1999). EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations. EPA QA/R-5 Interim Final, November 1999.

2. United States Environmental Protection Agency (1991). Preparation Aids for the Development of Category I Quality Assurance Project Plans. U.S. EPA/600/8-91/003, Risk Reduction Engineering Laboratory, Office of Research and Development, Cincinnati, Ohio, February 1991.

3. United States Environmental Protection Agency, (1993). Data Quality Objectives Process for Superfund Interim Final Guidance. U.S. EPA/540/R-93-071, Office of Solid Waste and Emergency Response (OSWER), September 1993.

4. United States Environmental Protection Agency, (1992). Specifications and Guidance for Contaminant-Free Sample Containers. OSWER Directive 9240.0-05A, April 1992.

5. United States Environmental Protection Agency. U.S. EPA National Functional Guidelines for Organic Data Review. U.S. EPA 540/R-2017-002.

6. United States Environmental Protection Agency. U.S. EPA National Functional Guidelines for Organic Data Review. U.S. EPA 540/R-2017-001.

7. United States Environmental Protection Agency. Test Methods for Evaluating Solid Waste, Office of Solid Waste, U.S. EPA, SW-846, November 1986, with updates.

8. New York State Department of Environmental Conservation, NYSDEC Analytical Services Protocol (ASP), Bureau of Environmental Investigation, 1991 with updates.

9. New York State Department of Environmental Conservation, NYSDEC, Division of Environmental Remediation, Technical Guidance for Site Investigation and Remediation, DER-10, May 2010.

10. New York State Department of Environmental Conservation, NYSDEC, Division of Environmental Remediation, Sampling, Analysis and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) under NYSDEC Part 375 Remedial Program, April 2023.

TABLES

TABLE I
SUMMARY OF ANALYSIS METHOD, PRESERVATION METHOD, HOLDING TIME, SAMPLE SIZE REQUIREMENTS AND SAMPLE CONTAINERS
28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

Analysis/Method	Sample Type	Preservation	Holding Time	Volume/Weight	Container
Volatile Organic Compounds/8260C	Soil	1 - 1 Vial MeOH/2 Vial Water, Cool, 4 ± 2 °C	14 days[1]	120 mL	3 - 40ml glass vials
Semivolatile Organic Compounds/8270D	Soil	Cool, 4 ± 2 °C	14 days	250 mL	1 - 8 oz Glass
Pesticides/8081B	Soil	Cool, 4 ± 2 °C	14 days	250 mL	1 - 4 oz Glass
Polychlorinated Biphenyls/8082A	Soil	Cool, 4 ± 2 °C	14 days	250 mL	1 - 4 oz Glass
Metals/6010D	Soil	Cool, 4 ± 2 °C	180 days	60 mL	1 - 4 oz Glass
PFAS/1633A	Soil	Cool, 4 ± 2 °C	14 days	250 mL	1 - teflon free 250 ml plastic container
1,4-Dioxane/8270	Soil	Cool, 4 ± 2 °C	14 days	250 mL	1 - 8 oz Glass
Toxicity Characteristic Leaching Procedure Metals	Soil	Cool, 4 ± 2 °C	180 days	120 mL	1 - 4 oz Glass
Volatile Organic Compounds/TO-15	Indoor Air	N/A	30 days	2.7 - 6 L	1 - 2.7 L Summa Canister

Notes:
1. Terracores and encores must be frozen within 48 hours of collection
2. Refer to text for additional information.

FIGURES



LEGEND

- PROPOSED HOT SPOT CONFIRMATION BASE SAMPLE
- PROPOSED HOT SPOT CONFIRMATION SIDEWALL SAMPLE
- PROPOSED SITE-WIDE EXCAVATION BASE CONFIRMATION AND DOCUMENTATION SAMPLE

EXCAVATION DEPTHS IN FEET BELOW GROUND SURFACE (BGS)

- 7 FT
- 9 FT (RI-SB-02 AND RI-SB-04)
- 15 FT (RI-SB-07)
- SITE BOUNDARY
- PARCEL BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ASSESSOR PARCEL DATA SOURCE: NYC DEPARTMENT OF CITY PLANNING, INFORMATION TECHNOLOGY DIVISION
3. AERIAL IMAGERY SOURCE: NEARMAP, OCTOBER 1, 2025

N

0 20 40
SCALE IN FEET

HALEY ALDRICH

28-12 41ST AVENUE
LONG ISLAND CITY, NEW YORK

PROPOSED DOCUMENTATION AND CONFIRMATION SAMPLE MAP

MAY 2026

FIGURE 12

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\0214374\GIS\214374_000_28_12_41_ST_AVENUE_BCP_RAWP.aprx - USER: pditillio - LAST SAVED: 11/11/2025 1:17 PM

ATTACHMENT A
Project Team Resumes

HALEY ALDRICH



JAMES BELLEW

Principal

EDUCATION

M.S., Environmental Geology, Queens College
B.S., Geology, Pre-Law, Environmental Science, Binghamton University

PROFESSIONAL SOCIETIES

American Council of Engineering Companies, Member, 2017
Urban Land Institute, Member, 2016
Business Council of New York, Member, 2018

SPECIAL STUDIES AND COURSES

40-Hour OSHA Hazardous Waste Operations and Emergency Response Training (29 CFR 1910.120)
30-Hour OSHA Construction Safety and Heath
8-hour OSHA Site Supervisor Certification
OSHA Confined Space Entry Training Certification
Erosion and Sediment Control, New York, No. 006925
USDOT/IATA Training on the Shipping and/or Transportation of Hazardous Materials

James has a hands-on approach to every project. He believes that being present and putting himself into his clients' shoes is the best way to understand their needs. As a Principal, James's expertise includes due diligence, environmental risk development, building surveys, remedial investigations, remedial design, and technical oversight. Mr. Bellew has completed over 50 NYCOER E-Designation Sites and NYSDEC Brownfield Cleanup Program Sites which include preparation of all reports through to the certificate of completion and a certificate of occupancy.

Clients appreciate James' strategies from the inception of a project through closure under various regulatory programs nationwide. That comprehensive approach is what James loves the most about his job. He enjoys taking on complex projects and finding rational, cost-effective, remedial solutions.

RELEVANT PROJECT EXPERIENCE

Development, EPA Site RCRA-02-2009-7306, NYSDEC Site 243016, Former Port Mobil Terminal, Staten Island, New York. Principal responsible for the preparation of the feasibility study, preparation of the Interim Remedial Reports, completion of the Interim Remedial Measures, completion of the remedial investigation stages, continued execution of the Monitoring and Natural Attenuation Program, preparation of the Remedial Action Work Plan/Remedial Designs, and RCRA Closure procedures for the Port Mobil Terminal Site under an Environmental Protection Agency and New York State DEC Consent Order. The Site has a footprint of 240-Acres SF with a planned development for commercial/industrial uses.

Government, NYCDDC Shirley Chisholm Recreational Center, Brooklyn, New York. Principal for the project released by the New York City Department of Design and Construction, on behalf of the NYC Parks Department, for the design and construction of a new recreational center located at 3002 Foster Avenue in Brooklyn New York. Scope of services included execution of a Phase II Environmental Site Assessment, soil characterization, remedial oversight, geotechnical percolation testing and closure with the NYC Department of Environmental Protection.

Development's, New York State Superfund Site 224136, Former NuHart Plastics Site, New York State Superfund Site (NuHart West) and NYSDEC Brownfield Program Site C224287 (NuHart East), Brooklyn, New York. Principal for the preparation of the feasibility study, offsite investigation reports, RCRA (Resource Conservation and Recovery Act) Closure Work Plan, execution of the RCRA Closure, preparation of the Brownfield Cleanup Application (NuHart East), 100% Remedial Design, preparation of all BCP related work plans (NuHart East), coordination to vest the Site for 421-, Final Engineering Reports, RCRA Closure Reports, Site Management Plan, Remedial Memorandum and all community

outreach programs for a former plasticizer facility with on- and off-site pollutant concerns. Responsible for all remedial cost and alternative analysis with the client to bring the Site to a certificate of completion. NuHart is a high-profile Site that requires coordination with the New York State Department of Environmental Conservation (NYSDEC), the New York City Office of Environmental Remediation (NYCOER), local regulatory agencies, community stakeholders and local elected officials. Remediation included shipping off a majority of the Site soil for thermal desorption under a nonhazardous contained in determination for thermal treatment, erection of a negative pressure enclosure in OU-1, groundwater extraction and treatment, underground storage tank (UST) removal, ex-situ chemical soil mixing of Zero Valent Iron (OU-1), In Situ Injection of Zero Valent Iron (OU-2), containment walls (OU-1 and OU-2), In Situ Soil Stabilization and Solidification, and automated LNAPL recovery (OU-2). The NuHart East Site has completed the remediation and received the Certificate of Completion from the NYSDEC in 2023 and the NuHart West Site is receiving its Certificate of Completion in 2025 with an anticipated transition from a Class 2 to a Class 4 Inactive Hazardous waste Site.

Development, NYSDEC Site C224345, 101 Fleet Place, Brooklyn, New York. Principal responsible for the due diligence during acquisition, preparation of the Brownfield Cleanup Program Application, Change of Use Documents, BCA Amendments, remedial investigation, remedial action design (BCP and OER) and Final Engineering Report for the former bus depot Site under the New York State Brownfield Cleanup program and NYCOER E-Designation Programs (Air/Noise). The Site has a footprint of 20,000 SF with a planned development of a 21-story mixed use building with approximately 292 units which include affordable housing. This Site received a NYSDEC Certificate of Completion in 2024.

Development, NYSDEC Site C231150 644 East 14th Street, New York, New York. Principal responsible for the due diligence during acquisition, preparation of the Brownfield Cleanup Program Application, Change of Use Documents, BCA Amendments, remedial investigation, remedial action design and Final Engineering Report for the 644 East 14th Street Site under the New York State Brownfield Cleanup program. The Site has a footprint of 10,000 SF with a planned development of a 24-story mixed use building with approximately 196 units which include affordable housing. The Site received a certificate of completion from the NYSDEC in 2024.

Development, NYSDEC Site C224338 Former Garone Bros Auto Site, 352-362 Shepherd, Brooklyn, New York. Principal responsible for the due diligence during acquisition, preparation of the Brownfield Cleanup Program Application, Change of Use Documents, BCA Amendments, remedial investigation, remedial action design (BCP and OER) and Final Engineering Report for the former Garone Bros Auto Site under the New York State Brownfield Cleanup program and NYCOER E-Designation Programs (Air/Noise). The Site has a footprint of 10,000 SF with a planned development of a 7-story mixed use building with approximately 56 units which include affordable housing. The Site received a certificate of completion from the NYSDEC in 2024.

Development's, NYSDEC Sites C224369, C224348, Speedway Portfolio, Multiple Boroughs, New York. Principal responsible for the expedited due diligence during acquisition of 5 former Speedway Sites of Phase I ESA's and Limited Phase II ESI's, preparation of the Brownfield Cleanup Program Applications, Remedial Investigation Work Plans, Interim Remedial Measure Work Plans, Air/Noise Remedial Action Work Plans (NYCOER), remedial investigations, remedial action designs (BCP and OER), Final Engineering Reports and Site Management Plans. Five of the Sites including 808-834 Metropolitan (C224368), 210 Greenpoint Avenue (C224348) 1885 Atlantic (C224347), 2864 Atlantic (C224349) and 401 West 207th (C231151), were accepted into the NYSDEC Brownfield Cleanup program. The remedial actions for the Sites included a variety of approaches which consisting of in situ chemical treatment for groundwater, soil vapor extraction, excavation and dewatering removal and treatment. All of the Sites received a certificate of completion from the NYSDEC in 2023 and 2024.

