202-208 Tillary Street

BROOKLYN, NEW YORK

Remedial Action Work Plan

NYC VCP Project Number: TBD
OER Project Number 19TMP2890K

Prepared For:

YYY Brooklyn NY LLC c/o Maddd Equities, LLC
15 Verbana Avenue
516-821-2065
katherine@madddequities.com

Prepared By:

VHB Engineering, Surveying, Landscape Architecture and Geology, P.C.
One Penn Plaza
Suite 715
New York, NY 1119-0800
212.857.7350
rhazard@vhb.com
VHB Reference 21183

JUNE 2021

REMEDIAL ACTION WORK PLAN
TABLE OF CONTENTS

FIGURES

APPENDICES

LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AS/SVE	Air Sparging/Soil Vapor Extraction
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
C&D	Construction and Demolition
CEQR	City Environmental Quality Review
CFR	Code of Federal Regulations
CHASP	Construction Health and Safety Plan
COC	Certificate of Completion
CQAP	Construction Quality Assurance Plan
CSOP	Contractors Site Operation Plan
DCR	Declaration of Covenants and Restrictions
ECs/ICs	Engineering Controls and Institutional Controls
ELAP	Environmental Laboratory Accreditation Program
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations Emergency Response
IRM	Interim Remedial Measure
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYCDEP	New York City Department of Environmental Protection
NYCDOHMH	New York State Department of Health and Mental Hygiene
NYCOER	New York City Office of Environmental Remediation
NYCVCP	New York City Voluntary Cleanup Program
NYCRR	New York Codes Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYSDOH	New York State Department of Health

NYSDOT	New York State Department of Transportation
ORC	Oxygen-Release Compound
OSHA	United States Occupational Health and Safety Administration
PCBs	Polychlorinated Biphenyls
PE	Professional Engineer
PID	Photo Ionization Detector
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan or Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design
RI	Remedial Investigation
RMZ	Residual Management Zone
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SSDS	Sub-Slab Depressurization System
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCL	Target Compound List
USGS	United States Geological Survey
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VOC	Volatile Organic Compound

CERTIFICATION

I, Catherine Lynn Applegate, am currently a registered professional engineer licensed by the State of New York. I performed professional engineering services and had primary direct responsibility for designing the remedial program for the 202-208 Tillary Street, Brooklyn, New York Site (OER Project Nos. 19TMP1890K and 19EHAN400K). I certify to the following:

- I have reviewed this document and the Stipulation List, to which my signature and seal are affixed.
- Engineering Controls developed for this remedial action were designed by me or a person under my direct supervision and designed to achieve the goals established in this Remedial Action Work Plan for this Site.
- The Engineering Controls to be constructed during this remedial action are accurately reflected in the text and drawings of the Remedial Action Work Plan and are of sufficient detail to enable proper construction.
- This Remedial Action Work Plan (RAWP) has a plan for handling, transport and disposal of soil, fill, fluids, and other materials removed from the property in accordance with applicable City, State and Federal laws and regulations. Importation of all soil fill and other material from off-Site will be in accordance with all applicable City, State and Federal laws and requirements. This RAWP has provisions to control nuisances during the remediation and all invasive work, including dust and odor suppression.

_____
Name

_____
PE License Number

_____
Signature

_____
Date

PE Stamp

It is a violation of New York State law for any person to alter this document in any way unless the person is acting under the direction of the licensed professional engineer from which the document originates. The professional engineer shall affix his/her seal to all revisions, followed by his/her signature and date of revision.

EXECUTIVE SUMMARY

YYY Brooklyn NY LLC c/o Maddd Equities, LLC is working with the New York City (NYC) Office of Environmental Remediation (OER) in the NYC Voluntary Cleanup Program (VCP) to investigate and remediate a 33,042-square foot Site located at 202-208 Tillary Street in Brooklyn, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

Site Location and Background

Paste Section 1.1 of this work plan. – Will add for final submission

Summary of Redevelopment Plan

Paste Section 1.2 of this work plan. – Will add for final submission

Summary of Surrounding Property

Paste from RIR Executive Summary. – Will add for final submission

Summary of Past Site Uses and Areas of Concern

Paste from RIR Executive Summary. – Will add for final submission

Summary of Work Performed under the Remedial Investigation

Paste from RIR Executive Summary. – Will add for final submission

Summary of Findings of Remedial Investigation

Paste from RIR Executive Summary. – Will add for final submission

Summary of the Remedial Action

The proposed remedial action achieves protection of public health and the environment for the intended use of the property. The proposed remedial action achieves all of the remedial action objectives established for the project and addresses applicable standards, criterion, and guidance;

is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants; is cost effective and implementable; and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

Paste bullet list from Section 4.1 – Will add for final submission

COMMUNITY PROTECTION STATEMENT

The NYCOER provides governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action Work Plan ("cleanup plan") describes the findings of prior environmental studies, shows the location of identified contamination at the Site, and describes the plans to clean up the Site to protect public health and the environment.

This cleanup plan provides a very high level of protection for neighboring communities and also includes many other elements that address common community concerns, such as community air monitoring, odor, dust and noise controls, hours of operation, good housekeeping and cleanliness, truck management and routing, and opportunities for community participation. The purpose of this Community Protection Statement is to explain these community protection measures in non-technical language to simplify community review.

Project Information:

- Site Name: 202-208 Tillary Street
- Site Address: 202-208 Tillary Street, Brooklyn, New York 11201
- NYC Voluntary Cleanup Program Project Number: TBD

Project Contacts:

- OER Project Manager: Kestana Anokye (212-788-8841)
- Site Project Manager: Robert Hazard (973-776-3772)
- Site Safety Officer: TBD
- Online Document Repository:
  link to OER's document repository PENDING

Remedial Investigation and Cleanup Plan: Under the oversight of the NYCOER, a thorough study of this property (called a remedial investigation) has been performed to identify past property usage, to sample and test soils, groundwater and soil vapor, and to identify

contaminant sources present on the property. The cleanup plan has been designed to address all contaminant sources that have been identified during the study of this property.

Identification of Sensitive Land Uses: Prior to selecting a cleanup, the neighborhood was evaluated to identify sensitive land uses nearby, such as schools, day care facilities, hospitals, and residential areas. The cleanup program was then tailored to address the special conditions of this community.

Qualitative Human Health Exposure Assessment: An important part of the cleanup planning for the Site is a study to find all of the ways that people might come in contact with contaminants at the Site now or in the future. This study is called a Qualitative Human Health Exposure Assessment (QHHEA). A QHHEA was performed for this project. This assessment has considered all known contamination at the Site and evaluated the potential for people to come in contact with this contamination. All identified public exposures will be addressed under this cleanup plan.

Health and Safety Plan: This cleanup plan includes a Construction Health and Safety Plan (CHASP) that is designed to protect community residents and on-Site workers. The elements of this RAWP are in compliance with applicable safety requirements of the United States Occupational Safety and Health Administration (OSHA). This RAWP includes many protective elements including those discussed below.

Site Safety Coordinator: This project has a designated Site safety coordinator to implement the CHASP. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is identified at the beginning of this Community Protection Statement.

Worker Training: Workers participating in cleanup of contaminated material on this project are required to be trained in 40-hour hazardous waste operators training course and to take

annual refresher training. This pertains to workers performing specific tasks including removing contaminated material and installing cleanup systems in contaminated areas.

Community Air Monitoring Plan: Community air monitoring will be performed during this cleanup project to ensure that the community is properly protected from contaminants, dust, and odors. Air samples will be tested in accordance with a detailed plan called the Community Air Monitoring Plan (CAMP). Results will be regularly reported to the NYCOER. This cleanup plan also has a plan to address any unforeseen problems that might occur during the cleanup (called a 'Contingency Plan').

Odor, Dust and Noise Control: This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and includes steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also required to comply with applicable NYC noise control standards. If you observe problems in these areas, please contact the on-Site Project Manager or NYCOER Project Manager listed on the first page of this Community Protection Statement document.

Quality Assurance: This cleanup plan requires that evidence be provided to illustrate that all cleanup work required under the plan has been completed properly. This evidence will be summarized in the final report, called the Remedial Action Report (RAR). This report will be submitted to the NYCOER and will be thoroughly reviewed.

Stormwater Management: To limit the potential for soil erosion and discharge, this cleanup plan has provisions for stormwater management. The main elements of the stormwater management include physical barriers such as tarp covers and erosion fencing, and a program for frequent inspection.

Hours of Operation: The hours for operation of cleanup will comply with the NYC Department of Buildings (DOB) construction code requirements or according to specific variances issued by that agency. For this cleanup project, the hours of operation will conform to requirements of the NYCDOB.

Signage: While the cleanup is in progress, a placard will be prominently posted at the main entrance of the property with a laminated project Fact Sheet that states that the project is in the NYCVCP and provides project contact names and numbers, and a link to the document repository where project documents can be viewed.

Complaint Management: The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager or the NYCOER Project Manager listed on the first page of this Community Protection Statement document, or call 311 and mention the Site is in the NYCVCP.

Utility Mark-outs: To promote safety during excavation in this cleanup, the contractor is required to first identify all utilities and must perform all excavation and construction work in compliance with NYCDOB regulations.

Soil and Liquid Disposal: All soil and liquid material removed from the Site as part of the cleanup will be transported and disposed of in accordance with all applicable City, State and Federal regulations, and required permits will be obtained.

Soil Chemical Testing and Screening: All excavations will be supervised by a trained and properly qualified environmental professional. In addition to extensive sampling and chemical testing of soils on the Site, excavated soil will be screened continuously using hand-held instruments, by sight, and by smell to ensure proper material handling and management, and community protection.

Stockpile Management: Soil stockpiles will be kept covered with tarps to prevent dust, odor, and erosion. Stockpiles will be frequently inspected. Damaged tarp covers will be promptly replaced. Stockpiles will be protected with silt fences. Hay bales will be used, as needed, to protect storm water catch basins and other discharge points.

Trucks and Covers: Loaded trucks leaving the Site will be covered in compliance with applicable laws and regulations to prevent dust and odor. Trucks will be properly recorded in logs and records and placarded in compliance with applicable City, State and Federal laws, including those of the New York State Department of Transportation (NYSDOT). If loads contain wet material that can leak, truck liners will be used. All transport of materials will be performed by licensed truckers and in compliance with applicable laws and regulations.

Imported Material: All fill materials proposed to be brought onto the Site will comply with rules outlined in this cleanup plan and will be inspected and approved by a qualified worker located on the Site. Waste materials will not be brought onto the Site. Trucks entering the Site with imported clean materials will be covered in compliance with applicable laws and regulations.

Equipment Decontamination: All equipment used for cleanup work will be inspected and washed, if needed, before it leaves the Site. Trucks will be cleaned at a truck inspection station on the property before leaving the Site.

Housekeeping: Locations where trucks enter or leave the Site will be inspected every day and cleaned regularly to ensure that they are free of dirt and other materials from the Site.

Truck Routing: Truck routes have been selected to: (a) limit transport through residential areas and past sensitive nearby properties; (b) maximize use of city-mapped truck routes; (c) limit total distance to major highways; (d) promote safety in entry to highways; (e) promote overall safety in trucking; and (f) minimize off-Site line-ups (queuing) of trucks entering the

property. Operators of loaded trucks leaving the Site will be instructed not to stop or idle in the local neighborhood.

Final Report: The results of all cleanup work will be fully documented in a final RAR that will be available for public review online. A link to the online document repository and the public library with Internet access nearest the Site is listed on the first page of this Community Protection Statement document

Long-Term Site Management: If long-term protection is needed after the cleanup is complete, the property owner will be required to comply with an ongoing Site Management Plan (SMP) that calls for continued inspection of protective controls, such as Site covers. The SMP is evaluated and approved by the NYCOER. Requirements that the property owner must comply with are defined either in the property's deed or established through a city environmental designation registered with the NYCDOB. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved cleanup is still effective.

REMEDIAL ACTION WORK PLAN

1.0 Project Background

YYY Brooklyn NY LLC c/o Maddd Equities, LLC is working with the NYCOER in the NYCVCP and in the "E" Designation Program to investigate and remediate a property located at 202-208 Tillary Street in the downtown section of Brooklyn, New York (the "Site"). A RI was performed to compile and evaluate data and information necessary to develop this RAWP in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, and complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 Site Location and Background

The Site is located in the downtown section of Brooklyn and is identified as Block 2050, Lot 100, and a portion of Lot 1. **Figure 1** shows the Site location and **Figure 2** shows a map of the Site boundary on the New York City Tax Map. The lots will be subsequently merged into one (1) lot identified as Lot 100. An RP602 form has been submitted with the NYC Department of Finance (DOF) and is pending. Currently, the approximately 33,042-square foot Site is developed with a five-story self-storage building with a full basement that occupies the entirety of Block 2050, Lot 100 and an outdoor at-grade asphalt-paved parking lot that occupies the northwest portion of Block 2050, Lot 1. The building covers approximately 19,450 square feet of Lot 100 and has approximately 114,500 square feet of interior space, including an interior loading dock. The building is currently operated by American Self Storage as a public storage facility with more than 1,300 storage units. The at-grade outdoor parking area occupies the northwest portion of Lot 1 and is approximately 13,591 square feet. The property is currently owned by the New York City Housing Authority (NYCHA).