Development, NYSDEC Site C203127, 138 Bruckner Boulevard, Bronx, New York. Principal responsible for the due diligence during acquisition, preparation of the Brownfield Cleanup Program Application, Change of Use Documents, coordination to vest the Site for 421-a, BCA Amendments, remedial investigation, remedial action design (BCP and OER) and Final Engineering Report for the former Zaro's Bakery Site under the New York State Brownfield Cleanup program and NYCOER E-Designation Programs (Air/Noise). The Site has a footprint of 50,000 SF with a planned

development of a 12-story mixed use building with approximately 447 units which include affordable housing. The Site received a certificate of completion from the NYSDEC in 2023.

Development, NYSDEC Site C203156 Former Mill Sanitary Wiping Cloth Site, 40 Bruckner Boulevard, Bronx, New York. Principal responsible for the due diligence during acquisition, preparation of the Brownfield Cleanup Program Application, Change of Use Documents, BCA Amendments, remedial investigation, remedial action design (BCP and OER) and Final Engineering Report for the former Mill Sanitary Wiping Cloth Site under the New York State Brownfield Cleanup program and NYCOER E-Designation Programs (Air/Noise). The Site has a footprint of 45,000 SF with a planned development of a 12-story mixed use building with approximately 480 units which include affordable housing. The Site received a certificate of completion from the NYSDEC in 2023.

Development, NYSDEC Site C203121, 310 Grand Concourse, Bronx, New York. Principal responsible for environmental and construction management services required to successfully navigate this two-building redevelopment project through the NYSDEC Brownfield Cleanup Program (BCP) and NYCOER E-Designation Program (Air/Noise). Project included site investigation, design, and remediation for development of two buildings within a 30,000 square-foot lot in the Bronx, New York. Remediation included excavation of approximately 20,000 cubic yards of soil, groundwater extraction and treatment, underground storage tank (UST) removal, design, and installation an ex-situ chemical in situ soil stabilization process for elevated levels of metals.

Development, NYSDEC Site C224299, 297 Wallabout Street, Brooklyn New York. Principal responsible for the due diligence during acquisition, preparation of the Brownfield Cleanup Program Application, Change of Use Documents, BCA Amendments, remedial investigation, and remedial action design (BCP and OER), Final Engineering Report and Site Management Plan for the 297 Wallabout Street Site under the New York State Brownfield Cleanup program and NYCOER E-Designation Programs (Air). Successfully delineated the onsite tetrachloroethene (PCE) plume in soil and groundwater. The Site is currently in the remedial implementation phase. Remediation included excavation of approximately 5,000 cubic yards of soil, groundwater extraction and treatment, underground storage tank (UST) removal, design, and installation an ex-situ chemical oxidation process for chlorinated solvents and monitoring and natural attenuation. The Site received a certificate of completion from the NYSDEC in 2024.

Development, NYSDEC Site C224239, Former Techtronics Site (8 Walworth Street), Brooklyn, New York. Principal for the remedial investigation, remedial action design and remedial action implementation for the former Techtronics Site under the New York State Brownfield Cleanup program as a Participant where trichloroethene (TCE) and tetrachloroethene (PCE) were encountered in soil and groundwater. James successfully delineated the vertical and lateral extents of the plumes which were identified as an upgradient, on-site. For this Site we have designed source removal to 20'bgs, Zero Valent Iron (ZVI) Reactive Barrier Wall, in situ ZVI injections sitewide and a vertical vapor mitigation system. The Site is currently in the remedial implementation phase.

Development, New York City OER Site - 346 Grand Concourse, Bronx, New York. Principal for the proposed 9-story, 60 key commercial building with one-level deep cellar. Design phase environmental services consist of guiding the Site through the New York City Office of Environmental of Remediation Voluntary Cleanup and E-Designation Programs, including Hazmat, Air Quality and Noise requirements. This program included submission of a Remedial Investigation Work Plan, implementation of a Remedial Investigation, submittal of a Remedial Investigation Report, Remedial Action Work Plans (Hazmat Air and Noise) and the Final Installation Report for the Certificate of Occupancy.

Development, New York City OER Site - 3294 Atlantic Avenue, Brooklyn, New York. Principal for the proposed 12-story, 80 key commercial building with one-level deep cellar. Design phase environmental services consist of guiding the Site through the New York City Office of Environmental of Remediation Voluntary Cleanup and E-Designation Programs, including Hazmat, Air Quality and Noise requirements. This program included submission of a Remedial Investigation Work Plan, implementation of a Remedial Investigation, submittal of a Remedial Investigation Report, Remedial Action Work Plans (Hazmat Air and Noise) and the Final Installation Report for the Certificate of Occupancy.

Development, New York City OER Site - 590-594 Myrtle Avenue, Brooklyn, New York. Principal for the proposed 6-story, 12-unit residential building with one-level deep cellar. Design phase environmental services consist of guiding the Site through the New York City Office of Environmental of Remediation Voluntary Cleanup and E-Designation Programs, including Hazmat, Air Quality and Noise requirements. This program included submission of a Remedial Investigation Work Plan, implementation of a Remedial Investigation, submittal of a Remedial Investigation Report, Remedial Action Work Plans (Hazmat Air and Noise) and the Final Installation Report for the Certificate of Occupancy.

Development, New York City OER Site - 3530 Webster Avenue, Bronx, New York. Principal for the proposed 8-story, 75 key commercial building with one-level deep cellar. Design phase environmental services consist of guiding the Site through the New York City Office of Environmental of Remediation Voluntary Cleanup and E-Designation Programs, including Hazmat, Air Quality and Noise requirements. This program included submission of a Remedial Investigation Work Plan, implementation of a Remedial Investigation, submittal of a Remedial Investigation Report, Remedial Action Work Plans (Hazmat Air and Noise). The project is currently in the construction phase of the NYCOER program.

Development, Former BP Station, Elmhurst Queens, New York. Principal for the preparation of a full environmental impact statement with respect to a mixed-use development proposed in Elmhurst Queens for submission to the NYC Department of City Planning to rezone the project. The work included a full impact assessment of the proposed construction with respect to the neighborhood, evaluation of green/open spaces for the community and environmental site investigation and remediation services.

Development, NYSDEC Site C224204, Former Delta Metals Site, Brooklyn, New York. Senior Project manager for the remedial investigation and remedial action design for the former Delta Metal Products Company. Project is under the New York State Brownfield Cleanup program as a Participant where TCE and tetrachloroethene (PCE) were encountered in soil and groundwater. James successfully delineated the vertical and lateral extents of the plumes which were identified as an upgradient, on-site and downgradient plume. Investigation results triggered the NYSDEC to utilize its call-out contract to perform a plume track down for the immediate area and identify additional Potentially Responsible Parties. The design for an Air Sparge Soil Vapor Extraction system has been accepted and the project is currently under construction.

Manufacturing-Industrial, Hess Amerada, Bogota and Edgewater, New Jersey. Senior Project Manager and technical Lead for the construction management services for the demolition of two waterfront terminals on the Hackensack and Hudson rivers. Services included demolition design, submittal review, site execution and coordination of activities related to asbestos abatement, demolition of buildings, thirty holding tanks, piping structures, containment structures and storm water structures.

Manufacturing-Industrial, PQ Corporation, Northeastern United States. Senior Project Manager responsible for the design and implementation of a three phased program for handling polychlorinated biphenyl (PCB) containing materials on approximately 100 tank structures at large, active industrial sites, which included coating removal, encapsulation, demolition, and Toxic Substances Control Act (TSCA) remediation. He was responsible for development of the overall program, specifications, drawings, bid packages, construction oversight and project administration until closure. The program also included design and oversight of a new façade and roof upgrades completed concurrently to client operations.

Development, NYSDEC Site C224194, Former Cascade Laundry, Brooklyn, New York. Senior Project Manager responsible for environmental and construction management services required to successfully navigate a seven-building redevelopment project through the NYSDEC Brownfield Cleanup Program (BCP) and NYCOER E-Designation Program (Air/Noise). Project included site investigation, design, and remediation for development of seven buildings within a 2-acre site in Brooklyn, New York. Remediation included excavation of approximately 40,000 cubic yards of soil, groundwater extraction and treatment, underground storage tank (UST) removal, design, and installation of a sub slab depressurization system (SSDS) and ex situ chemical oxidation of groundwater impacted by petroleum.

Development, New York City OER Site - 520-534 West 29th Street, New York, New York. James was responsible for environmental site investigation and remediation activities required to successfully navigate the project through the

NYCOER's E-Designation and Voluntary Cleanup Programs. This program included submission of a Remedial Investigation Work Plan, implementation of a Remedial Investigation, submittal of a Remedial Investigation Report, Remedial Action Work Plans (Hazmat Air and Noise). The project is currently in the construction phase of the NYCOER program.

Development, New York State Brownfield Site, BJ's Wholesale, Brooklyn, New York. Senior Project Manager for the remedial execution within the NYSDEC BCP and NYCOER E-Designation programs at an 8-acre peninsula in Gravesend Bay being redeveloped by BJ's Wholesale Club (BJ's) into a "big-box" warehouse and parking garage, and a publicly accessible, waterfront open space. He implemented a comprehensive community air monitoring plan (CAMP), managed the design and installation of a passive sub slab depressurization system, and oversaw handling and off-site disposal of impacted material generated by BJ's (the Lessee for the subject site) during their foundation construction activities.

Development, New York State Brownfield Site, Coney Island, Brooklyn, New York. Senior Project Manager responsible for the environmental design during the rehabilitation and expansion of a 1970s-era mixed-use complex, which covers an area equivalent to three city blocks. He facilitated the BCP applications for two adjacent parcels within the complex impacted by historic dry-cleaning uses. Site investigations performed had documented the presence of PCE in soil gas and was delineated over three separate structural slabs in commercial and residential space utilizing a mobile laboratory. He designed and installed two sub-slab depressurization systems and prepared Remedial Investigation Work Plan which outlined work required to delineate the vertical and horizontal extent of the impacted soils, soil vapor and groundwater at both BCP sites. The system was designed with below slab suction pits, remote sensing vacuum monitoring points, and a variable frequency drive blower tied into the monitoring points for optimization and power savings.

Development, New York City OER Site - Memorial Sloan Kettering Cancer Center (MSKCC), New York, New York. Project Manager for environmental remediation for this MSKCC development project. James was solely responsible for subsurface investigation and remediation activities, large, manufactured gas plant (MGP) gas holder removal (from former Con Edison Operations), UST removal, daily status updates to the NYCOER, implementation of the CAMP and the management, handling, characterization, and off-site disposal of MGP impacted soil and dewatering fluids.

New York State Spill Remediation, Metropolitan Transportation Agency Bridges and Tunnels, New York, New York. Project Manager responsible for execution of a remedial action scope which included UST removal, excavation of 600 cubic yards of petroleum impacted soil, design and installation of a groundwater extraction and treatment system and post remediation samples. He implemented the In Situ Chemical Oxidation program for the injection of 54,000 gallons of 8 percent solution Fenton's Reagent and the O&M (Operation & Maintenance) of the petroleum spill with respect to Fenton's performance and the plume migration.

Various Public Schools, New York City School Construction Authority, New York, New York. Project Manager responsible for environmental remediation proposed several school developments sites, including PS 312, P.S. 281, and PS 27K. Assisted in the design and implementation of the remediation programs for the sites for petroleum spills, PCB TSCA contamination and hazardous lead hot spots.

Development, i.Park Edgewater, Edgewater, New Jersey. Project Manager responsible for the design and environmental remediation on-site. Implemented the construction plan for remediation of arsenic, pitch- and PCB-impacted soil for excavation and off-site disposal of 20,000 tons. He managed the air monitoring system on-site which consisted of four permanent stations set upwind and downwind on-site for volatile organic compounds (VOCs) and particulate migration off-site. Also, James performed redesigns throughout the project to keep within the current schedule and budget.

Development, New York State Brownfield, Queens West, Long Island City, New York. Project Manager responsible for oversight of the Environmental Remediation on-site. James implemented the construction plan for remediation of 20,000 cubic yards of LNAPL on the Site; he assisted in design and oversight of the In Situ Chemical Oxidation mixing on-site. The project was eventually developed into three large towers and a new school.

Manufactured Gas Plant, National Grid, Rockaway, New York. James aided in the design and implementation of the soil characterization plan for MGP impacted sands. After delineation of the contamination plume, drafted work plans and site layout of the negative pressure tent. He performed and trained the on-site staff on the use of personal air monitoring equipment and aided with design considerations on the installation of a waterloo barrier to be advanced to minus 80 feet below grade surface. James also helped with the design and permitting for the groundwater treatment system installed on-site.

Manufactured Gas Plant, Con Edison, New York, New York. Environmental engineer for responsible party for all environmental issues associated with this job, including transportation and disposal of 8,000 tons of MGP contaminated soil from former Con Edison operations. James scheduled weekly work for all civil and environmental tasks on the job. He was responsible for the design and installation of the dewatering treatment system with a daily discharge of 25,000 gallons per day of MGP -impacted water.

New York State Superfund Project, NYSDEC, Hicksville, New York. James performed O&M and reporting on the Site's Potassium Permanganate Injection system, which was on a timed system; maintained the system, troubleshooting problems and ensuring that the proper ratios were being injected. He performed the fieldwork for analysis and drafted interim reports for the project manager.

Retail Petroleum, New York State Spills Program, Hess Amerada, Various Locations, New York. Environmental Engineer responsible for the design and installation of groundwater and soil vapor remedial systems at over 30 retail petroleum stations for Hess. Responsible for ensuring that the remedial systems were operating properly and performing repairs as necessary during operation. He performed groundwater and soil vapor monitoring and drafted O&M reports for the NYSDEC. Plume size ranged from within the retail station property with monitoring off-site impacts in local neighborhoods greater than a 3-mile radius.

Retail Petroleum, New York State Spills Program, British Petroleum (BP), Various Locations, New York. Environmental Engineer responsible for the design and installation of groundwater and soil vapor remedial systems at over 10 retail petroleum stations for BP. He was responsible for ensuring that the remedial systems were operating properly and performing repairs necessary during operation. He performed groundwater and soil vapor monitoring and drafted O&M reports for the NYSDEC. Plume size ranged from within the retail station property with monitoring off-site impacts in local neighborhoods greater than a 2-mile radius.

Development, 524 West 19th Street, New York, NY (Metal Shutter Homes). Project Engineer responsible party for all environmental and civil issues associated with this job, including transportation and disposal of 5,000 tons of MGP contaminated soil from former Con Edison operations. James scheduled weekly work for all civil and environmental tasks on the job. He successfully redesigned the grout cutoff wall connections to the installed steel sheeting with a secant wall installed off-site. He provided technical guidance for drilling 4-foot diameter exploratory casings for subsurface anomalies. Additionally, James was responsible for the design and installation of the dewatering treatment system with a daily discharge of 25,000 gallons per day of MGP impacted water.

EPA Superfund Site, Newtown Creek Superfund, Brooklyn, New York. Environmental Engineer who aided in the design of the pump and treat system installed at Peerless Importers. He also aided in the design and installation of the harbor boom set up. Operated and Maintained groundwater/LNAPL extraction systems on-site and performed monthly site gauging as part of the O&M plan.



ZHAN SHU, P.E., PH.D.

Senior Project Manager/Technical Specialist

EDUCATION

Ph.D., Environmental Engineering, New Jersey Institute of Technology (NJIT)
B.S., and M.S., Environmental Engineering, National Hua Chiao University, China

PROFESSIONAL REGISTRATIONS

2018/ NJ: Professional Engineer (Reg. No. 24GE05424500)

PROFESSIONAL SOCIETIES

American Society of Civil Engineering
American Chemical Society
New Jersey Society of Women Environmental Professionals
Reviewer, Journal of Environmental Engineering Science
Reviewer, Journal of Science of Total Environment
Reviewer, Journal of Environmental Engineering

SPECIAL STUDIES AND COURSES

OSHA - Hazardous Waste Operations and Emergency Response (OSHA 40-Hour HAZWOPER)
8-Hour OSHA Annual HAZWOPER Refresher
Application of Risk Assessment as a Decision-Making Tool for Contaminated Sites

Zhan has over 11 years of experience in project management, environmental consulting, remediation, engineering, and construction management. She is a licensed professional engineer (P.E.) in the state of New Jersey. She is a senior project manager with experience in soil and groundwater remediation, geochemistry, contaminant hydrogeology, contaminant attenuation and mobility, mechanistic and transport modeling, statistical data analysis, and waste characterization. She has delivered several presentations at professional gatherings, including the Annual International Conference on Soil, Water, Energy, and Air (AEHS) and other technical conferences.

RELEVANT PROJECT EXPERIENCE

Former Pesticide Manufacturing Facility, Site Investigation and Remediation, Middlesex, New Jersey. The 57-acre site is composed of multiple properties that are impacted by former manufacturing activities involving arsenic compounds and other chemicals used as pesticide ingredients. A groundwater remediation system pumps and treats arsenic, pesticides, and volatile organic compounds (VOCs)-impacted groundwater in accordance with New Jersey Department of Environmental Protection (NJDEP) and Publicly Owned Treatment Work (POTW) permits. As project manager, performed a wide variety of tasks related to site investigation and remediation for this project, including:

- Assessed multimedia environmental data, delineated contaminant plumes, completed geologic mapping, and prepared conceptual site model (CSM) and associated interpretation;
- Prepared technical reports (RIR, RASR, RAW, and RAR) for clients and the NJDEP;
- Statistically developed surface water background threshold values (BTV) to evaluate the effectiveness of engineering controls;
- Statistically evaluated remedial alternatives to ensure environmental compliance;
- Assisted in groundwater treatment plant modification projects and feasibility studies, evaluated pilot study results and assessed feasibility of scaling up operations, and prepared associated engineering cost estimate; and

- Prepared engineering design, bid package, and assisted in permit application.

Former Dry Cleaner Facility Remediation, Toms River, New Jersey. As project manager, provided environmental engineering services for an in-site remediation project involving tetrachlorethene (PCE) vapor intrusion. Soil vapor extraction (SVE) and air sparging (AS), along with groundwater monitored natural attenuation (MNA) were applied to reduce contaminant residuals. Conceptually designed intuitional controls—Deed Notice and Classification Exception Area (CEA)—to address on-site residual soil and groundwater contamination.

Active Waste Oil Recycling Facility, Elizabeth, New Jersey. As project manager/project engineer, delineated previous and current light non-aqueous phase liquid (LNAPL) contaminant plume in the groundwater system. Updated facility's Storm Water Pollution Prevention Plan (SWPPP) according to New Jersey Pollution Discharge Elimination System (NJPDES) permit conditions.

The Salvation Army, Asbury Park, New Jersey. As project manager for this underground storage tank (UST) spill case, designed and performed the chemical injection to address petroleum-impacted groundwater and post-monitoring required to move this case toward regulatory closure. The objective of the in situ remediation is to destroy the VOCs in groundwater through chemical oxidation and enhance biodegradation within the source area.

Soil Geobiochemistry Study at DuPont Chambers Works Site (CWKs), Deepwater, New Jersey. As an external consultant for the DuPont Geobiochemistry group, developed protocols for collecting and processing soil core samples in an anaerobic condition, and analyzed the collected data to support the refinement of the site-wide CSM. Assisted in understanding the interactions and mechanisms at the interface as well as in explaining groundwater chemistry, redox conditions, Fe speciation, S speciation, and abiotic/biotic processes.

Former Steel Fabrication Shop, Brownfield Redevelopment Brooklyn, New York. As project manager/project engineer, provided environmental engineering services for a brownfield redevelopment site in the Williamsburg neighborhood of Brooklyn, New York. Previous remedial investigations had documented the presence of PCE in groundwater, soil, and soil gas. Performed a supplemental investigation to delineate the on-site and off-site PCE plumes. Performed the pilot study to evaluate the effectiveness of zero valent iron (ZVI) in treating the high concentrations of chlorinated volatile organic compounds (CVOCs) in groundwater. Also conducted strategic soil management (for hazardous [F-listed] and nonhazardous soil) and remediation as part of site redevelopment and building construction preferred. Reviewed site remedies, including soil excavation, ZVI wall injection, dewatering, in-situ chemical oxidation (ISCO)/in situ chemical reduction (ISCR), sub-slab depressurization system (SSDS), and other remedies.

205 Park Avenue, Brownfield Redevelopment, Brooklyn, New York. As project manager/project engineer, prepared Brownfield Cleanup Program Applications (BCA). Involved in each phase of the project including Phase I Environmental Site Assessment (ESAs), remedial investigations (for chlorinated solvents in soil, groundwater, and soil vapor), CSMs, remedial design (SSDS and ISCO), and long-term operations and maintenance of remedial systems. Prepared the remedial investigation, Remedial Action Work Plan, Site Management Plan (SMP), and Final Engineering Report (FER).

Former Alpine Paper Box Manufacturing Site, Brooklyn, New York. This project was under the jurisdiction of the New York City Office of Environmental Remediation (NYCOER), since an E-Designation for air quality, noise, and HAZMAT was placed on the subject property as part of a rezoning. As project manager/project engineer, performed a Phase I Preliminary Site Assessment, a Phase II Site Investigation, and prepared a Remedial Action Plan. Also prepared Brownfield Cleanup Program Applications and evaluated the potential tax credit for the client.

Former Cascade Laundry Site, Brownfield Redevelopment, Brooklyn, New York. The whole city block has been used as a commercial laundry beginning in the 1920s. USTs were observed, and the site had fuel oil/petroleum-related impacts to both soil and groundwater. As project manager/project engineer, conducted remedial investigation to delineate the vertical and horizontal extent of petroleum contamination in soil. Designed a vapor barrier and passive

SSDS system. Conducted ISCO to address the remaining CVOCs in groundwater. Negotiated with the New York State Department of Environmental Conservation (NYSDEC) to change the conditional track 1 to standard track 1 as the final remedy outcome to obtain more tax credits for the client.

Former Dry Cleaner Site, Brownfield Redevelopment, Coney Island, Brooklyn, New York. As project manager/project engineer, provided environmental services during the rehabilitation and expansion of the expansive, 1970s-era mixed-use complex. Facilitated the BCP applications for two adjacent parcels within the complex: the first for an existing retail space formerly occupied by a dry cleaner; the second application for an adjacent "historic" dry cleaner lot that had been razed as part of urban renewal in the 1960s. Previous site investigations had documented the presence of PCE in soil gas; the Remedial Investigation Work Plan (RIWP) outlined the work required to delineate the vertical and horizontal extent of the impacted soils, soil vapor, and groundwater at both BCP sites. A Remedial Action Work Plan was developed to address contaminated media. An SSDS was designed to protect residential and retail tenants, in conjunction with source area treatments.

296 Wythe Avenue, E-Designation Site, Brooklyn, New York. As project manager/project engineer, managed and oversaw the removal of three USTs and the excavation of non-hazardous soil/fill for off-site disposal. Designed a vapor barrier and passive SSDS. Prepared the OER and NYSDEC-required documents including daily/monthly report, Noise/Air Remedial Action Plan, and Remedial Action Report.

Standard Motor Products, Brownfields Redevelopment, New York. Low levels of chlorinated solvents were detected in the groundwater. As project engineer, contributed to AS and SVE system designed and implemented at the site. Project also entailed operating and managing the system, maintaining the right pressure and flow for the system to effectively remediate the contamination.