1.2 Redevelopment Plan

The proposed future use of the Site will consist of a new 426,674 gross square foot commercial and residential mixed-use 32-story building including one (1) tower, two (2) setbacks, and a full basement. The building footprint will occupy a majority of the merged lots with the exception on an outdoor terrace located at grade in the eastern portion of the property. The basement of the structure will include a gas meter room, mechanical room, compactor room, bicycle storage room, a building supervisor office/workshop, water heater room, switchboard room, fire pump room, telecommunications room, plumbing equipment room, two (2) stormwater detention tanks, and elevator/stairway space. The first floor will include a parking garage/outdoor parking area with space for 70 vehicles, an outdoor terrace area, commercial space, a lobby/reception area, a mail room, package room, marketing office, and elevator/stairway access. Residential space is located on floors two (2) through 30. A fitness area, gallery, and co-working space will be located on the 31st floor. A communal dining facility, lounge area, and two (2) outdoor amenity spaces will be located on the 32nd floor. Only mechanical rooms are proposed above the 32nd floor. Setbacks are proposed below the 2nd and 32nd floors of the tower. The residential units include studio to two-bedroom apartments. According to development plans, 25% of residential units will designated affordable through the NYC Housing Preservation and Development (HPD) Mandatory Inclusionary Housing (MIH) program (approximately 116 units).

The soil excavation for the cellar foundation is proposed to approximately 15 feet below grade surface (bgs) including the installation of footings, piles, and pile caps. Additional localized excavation will extend to approximately 20 feet bgs in the area of hot-spots and elevator vaults.

The zoning designation of the property is part of the Special Downtown Brooklyn District as of July 26, 2001 and is identified as Zoning District No. C6-4. This zoning designation is descriptive of commercial and residential use. The proposed use is consistent with existing zoning for the property. The Redevelopment Plans are provided as **Appendix I**.

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

1.3 Description of Surrounding Property

Current uses of surrounding properties are as follows:

North: Tillary Street and the entrance/exits ramps to Route 278 are located to the north of the Site.

East: Multi-family residential buildings are located to the east of the Site.

South: Multi-family residential buildings are located to the south of the Site.

West: A multi-family residential building at 194 Tillary Street is located to the west of the Site; Further west, an NYC Police Department facility at 172 Tillary Street is located across Prince Street.

According to Google Maps (google.com/maps), there are no schools, hospitals, or day care facilities within a 500-foot radius of the Site. **Figure 3** shows the surrounding land usage.

1.4 Summary of Past Site Uses and Areas of Concern

A Phase I ESA, dated July 14, 2015, was performed by Brinkerhoff Environmental Services, Inc. (Brinkerhoff) for 202-208 Tillary Street, Brooklyn, New York (Block 2050, Lot 100). The Phase I ESA identified that the subject property was developed with residences, stores, and stables from at least the 1880s until 1948 when the present-day structure was constructed and utilized as a manufacturing facility. The former uses of the building included a Polytechnic Research & Development Co. Inc. Receiving Dep't., PRD Electronics Inc. Receiving Dep't., residential use, a potential garage identified as "Garage Atndt H", headwear/curtain/textile companies, a binding company, wholesalers/traders, a beverage company, a vegetable company, and a self-storage facility. The Phase I ESA identified the following Recognized Environmental Condition (REC):

- According to the EDR environmental database search, the subject property was identified in the ERNS database at the 202 Tillary Street address. According to the report, the listing is related to a 150-gallon diesel oil spill that occurred on April 6, 1990. The report indicated that the oil spilled while a delivery truck was approaching the fuel dock and it

struck a curb. The police and fire department were on Site, and a cleanup was undertaken. The material spilled from the truck's fuel tank.

A Phase I ESA, dated February 18, 2019, was performed by Brinkerhoff for the adjoining parking lot area located on the northwestern portion of Block 2050, Lot 1. The Phase I ESA identified the following REC:

- According to historical data, this portion of the subject property appeared to be developed with several structures along Prince Street and Fleet Street prior to at least 1887. Although no structures are currently present, supporting documentation regarding the prior heating source of the former structures were not identified or provided to Brinkerhoff. Therefore, the potential exists for heating oil underground storage tanks (USTs) to be present at the Site associated with the former structures.

According to the *Revised Condition Negative Declaration*, dated September 18, 2017 and prepared by the NYC Planning Commission, the Site is part of the Tillary and Prince Streets Rezoning (CEQR No. 17DCP176K). An E-Designation (E-437) has been assigned to the project Site (Block 2050, Lot 100) related to hazardous materials, air quality, and noise.

1.5 Summary of Work Performed under the Remedial Investigation

Brinkerhoff performed the following scope of work as a part of the RI in October 2020:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e., structures, buildings, etc.);
2. Conducted a Geophysical Investigation in accessible areas to detect subsurface anomalies indicative of potential Underground Storage Tanks (USTs);
3. Installed eight (8) soil borings across the entire project Site and collected 12 soil samples for chemical analysis from the soil borings to evaluate soil quality;
4. Installed three (3) temporary groundwater monitoring well points throughout the Site to establish groundwater flow and collected three (3) groundwater samples for chemical analysis to evaluate groundwater quality; and

5. Installed seven (7) soil vapor probes across the entire project Site and collected seven (7) samples for chemical analysis.

1.6 Summary of Findings of Remedial Investigation

A remedial investigation was performed and the results are documented in a companion document called "Remedial Investigation Report, 202-208 Tillary Street", dated March 2021 (RIR). The environmental findings from the RI are provided below:

1. Surface elevation of the property is approximately 20 feet above mean sea level;
2. Depth to groundwater is approximately 15 feet bgs at the Site;
3. Groundwater flow is generally from north beneath the Site towards the East River;
4. Bedrock was not encountered at the Site;
5. A geophysical investigation conducted on October 27, 2020, did not identify anomalies indicative of subsurface debris or other buried objects in the parking lot portion of the subject property only.
6. The stratigraphy of the Site, from the surface down, consists of approximately 12 feet of urban historic fill overlying up to six (6) feet of fine to medium grain sand with some silt and clay. The urban historic fill layer consists of gray and brown sand with varying amounts of gravel, concrete, and brick fragments.
7. Twelve (12) soil/fill samples collected during the RI were compared to the New York State Department of Environmental Conservation (NYSDEC) Part 375 Table 375-6.8 Unrestricted Use (NYURU) and Restricted-Residential (NYRRES) Use Soil Cleanup Objectives (SCOs).
    - The results for the two (2) shallow soil/fill samples SB-7 (0-2) and SB-8 (0-2) collected between grade and 2 feet bgs in the current parking lot indicated:
        - VOCs, Pesticides, and Polychlorinated biphenyls (PCBs) were not detected above NYURU SCOs or NYRRES Use SCOs in either soil samples;

- Several SVOCs consisting of benzo(a)anthracene (6.4 mg/kg), benzo(a)pyrene (6.8 mg/kg), benzo(b)fluoranthene (8.7 mg/kg), chrysene (5.3 mg/kg), dibenzo(a,h)anthracene (0.8 mg/kg), and indeno(1,2,3-cd)pyrene (3.8 mg/kg) exceeded the NYRRES Use SCOs in soil sample SB-8 (0-2);
- One (1) SVOC, benzo(k)fluoranthene (2.5 mg/kg), exceeded the NYURU SCOs in soil sample SB-8 (0-2);
- Metals consisting of nickel (31.3 mg/kg) in soil sample SB-7 (0-2) and lead (73.6 mg/kg) in soil sample SB-8 exceeded the NYURU SCOs.

- The results for the two (2) deep soil/fill samples SB-1 (12-14) and SB-4 (12-14) collected between 12 and 14 feet bgs in the location of the existing cellar and the proposed elevator pits indicated:
  - PCBs were not detected above NYURU SCOs or NYRRES Use SCOs in either soil samples;
  - Several VOCs including benzene (11 mg/kg), toluene (520 mg/kg), ethylbenzene (180 mg/kg), total xylenes (310 mg/kg), and 1,2,4-trimethylbenzene (93 mg/kg) exceeding NYRRES Use SCOs and 1,4-dichlorobenzene (1.9 mg/kg), naphthalene (43 mg/kg), n-propylbenzene (30 mg/kg), 1,3,5-trimethylbenzene (25 mg/kg) exceeded NYURU SCOs in soil sample SB-1 (12-14);
  - One (1) VOC, 2-butanone (0.23 mg/kg) exceeded the NYURU SCOs in soil sample SB-4 (12-14);
  - One (1) SVOC, benzo(a)anthracene (1.5 mg/kg) exceeded NYSDEC RRES SCOs in soil sample SB-1 (12-14);
  - SVOCs including naphthalene (17 mg/kg), chrysene (1.3 mg/kg), 2-methylphenol (3 mg/kg), 3-methylphenol/4-methylphenol (5.9 mg/kg) exceeded NYURU SCOs in soil sample SB-1 (12-14);

- One (1) pesticide, 4,4-dichlorodiphenyldichloroethane (4,4-DDD) (0.044 mg/kg), exceeded NYURU SCOs in soil sample SB-1 (12-14);
- Two (2) pesticides, including 4,4-dichlorodiphenyldichloroethylene (4,4-DDE) (0.004 mg/kg) and 4,4-dichlorodiphenyltrichloroethane (4,4-DDT) (0.005 mg/kg) exceeded NYURU SCOs in soil sample SB-4 (12-14);
- Several metals, including lead (65.5 mg/kg), mercury (0.199 mg/kg), and nickel (39 mg/kg), exceeded NYURU SCO in soil sample SB-1 (12-14);
- One (1) metal, mercury (0.211 mg/kg), exceeded NYURU SCOs in soil sample SB-4 (12-14).

o The results for the four (4) deep soil/fill samples SB-2 (12-14), SB-3 (12-14), SB-5 (12-14) and SB-6 (12-14), collected between 12 and 14 feet bgs in the location of the existing building indicated:

- Pesticides, PCBs, and metals were not detected above NYURU SCOs or NYRRES Use SCOs in any of the soil samples;
- Several VOCs, including toluene (1.3 mg/kg), total xylenes (1.4 mg/kg), and 2-butanone (0.25 mg/kg) exceeded NYURU SCOs in soil sample SB-2 (12-14);
- One (1) VOC, acetone (0.08 mg/kg), exceeded NYURU SCOs in soil sample SB-3 (12-14).

o The results for the two (2) deep soil/fill samples SB-7 (12-14) and SB-8 (12-14) collected between 12 and 14 feet bgs in the current parking lot indicated:

- VOCs, SVOCs, Pesticides, and PCBs were not detected above NYURU SCOs or NYRRES Use SCOs in any of the soil samples;
- One (1) metal, nickel (38.3 mg/kg), exceeded NYURU SCOs in soil sample SB-8 (12-14).

o The results for the two (2) deep soil samples SB-1 (16-18) and SB-4 (16-18) collected between 16 and 18 feet bgs in the location of the current cellar and proposed elevator pits indicated:

- Pesticides and PCBs were not detected above NYURU SCOs or NYRRES Use SCOs in any of the soil samples;
- Several VOCs, including benzene (16 mg/kg), toluene (540 mg/kg), ethylbenzene (190 mg/kg), total xylenes (300 mg/kg), and 1,2,4-trimethylbenzene (110 mg/kg) exceeded NYRRES Use SCOs and naphthalene (52 mg/kg), n-propylbenzene (29 mg/kg), and 1,3,5-trimethylbenzene (26 mg/kg) exceeded NYURU SCOs in soil sample SB-1 (16-18);
- Several SVOCs, including benzo(a)anthracene (1.3 mg/kg) exceeded NYRRES Use SCOs and naphthalene (20 mg/kg), chrysene (1.3 mg/kg), 2-methylphenol (7.1 mg/kg), and 3-methylphenol/4-methylphenol (14 mg/kg) exceeded NYURU SCOs in soil sample SB-1 (16-18);
- Two (2) metals, including lead (226 mg/kg) and mercury (0.264 mg/kg), exceeded NYURU SCOs in soil sample SB-4 (16-18).

- Total Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) concentrations were detected at 0.00133 mg/kg in soil sample SB-7 (0-2).

Overall, soil chemistry is similar to sites with urban historic fill in New York City.

8. Three (3) groundwater samples collected during the RI were compared to the NYSDEC TOGS 1.1.1 Ambient Water Quality Standards (NY-AWQS). The results indicated:
   - SVOCs, Pesticides, or PCBs were not detected above the NY-AWQS.
   - Two (2) VOCs, sec-butylbenzene (7.4 µg/L) and 1,2,4,5-trimethylbenzene (12 µg/L) were detected exceeding the NY-AWQS in groundwater sample TWP-1;
   - Several total and dissolved metals were identified in groundwater samples exceeding their respective NY-AWQS values.
   - Emerging contaminant 1,4-Dioxane was not detected in groundwater. Total Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) concentrations were detected at 0.122 µg/L in TWP-1.