JPMorgan Chase, Brownfields Redevelopment, Orangeburg, New York. Served as project engineer. Investigation/remediation/oversight project at a 90+-year-old state hospital campus redeveloped as a database center. The 61-acre site consisted of 32 abandoned and derelict buildings, walkways, roads, and significantly overgrown landscape areas. Initial project work included the preparation of an NYSDEC BCP application and the design and implementation of a fast-track, comprehensive remedial investigation.

Former Nuhart Plastics Site, New York State Superfund Site, Brooklyn, New York. As project engineer, conducted a feasibility study and remedial planning for this former plasticizer facility with on-site and off-site pollutant concerns. Initial site investigations were conducted by others. Project is a high-profile New York State Superfund Site and requires regulatory compliance with NYSDEC and NYCOER, as well as close coordination with local government bodies.

Junior High School 226 Queens (I.S. 226), Queens, New York. As environmental engineer, managed construction support services related to soil management associated with the construction of a New York City school complex and associated utility corridors. Prepared Excavated Material Disposal Plans, reviewed potential disposal facilities, and conducted waste characterization soil sampling.

599 Valley Health Plaza, SSDS, Paramus, New Jersey. As environmental engineer, provided environmental services including a Phase I ESA, Vapor Encroachment Assessment, Phase II ESA, Remedial Action Plan, and Construction Health and Safety Plan. For active SSDS, designed and prepared bid specifications.

2581 & 2587 Atlantic Avenue, 40-44 Georgia Avenue, Brooklyn, New York. Served as environmental engineer and provided environmental services including a Phase I ESA, Vapor Encroachment Assessment, Phase II ESA, Remedial Action Plan, and Construction Health and Safety Plan. Designed the active and passive SSDS systems and prepared bid specifications.

Steel Craft, Newark, New Jersey. Served as environmental engineer and conducted groundwater sampling; delineated and differentiated the on-site and off-site PCE and Trichloroethylene (TCE) plumes.

Oil Spill Risk Assessment, BP and National Oceanic and Atmospheric Administration (NOAA), Gulf of Mexico. Performed risk assessment for oil spill contamination. Statistically evaluated the data obtained from the site. Reviewed reports and conducted associated research.

Contaminant Mobility in Paint Waste during Bridge Rehabilitation, New York State Department of Transportation, New York State. Collaborated with the New York State Department of Transportation (NYSDOT) to investigate the transport and mitigation of the heavy metal contamination from lead-based paint during bridge rehabilitation. Developed a mathematical model using a variety of statistical approaches to rapidly characterize paint waste during bridge rehabilitation. Nine task deliverables were submitted and presented to NYSDOT.

Impact Study on Effects of Superstorm Sandy, National Science Foundation (NSF), Raritan Bay, New Jersey. Investigated water quality, trace metals, nitrogen, phosphate, and related contaminants in the groundwater and sediment in the shorelines along Raritan Bay in New Jersey. Evaluated coastal ecosystem recovery and resilience potential after Superstorm Sandy.

Bio-remediation of Tannery Sludge, China. Conducted bio-remediation using indigenous sulfur-oxidizing bacteria present in the tannery sludge to reduce elevated hexavalent chromium in tannery sludge. Chromium removal rate of 90 percent was achieved.

Fujian Petrochemical Industrial Group Co., Compliance Services, China. Supported lead engineer in the preparation of planning documents and completion of regulatory permit applications. Assisted lead scientist in modifying related EHS programs and procedures to ensure compliance.

PUBLICATIONS

"Field Methods for Rapidly Characterizing Paint Waste during Bridge Rehabilitation," with L. Axe, K. Jahan, and K.V. Ramanujachary, *Chemosphere* 134: 598-605, 2015.

"Metal Concentrations and Distribution in Paint Waste Generated during Bridge Rehabilitation in New York State," with L. Axe, K. Jahan, and K.V. Ramanujachary, *Science of the Total Environment* 526: 262-270, 2015.

"Monitoring Changes in Salinity and Metal Concentrations in New Jersey (USA) Coastal Ecosystems Post Hurricane Sandy," with Y.R. Personna, X. Geng, F. Saleh, N. Jackson, M. Weinstein, and M. Boufadel, *Environ Earth Science*, 73(3): 1169-1177. 2015

"Metal Leaching from the Bridge Paint Waste in the Presence of Steel Grit, ," with L. Axe, K Jahan, and K.V. Ramanujachary, Chemosphere 119, 1105–1112, 2015.

INVITED LECTURER OR SPEAKER

"Thermal Enhanced Recovery for Phthalate-Cutting Oil Mixture Treatability Study – Former Plastic Manufacturing Facility," with D. Winslow, presented at 29th Annual International Conference on Soil, Water, Energy, & Air, March 18-21, 2019.

"Trace metal leaching from bridge paint waste in the presence of iron oxide surfaces," with L. Axe, K. Jahan, K.V. Ramanujachary, Division of Colloid and Surface Chemistry, 246th American Chemical Society (ACS) National Meeting, Indianapolis, Indiana, September 8-12, 2013.

"Leaching behavior of lead and chromium from bridge paint waste in the presence of steel grit," with L. Axe, K. Jahan, and K.V. Ramanujachary, session of Steel Bridges Committee, Transportation Research Board 92nd Annual Meeting, Washington, D.C., January 13-17, 2013.

"Field methods for rapidly characterizing paint waste during bridge rehabilitation," with L. Axe, K. Jahan, and K.V. Ramanujachary, session of Environmental Chemistry for a Sustainable World, 243rd American Chemical Society (ACS) National Meeting, San Diego, California, March 25-29, 2012.



LUKE J. MCCARTNEY, PG

Project Manager

EDUCATION

B.S., Water Resources/Geology (Hydrogeology Focus), State University of New York- Oneonta

PROFESSIONAL REGISTRATIONS

2018/NY: Professional Geologist (PG Reg. No. 000760)

PROFESSIONAL SOCIETIES

New York State Council of Professional Geologists (NYSCPG) – Member

SPECIAL STUDIES AND COURSES

40-Hour OSHA Hazardous Waste Operations and Emergency Response Training (29 CFR 1910.120)

8-Hour OSHA Hazardous Waste Worker Refresher Training (29 CFR 1910.120)

10 Hour OSHA Construction Safety and Health

DOT HazMat Certification

Luke is a highly motivated and detail-oriented professional with more than 28 years of experience in the environmental and construction industry, including field and office-level management of multi-disciplinary teams and implementing projects. He excels at time management, subcontractor and schedule coordination, mentoring junior staff, preparation of technical reports, and maintaining communication/relations between all facets of the project team and clients. He has extensive field experience coordinating and inspecting earthwork, construction oversight, remediation of contaminated soil and groundwater, and remedial system design implementation and operation. He also commits his knowledge to office operations and developing standardized protocols, systems, and efficiencies for office and field teams.

RELEVANT PROJECT EXPERIENCE

Manhattan Management, New York State Department of Environmental Conservation (NYSDEC), Brownfield Cleanup Program (BCP), Brooklyn and Bronx, New York. As Project Manager, Luke was responsible for the execution of Remedial Investigations and Remedial Action Plans for two sites in the New York State Brownfield Cleanup Program (NYS BCP). Both projects involved remediation of contaminated soil during development of the properties into multi-family residential buildings, providing more housing for underdeveloped neighborhoods within New York City. Remedial objectives included both a Track 1 and Track 2 cleanup and through daily coordination with internal teams and external stakeholders during the remedial actions to technical review and compilation of Final Engineering Reports, both projects were completed in compliance with approved plans and achieved Certificates of Completion (COCs) from the NYSDEC.

LendLease/Consigli, New York City (NYC) Department of Design and Construction (DDC) Public Building (PB) Division on behalf of NYC Department of Parks and Recreation (NY Parks), Shirley Chisholm Recreation Center (Design Build), Brooklyn, New York. As Project Manager, Luke leads environmental consulting and geotechnical engineering services for the Shirley Chisholm Recreation Center Design-Build project with a footprint area of about 45,700 sf within Nostrand Playground in Brooklyn, New York. The recreation center will include a three-story building with a total of 76,603 gross square feet (gsf) and will include an indoor pool, areas for social and cultural activities, classrooms, multi-

media rooms, and indoor basketball court, and a gym. The building will be surrounded by landscaped areas and concrete sidewalks.

Luke coordinated environmental consulting services and planning in the design phase of the project to comply with the requirements of an Environmental Assessment Statement (EAS) completed for the site. Luke has guided his project team through completion of a Limited Phase II Environmental Site Assessment, compilation and implementation of a Remedial Action Plan that has included a soil characterization, remedial construction oversight, and a Community Air Monitoring Program (CAMP). Geotechnical services have included permeability testing for design of Stormwater Management Practices (SMPs) and borings for the installation of Consolidated Edison (ConEd) underground electrical vaults. This is an ongoing project with a completion date in late 2025.

Related Companies, New York State Department of Environmental Conservation (NYSDEC), Brownfield Cleanup Program (BCP), Willets Point, Queens, New York. As Field Manager, Luke was responsible for on-site field management of a 20+ acre redevelopment enrolled in the NYSDEC BCP with a significant history of landfilling and multiple sources and types of contamination. He managed daily operations and field staff performing inspections to ensure compliance with technical plans and construction specifications. He coordinated and attended weekly meetings with client and construction teams to provide technical, regulatory, and risk management status updates and guidance. Additionally, Luke ensured that project milestone schedules were achieved, prepared change orders and updated plans to efficiently manage out-of-scope field changes and coordinated and managed subcontractors to finalize scopes and project objectives. He also provided site training and skill development of junior staff.

Park Tower Group, New York City Office of Environmental Remediation (NYCOER), Greenpoint Landing, Brooklyn, New York. For this large-scale urban redevelopment project under NYCOER regulatory oversight, Luke coordinated and managed the field effort during implementation of multiple Remedial Action Work Plans (RAWPs) supporting construction of one parking lot, one Combined Sewer Outfall (CSO) utility line, two new roadways, three affordable-housing residential buildings, and one, 38-story market-rate high rise. He trained and supported field staff during the work and interfaced daily with the project team and client to keep field efforts focused and on track. Additionally, Luke participated in project meetings with client, construction management teams, contractors, and regulatory agency personnel, assisted with project scheduling and issuance of work change orders, technical review of contractor environmental submittals to ensure compliance with RAWPs. He also completed environmental sampling throughout the field activities including delineation and disposal coordination of hazardous metals in soil, completed oversight during the installation of site Engineering Controls (ECs) and commissioning of Sub-Membrane Depressurization (SMD) systems involving Indoor Air Quality (IAQ) Assessments and Sampling, reviewed and completed QA/QC on field-logs and data post-field.

Consolidated Edison (ConEd), Multiple Sites, New York. As Field Manager, Luke completed USEPA Spill Prevention, Control, and Countermeasure (SPCC) compliance inspections at 13 ConEd electrical substations in response to requirements of the NYSDEC. He also reviewed SPCC Plans, historical inspection reports, and facility plans to ascertain site-specific details and recommendations prior to conducting site visits. Additionally, Luke completed walk-throughs of each substation facility to identify and provide management team with detailed summaries and supporting photo-documentation of concerns at each site, participated in meetings with client project, operations, engineering, and legal teams.

Urstadt Biddle Properties, Inc., Wayne, New Jersey. As Project Manager, Luke was responsible for environmental oversight and management during remedial activities related to a dense non-aqueous phase liquid (DNAPL) tetrachloroethylene (PCE) spill. He provided environmental investigation, oversight services, and management during Phase I and Phase II Environmental Site Assessments at the site, including soil and groundwater sampling, sample handling, sewer line video analysis, and soil excavation and disposal. He coordinated subcontractor scopes, reviewed invoices, and compiled a Remedial Investigation and Remedial Action Report for the site for submittal to the New Jersey Department of Environmental Protection (NJDEP)

Town of Putnam Valley, Hydrogeologic Assessment and Delineation of Aquifer Protection Zones, New York. As Project Manager, Luke completed a Hydrogeologic Assessment and Delineation of Aquifer Protection Zones that considered hillslopes, soils, surface waters, groundwater, open spaces, and existing land uses for inclusion in the Towns Master Plan and development of a Comprehensive Plan and Generic Environmental Impact Statement (GEIS). He also completed watershed boundary mapping, oversaw the implementation of aquifer pumping/yield tests, completed visual inspections of watershed features, participated in town meetings in a technical advisement capacity.

PUBLICATIONS

"Creation of Groundwater Resource Maps for Planning Future Development," with W. Canavan, CPG, E. Sivers, and E. Wolley, *American Water Resources Association,* AWRA's Annual Resource Conference, November 2001.



BRIAN FITZPATRICK, CHMM

Corporate Director, Health and Safety

EDUCATION

M.P.A., Environmental Policy, Syracuse University
B.S., Environmental Science, University of Massachusetts-Amherst
A.S., Chemistry, Valley Forge Military Junior College
Commissioned Officer, United States Army

CERTIFICATIONS

Certified Hazardous Materials Manager (Reg. No. 13454)
Certified Department of Transportation Shipper
Certified International Air Transport Authority Shipper

PROFESSIONAL SOCIETIES

Alliance of Hazardous Materials Professionals
Academy of Certified Hazardous Materials Managers, New England Chapter

SPECIAL STUDIES AND COURSES

Department of Transportation
International Air Transport Authority
Incident Commander
Confined Space Entry and Rescue
Radiation Safety Officer
RCRA Hazardous Waste
Massachusetts Industrial Waste Water Operator Grade 2I (expired)

AWARDS

Presidents Club Award (one million hours worked without a recordable injury, Cabot Corporation
Chancellors Award for Excellence, Syracuse University

Brian has over 25 years of experience in developing, implementing, and managing a wide range of environmental, health, and safety (EH&S) solutions for a variety of clients. Brian has served as the Health and Safety Manager and Incident Commander at several research and development sites and has managed extensive programs to maintain and clean contaminated sites under Federal and State regulatory programs. He has provided expertise in managing EH&S programs as a consultant, and has actively developed, implemented, and managed these programs as an EH&S professional for various industries.

Brian is currently working as the Chief Health and Safety Officer for Haley & Aldrich, Inc. He, and his staff, are involved in every project Haley & Aldrich, Inc. undertakes. Brian is involved on several projects, directly overseeing the health and safety on the project site of our staff, our contractors, and the public. Brian also acts as support for our on-site health and safety staff on other larger construction and remediation projects.

Through Brian's leadership our safety culture and focus extend from the top of our organization to each and every Haley & Aldrich employee as well as subconsultants and subcontractors. Utilizing a Behavior Based Safety approach, Haley & Aldrich expects every project team member to play an important role in making our projects safe and has given authority to every Haley & Aldrich employee, subconsultant, and subcontractor to stop any activity at any time for health or safety concerns. Our record illustrates that our hard work is paying off. The company has gone 4 years without a lost time injury, and our TRIR and EMR have consistently improved each of the last 3 years.

RELEVANT PROJECT EXPERIENCE

Haley & Aldrich, Inc., Burlington, Massachusetts. As Chief Health and Safety Officer, Brian has led and facilitated the development and implementation of corporate health and safety (H&S) improvement plans to enhance compliance and improve H&S performance. In Brian's time with Haley & Aldrich, Inc., the company has realized dramatic improvement on H&S goals and in Key Performance Indicators. Brian is responsible for developing a risk competence culture, where our staff are empowered to look for and engage to address risk before anyone is injured. Brian oversees the development, implementation and continuous improvement of all H&S programs for the company. Additional responsibilities include:

- Developing a safety culture through incident reporting, root cause analysis, behavior-based safety, hazard recognition and risk assessment, communication, and developing leaders;
- Monitoring proposed and existing SH&E regulations and legislation to determine their impact on operations and to ensure continued compliance;
- Overseeing the safety, industrial hygiene, and toxicology programs for over 600 staff members engaged in remediation, construction, health and safety, consulting, and general office work across 28 offices in the United States and on assignment to international project sites;
- Continuously seeks to improve H&S performance as measured by the OSHA Incident Rating (IR) and Worker's Compensation Experience Modification Rating (EMR), as well as Leading Indicators developed with the management team; and
- Participating in the corporate audit program as an auditor or lead auditor;

Energy Client, California. As Chief Health and Safety Officer, Brian led and facilitated the Alliance Partnership Safety Council in 2017, is still an active contributor to the council, and hosts routine contractor safety forums for the client. Brian is actively involved in the development and implementation of program safety, health, and environmental (SH&E) plans to ensure safe operations on project sites. Brian developed permits and Health and Safety Plans for large projects and routinely audits the site safety. Additional responsibilities include:

- Driving reporting and behavior-based safety initiatives to support our internal safety culture and developing monthly summary reports to illustrate performance to our client.
- Develop, assess and continuously improve site safety plans and practices, including specific safety protocols for working safely over and around water.
- Worked as an extension of the client's organization to provide assurance that the remedy was completed safely and consistent with client-specific requirements.
- Support on-site safety personnel in ensuring the health and safety of the general public, our staff, and our sub-contracted employees.
- Audits and visits sites to ensure compliance with our internal policies and client-specific requirements.

Energy Client, Ohio. As Chief Health and Safety Officer, Brian supports the project team in developing and executing client and project specific health and safety measures, such as a site specific Health and Safety Plan, Job Hazard Analyses, Industrial Hygiene program, and site specific training. Brian also routinely visits the site to assess current practices and condition and to ensure continuous improvement. Additional responsibilities include:

- Develop, assess, and continuously improve site safety plans and practices, including specific safety protocols to comply with supplemental EH&S requirements such as the Duke Health and Safety Handbook, Environmental Supplemental, and EHS Keys to Life.
- Develop, assess, and continuously improve site safety plans and practices to address the risks associated with the work being performed on site, as well as the environmental conditions and simultaneous operations, including trenching and excavation, hot work, work over and near water, heavy equipment, HAZWOPER, etc.
- Worked as an extension of the client's organization to provide assurance that the remedy was completed safely and consistent with client-specific requirements.
- Support on-site safety personnel in ensuring the health and safety of the general public, our staff, and our sub-contracted employees.
- Audits and visits site to ensure compliance with our internal policies and client-specific requirements.

BRIAN A. FERGUSON

Senior Engineer

EDUCATION

M. S. Geotechnical Engineering, Tufts University, Medford, Massachusetts; 2012
B. S. Civil Engineering, State University of New York - Environmental, Science, and Forestry, Syracuse, New York; 2000
Ass. Science Degree in Applied Science and Technology (Nuclear Engineering), Thomas A. Edison State College, Trenton, New Jersey; 2000

PROFESSIONAL SOCIETIES

Order of the Engineer – 2000
Boston Society of Civil Engineers (BSCE)
American Society of Civil Engineers (ASCE)

SPECIAL STUDIES AND COURSES

American Concrete Institute – Certified Field Technician Certified Grade 1
Radiation Safety and Operations of Nuclear Testing Equipment – Troxler
40-Hour OSHA Hazardous Waste Operations Training (+ 8-Hour annual refresher)
10-Hour OSHA Construction training
Confined Space Entry Training
16-Hour Asbestos Operations and Maintenance

Mr. Ferguson has over six years of experience serving as project engineer on a variety of real estate development projects. His project experience has included monitoring field investigations and performing construction oversight, performing due diligence and engineering analyses, performing geotechnical analyses and developing geotechnical recommendations, and preparing geotechnical reports and project specifications.

In addition to providing engineering design support, Mr. Ferguson has managed and participated in a number of field service activities. Field work has included construction monitoring and documentation of contractors' deep and shallow foundation related construction, including slurry walls, caissons, pile driving, pile cap installation, earthwork, backfilling and compaction, installation of soldier pile and wood lagging support systems, installation of tie backs, reading inclinometers, conducting in-place field unit weight tests, tie-back load testing, seismograph installation, monitoring, and evaluating, and preparation of footing bearing surfaces. Other responsibilities have included site development activities, including placement of utilities and subgrade preparation for roads; observations and testing to determine that work is completed in compliance with contract documents; on-site soil management; sampling of soil and groundwater for chemical laboratory testing and conducting in situ field screening; maintenance of job records including pile driving logs, results of field density tests, records of caisson and footing installations; preparation of daily field reports; in contact with key personnel; and resolution of field related problems.

RELEVANT PROJECT EXPERIENCE

St. Elizabeths Hostpital – West Campus Forensic Evaluations, Washington, D.C. Project Engineer for forensic evaluations on the adaptive reuse of former hospital buildings. Responsibilities included coordination of a field exploration program, including test borings and test pits to obtain subsurface information for project design and construction, overseeing multiple field personnel, subcontractors, assisting with project management, reviewing subcontractors invoices, reviewing and summarizing subsurface data and writing data reports.

TUFTS University, New Central Energy Plant, Medford, MA. Project engineer for a new Central Energy Plant that will house new co-generation steam boilers, centralized chilled water and electrical transformer switchgear that is planned to occupy approximately 20,000 square feet across two or three levels. Responsibilities included coordination of construction monitoring, observing SOE and footing installation, assisting with project management,

reviewing weekly field construction reports, reviewing and responding to geotechnical design submittals and attending project meetings.

Lahey Hospital and Medical Center – Stilts Infill Project, Burlington, MA Project Engineer for an addition to the existing Stilts building on the Lahey campus. Responsibilities included coordination and overseeing geotechnical and environmental subsurface investigations, coordination of construction monitoring, observing footing installation, assisting with project management, reviewing weekly field construction reports, reviewing and responding to geotechnical design submittals and attending project meetings.

Gloucester Beauport Hotel, Gloucester, MA Project engineer for a four story hotel with a seawall constructed adjacent to tidal beach. Responsibilities included coordination and overseeing geotechnical and environmental subsurface investigations, coordination of construction monitoring, assisting with project management, reviewing weekly field construction reports, reviewing and responding to geotechnical design submittals and attending project meetings, design and implementation of a sub-slab gas mitigation system.

275 Wyman Street, New Office Building, Waltham, MA. Project engineer for a new office building and parking garage founded on a shallow foundation system. Responsibilities included preparing proposals, assisting with management and planning of a subsurface investigation program, summarizing subsurface data and reviewing geotechnical test boring logs, coordination of construction monitoring and instrumentation monitoring programs, reviewing weekly field construction reports, reviewing and responding to specialty geotechnical design submittals and RFIs by others and attending project meetings.

Suffolk University - 20 Somerset Street, Boston, MA Project engineer for design of 8-story academic building with two levels of below grade finished space. Responsibilities included coordination of construction monitoring, observing SOE and footing installation, assisting with project management, reviewing weekly field construction reports, reviewing and responding to geotechnical design submittals and attending project meetings.

Worcester State University, New Student Housing, Worcester, MA Project engineer for design and construction of a 7-story residence/dining hall with a single level basement and a major site retaining wall structure. Responsibilities included overseeing geotechnical subsurface investigations, provided foundation recommendations and specifications, and prepared a retaining wall contract document. Responsibilities included coordination of construction monitoring, excavation and construction of footings, and soil reuse and management, assisting with project management, reviewing weekly field construction reports, reviewing and responding to geotechnical design submittals and attending project meetings.

University of Massachusetts Boston, General Academic Building No.1, Boston, MA. Project engineer responsible for assisting project manager in preliminary foundation engineering recommendations and construction considerations for a new academic building on a part of Columbia Point, a historic landfill area. Assisted in design phase services that included preparing foundation support design recommendations including the use of high allowable stresses for 190-ft long end-bearing H-piles and application of Slickcoat coating to address downdrag concerns and reduce foundation costs.