9. Seven (7) soil vapor samples (SV-1 through SV-7) were collected during the RI and were compared to the New York State Department of Health (NYSDOH) Final Guidance on Soil Vapor Intrusion (May 2017) Matrix A, B and C values. The results indicated:
    - Chlorinated-related VOCs, including vinyl chloride (max 598 [micrograms per cubic meter] µg/m^3), methylene chloride (max 184 µg/m^3), cis-1,2-dichloroethene (max 1,300 µg/m^3), trichloroethene (TCE) (max 3.97 µg/m^3), and tetrachloroethene (PCE) (max 54.9 µg/m^3) were detected in several soil vapor samples.
    - Concentrations of vinyl chloride (598 µg/m3) and cis-1,2-dichloroethene (1,300 µg/m3) were detected above the mitigate action level established by the NYSDOH in soil vapor sample SV-1.
    - Methylene chloride (184 µg/m3) was detected above the monitor/mitigate action level established by the NYSDOH in soil vapor sample SV-4.

For more detailed results, consult the RIR. Based on an evaluation of the data and information from the RIR and this RAWP, disposal of significant amounts of hazardous waste is not suspected at this Site.

2.0 Remedial Action Objectives

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

Soil

- Prevent direct contact with contaminated soil.

Groundwater

- Prevent direct exposure to contaminated groundwater.

Soil Vapor

- Prevent exposure to contaminants in soil vapor.
- Prevent migration of soil vapor into dwelling and other occupied structures.

3.0 Remedial Alternatives Analysis

The goal of the remedy selection process is to select a remedy that is protective of human health and the environment taking into consideration the current, intended and reasonably anticipated future use of the property. The remedy selection process begins by establishing RAOs for media in which chemical constituents were found in exceedance of applicable standards, criteria, and guidance values (SCGs). Remedial alternatives are then developed and evaluated based on the following ten criteria:

- Protection of human health and the environment;
- Compliance with SCGs;
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community acceptance;
- Land use; and
- Sustainability.

As required, a Track 1 Unrestricted Use scenario is evaluated for the remedial action. The following is a detailed description of the alternatives analyzed to address impacted media at the Site:

Alternative 1:

- Selection of NYSDEC 6NYCRR Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
- Removal of all soil/fill exceeding Track 1 Unrestricted Use SCOs throughout the Site and confirmation that Track 1 Unrestricted Use SCOs have been achieved with post-excavation endpoint sampling. Based on the results of the Remedial Investigation, it is

expected that this alternative would be achieved by excavating the entire Site to a depth of approximately to 20 feet bgs to remove all historic fill".

- If soil/fill containing analytes at concentrations above Unrestricted Use SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building's cellar level is complete, additional excavation would be performed to ensure complete removal of soil/ fill that does not meet Track 1 Unrestricted Use SCOs.
- No Engineering or Institutional Controls (EC/ICs) are required for a Track 1 cleanup. As part of development and as a preventative measure, a vapor barrier system would be installed to prevent potential exposures from soil vapor in the future.

Alternative 2:

- Establishment of NYSDEC 6NYCRR Part 375 Restricted-Residential (Track 2) SCOs;
- Removal of all soil/fill exceeding Track 2 SCOs and confirmation that Track 2 SCOs have been achieved with a combination of in-situ endpoint sampling results provided by the RI and post-excavation end point sampling. Based on the results of the RI, it is expected that this alternative would be achieved by excavating the property to 15 feet with additional excavation performed in the location of one (1) hotspot in the northwest portion of the Site (in the location of soil boring SB-1 from the RI) to a depth of about 20 feet and an additional one (1) hotspot to approximately 10 feet bgs (in the location of soil boring SB-8 from the RI). As part of development, soil beneath majority of the Site will be removed to a depth of 15 feet. If soil/fill containing analytes at concentrations above Track 2 SCOs is still present at the base of the excavation, additional excavation would be performed to meet Track 2 SCOs.
- As part of development and as a preventative measure, placement of a composite cover system over the entire Site to prevent exposure to remaining soil/fill;
- As part of development and as a preventative measure, installation of a vapor barrier system beneath the building slab and along foundation side walls to prevent potential exposures from soil vapor in the future.

3.1 Threshold Criteria

Protection of Public Health and the Environment

This criterion is an evaluation of the remedy's ability to protect public health and the environment, and an assessment of how risks posed through each existing or potential pathway of exposure are eliminated, reduced or controlled through removal, treatment, and implementation of ECs/ICs. Protection of public health and the environment must be achieved for all approved remedial actions.

Alternative 1 would be protective of human health and the environment by removing all soil/fill exceeding Track 1 Unrestricted Use SCOs and groundwater protection standards, thus eliminating potential for direct contact with contaminated soil/fill once construction is complete and eliminating the risk of contaminants leaching into groundwater.

Alternative 2 would achieve comparable protections of human health and the environment by excavation and removal of most of the historic fill at the Site and by ensuring that remaining soil/fill on-Site meets Track 2 SCOs. Establishment of Track 2 SCOs would minimize the risk of contamination leaching into groundwater.

For both alternatives, potential exposure to contaminated soils or groundwater during construction would be minimized by implementing a CHASP, an approved Soil/Materials Management Plan (SMMP), and a CAMP. Potential contact with contaminated groundwater would be prevented as its use is prohibited by city laws and regulations. Potential future migration of off-Site soil vapors into the new building would be prevented by installing a vapor barrier below the building slab and outside foundations walls below grade.

3.2 Balancing Criteria

Compliance with Standards, Criteria and Guidance (SCGs)

This evaluation criterion assesses the ability of the alternative to achieve applicable standards, criteria, and guidance.

Alternative 1 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to achieve Track 1 Unrestricted Use SCOs and Protection of Groundwater SCOs. Compliance with SCGs for soil vapor would also be achieved by installing a vapor barrier system below the new building's basement slab and continuing the vapor barrier outside of subgrade foundation walls, as part of development and as a preventative measure.

Alternative 2 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil/fill to meet Track 2 SCOs. Compliance with SCGs for soil vapor would also be achieved by installing a vapor barrier system below the new building's basement slab and continuing the vapor barrier outside of subgrade foundation walls, as part of development and as a preventative measure.

Health and safety measures contained in the CHASP and CAMP will be implemented during Site redevelopment under this RAWP. For both alternatives, focused attention on means and methods employed during the remedial action would ensure that handling and management of contaminated material would be in compliance with applicable SCGs. These measures will protect on-Site workers and the surrounding community from exposure to Site-related contaminants.

Short-Term Effectiveness and Impacts

This evaluation criterion assesses the effects of the alternative during the construction and implementation phase until remedial action objectives are met. Under this criterion, alternatives are evaluated with respect to their short-term effects during the remedial action on public health

and the environment during implementation of the remedial action, including protection of the community, protection of onsite workers and environmental impacts.

Both **Alternative 1** and **2** have similar short-term effectiveness during their implementation, as each requires excavation of historic fill material. Both alternatives would result in short-term dust generation impacts associated with excavation, handling, load out of materials, and truck traffic. Short-term impacts could potentially be higher for **Alternative 1** since excavation of greater amounts of historical fill material would take place. However, focused attention to means and methods during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize the overall impact of these activities.

An additional short-term adverse impact and risks to the community associated with both remedial alternatives are increased truck traffic and noise impacts. However, the project is required to comply with applicable NYC noise control standards and truck traffic will be routed on the most direct course using major thoroughfares where possible and flag persons will be used to protect pedestrians at Site entrances and exits.

The potential adverse impact to the community, workers and the environment for both alternatives would be minimized through implementation of control plans including a CHASP, a CAMP, and a SMMP, during all on-Site soil disturbance activities and would minimize the release of contaminants into the environment. Both alternatives provide short-term effectiveness in protecting the surrounding community by decreasing the risk of contact with on-Site contaminants. Construction workers operating under appropriate management procedures and a CHASP would provide protection from on-Site contaminants by using personal protective equipment would be worn consistent with the documented risks within the respective work zones.

Long-term effectiveness and permanence

This evaluation criterion addresses the results of a remedial action in terms of its permanence and quantity/nature of waste or residual contamination remaining at the Site after response objectives have been met, such as permanence of the remedial alternative, magnitude of

remaining contamination, adequacy of controls including the adequacy and suitability of ECs/ICs that may be used to manage contaminant residuals that remain at the Site and assessment of containment systems and ICs that are designed to eliminate exposures to contaminants, and long-term reliability of ECs.

Alternative 1 would achieve long-term effectiveness and permanence related to on-Site contamination by permanently removing all impacted soil/fill above Track 1 Unrestricted Use SCOs and enabling unrestricted use of the property. Removal of on-Site contaminant sources will also prevent future groundwater contamination.

Alternative 2 would provide long-term effectiveness by removing most on-Site contamination and attaining Track 2 Restricted-Residential Use SCOs, and as a part of development and as a preventative measure, installation of a vapor barrier beneath the building slab and a composite cover system across the Site.

Reduction of toxicity, mobility, or volume of contaminated material

This evaluation criterion assesses the remedial alternative's use of remedial technologies that permanently and significantly reduce toxicity, mobility, or volume of contaminants as their principal element. The following is the hierarchy of source removal and control measures that are to be used to remediate a Site, ranked from most preferable to least preferable: removal and/or treatment, containment, elimination of exposure and treatment of source at the point of exposure. It is preferred to use treatment or removal to eliminate contaminants at a Site, reduce the total mass of toxic contaminants, cause irreversible reduction in contaminants mobility, or reduce of total volume of contaminated media.

Alternative 1 will permanently eliminate the toxicity, mobility, and volume of contaminants from on-Site soil by removing all soil in excess of Track 1 Unrestricted Use SCOs.

Alternative 2 would remove most of the historic fill at the Site by excavating a majority of the Site to 15 feet bgs for the new building's cellar with additional hotspot excavation to

approximately 12 or 20 feet bgs; all remaining on-Site soil/fill would meet Track 2 Restricted-Residential Use SCOs.

Both alternatives would result in reducing the toxicity, mobility, and volume of contaminated material on-Site; however, **Alternative 1** would remove a greater total mass of contaminants from the Site. The removal of soil to 15 feet for the new development in both scenarios would lessen the difference in contaminant mass removal between these two alternatives.

Implementability

This evaluation criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation, including technical feasibility of construction and operation, reliability of the selected technology, ease of undertaking remedial action, monitoring considerations, administrative feasibility (e.g. obtaining permits for remedial activities), and availability of services and materials.

The proposed remedial action is both feasible and implementable. The techniques, materials, and equipment to implement both **Alternative 1** and **2** are readily available and have been proven to be effective in remediating the contaminants present on the Site. They use standard equipment and technologies that are well established in the industry. The reliability of each remedy is also high. There are no special difficulties associated with any of the activities proposed.

Cost effectiveness

This evaluation criterion addresses the cost of alternatives, including capital costs (such as construction costs, equipment costs, and disposal costs, engineering expenses) and Site Management costs (costs incurred after remedial construction is complete) necessary to ensure the continued effectiveness of a remedial action.

Since historic fill at the Site was found to extend to a depth of up to 10-12 feet below grade during the RI, and the new building requires excavation of the entire Site to a depth of 15 feet,

the costs associated with both **Alternative 1** and **Alternative 2** will likely be comparable. Costs associated with **Alternative 1** could potentially be higher than **Alternative 2** if soil with analytes above Track 1 Unrestricted Use SCOs is encountered below the excavation depth required for development. Additional costs would include installation of additional shoring/underpinning, disposal of additional soil, and import of clean soil for backfill.

The remedial plan would couple the remedial action with the redevelopment of the Site, lowering total costs. The remedial plan will also consider the selection of the most appropriate disposal facilities to reduce transportation and disposal costs during cleanup and redevelopment of the Site.

Community Acceptance

This evaluation criterion addresses community opinion and support for the remedial action. Observations here will be supplemented by public comment received on the RAWP.

This RAWP will be subject to a public review under the NYCVCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedy. This public comment will be considered by NYCOER prior to approval of this plan. The Citizen Participation Plan (CPP) for the project is provided in **Appendix II**. Observations here will be supplemented by public comment received on the RAWP. Under both alternatives, the overall goals of the remedial program, to protect public health and the environment and eliminate potential contaminant exposures, have been broadly supported by citizens in NYC communities.

Land use

This evaluation criterion addresses the proposed use of the property. This evaluation has considered reasonably anticipated future uses of the Site and takes into account: current use and historical and/or recent development patterns; applicable zoning laws and maps; NYS Department of State's Brownfield Opportunity Areas (BOA) pursuant to section 970-r of the general municipal law; applicable land use plans; proximity to real property currently used for residential use, and to commercial, industrial, agricultural, and/or recreational areas; environmental justice impacts, Federal or State land use designations; population growth patterns

and projections; accessibility to existing infrastructure; proximity of the Site to important cultural resources and natural resources, potential vulnerability of groundwater to contamination that might emanate from the Site, proximity to flood plains, geography and geology; and current Institutional Controls applicable to the Site.

The current, intended, and reasonably anticipated future land use of the Site and its surroundings are compatible with the selected remedy of soil remediation. The proposed future use of the Site will include commercial and residential units including a tower with 32 floors. A total of 116 affordable residential units will be located in Site building ranging from studio to three (3) bedrooms. Commercial space will be located on the first floor of the building and encompass 3,793 square feet and will front along Tillary Street. Setbacks are proposed below the 2nd and 32nd floors.

Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 2 Restricted-Residential Use SCOs, both of which are protective of public health and the environment for its planned residential use. The proposed use is compliant with the property's zoning and is consistent with recent development patterns. The areas surrounding the Site is urban and consists of predominantly mixed residential and commercial buildings in zoning districts designated for commercial and residential uses. The development would remediate a property and provide a modern mixed-use residential/commercial building. The proposed development would clean up the property and make it safer, create new employment opportunities, living space for affordable and supportive housing and associated societal benefits to the community, and other economic benefits from land revitalization.

Temporary short-term project impacts are being mitigated through Site Management controls and truck traffic controls during remediation activities. Following remediation, the Site will meet either Track 1 Unrestricted Use SCOs or Track 2 Restricted-Residential Use SCOs, both of which are protective of public health and the environmental for its planned use.

The Site is not in close proximity to important cultural resources, including federal or state historic or heritage sites or Native American religious sites, natural resources, waterways,

wildlife refuges, wetlands, or critical habitats of endangered or threatened species. The Site is located in an urban area and not in proximity to fish or wildlife and neither alternative would result in any potential exposure pathways of contaminant migration affecting fish or wildlife. The remedial action is also protective of groundwater natural resources. The Site does not lie in a Federal Emergency Management Agency (FEMA)-designated flood plain. Both alternatives are equally protective of natural resources and cultural resources. Improvements in the current environmental condition of the property achieved by both alternatives considered in this plan are consistent with the City's goals for cleanup of contaminated land.

Sustainability of the Remedial Action

This criterion evaluates the overall sustainability of the remedial action alternatives and the degree to which sustainable means are employed to implement the remedial action including those that take into consideration NYC's sustainability goals defined in "PlaNYC": A Greener, Greater New York. Sustainability goals may include: maximizing the recycling and reuse of non-virgin materials; reducing the consumption of virgin and non-renewable resources; minimizing energy consumption and greenhouse gas emissions; improving energy efficiency; and promotion of the use of native vegetation and enhancing biodiversity during landscaping associated with Site development.

While **Alternative 2** would potentially result in lower energy usage based on reducing the volume of material transported off-Site, both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action. The remedial plan for either alternative would take into consideration the shortest trucking routes during off-Site disposal of historic fill and other soils, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. The New York City Clean Soil Bank program is available for reuse of any clean native soils under either alternative. A complete list of green remedial activities considered as part of the NYCVCP is included in a Sustainability Statement is included in a Sustainability Statement provided as **Appendix III**.

4.0 Remedial Action

4.1 Summary of Preferred Remedial Action

The preferred remedial action alternative is **Alternative 2**, the establishment of Track 2 Restricted-Residential Use SCOs. The preferred remedial action achieves protection of public health and the environment for the intended use of the property. The preferred remedial action will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action is effective in both the short-term and long-term and reduces mobility, toxicity, and volume of contaminants. The preferred remedial action alternative is cost effective and implementable and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYCVCP Citizen Participation activities according to an approved CPP;
2. Performance of a CAMP for particulates and volatile organic carbon compounds;
3. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas;
4. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility(s). A Waste Characterization Report documenting sample procedures, location, analytical results shall be submitted to NYCOER prior to start of remedial action;
5. Excavation and removal of soil/fill exceeding Track 2 Restricted-Residential Use SCOs. The entire footprint of the Site building will be excavated to a depth of approximately 15 feet below grade for development purposes. An additional hotspot area of approximately 25 square feet will be excavated to a depth of approximately 20 feet bgs in the location of soil boring SB-1. Additional localized excavation maybe necessary for the installation of footings and/or elevator pit(s). The southeastern portion of the Site in the location of the at-grade outdoor parking area will be remain unexcavated with the exception an additional second approximately 25-square foot

hotspot area in the location of the soil boring SB-8 from the RI. This hotspot area will be excavated to a depth of approximately 15 feet bgs;

6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site;
7. Management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials;
8. Removal of all USTs that are encountered during soil/fill removal actions. Registration of tanks and reporting of any petroleum spills associated with USTs and appropriate closure of these petroleum spills in compliance with applicable local, State and Federal laws and regulations;
9. Transportation and off-Site disposal of all soil/fill material at licensed or permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site;
10. Collection and analysis of five (5) endpoint samples [one (1) from the base of the excavation and four (4) from the sidewalls of the excavation] to determine the performance of the remedy with respect to attainment of SCOs;
11. Demarcation of residual soil/fill;
12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations;
13. As part of development and as a preventative measure, construction of an engineered composite cover system consisting of a minimum 4-inch thick concrete slab overlying a vapor barrier membrane, 4-inch layer of clean 2/4-inch RCA, and underlying native compacted soil or bedrock, across the entire building footprint to prevent human exposure to residual soil remaining under the Site;
14. As part of development and as a preventative measure, installation of a vapor barrier membrane beneath the concrete building slab and along the exterior portions of the below-grade foundation walls. The vapor barrier will consist of a minimum 20-mil Vapor Barrier Membrane. All welds, seams and penetrations will be properly sealed

according to manufacturer specifications to prevent preferential pathways for vapor migration. The remedial engineer will certify in the RAR that the Vapor Barrier System was designed and properly installed to mitigate potential soil vapor migration into the building.

15. Performance of all activities required for the remedial action, including acquisition of required permits and attainment of pretreatment requirements, in compliance with applicable laws and regulations.
16. Dewatering in compliance with city, state, and federal laws and regulations. Extracted groundwater will either be containerized for off-Site licensed or permitted disposal or will be treated under a permit from New York City Department of Environmental Protection (NYCDEP) to meet pretreatment requirements prior to discharge to the sewer system.
17. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
18. Submission of a RAR that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.
19. If Track 2 SCOs are not achieved, submission of an approved SMP in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection, and certification of EC/ICs and reporting at a specified frequency.
20. If Track 2 SCOs are not achieved, the property will continue to be registered with an E-Designation with the NYCDOB. Establishment of ECs/ICs in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. ICs will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without NYCOER approval.

4.2 Soil Cleanup Objectives and Soil/ Fill Management

Track 2 Restricted-Residential Use SCOs are proposed for this project and SCOs are defined in 6 NYCRR Part 375, Table 6.8 Track 2 Restricted-Residential Use. If Track 2 Restricted-Residential Use SCOs are not achieved, Track 4 Site-Specific SCOs will apply. The following Track 4 Site-Specific SCOs will be used:

Contaminant	Track 4 SCOs
Total SVOCs	150 ppm
Copper	300 ppm
Lead	1000 ppm
Mercury	2.5 ppm

Soil and materials management on-Site and off-Site, including excavation, handling and disposal, will be conducted in accordance with the SMMP in **Appendix IV**. Discrete contaminant sources (such as hotspots) identified during the remedial action will be identified by GPS or surveyed. This information will be provided in the RAR.

Soil/Fill Excavation and Removal

The total quantity of soil/fill expected to be excavated and disposed of off-Site is approximately 2,500 cubic yards. For development purposes, the entire footprint of the building will be excavated. The soil excavation for the cellar foundation is proposed to approximately 15 feet bgs. Approximately 125 cubic yards of soil/fill will be excavated from a 25-square foot area in the location of the hotspot in the northwestern portion of the Site (in the location of soil boring SB-1 from the RI). Approximately 300 cubic yards of soil/fill will be excavated from a 25-square foot area of the hotspot in the southeastern portion of the Site (in the location of soil boring SB-8 from the RI). For each disposal facility to be used in the remedial action, a letter from the developer/Qualified Environmental Professional (QEP) to the receiving facility requesting approval for disposal and a letter back to the developer/QEP providing approval for disposal will be submitted to NYCOER prior to any transport and disposal of soil at a facility. The location of planned excavation is shown on **Figure 4**.

Disposal facilities will be reported to NYCOER when they are identified and prior to the start of remedial action.

Endpoint Sampling

Endpoint samples will be analyzed for compounds and elements as described below utilizing the following methodology:

- Volatile organic compounds by EPA Method 8260;
- Semi-volatile organic compounds by EPA Method 8270;
- Target Analyte List metals; and
- Pesticides/PCBs by EPA Method 8081/8082.

New York State Environmental Laboratory Accreditation Program (ELAP) certified labs will be used for all endpoint sample analyses. Labs performing endpoint sample analyses will be reported in the RAR. The RAR will provide a tabular and map summary of all endpoint sample results and will include all data including non-detects and applicable standards and/or guidance values.

Confirmation Endpoint Sampling

Removal actions for development purposes under this plan will be performed in conjunction with confirmation endpoint soil sampling. Sampling results from the RI will act as in-situ endpoint samples for a majority of the Site. From each hotspot excavation location, five (5) confirmation samples will be collected ([one (1) from the base and four (4) from the sidewall of the excavation] at location of the hotspot soil excavation for an overall total of 10 samples. The proposed locations are shown on **Figure 5**, the Proposed Confirmatory Endpoint Sample Location Map. To evaluate attainment of Track 2 SCOs according to analytical methods described above. If Track 1 Unrestricted Use SCOs are pursued, samples will be analyzed for VOCs, SVOCs, pesticides, PCBs, and metals according to analytical methods described above.

Hotspot Endpoint Sampling

Endpoint samples will be collected from the sidewalls and base of excavation at the one (1) hotspot excavation location identified in the Remedial Investigation, according to the procedure

listed below. Hotspots include soil boring SB-1 for VOCs and SVOCs. Endpoint samples will be analyzed for SCO trigger parameters.

For any hotspots identified during this remedial program, including any hotspots identified during the remedial action, hotspot removal actions will be performed to ensure that hotspots are fully removed and endpoint samples will be collected at the following frequency:

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.
2. For excavations 20 to 300 feet in perimeter:
    - For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
    - For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
3. For sampling of volatile organics, bottom samples should be taken within 24 hours of excavation and should be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours should be taken at six to twelve inches.
4. For contaminated soil removal, post remediation soil samples for laboratory analysis should be taken immediately after contaminated soil removal. If the excavation is enlarged horizontally, additional soil samples will be taken pursuant to bullets 1-3 above.

Post-remediation endpoint sample locations and depths will be biased towards the areas and depths of highest contamination identified during previous sampling episodes unless field indicators such as field instrument measurements or visual contamination identified during the remedial action indicate that other locations and depths may be more heavily contaminated. In all cases, post-remediation samples should be biased toward locations and depths of the highest expected contamination.

If either LNAPL and/or DNAPL are detected, appropriate samples will be collected for characterization and "fingerprint analysis" and required regulatory reporting (i.e. spills hotline) will be performed.

Quality Assurance/Quality Control

The fundamental QA objective with respect to accuracy, precision, and sensitivity of analysis for laboratory analytical data is to achieve the QC acceptance of the analytical protocol. The accuracy, precision, and completeness requirements will be addressed by the laboratory for all data generated.

Collected samples will be appropriately packaged, placed in coolers, and shipped via overnight courier or delivered directly to the analytical laboratory by field personnel. Samples will be containerized in appropriate laboratory-provided glassware and shipped in plastic coolers. Samples will be preserved through the use of ice or "cold-packs" to maintain a temperature of 4°C.

Dedicated disposable sampling materials will be used for the collection of endpoint samples, eliminating the need to prepare field equipment (rinsate) blanks. However, if non-disposable equipment is used (stainless steel scoop, etc.), field rinsate blanks will be prepared at the rate of one (1) for every eight (8) samples collected. Decontamination of non-dedicated sampling equipment will consist of the following:

- Gently tap or scrape to remove adhered soil;
- Rinse with tap water;
- Wash with Alconox® detergent solution and scrub;
- Rinse with tap water; and,
- Rinse with distilled or deionized water.

Field blanks will be prepared by pouring distilled or deionized water over decontaminated equipment and collecting the water in laboratory provided containers. Trip blanks will be used whenever samples are transported to the laboratory for analysis of VOCs. Trip blanks will not

be used for samples to be analyzed for metals, SVOCs, or pesticides. One (1) blind duplicate sample will be prepared and submitted for analysis every 20 samples. One (1) duplicate and one (1) matrix spike/matrix spike duplicate will be collected for every 20 samples.

Import of Soils

Import of soils onto the property will be performed in conformance with the SMMP in **Appendix IV**. Imported soil will meet the lower of:

- Track 2 Restricted-Residential Use SCOs, and
- Groundwater Protection Standards in Part 375-6.8.

Soil import is not planned on this project; however, approximately 1,000 tons of crushed stone is proposed for use as backfill around footings. A map of imported material placement locations is shown in **Figure 6**.

Reuse of On-Site Soils

Reuse of on-Site soils already on-Site will be performed in conformance with the SMMP in **Appendix IV**. Reuse soils will meet the SCOs established for this project. Soil reuse is not planned on this project.

4.3 Engineering Controls

Track 2 Restricted-Residential Use SCOs are proposed for the Site and Engineering Controls (ECs) are not required; however, as part of development and as a preventative measure, the following construction elements will be installed to address residual contamination remaining at the Site: These are:

(1) Composite Cover System
(2) Soil Vapor Barrier System

Composite Cover System

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. The composite cover system for the entire building footprint will consist of a minimum four (4)-inch reinforced concrete building slab overlying a vapor barrier membrane and approximately six (6)-inches of clean ¾-inch RCA or bluestone overlying residual soil. **Figure 7** shows the typical cross-section design and location of the composite cover at the site.

Vapor Barrier System

Migration of soil vapor from onsite or offsite sources into the building will be mitigated with a combination of building slab and vapor barrier. A minimum 20-mil Vapor Barrier Membrane, comparable to the Stego Wrap 20-Mil Vapor Barrier manufactured by Stego Industries, will be installed beneath the concrete foundation slab and along the exterior portions of the below-grade foundation sidewalls. Product specification sheets and installation details (penetrations, joints, etc.) with respect to the proposed building's slab and foundation components are provided in **Appendix V**. The Remedial Action Report will include as-built drawings and diagrams; manufacturer documentation; and photographs.

The project's PE, licensed by the State of New York, will have primary direct responsibility for overseeing the implementation of the vapor barrier. A plan view showing the location of the proposed vapor barrier system and typical design sections for the vapor barrier are provided on **Figure 7**. The RAR will include as-built drawings and diagrams; a PE/Registered Architect certified letter (on company letterhead) from the primary contractor responsible for installation oversight and field inspections; a copy of the manufacturers certificate of warranty; and photographs of the installation process.

4.4 Institutional Controls

Track 2 Restricted-Residential Use SCOs are proposed for the Site and Institutional Controls (ICs) are not required. If Track 2 Restricted-Residential Use SCOs are not achieved, ICs will be incorporated in this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. These ICs define the program to operate, maintain, inspect, and certify the performance of Engineering Controls and Institutional Controls

on this property. Institutional Controls would be implemented in accordance with an SMP included in the final RAR. Institutional Controls would be:

- Continued registration of the E-Designation for the property. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the SMP which will note that the property owner and property owner's successors and assigns must comply with the approved SMP;
- Submittal of a SMP in the RAR for approval by OER that provides procedures for appropriate operation, maintenance, inspection, and certification of ECs and IC's. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification shall be submitted at a frequency to be determine by OER in the SMP and will comply with RCNY §43-1407(l)(3).
- Vegetable gardens and farming on the Site are prohibited in contact with residual soil materials;
- Use of groundwater underlying the Site is prohibited without treatment rendering it safe for its intended use;
- All future activities on the Site that will disturb residual material must be conducted pursuant to the soil management provisions in an approved SMP;
- The Site will be used for residential and commercial use and will not be used for a higher level of use without prior approval by OER.

4.5 Site Management Plan

Track 2 Restricted-Residential Use SCOs are proposed for the Site and Site Management is not required. If a Track 2 Restricted-Residential Use SCOs are not achieved, Site Management will be required and will be the last phase of remediation. Site Management will begin with the

approval of the RAR and issuance of the Notice of Completion (NOC) for the remedial action. The SMP describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by this RAWP. The SMP is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by NYCOER. The property owner is responsible to ensure that all Site Management responsibilities defined in the SMP are implemented.

The SMP will provide a detailed description of the procedures required to manage residual soil/fill left in place following completion of the remedial action in accordance with the Voluntary Cleanup Agreement with NYCOER. This includes a plan for: (1) implementation of ECs/ECs; (2) operation and maintenance of ECs; (3) inspection and certification of ECs/ICs.

Site management activities and EC/IC certification will be scheduled by NYCOER on a periodic basis to be established in the RAR and the SMP and will be subject to review and modification by NYCOER. The SMP will be based on a calendar year and certification reports will be due for submission to NYCOER by July 30 of the year following the reporting period.

4.6 Qualitative Human Health Exposure Assessment

The objective of the qualitative exposure assessment is to identify potential receptors and pathways for human exposure to the contaminants of concern (COC) that are present at, or migrating from, the Site. The identification of exposure pathways describes the route that the COC takes to travel from the source to the receptor. An identified pathway indicates that the potential for exposure exists; it does not imply that exposures actually occur.

Data and information reported in the RIR are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA) for this project. As part of the VCP process, a QHHEA was performed to determine whether the Site poses an existing or future health hazard to the Site's exposed or potentially exposed population. The sampling data from the RI were evaluated to determine whether there is any health risk under current and future conditions by characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and

transport. This QHHEA was prepared in accordance with Appendix 3B and Section 3.3 (b) 8 of the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation.

Known and Potential Contaminant Sources

Based on the results of the RIR, the contaminants of concern are:

Soil:

- VOCs including Benzene, Toluene, Ethylbenzene, Total Xylenes, and 1,2,4-Trimethylbenzene were detected exceeding NYSDEC Restricted-Residential Use SCOs. VOCs including 1,4-Dichlorobenzene, Acetone, 2-Butanone, Naphathalene, N-propylbenzene, and 1,3,5-Trimethylbenzene were detected exceeding NYSDEC Unrestricted Use SCOs.
- SVOCs including Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, and Ideno(1,2,3-cd)pyrene were detected exceeding NYSDEC Restricted-Residential Use SCOs. SVOCs including Naphthalene, Benzo(k)fluoranthene, 2-Methylphenol, and 3/4-MethylPhenol were detected exceeding NYSDEC Unrestricted Use SCOs.
- Several Pesticides including Dichlorodiphenyldichloroethane (4,4'DDD), Dichlorodiphenyldichloroethylene (4,4'DDE), and Dichlorodiphenyltrichloroethane (4,4'DDT), aldrin, and dieldrin were detected exceeding the NYSDEC Unrestricted Use SCOs;
- Metals including Lead, Mercury, and Nickel were detected exceeding NYSDEC Unrestricted Use SCOs.

Groundwater:

- VOCs including sec-Butylbenzene and 1,2,4,5-Tetramethylbenzene were detected exceeding the NYGQS;
- Dissolved Metals including Iron, Manganese, and Sodium were detected exceeding the NYGQS;
- Total Metals including Beryllium, Chromium, Iron, Lead, Magnesium, Manganese, Nickel, Selenium, Sodium, and Thallium were detected exceeding the NYGQS.

Soil Vapor:

- Chlorinated VOCs including Vinyl Chloride and Cis-1,2-dichloroethene were detected at concentrations above the NYSDOH mitigate threshold and at low concentrations below NYSDOH monitoring threshold. Methylene chloride was detected at concentrations above and below the NYSDOH monitoring thresholds. Trichloroethene and Tetrachloroethane were detected at concentrations below the NYSDOH monitoring thresholds.

Nature, Extent, Fate and Transport of Contaminants

Several pesticides, SVOCs, VOCs, and metals are present in the urban historic fill throughout the Site. The pesticides were detected in several shallow soil samples deep soil samples and are likely a result from the nature of the urban historic fill. Since no pesticides were detected in the groundwater, it is likely for the pesticides to remain immobile. Several petroleum related SVOCs were found in two (2) shallow soil samples at the Site and in one (1) deep sample at a single location. However, the petroleum-impacted soil appears to have not impacted on-Site groundwater since only groundwater at the soil boring location appears to have been impacted. It is believed that hotspot excavation of this material will remove a majority of the contamination. Since the groundwater table is confined within the native sand layer beneath the urban historic fill layer and the analytical results indicated no related contamination, it is likely for the on-Site petroleum-impacts to remain immobile and not have the potential to easily transport off Site. Several metals were found throughout the Site in shallow and deep samples within the urban historic fill. The majority of the metal compounds and concentrations are commonly and typically found in urban historic fill throughout the NYC Metropolitan Area.

Several metals were detected above the NYGQS, and the metal exceedances are commonly and typically found in groundwater throughout the NYC Metropolitan Area. Two (2) VOCs were also were detected above the NYGQS in a single sampling location; however, these compounds were detected at relatively low concentrations and it is unlikely for the compounds to migrate off Site.

Soil vapor samples detected chlorinated compounds at an elevated concentration in a single location. Additional chlorinated compounds were detected below the NYSDEC monitoring

thresholds in other sampling locations.

Receptor Populations

On-Site Receptors: The site is currently utilized as a self-storage facility and is accessed through a manned attendant room. A six-foot high chain-link perimeter fence provides access to the outdoor parking lot. Onsite receptors are limited to storage unit tenants, site representatives and visitors granted access to the property. During construction, potential on-site receptors include construction workers, site representatives, and visitors. Under proposed future conditions, potential on-site receptors include building residents, workers, and visitors.

Off-Site Receptors: Potential off-site receptors within a 500-foot radius of the Site include adult and child residents; commercial and construction workers; pedestrians; and trespassers based on the following land uses within 500 feet of the Site:

1. Commercial Businesses – existing and future
2. Residential Buildings – existing and future
3. Building Construction/ Renovation – existing and future
4. Pedestrians, Trespassers, Cyclists – existing and future

Potential Routes of Exposure

Three potential primary routes exist by which chemicals can enter the body: ingestion, inhalation, and dermal absorption. Exposure can occur based on the following potential media:

- Ingestion of groundwater or fill/ soil;
- Inhalation of vapors or particulates; and
- Dermal absorption of groundwater or fill/ soil.

Potential Exposure Points

Current Conditions: The Site currently contains one (1) multi-story building utilized as a self-storage facility and a gated asphalt-paved parking lot. The potential for exposure to surficial historic fill does not exist under current conditions since surficial historic fill is not exposed as the entirety of the Site is covered. Access to the Site is also limited to authorized building guests and employees by a secured entrance or parking lot gate. Groundwater is marginally contaminated but is not exposed at the Site and, because the Site is served by the public water

supply and groundwater use for potable supply is prohibited, groundwater is not used at the Site and there is no potential for exposure. The potential for exposure to soil vapor exists since soil vapor may accumulate in the structure present on the Site but is limited by security present in the building granting access for authorized employees and guests only.

Construction/ Remediation Conditions: Once redevelopment activities begin, construction workers will come into direct contact with surface and subsurface soils as a result of on-Site construction and excavation activities. On-Site construction workers potentially could ingest, inhale, or have dermal contact with any exposed impacted soil and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. During construction, on-Site and off-Site exposures to contaminated dust from on Site will be addressed through the SMMP, dust controls, and through the implementation of the CAMP and a CHASP.

Proposed Future Conditions: Under future remediated conditions, all soils in excess of Track 2 Restricted-Residential Use SCOs will be removed. The site will be fully capped, preventing potential direct exposure to soil and groundwater remaining in place, and engineering controls (composite cover system/vapor barrier) will prevent any potential exposure due to inhalation by preventing soil vapor intrusion. The site is served by the public water supply, and groundwater is not used at the site. There are no plausible off-site pathways for oral, inhalation, or dermal exposure to contaminants derived from the site.

Overall Human Health Exposure Assessment

There are potential complete exposure pathways for the current site condition. There are potential complete exposure pathways that require mitigation during implementation of the remedy. There are no complete exposure pathways under future conditions after the site is developed. This assessment takes into consideration the reasonably anticipated use of the site, which includes a residential structure, site-wide surface cover, and a subsurface vapor barrier system for the building.

Under current conditions, on-Site exposure pathways exist for those with access to the Site and trespassers. During remedial construction, on-Site and off-Site exposures to contaminated dust

from historic fill material will be addressed through dust controls, and through the implementation of the CAMP, the SMMP, and a CHASP. After the remedial action is complete, there will be no remaining exposure pathways to on-site soil/fill, as all soil above Track 2 Restricted-Residential Use SCOs will have been removed and a vapor barrier system and composite cover system will have been installed. The vapor barrier system will prevent potential vapor intrusion. The composite cover system will prevent contact with residual soil or groundwater. Potential post-construction use of groundwater is not considered an option because groundwater in this area of New York City is not used as a potable water source. There are no surface waters in close proximity to the Site that could be impacted or threatened.

5.0 Remedial Action Management

5.1 Project Organization and Oversight

Principal personnel who will participate in the remedial action include Professional Engineer, Catherine Lynn Applegate, and field personnel under the direct supervision of the PE.

5.2 Site Security

Site access will be controlled by a guarded gated entrance and an entirely fenced property.

5.3 Work Hours

The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. The hours of operation will be conveyed to OER during the pre-construction meeting.

5.4 Construction Health and Safety Plan

The CHASP is included in **Appendix VI**. The Site Safety Coordinator will be determined prior to the start of the remedial action. Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations. The HASP pertains to remedial and invasive work performed at the Site until the issuance of the NOC.

All field personnel involved in remedial activities will participate in training required under 29 CFR 1910.120, such as 40-hour hazardous waste operator training and annual 8-hour refresher training. Site Safety Officer will be responsible for maintaining workers training records.
Personnel entering any exclusion zone will be trained in the provisions of the HASP and will comply with all requirements of 29 CFR 1910.120. Site-specific training will be provided to field personnel. Additional safety training may be added depending on the tasks performed. Emergency telephone numbers will be posted at the site location before any remedial work

begins. A safety meeting will be conducted before each shift begins. Topics to be discussed include task hazards and protective measures (physical, chemical, environmental); emergency procedures; PPE levels and other relevant safety topics. Meetings will be documented in a logbook or specific form.

An emergency contact sheet with names and phone numbers is included in the CHASP. That document will define the specific project contacts for use in case of emergency.

5.5 Community Air Monitoring Plan

Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be performed. Continuous monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well bailing/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence. Exceedances of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the OER Project Manager and included in the Daily Report.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work.

Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities 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 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All 15-minute readings must be recorded and be available for OER personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The

equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) 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 mcg/m3 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 mcg/m3 above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for NYCOER personnel to review.