Waltham Watch Factory, Waltham, MA project engineer for redevelopment of former watch factory. Responsibilities included construction oversight of new precast parking garage, utilitiy upgrades, soil remediation and management, installation of gas mitigation systems, assisting with project management, reviewing weekly field construction reports, reviewing and responding to geotechnical design submittals and attending project meetings.

Massachusetts Green High Performance Computing Center, Holyoke, MA. Project engineer for 60,000 sq. ft high level computing center and associated support utilities. Redevelopment of the site included recycling 50,000 cy of construction debris into the site fills at this historic site along the Connecticut River. Responsibilities included coordinating geotechnical and environmental field investigations, coordination of construction monitoring, seismic analysis, reviewing weekly field construction reports, reviewing and responding to geotechnical design submittals and attending project meetings.

The Shops at Riverwood, Hyde Park, MA. The project consisted of the redevelopment of a colonial era paper mill. The multi-building complex was demolished and the concrete and brick from the previous buildings were recycled. The project involved crushing 50,000 cy of brick and concrete and placement of excavated soils and recycled brick and concrete as compacted fill materials to support proposed buildings, pavement areas, and achieve 5 to 9 ft. raises in grade. Field Representative was responsible for management and reuse of brick and concrete stockpiles, in-place density testing, coordination of test pits, installation of soldier pile and versa-lok walls, and backfilling of underground vaults. Remedial activities included: excavation of 5,000 cy of petroleum contaminated soils, on-site cement batching in a pug mill, and placement of compacted recycled materials in roadway areas; delineation, excavation and off-site disposal of TSCA-regulated PCB contaminated soils associated with historical Askarel transformers and dioxin-contaminated soils associated with historical bleaching operations; and disposition of 1,000 tons of paper mill sludge encountered within an abandoned granite-walled sluiceway structure. In addition, assisted with weekly project meetings, maintaining a record of material reuse, and providing weekly field reports.

Harvard Law School, Cambridge, MA. The Harvard Law School project is located on Massachusetts Avenue in Cambridge. The project consisted of a multistory building above ground with 5 levels below ground for a parking garage. Field Representative was responsible for overseeing the installation of slurry walls into bedrock and LBEs with three installation rigs while monitoring the removal of urban fill and transfer to several different receiving facilities from another portion of the site. The slurry walls were constructed into bedrock. Other Field Representative activities were: testing of the slurry, management of the excavated soils, and record keeping of the Contractor's obstruction and down time of the equipment. In addition, assisted with weekly project meetings, maintaining a record of obstruction and machine time, and providing weekly field reports.

KATHERINE R. MILLER

Project Manager

EDUCATION

B.S., Chemistry, University of Arizona

SPECIAL STUDIES AND COURSES

40-Hour OSHA Hazardous Waste Operations and Emergency Response Training (29 CFR 1910.120 and 40 CFR 265.16)
8-Hour OSHA Refresher Training (29 CFR 1910.120)
Level IV Data Validation Training

AWARDS

Pinnacle Award, 2009
Pathfinder Award, 2014

In her 10 years at Haley & Aldrich, Katherine has worked on soil and groundwater environmental investigations and the preparation of environmental reports for private, industrial, and government-based project clients. She is a qualified Data Validator capable of performing various levels of validation on laboratory water quality data according to U.S. Environmental Protection Agency (EPA) National Functional Guidelines and to U.S. Department of Energy radiochemical guidelines. She also has experience designing and maintaining databases for project-specific needs.

Project management responsibilities for a $1.5 million per year stormwater project include preparation of subcontractor bids and contracts; preparation of cost estimates, proposals, and reports; coordination of field testing programs; and interpretation of chemical testing results. She has interacted with local regulatory agencies.

RELEVANT PROJECT EXPERIENCE

Confidential Aerospace Manufacturer, Groundwater Monitoring, Western U.S. Katherine served as project manager for the comprehensive stormwater management program. Responsibilities included project finance management and data management including quality assurance/quality control (QA/QC) and interpretation of chemical testing results. Evaluated QA/QC of groundwater quality data, prepared reports and managed data for the site. Performed data validation of quarterly water quality data from over 300 locations according to EPA National Functional Guidelines and to DOE radiochemical guidelines over a six-year period. Also, responsible for updating and maintaining the integrity of over 200,000 records during that time period. Assisted with management of sampling, analysis, and reporting of constituents of concern, ensured compliance with post-closure permit monitoring and reporting requirements, Data Management Plan, QAPP, and Environmental Data Management System, and ensured and maintained 100% compliance with the QAPP and Data Management Plan. Additionally, prepared groundwater data summaries for proposed extraction wells including comparisons to site NPDES outfall limits in support of Groundwater Interim Measures planning.

Asarco Hayden Plant Site, Hayden, Arizona. Katherine assisted with field preparation, QA/QC of analytical data, and data validation as part of the Remedial Investigation/Feasibility Work Plan including soil, sediment, air, process water, surface water, and stormwater.

Former MGP Site, California. Katherine assisted with report preparation, QA/QC of soil and/or groundwater quality data, and data validation for the investigation of three large former MGP sites in an urban, residential setting; includes over 200 residential properties.

General Manufacturing, Leitchfield, Kentucky. Katherine assisted with report preparation, QA/QC of soil and/or groundwater quality data, and data validation for a soil and groundwater RCRA site. Groundwater monitoring is conducted annually at more than 50 locations for volatile organic compounds (VOCs), including 1,4-dioxane and semi-volatile organic compound (SVOCs).

Skyworks Solutions, Inc., Newbury Park, California. Katherine assisted with report preparation, QA/QC of soil and/or groundwater quality data, and data validation at groundwater remediation site. She monitored for VOCs, including 1,4-dioxane, and inorganic chemicals, including hexavalent chromium.

Teledyne Scientific Company, Thousand Oaks, California. Katherine assisted with report preparation for this groundwater assessment site. Monitored natural attenuation has been instituted as the long-term site remedy.

Port of Redwood City, Permitting and Sediment Characterization, California. Katherine assisted with report preparation, QA/QC of sampling data, and data validation.

Kiewit Infrastructure West, Sediment Quality Study, California. Katherine assisted with report preparation, QA/QC of sampling data, and data validation.

Aeolian Yacht Harbor, Permitting, Eel Grass Conservation and Sediment Characterization, California. Katherine assisted with report preparation, QA/QC of sampling data, and data validation.

Marin County, Paradise Cay Permitting and Sediment Characterization, California. Katherine assisted with report preparation, QA/QC of sampling data, and data validation.

SANTA E. MCKENNA

Senior Geologist

EDUCATION

B.S., Geology, State University of New York at Oswego

PROFESSIONAL REGISTRATIONS

2018/ NY: Professional Geologist (Reg. No. 000984)

PROFESSIONAL SOCIETIES

Geological Society of America, Professional Member

SPECIAL STUDIES AND COURSES

40-Hour OSHA Hazardous Waste Operations Training (29 CFR 1910.120)
8-Hour OSHA HAZWOPER Annual Refresher Course
8-Hour OSHA Supervisory Training
10-Hour OSHA Construction Safety
National Safety Council First Aid/CPR Certification

Santa has ten years of experience working as a geologist in support of environmental and geologic investigations. She is experienced in various aspects of site characterization and investigations, having worked on a variety of geotechnical, and contaminated sites, including several manufactured gas plants (MGP), industrial, and refinery sites. She is well versed in the methods and procedures of subsurface investigations and developing data to characterize site geology and subsurface conditions.

As senior geologist she has a strong knowledge of field investigation procedures and is experienced in drilling methods in soil and bedrock. She has also performed extensive remedial investigation and construction monitoring at several environmental sites. Santa has experience in the preparation of proposals, permit applications, geotechnical, and site investigation reporting. She has knowledge in geotechnical and environmental soils logging and analysis. Santa is also experienced in construction monitoring, air monitoring, soil vapor monitoring, and groundwater monitoring well installation and sampling.

RELEVANT PROJECT EXPERIENCE

TY-Lin, highway realignment environmental impact study, Buffalo, New York. Santa served as the assistant project manager and community coordinator on an environmental impact study and geotechnical investigation for a proposed highway relocation within the city of Buffalo. She coordinated the geotechnical investigation, analytical and geotechnical testing, as well as environmental monitoring and testing at boring locations within a NYSDEC Cleanup Program. Santa coordinated a test boring program on land and water and assisted field staff in characterizing subsurface conditions. She also served as the primary contact for communication with property owners, state regulatory representatives, and the client.

Confidential utility client, former MGP site environmental investigation, New York. Santa served as the project manager and coordinated routine environmental monitoring, including an annual groundwater event, monthly sub-slab check, and an annual site inspection to follow the site management plan. She facilitates the reporting for the annual project groundwater monitoring report and the periodic review report. Santa is the primary contact for the client, stakeholders, and state regulatory representatives.

Confidential client, former industrial property remedial measures, Leitchfield, Kentucky. Santa served as the project manager for a vacant industrial facility surrounded by a residential community under an Environmental Protection Agency Consent Order. She facilitated environmental investigations, including monitoring well installation, soil sampling, and routine groundwater sampling events. Santa also coordinated biannual residential indoor air sampling within citizens' homes and directly communicated with residents via phone and letter. She generated monthly progress reports and annual site investigation reporting. Santa was a primary contact for the client, residential community, consultants, and the U.S. Environmental Protection Agency.

Confidential client, brownfield cleanup, Southern Tier, Western New York. Santa served as the data and field task manager for a vacant industrial facility located Western New York. She coordinated field staff and subcontractors' on-site scope and managed incoming data from more than 400 sample locations. She reviewed ongoing sampling against multiple site analysis plans, comparing data to applicable NYSDEC criteria, and drove additional excavation and sampling based on preliminary data review.

Confidential Utility Client Former MGP Site Environmental Investigation, New York. Field geologist responsible for oversight of test borings for soil and bedrock characterization, groundwater monitoring well installations and soil sampling, and monitored large-scale excavation and disposal of soils at an active facility. Santa was also responsible for supervising contractors, Community Air Monitoring Program activities with direct reporting to regulators, and onsite regulator interaction.

Fort Calhoun, environmental reporting, Omaha, Nebraska. As a senior geologist, Santa assisted with research and reporting for an environmental report in connection with the decontamination and decommissioning of the Fort Calhoun nuclear power plant. This report provided current information and significant environmental changes associated with site-specific decommissioning and site closure activities.

Active Construction Site Soil Management and CAMP Monitoring, Corning, New York. As field geologist, Santa was responsible for oversight of excavated material, assist with proper segregation of fill material to be disposed, Community Air Monitoring Program activities with direct reporting to regulators, and onsite regulator interaction. Management of lab data analysis, assisted in report writing, participation at project meetings with client.

Confidential Utility Client Site Environmental Investigation, New York. As field geologist, Santa provided field support for groundwater sampling, manage field staff, and analytical data. She also prepared analytical results, site figures, and investigation reports.

Confidential Utility MGP Site Remediation, Pennsylvania. As field geologist, Santa provided oversight and environmental logging of soils during soft dig, test pits, Geoprobe, auger, and mud rotary activities, conducted groundwater sampling events per state, and site-specific requirements including low flow sampling, assisted in report writing.

Confidential Utility MGP Site Remediation, Pennsylvania. As field geologist, Santa provided health & safety oversight of construction subcontractors, oversight of excavation shoring activities, oversight for impacted and excavated materials and oversight CAMP monitoring during remedial construction activities.