5.6 Agency Approvals

All permits or government approvals required for remedial construction have been or will be obtained prior to the start of remedial construction. Approval of this RAWP by OER does not constitute satisfaction of these requirements and will not be a substitute for any required permit.

5.7 Site Preparation

Pre-Construction Meeting

NYCOER will be invited to attend the pre-construction meeting at the Site with all parties involved in the remedial process prior to the start of remedial construction activities.

Mobilization

Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation, equipment mobilization (including securing all sampling

equipment needed for the field investigation), marking/staking sampling locations and utility mark-outs. Each field team member will attend an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

Utility Marker Layouts, Easement Layouts

The presence of utilities and easements on the Site will be fully investigated prior to the performance of invasive work such as excavation or drilling under this plan by using, at a minimum, the One-Call System (811). Underground utilities may pose an electrocution, explosion, or other hazard during excavation or drilling activities. All invasive activities will be performed incompliance with applicable laws and regulations including NYC Building Code to assure safety. Utility companies and other responsible authorities will be contacted to locate and mark the locations, and a copy of the Mark-Out Ticket will be retained by the contractor prior to the start of drilling, excavation, or other invasive subsurface operations. Overhead utilities may also be present within the anticipated work zones. Electrical hazards associated with drilling in the vicinity of overhead utilities will be prevented by maintaining a safe distance between overhead power lines and drill rig masts.

Proper safety and protective measures pertaining to utilities and easements, and compliance with all laws and regulations will be employed during invasive and other work contemplated under this RAWP. The integrity and safety of on-Site and off-Site structures will be maintained during all invasive, excavation or other remedial activity performed under the RAWP.

Dewatering

Dewatering is anticipated during remediation and construction.

Dewatering will be performed in order to excavate soil and fill material below the water table (approximately 15 feet bgs). Dewatering for this site will utilize a pumping system, settling tanks, possibly a treatment system prior to discharge into the city sewer system. All required permits will be obtained from NYCDEP prior to any discharge of groundwater into the sewer system.

Equipment and Material Staging

Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations. Staging locations will be reported to NYCOER prior to the start of the remedial action.

Stabilized Construction Entrance

Steps will be taken to ensure that trucks departing the site will not track soil, fill or debris off-Site. Such actions may include use of cleaned asphalt or concrete pads or use of stone or other aggregate-based egress paths between the truck inspection station and the property exit. Measures will be taken to ensure that adjacent roadways will be kept clean of project related soils, fill and debris.

Truck Inspection Station

An outbound-truck inspection station will be set up close to the Site exit. 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. Soil and debris will be removed. Brooms, shovels, and clean water will be utilized for the removal of soil from vehicles and equipment, as necessary.

Extreme Storm Preparedness and Response Contingency Plan

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

Storm Preparedness

Preparations in advance of an extreme storm event will include the following: containerized hazardous materials and fuels will be removed from the property; loose materials will be secured

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

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to NYCOER at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911. Petroleum spills will be reported to NYSDEC within 2 hours of identification and consistent with State regulations. Emergency and spill conditions will also be reported to NYCOER. 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. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Stormwater control systems and structures will be inspected and maintained as necessary. If soil or fill materials are discharged off site to adjacent properties, property owners and NYCOER will be notified and corrective measure plan designed to remove and clean dislocated material will be submitted to NYCOER and implemented following approval by NYCOER and granting

of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of NYCOER. If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYSDEC's spill hotline at 800-457-7362 within statutory defined timelines. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYSDEC.

Storm Response Reporting

A site inspection report will be submitted to NYCOER at the completion of site inspection. An inspection report established by NYCOER is available on NYCOER's website (www.nyc.gov/oer) and will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the NYCOER project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number. Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYSDEC; description of corrective actions; schedule for corrective actions. This report should be completed and submitted to NYCOER project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

5.8 Traffic Control

Drivers of trucks leaving the Site with soil/fill will be instructed to proceed without stopping in the vicinity of the Site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site is shown on **Figure 9**.

5.9 Demobilization

Demobilization will include:

- As necessary, restoration of temporary access areas and areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management areas, and access area);
- Removal of sediment from erosion control measures and truck wash and disposal of materials in accordance with applicable laws and regulations;
- Equipment decontamination, and;
- General refuse disposal.

Equipment will be decontaminated and demobilized at the completion of all field activities. Investigation equipment and large equipment (e.g., soil excavators) will be washed at the truck inspection station as necessary. In addition, all investigation and remediation derived waste will be appropriately disposed.

5.10 Reporting and Record Keeping

Daily reports

Daily reports providing a general summary of activities for each day of active remedial work will be emailed to the NYCOER Project Manager by the end of the following business day. Those reports will include:

- Project number and statement of the activities and an update of progress made and 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 all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP results noting all excursions. CAMP data may be reported;
- Photograph of notable Site conditions and activities.

The frequency of the reporting period may be revised in consultation with NYCOER project manager based on planned project tasks. Daily email reports are not intended to be the primary

mode of communication for notification to NYCOER of emergencies (accidents, spills), requests for changes to the RAWP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RAWP will be communicated directly to the NYCOER project manager by personal communication. Daily reports will be included as an Appendix in the RAR.

Record Keeping and Photo Documentation

Job-site record keeping for all remedial work will be performed. These records will be maintained on-Site during the project and will be available for inspection by NYCOER staff. Representative photographs will be taken of the Site prior to any remedial activities and during major remedial activities to illustrate remedial program elements and contaminant source areas. Photographs will be submitted at the completion of the project in the RAR in digital format (i.e. jpeg files).

5.11 Complaint Management

All complaints from citizens will be promptly reported to NYCOER. Complaints will be addressed and outcomes will also be reported to NYCOER in daily reports. Notices to NYCOER will include the nature of the complaint, the party providing the complaint, and the actions taken to resolve any problems.

5.12 Deviations From The Remedial Action Work Plan

All changes to the RAWP will be reported to, and approved by, the NYCOER Project Manager and will be documented in daily reports and reported in the Remedial Action Report. The process to be followed if there are any deviations from the RAWP will include a request for approval for the change from NYCOER noting the following:

- Reasons for deviating from the approved RAWP;
- Effect of the deviations on overall remedy; and
- Determination with basis that the remedial action with the deviation(s) is protective of public health and the environment.

6.0 Remedial Action Report

A RAR will be submitted to NYCOER following implementation of the remedial action defined in this RAWP. The RAR will document that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The RAR will include:

- Information required by this RAWP;
- Text description with thorough detail of all engineering and institutional controls (if Track 1 remedial action is not achieved)
- As-built drawings for all constructed remedial elements;
- Manifests for al soil or fill disposal;
- Photographic documentation of remedial work performed under this remedy;
- Site Management Plan (if Track 1 remedial action is not achieved);
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;
- Tabular summary of all end point sampling results (including all soil test results from the remedial investigation for soil that will remain on site) and all soil/fill waste characterization results, QA/QC results for endpoint sampling, and other sampling and chemical analysis performed as part of the remedial action;
- Test results or other evidence demonstrating that remedial systems are functioning properly;
- Account of the source area locations and characteristics of all soil or fill material removed from the Site including a map showing the location of these excavations and hotspots, tanks, or other contaminant source areas;
- Full accounting of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material;
- Account of the origin and required chemical quality testing for material imported onto the Site;
- Continue registration of the property with an E-Designation by the NYCDOB (if Track 1 remedial action is not achieved);

- The RAWP and Remedial Investigation Report will be included as appendices to the RAR;
- Reports and supporting material will be submitted in digital form and final PDF's will include bookmarks for each appendix.

Remedial Action Report Certification

I, [name], am currently a registered professional engineer licensed by the State of New York. I performed professional engineering services and had primary direct responsibility for implementation of the remedial program for the [site name (address)] site, site number [VCP site number]. I certify to the following:

- I have reviewed this document, to which my signature and seal are affixed.
- Engineering Controls implemented during this remedial action were designed by me or a person under my direct supervision and achieve the goals established in the Remedial Action Work Plan for this site.
- The Engineering Controls constructed during this remedial action were professionally observed by me or by a person under my direct supervision and (1) are consistent with the Engineering Control design established in the Remedial action Work Plan and (2) are accurately reflected in the text and drawings for as-built design reported in this Remedial Action Report.
- The OER-approved Remedial Action Work Plan dated [date] and Stipulations in a letter dated [date] were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids, or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

Name

PE License Number

Signature

Date

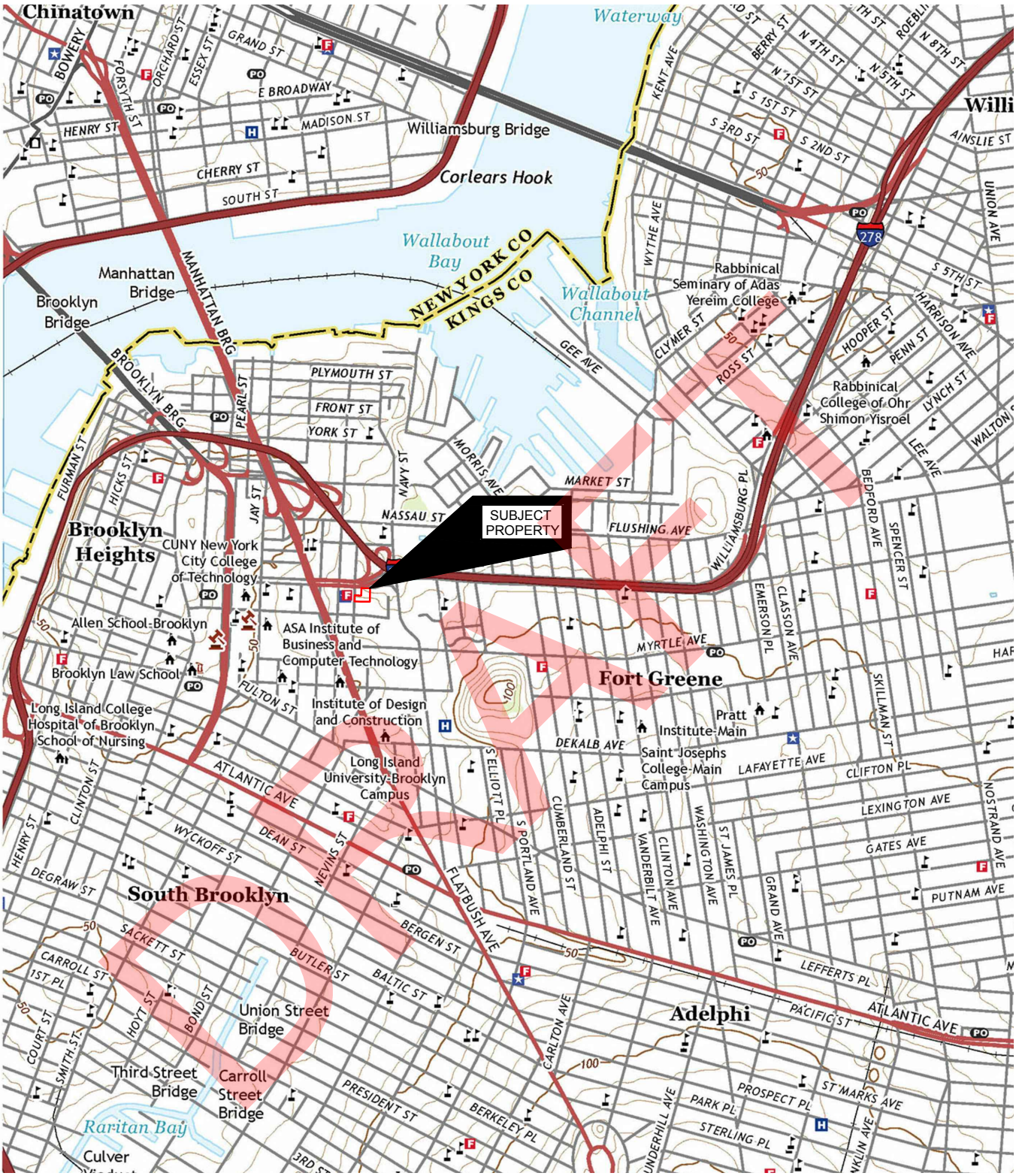
PE Stamp

7.0 Schedule

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a number month remediation period is anticipated.