Confidential Utility MGP Site Remediation, Pennsylvania. As field geologist, Santa preformed oversight and environmental logging of soils during soft dig, test pits, Geoprobe, auger activities, oversight of monitoring well, soil vapor point installation, conducted groundwater sampling events per state, and site-specific requirements including low flow sampling, conducted soil vapor and air monitoring investigations, health & safety oversight of construction subcontractors, oversight of site dewatering activities in preparation for remedial excavations, oversight of excavation shoring activities and removal of impacted materials, oversight CAMP monitoring during remedial construction activities.

Bluestone Gas Company 20" Natural Gas Pipeline, Binghamton, New York. As field geologist, Santa provided field support for geotechnical subsurface investigation at proposed natural gas pipeline crossings. Field support included drilling oversight, soil characterization, rock core characterization, and sampling.

Overhead Utility Relocation Project, Glouster City, New Jersey. As field geologist, Santa provided field support for geotechnical subsurface investigation at proposed overhead utility pole relocation sites. Field support included geotechnical drilling oversight, creating geotechnical boring logs, and sampling.

Tesoro Corporation – Portfolio Management Support, Auburn, Washington. As staff geologist, Santa assisted with portfolio management support of active retail and retained liability sites contaminated with gasoline constituents.

Facilitate and support in purchase order and invoice inventory for auditing purposes, Monte Carlo analysis, portfolio risk assessments, and acquisition management.

Confidential Utility Client Site Environmental Investigation, Central Pennsylvania. As staff geologist and data manager, Santa provided all data management responsibilities during investigation phase. She developed a knowledge of PADEP's Act 2 standards and assisted with writing several site investigation reports including the Final Act 2 Report which was approved by the PADEP within 90 days of submittal. Additionally, Santa provided support for field staff with coordinating day to day tasks and laboratory supplies, and sample analysis.

Confidential Client Brownfield Cleanup Project, Henrietta, New York. As staff geologist and data manager, Santa was responsible for all data management during investigation and remediation phases. She developed a knowledge of NYSDEC DER-10 standards and assisted with writing several site investigation reporting including the Final Engineering Report and Site Management Plan. Additionally, Santa provided support for field staff with coordinating day to day tasks and laboratory supplies, and sample analysis, client meetings, waste disposal coordination.

APPENDIX I
Proposal Remedial Action Project Schedule

Remedial Action Project Schedule
28-12 41st Avenue, Long Island City, New York
28-12 41st Avenue Site
BCP Project C241300

PROJECT SCHEDULE		2025			2026												2027
Task	Description	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January
1	Design, Remedial Investigation, Permitting																
2	BCP Application																
3	RIR Submittal to NYSDEC/NYSDOH																
4	RAWP Submission to NYSDEC/NYSDOH																
5	NYSDEC RIR/RAWP Review																
6	45-Day Public Comment Period																
7	Private Funding Source Deadline						3/15/2026										
8	NYSDOH Significant Threat Determination																
9	RAWP Revised Submittal and NYSDEC/NYSDOH Review																
10	RAWP Comments and Resubmission																
11	45-Day Public Comment Period - Significant Threat																
12	DD Issuance																
13	SSDS Work Plan Submittal and NYSDEC Review/Approval																
14	SVE Pilot Test Work Plan Submittal and NYSDEC Review/Approval																
Remedy Implementation Components																	
15	Implementation of Remedy - Remedial Excavation																
16	SVE Pilot Test																
17	SVE System Installation (Subgrade and Above-grade)																
18	SSDS Installation (Subgrade and Above-grade)																
19	SSDS/SVE Systems Startup																
Remedy Deliverables and COC																	
20	Preparation of SMP																
21	Preparation of FER																
22	NYSDEC/NYSDOH Review of FER/SMP																
23	Issuance of COC																

Notes:

1. Schedule is estimated and subject to change.
2. Implementation of RAWP does not include completion of building construction
3. NYSDEC - New York State Department of Environmental Conservation
4. NYSDOH - New York State Department of Health
5. BCP - Brownfield Cleanup Program
6. RAWP - Remedial Action Work Plan
7. DD - Decision Document
8. SVE - Soil Vapor Extraction
9. SSDS - Sub-Slab Depressurization System
10. SMP - Site Management Plan
11. FER - Final Engineering Report
12. COC - Certificate of Completion
13. COC issuance estimated for December 2026

**Expedited scheduling anticipated to attempt COC in 2026 with flexibility into 2027*

APPENDIX J
NYSDEC Special Community Air Monitoring Program

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). 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 K
Odor Suppressant Safety Data Sheet

SAFETY DATA SHEET

State Industrial Products
5915 Landerbrook Drive
Mayfield Heights, OH 44124
To Order Call: 1-866-747-2229

6935 Davand Drive
Mississauga, Ontario L5T 1L5
To Order Call: 1-800-668-6513

Royal Industrial Park, Bldg "M"
Local #5, Carr 869, km 1.5 Palmas
Cataño, P.R. 00962
To Order Call: 787-275-3185

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: BLANKET 510 WINTERGREEN
Product Description: A floating air freshener.
EPA Registration Number: NA

24 Hour Emergency CHEMTREC Number: 800-424-9300
MSDS Number: 123285
EPA Establishment Number: NA

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

FIFRA Hazard Classification:
Not Applicable

Acute toxicity; oral: Category 4
Skin corrosion/irritation: Category 3



Exclamation Mark

WARNING

Hazard Statements:
H302 Harmful if swallowed. H316_3 Causes mild skin irritation.

Precautionary Statements:
P270 Do not eat, drink or smoke when using this product. P264 Wash hands thoroughly after handling.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredients	CAS Number	Weight	ACGIH	OSHA
Methyl Salicylate	119-36-8	<12%	NE	NE

The exact percentages have been withheld as a trade secret.

4. FIRST AID MEASURES

P332+P313 IF SKIN irritation occurs: Get medical attention. P301+P312 IF SWALLOWED: call a POISON CENTER or physician if you feel unwell.
P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

5. FIRE FIGHTING MEASURES

Flashpoint(Method): >200°F [93°C]
Lower Explosive Limit(LEL): NA Upper Explosive Limit(UEL): NA Autoignition Temperature: NA
Flammable Properties: None Expected
Extinguishing Media: Carbon Dioxide, dry chemical, foam.
Fire Fighting Instructions: Wear a self-contained breathing apparatus with full protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area. Halt spill at source, dike and contain spill. Flush with plenty of water to drain. Dispose of in accordance with Federal, State and Local Regulations regarding waste disposal.

7. HANDLING AND STORAGE

P402 Store in dry place.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Use general or local ventilation to keep exposure levels below exposure limits.
Personal Protective Equipment:
Respiratory: Normal room ventilation is adequate. Use a NIOSH/MHSA approved respirator if exposure limits are exceeded.
Eye: Wear approved safety glasses or goggles with unperforated eyeshields where splashing may occur.
Skin: For repeated or prolonged contact, wear chemically impervious gloves such as Nitrile.
Other: An emergency eyewash station or source of clean potable water should be available in case of accidental eye contact.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Green
Physical State: Liquid.

Odor: Mint
pH: NA

Solubility in Water: Insoluble
Boiling Point: NA
Freezing Point: NA
Melting Point: NA

Diluted pH: NA
Specific Gravity: 0.902
VOC Content: <3%

10. STABILITY AND REACTIVITY

Stability: Stable
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Do not mix with any other chemicals.
Incompatibility: Solvents, caustics, acids or oxidizers
Hazardous Decomposition Products: Carbon Dioxide, Carbon Monoxide

11. TOXICOLOGICAL INFORMATION

This product contains no ingredient at 0.1% or greater that is listed as a human carcinogen.

Hazardous Ingredients	CAS Number	LD50	LC50
Methyl Salicylate	119-36-8	NE	NE

12. ECOLOGICAL INFORMATION

The product is not expected to be hazardous to the environment.

13. DISPOSAL CONSIDERATIONS

P501 Dispose of container in accordance with all Federal, State and Local Regulations regarding waste disposal.

14. TRANSPORT INFORMATION

DOT Shipping Data: Not Regulated
Canadian TDG: Not Regulated
For International Shipments by Air: Not Regulated
For International Shipments by Vessel: Not Regulated

15. REGULATORY INFORMATION

TSCA: All ingredients in this product are listed or exempt from listing on the TSCA Chemical Inventory.
CEPA: All ingredients in this product are listed or exempt from listing on the Canadian DSL/NDSL.
Proposition 65: This product contains no listed substances known to the State of California to cause cancer, birth defects or reproductive harm, at reportable levels under the statute.
SARA 313: This product contains no toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of1986 (40CFR372).
VOC: <3%

HMIS RATING: HEALTH = 1 FLAMMABILITY = 0 REACTIVITY = 0 PPE = B

WHMIS RATING: See hazards identified in Section 2 above.

16. OTHER INFORMATION

NA = Not Available or Not Applicable
NE = Not Established

Read and follow all label directions and precautions before using the product. This product is intended for industrial and institutional use only. NOT FOR HOUSEHOLD USE OR RESALE. KEEP OUT OF THE REACH OF CHILDREN. While we believe that the data contained herein is factual and the opinions expressed are those of qualified experts, the data are not to be taken as a warranty or representation for which the company assumes legal responsibility. They are offered solely for your consideration, investigation, and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State, and Local Laws and regulations.

Prepared On: 07/02/2018 Replaces: 08/11/2014

FICHE SIGNALÉTIQUE DE SÉCURITÉ

State Industrial Products
5915 Landerbrook Drive
Mayfield Heights, OH 44124
To Order Call: 1-866-747-2229

6935 Davand Drive
Mississauga, Ontario L5T 1L5
To Order Call: 1-800-668-6513

Royal Industrial Park, Bldg "M"
Local #5, Carr 869, km 1.5 Palmas
Cataño, P.R. 00962
To Order Call: 787-275-3185

1. IDENTIFICATION DU PRODUIT CHIMIQUE ET DE LA SOCIÉTÉ

Nom du produit : BLANKET 510 WINTERGREEN
Description du produit : Un refraîchissant d'air de flottement.
EPA Registration Number : NA

Numéro d'urgence CHEMTREC 24 h/24 : 800-424-9300
Numéro de la fiche signalétique de produit : 123285
EPA Establishment Number : NA

2. IDENTIFICATION DES DANGERS

VUE GÉNÉRALE D'URGENCE



Point
d'exclamation

AVERTISSEMENT

Mention de danger:
H302 Nocif en cas d'ingestion. H316_3 Provoque une légère irritation de la peau.

Conseils de prudence:
P270 Ne pas manger, boire ou fumer en manipulant ce produit. P264 Se laver soigneusement la peau après manutention.

3. COMPOSITION/INFORMATION SUR LES INGRÉDIENTS

Ingrédients dangereux	Numéro CAS	Poids	ACGIH	OSHA
salicylate de méthyle	119-36-8	<12%	NE	NE

The exact percentages have
been withheld as a trade secret.

4. PREMIERS SOINS

P332+P313 En cas d'irritation cutanée: consulter un médecin. P301+P312 EN CAS D'INGESTION : Appeler un CENTRE ANTIPOISON ou un médecin en cas de malaise. P301+P330+P331 EN CAS D'INGESTION : Rincer la bouche. NE PAS faire vomir.

5. EN CAS D'INCENDIE

Point d'éclair : >200°F [93°C]
Limite d'explosivité inférieure (LIE) : NA Limite d'explosivité supérieure (LSE) : NA
Température d'auto-inflammation : NA
Propriétés d'inflammabilité : aucune présumée
Moyens d'extinction : Dioxyde de carbone, poudre chimique, mousse extinctrice.
Lutte contre l'incendie : Porter un appareil respiratoire autonome et des vêtements de protection complète.

6. ÉMISSIONS ACCIDENTELLES

Ventiler la zone. Interrompre le déversement à la source, l'endiguer et le contenir. Évacuer à grande eau. Éliminer conformément aux réglementations fédérale, provinciale et locale en vigueuren matière d'élimination des déchets

7. MANIPULATION ET CONSERVATION

P402 Stocker dans un endroit sec.