Schedule Milestone	**Weeks from Remedial Action Start**	**Duration (weeks)**
NYCOER Approval of RAWP	0	-
Fact Sheet 2 announcing start of remedy	0	-
Mobilization	number	number
Remedial Excavation	number	number
Demobilization	number	number
Submit Remedial Action Report	number	-

FIGURES



SCALE: 1 : 24,000
PHOTO REVISED: 2019

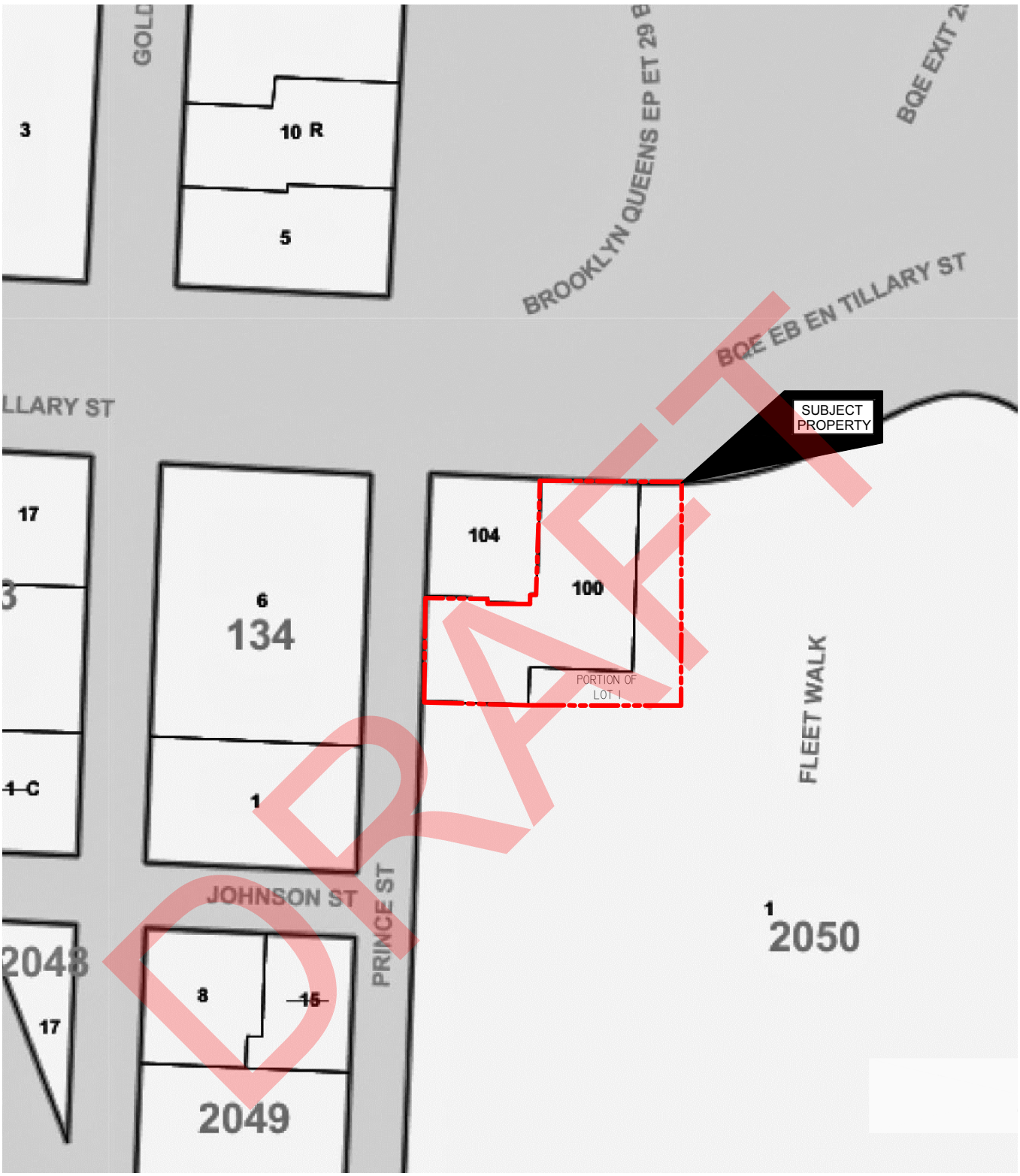
0′ 1000′ 2000′

SCALE: 1"=2000′

BRINKERHOFF
ENVIRONMENTAL SERVICES, INC.

FIGURE 1 - SITE LOCATION MAP
U.S.G.S. TOPOGRAPHIC BROOKLYN, NY QUAD
202 - 208 TILLARY STREET
BLOCK 2050, LOT 100 AND A PORTION OF LOT 1
BOROUGH OF BROOKLYN, KINGS COUNTY, NEW YORK

DATE: 12/10/20	JOB NO.: 15BR103	SCALE: 1" = 2000′



0′ 60′ 120′

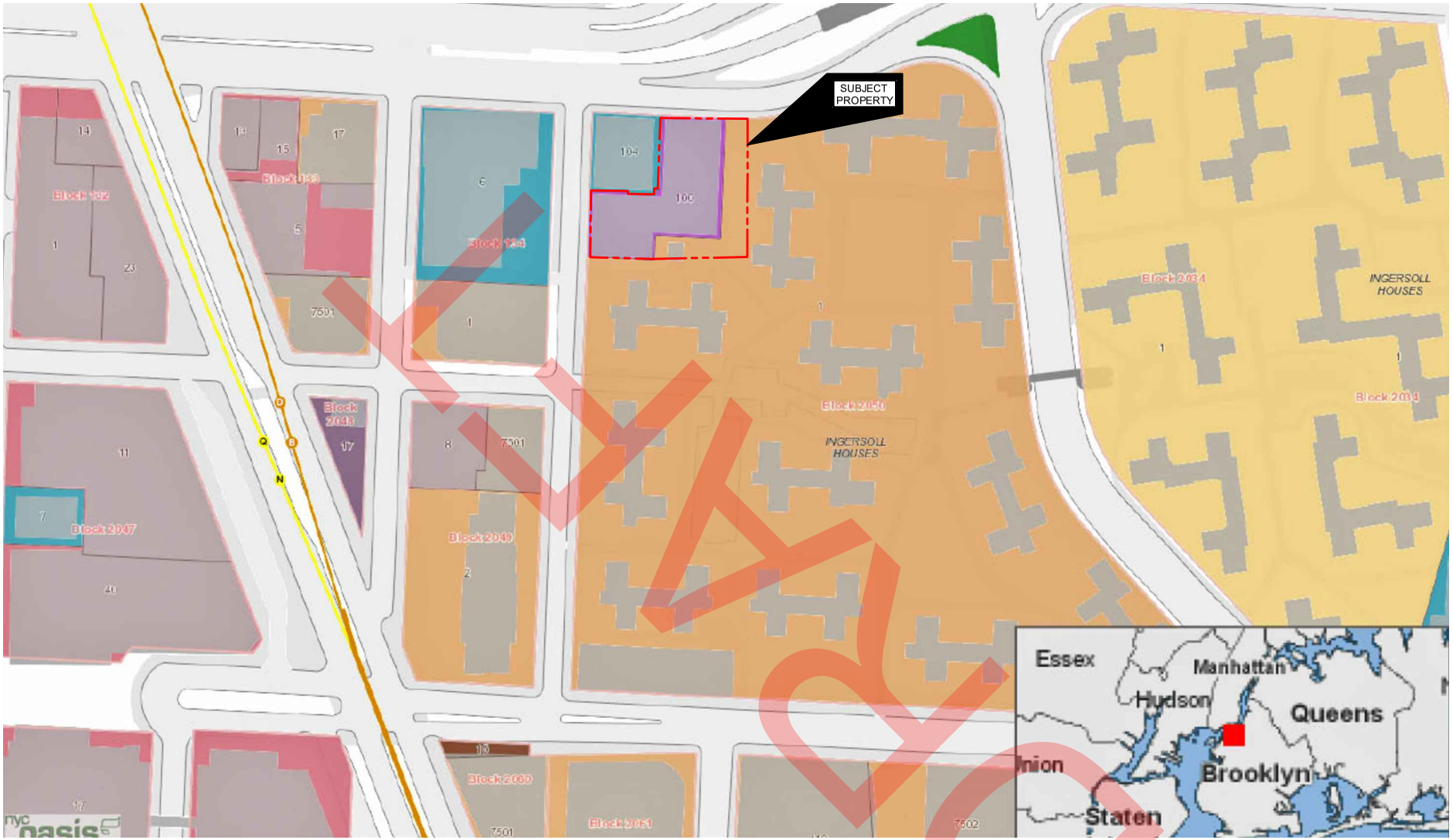
SCALE: 1"=120′

BRINKERHOFF ENVIRONMENTAL SERVICES, INC.

FIGURE 2 – PARCEL MAP

202 – 208 TILLARY STREET
BLOCK 2050, LOT 100 AND A PORTION OF LOT 1
BOROUGH OF BROOKLYN, KINGS COUNTY, NEW YORK

DATE: 11/24/20	JOB NO.: 15BR103	SCALE: 1″ = 120′



Legend

- Parks, Playgrounds, & Open Space
  - Open Space (NYC Dept of City Planning)
  - Forested Areas (NJ)
  - Community Gardens
  - School property with garden
  - Playgrounds
  - Green Spaces Along Streets
  - Golf Courses
  - Baseball/Soccer/Football Fields
  - Tennis/Basketball/Handball Courts & Tracks
  - Cemeteries
- Land Use
  - Block/Lot Boundaries
  - (Building footprints in gray)
  - 1 & 2 Family Residential
  - Multi-family Residential
  - Mixed Use
  - Open space & outdoor recreation
  - Commercial
  - Institutions
  - Industrial
  - Parking
  - Transportation / Utilities
  - Vacant Lots

0′ 100′ 200′

SCALE: 1"=200′

vhb

FIGURE 3 - SURROUNDING LAND USE MAP

202 - 208 TILLARY STREET
BLOCK 2050, LOT 100 AND A PORTION OF LOT 1
BOROUGH OF BROOKLYN, KINGS COUNTY, NEW YORK

DATE:	JOB NO.:	SCALE:
6/10/21	21183.01	1" = 200′

0′ 20′ 40′

SCALE: 1"=40′

LEGEND

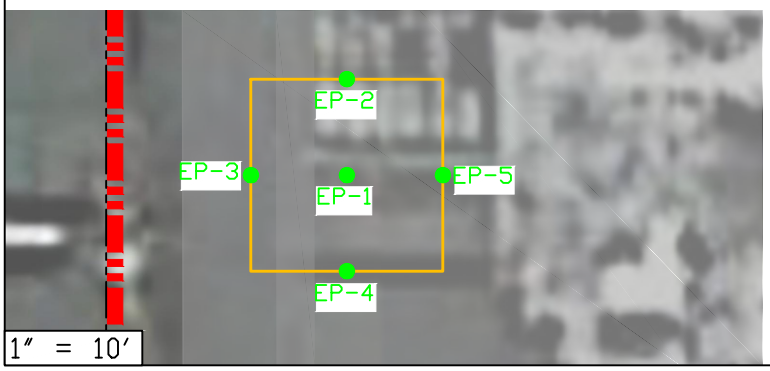
- SITE BOUNDARY
- LOT BOUNDARY
- EXISTING BUILDING FOOTPRINT
- EXCAVATION AREA 15′ BELOW GRADE SURFACE
- EXCAVATION AREA 20′ BELOW GRADE SURFACE

vhb

FIGURE 4 - PROPOSED EXCAVATION MAP

202 - 208 TILLARY STREET
BLOCK 2050, LOT 100 AND A PORTION OF LOT 1
BOROUGH OF BROOKLYN, KINGS COUNTY, NEW YORK

DATE: 6/10/21	JOB NO.: 21183.01	SCALE: 1" = 40′



LEGEND

- SITE BOUNDARY
- LOT BOUNDARY
- EXISTING BUILDING FOOTPRINT
- ENDPOINT SAMPLE LOCATION (EP-1)

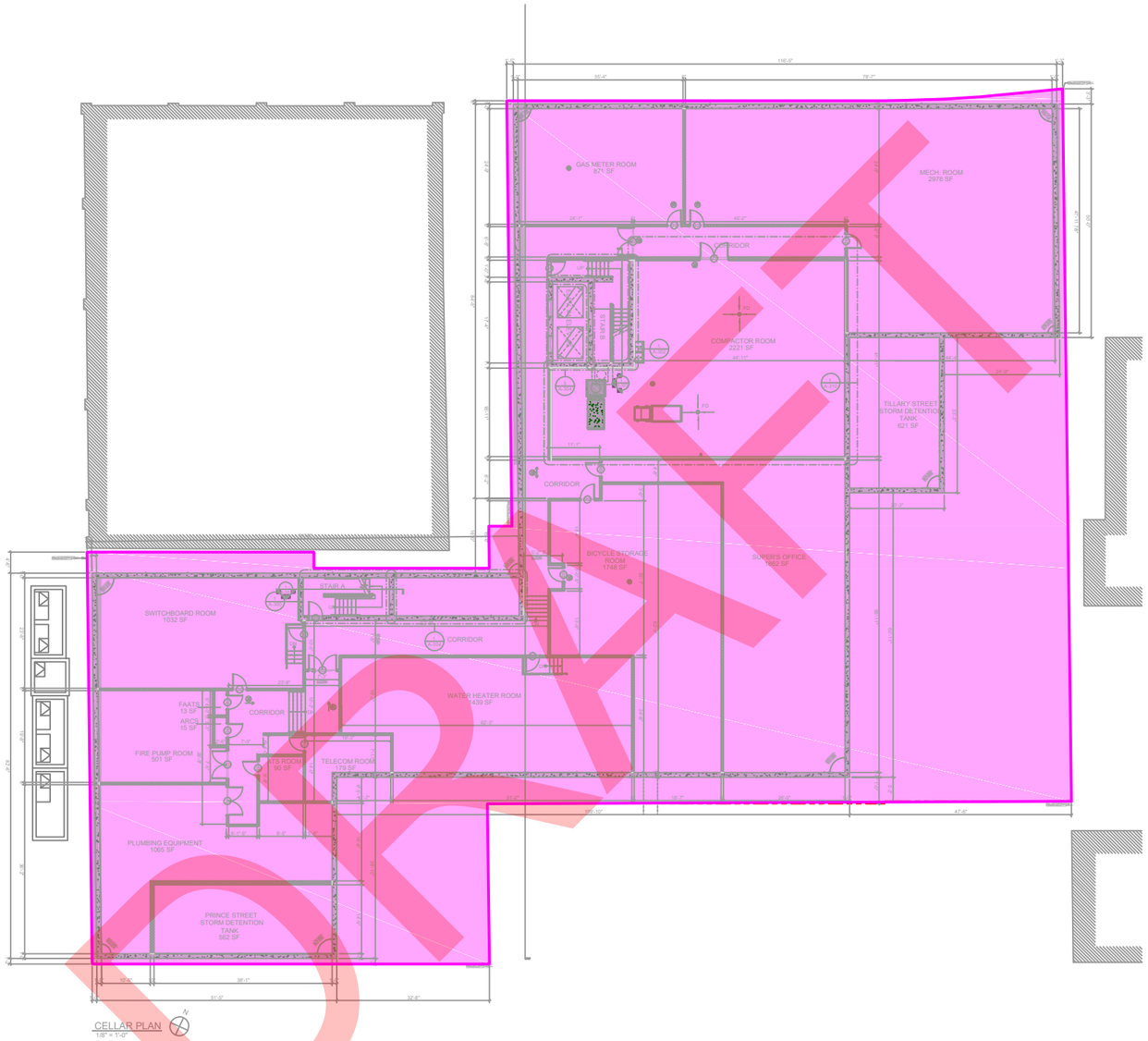
0' 20' 40'