8. EXPOSITION/PROTECTION INDIVIDUELLE

Moyens techniques : Assurer une ventilation forcée adéquate pour maintenir l'exposition en deçà de la valeur limite d'exposition.
Équipement de protection individuelle :
Respiratoire : La ventilation normale est suffisante. Si les limites d'exposition sont dépassées, utiliser un appareil respiratoire agréé NIOSH/MSHA.
Oculaire : Porter des lunettes de protection homologuées munies d'écrans latéraux non perforés.
Cutanée : En cas de contact répété ou prolongé, porter des gants de protection chimique.
Autre : Un bassin oculaire d'urgence ou une source d'eau potable propre devrait être prêt à être utilisé en cas de contact oculaire accidentel.

9. PROPRIÉTÉS PHYSIQUES ET CH IMIQUES

Aspect : Vert
État de la matière : Liquide
Solubilité dans l'eau : Insoluble
Contenu de VOC : <3%

Odeur : Menthe
Concentrer pH : NA
Dilué pH : NA
Densité : NA
Point de congélation/fusion : NA / NA

10. STABILITÉ ET RÉACTIVITÉ

Stabilité : Stable
Polymérisation dangereuse : Ne se produira pas.
Conditions à éviter : Ne pas mélanger avec d'autres produits chimiques.
Incompatibilité : Les solvants, les produits caustiques, acides ou oxydants
Produits de décomposition dangereuse : Monoxyde de carbone, dioxyde de carbone.

11. INFORMATIONS TOXICOLOGIQUES

Ce produit ne contient aucun ingrédient déclaré cancérogène humain à des teneurs supérieures ou égales à 0,1 %.

Ingrédients dangereux	Numéro CAS	LD50	LC50
salicylate de méthyle	119-36-8	NE	NE

12. INFORMATIONS ÉCOLOGIQUES

Le produit ne devrait pas être dangereuse pour l'environnement.

13. DESTRUCTION

P501 Éliminer le contenant conformément à tous les règlements fédéraux, d'État et locales en matière d'élimination des déchets.

14. TRANSPORT

INFORMATION DE TRANSPORT D.O.T. : non réglementé.
TMD AU CANADA : non réglementé.
Pour les expéditions internationales par Air : non réglementé.
Pour les expéditions internationales par Vessel : non réglementé.

15. INFORMATIONs RÉGLEMENTAIRES

TSCA : Tous les ingrédients contenus dans ce produit figurent ou sont exempts de figurer sur l'inventaire du TSCA.
CEPA : Tous les ingrédients contenus dans ce produit figurent ou sont exempts de figurer sur la LIS et la LES (Canada).
Proposition 65 : Ce produit ne contient aucune substance chimique reconnus dans l'État de Californie pour causer le cancer, des malformations congénitales ou d'autres problèmesde reproduction.
SARA 313 : Ne produit ne contient aucune substance chimique toxique devant être déclarée aux termes de la section 313 de la loi Emergency Planning andCommunity Right-To-Know Act de 1986 (40 CFR 372.65C).

CLASSIFICATION HMIS : SANTÉ = 1 INFLAMMABILITÉ = 0 RÉACTIVITÉ = 0 EPS = B

CLASSIFICATION SIMDUT : Voir les risques identifiés dans la section 2 ci-dessus.

16. AUTRES INFORMATIONS

néant = Non disponible ou sans objet
n.e. = Non établi

Lire et suivre toutes les instructions et les précautions d'emploi figurant sur l'étiquette avant d'utiliser le produit. Ces produits sont réservés uniquement à l'usage industriel et par les collectivités. CES PRODUITS NE SONT PAS DESTINÉS À L'USAGE DOMESTIQUE OU À LA REVENTE. GARDER HORS DE LA PORTÉE DES ENFANTS. Bien qu'à notre avis les informations énoncées ci-dessus soient réelles et que le jugement exprimé soit celui d'experts qualifiés, elles ne doivent pas être considérées comme une garantie ou une déclaration pour lesquelles la société assume une responsabilité légale. Ces informations sont données uniquement pour examen, investigation et vérification. L'utilisation des ces informations doit être déterminée par l'utilisateur conformément à la réglementation et à la loi fédérales, d'État et régionales applicables.

INFORMATIONS SUR LA SANTÉ ET LA SÉCURITÉ : (216) 861-7114

Date de Préparation: 07/02/2018 Remplace : 08/11/2014

PLANILLA DE DATOS DE SEGURIDAD

State Industrial Products
5915 Landerbrook Drive
Mayfield Heights, OH 44124
To Order Call: 1-866-747-2229

6935 Davand Drive
Mississauga, Ontario L5T 1L5
To Order Call: 1-800-668-6513

Royal Industrial Park, Bldg "M"
Local #5, Carr 869, km 1.5 Palmas
Cataño, P.R. 00962
To Order Call: 787-275-3185

State® Since 1911

1. PRODUCTO QUÍMICO Y DATOS DE LA COMPAÑÍA

Nombre del producto: BLANKET 510 WINTERGREEN
Descripción del producto: Un ambientador de aire flotante.
EPA Registration Number: NA

Núm. CHEMTREC las 24 horas: 800-424-9300
Número MSDS: 123285
EPA Establishment Number: NA

2. ENUMERACIÓN DE PELIGROS

DESCRIPCIÓN GENERAL DE LAS SITUACIONES DE EMERGENCIA



Signo de exclamación

ADVERTENCIA

H302 Nocivo en caso de ingestión. H316_3 Puede causar irritación leve de la piel.

P270 No comer, beber ni fumar durante su utilización. P264 Lavar la piel meticulosamente después de la manipulación.

3. COMPOSICIÓN/INFORMACIÓN SOBRE LOS COMPONENTES

Componentes peligrosos	Número CAS	Peso	ACGIH	OSHA
salicilato de metilo	119-36-8	<12%	NE	NE

The exact percentages have been withheld as a trade secret.

4. MEDIDAS DE PRIMEROS AUXILIOS

P332+P313 En caso de irritación cutánea: Consultar a un médico. P301+P312 EN CASO DE INGESTIÓN: llamar a un CENTRO DE TOXICOLOGÍA o médico SI se siente indispuesto. P301+P330+P331 EN CASO DE INGESTIÓN: Limpie la boca. NO provoque el vómito.

5. MEDIDAS PARA COMBATIR INCENDIOS

Pto. inflamabilidad: >200ºF [93ºC]
Límite explosivo inferior (LEL): NA Límite explosivo superior (UEL): NA Temperatura de autoignición: NA
Inflamabilidad: No se espera ninguna.
Medio extinguidor: Dióxido de carbono, productos químicos en polvo, espuma.
Instrucciones para combatir el fuego: Use un aparato de respiración independiente con indumentaria de protección total.

6. MEDIDAS EN CASO DE DERRAME ACCIDENTAL

Ventile el área. Coloque una barrera física y contenga el derrame en el propio sitio de origen. Limpie el derrame con agua en abundancia y vierta todo por el drenaje. Obedezca todos losreglamentos federales, estatales y locales relativos a la disposición final de residuos.

7. MANIPULACIÓN Y ALMACENAMIENTO

P402 Almacenar en un lugar seco.

8. CONTROL DE EXPOSICIÓN/PROTECCIÓN PERSONAL

Controles de ingeniería: Proveer suficiente ventilación mecánica para mantener la exposición por debajo del límite de concentración máxima (Threshold Limit Value, TLV).
Equipo de protección personal:
Respiratorio: Si el límite de exposición en el lugar de trabajo es excedido, se aconseja el uso de un respirador de aire ante la ausencia de control ambiental.
Ojos: Use gafas protectoras o gafas con protección lateral sin perforaciones aprobadas.
Piel: Si el contacto fuera prolongado o repetido, use guantes resistentes a productos químicos.
Otros: Una estación de lavaojos de emergencia o una fuente de agua potable limpia debe estar disponible en caso de contacto accidental con los ojos.

9. PROPIEDADES FÍSICAS Y QUÍMICAS

Aspecto: Verde
Estado de agregación: Líquido
Solubilidad en agua: Insoluble
Contenido de VOC: <3%

Olor: Menta
Concentrarse pH: NA
Diluido pH: NA
Peso específico: 0.902
Punto de congelación/fusión: NA / NA

10. ESTABILIDAD Y REACTIVIDAD

Estabilidad: Estable
Polimerización peligrosa: No ocurrirá.

Condiciones a evitar: No mezcle con otros productos químicos.
Incompatibilidad: Disolventes, productos cáusticos, ácidos u oxidantes
Productos de descomposición peligrosos: Monóxido de carbono, Dióxido de carbono.

11. INFORMACIÓN TOXICOLÓGICA

Este producto no contiene ningún componente en 0.1% o más del que se señale como un carcinógeno humano.

Componentes peligrosos	Número CAS	LD50	LC50
salicilato de metilo	119-36-8	NE	NE

12. INFORMACIÓN ECOLÓGICA

El producto no se espera que sea peligroso para el medio ambiente.

13. SUGERENCIAS PARA SU DISPOSICIÓN FINAL

P501 Elimine el recipiente en conformidad con todas las regulaciones federales, estatales y locales relacionadas con la eliminación de residuos.

14. INFORMACIÓN SOBRE TRANSPORTE

DATOS DE EMBARQUE SEGÚN EL DOT (Ministerio de Transporte de los EE.UU.): No se ha regulado.
TDG CANADIENSE: Producto no regulado. No se ha regulado.
Para los envíos internacionales de Air: No se ha regulado.
Para los envíos internacionales de Vessel: No se ha regulado.

15. INFORMACIÓN SOBRE REGLAMENTOS

TSCA: Todos los químicos de este producto están catalogados o están exentos de ser catalogados en el inventario químico de la Ley de Control de Sustancias Tóxicas(Toxic Substances Control Act, TSCA).
CEPA: Todos los químicos de este producto están catalogados o están exentos de ser catalogados en el DSL/NDSL canadiense.
Propuesta 65: Este producto no contiene sustancias registradas en el Estado de California como causante de cáncer, defectos de nacimiento u otros daños reproductivos.
SARA 313: Este producto no contiene sustancias tóxicas sujetas a los requisitos de información del Artículo 313 de la ley de 1986 (40 CFR 372.65) de Planeamiento anteemergencias y Derecho a Estar Informado de la Comunidad.

CLASIFICACIÓN HMIS: SALUD = 1 INFLAMABILIDAD = 0 REACTIVIDAD = 0 EQUIPO DE PROTECCIÓN PERSONAL= B

CLASIFICACIÓN WHMIS: Ver los riesgos identificados en la Sección 2 anterior.

16. OTRA INFORMACIÓN

NA = No disponible o No se aplica
NE = No se ha establecido

Antes de utilizar este producto, lea y obedezca todas las instrucciones y precauciones. Este producto fue formulado para utilizarse únicamente en el ámbito industrial e institucional. NO ES PARA REVENTA NI PARA USO EN EL ÁMBITO HOGAREÑO. MANTENGA FUERA DEL ALCANCE DE LOS NIÑOS.
Si bien se considera que los datos contenidos en esta planilla son correctos y las opiniones expresadas son las de calificados expertos, los datos no deberán considerarse como garantía ni como declaración por las que la compañía asume responsabilidad legal alguna. Estos datos se brindan sólo para evaluación, investigación y verificación por parte del cliente. El usuario es quien deberá determinar si cualquier uso que se dé a estos datos e información está de acuerdo con las leyes y reglamentos federales, estatales y locales aplicables.

INFORMACIÓN DE SEGURIDAD Y SALUD: (216) 861-7114

Preparado Encendido: 07/02/2018 Reemplaza: 08/11/2014