SCALE: 1"=40'

vhb

FIGURE 5 - PROPOSED ENDPOINT SAMPLE LOCATION MAP
202 - 208 TILLARY STREET
BLOCK 2050, LOT 100 AND A PORTION OF LOT 1
BOROUGH OF BROOKLYN, KINGS COUNTY, NEW YORK

DATE:	JOB NO.:	SCALE:
6/10/21	21183.01	AS SHOWN



LEGEND

- PROPOSED BACKFILL AREA

REFERENCE DRAWING:
AUFGANG ARCHITECTS, SUFFERN, NY
A-100.00 PROPOSED DEVELOPMENT FOR 67 PRINCE STREET 11201
DATED: 1/30/19

0' 15' 30'

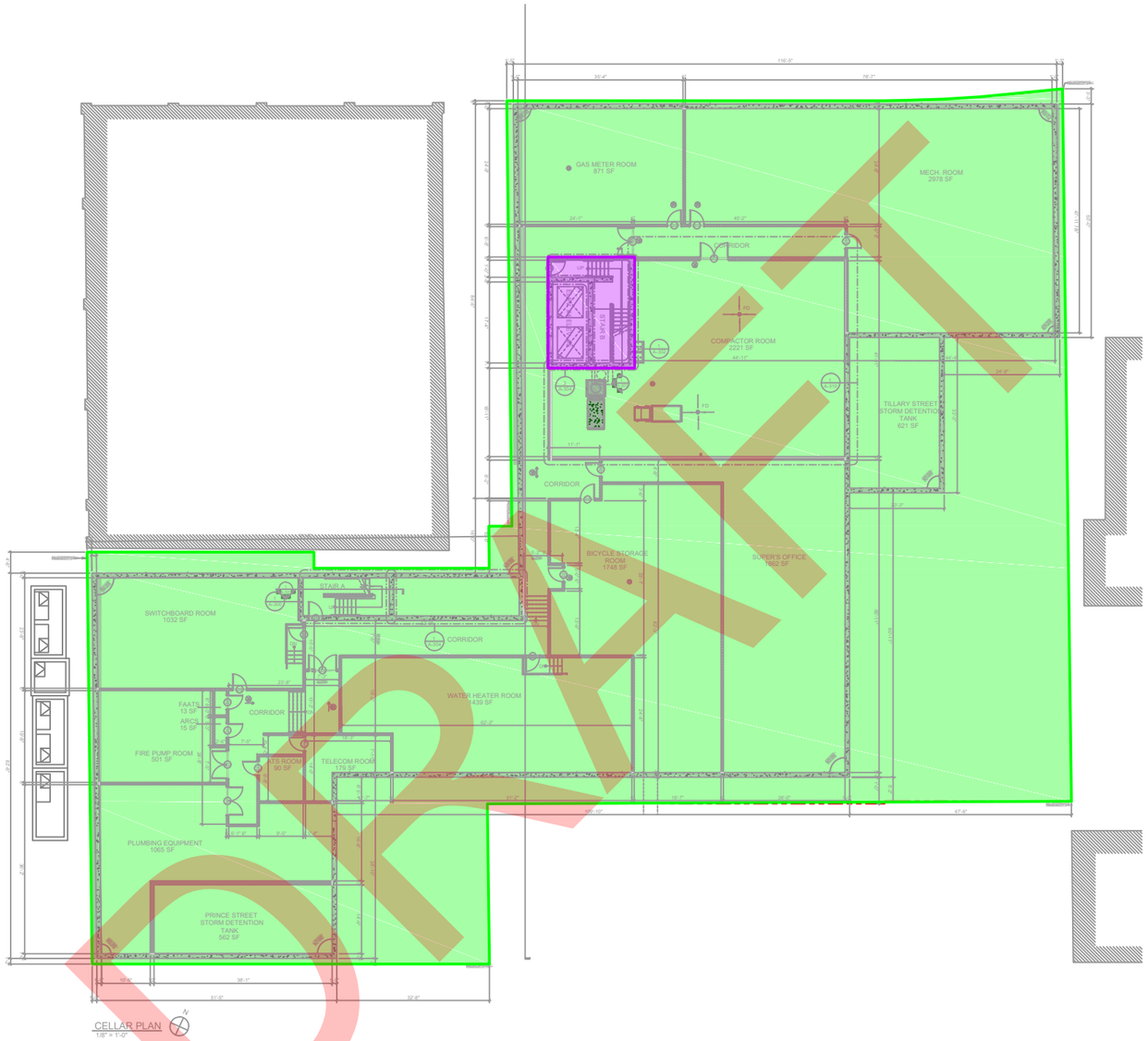
SCALE: 1"= 30'

vhb

FIGURE 6 - PROPOSED BACKFILL LOCATION MAP

202 - 208 TILLARY STREET
BLOCK 2050, LOT 100 AND A PORTION OF LOT 1
BOROUGH OF BROOKLYN, KINGS COUNTY, NEW YORK

DATE:	JOB NO.:	SCALE:
6/10/21	21183.01	1" = 30'



LEGEND
- VAPOR BARRIER
- VAPOR BARRIER/WATERPROOFING

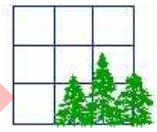
REFERENCE DRAWING:
AUFGANG ARCHITECTS, SUFFERN, NY
A-100.00 PROPOSED DEVELOPMENT FOR 67 PRINCE STREET 11201
DATED: 1/30/19

0' 15' 30'
SCALE: 1"= 30'

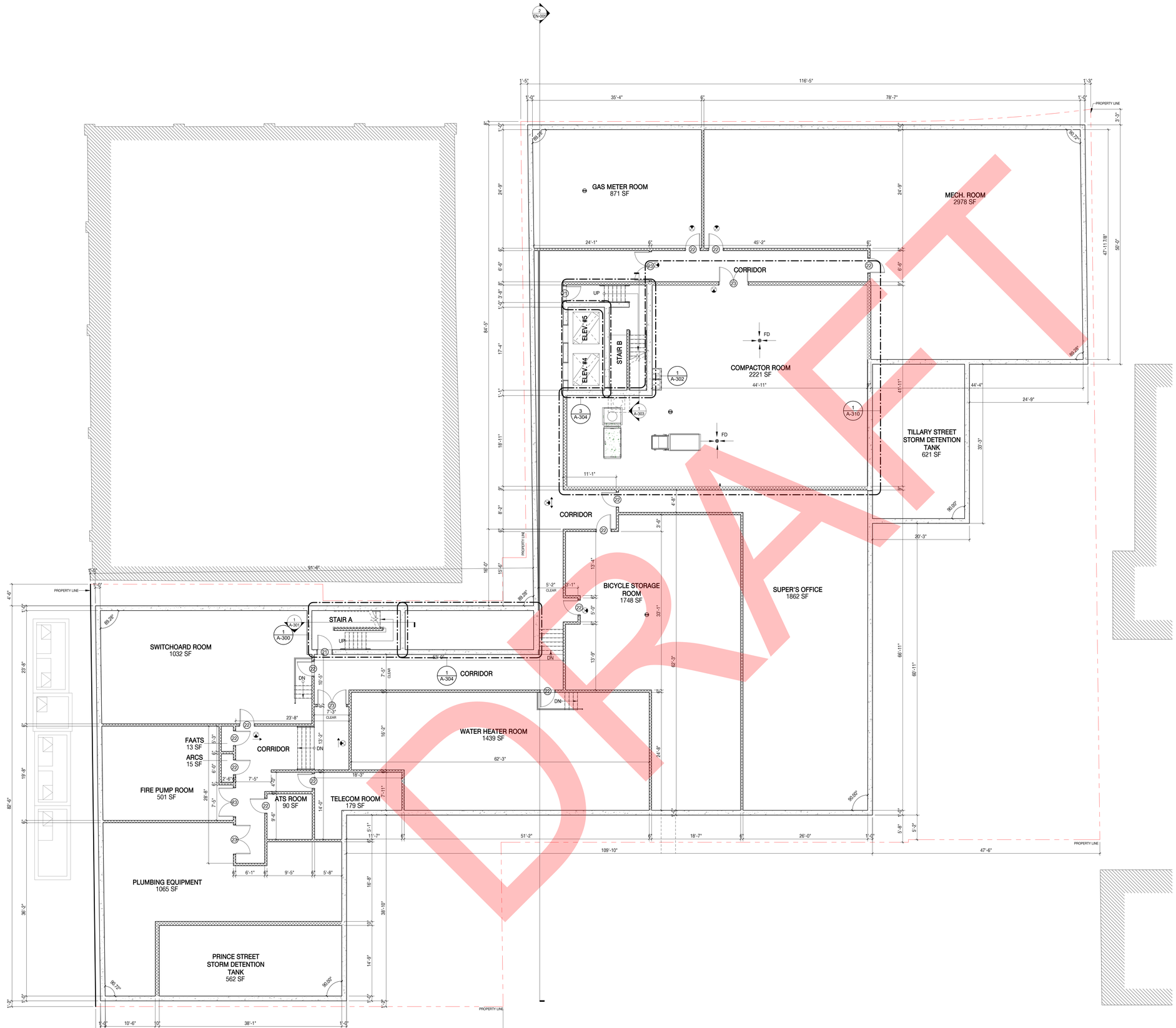
vhb

FIGURE 7 - COMPOSITE COVER SYSTEM LOCATION MAP &
CROSS SECTIONAL DETAIL MAP
202 - 208 TILLARY STREET
BLOCK 2050, LOT 100 AND A PORTION OF LOT 1
BOROUGH OF BROOKLYN, KINGS COUNTY, NEW YORK

DATE:	JOB NO.:	SCALE:
6/10/21	21183.01	1" = 30'



APPENDIX I



CELLAR PLAN
1/8" = 1'-0"

LEGEND:

- CONCRETE FOUNTAION WALL - SEE STRUCTURAL DWG'S.
- CONCRETE BLOCK WALL (CMU) - SEE PLANS FOR SIZE
- MASONARY VENEER W/ RIGID INSULATION
- EIFS FINISH
- GYPSUM BOARD PARTITION (GYP BD.) - SEE PLAN FOR SIZE
- DOOR & FRAME- SEE DOOR SCHEDULE -DWG A-600
- PARTITION - SEE WALL TYPE LEGEND
- WINDOW - SEE WINDOW SCHEUDLEDWG - A-600
- EXIT LIGHT & SIGN
- SMOKE / CARBON MONOXIDE DETECTOR
- SUSPENDED GYPSUM BOARD CEILING
- ELECTRIC HOUSE PANEL - SEE ELEC. DWGS.
- APARTMENT DESIGNATION #(FLOOR) XX (APARTMENT NUMBER)
- APARTMENT TYPE
  - I.U. = INCLUSIONARY UNIT
  - A = MOBILITY IMPARIED UNIT
  - H.V.I = HEARING & VISUALLY IMPARED UNIT

TYPE-A18 (I.U. | A | H.V.I.)
3BR
150 SF

"T" FLOOR TURNING SPACE

5-0" DIAMETER CLEAR FLOOR TURNING SPACE

30" X 48" CLEAR FLOOR SPACE

REMOVABLE KITCHEN BASE CABINET. 2'-6" WIDE X 2'-0" DEEP

GENERAL NOTES:
1. ALL PLAN DIMEMSIONS ARE TAKEN FINISH TO FINISH (U.O.N.)
2. FOR KITCEN AND TOILET ELEVATIONS SEE DWG'S A-5XX, A-5XX & A-5XX
3. G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN PLANK/ SLAB/ DECKING WITH MECHANICAL DWGS.
4. G.C. SHALL COORDINATE SIZE AND LOCATION OF ALL MASONARY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
5. BOTTOM OF DROPPED ARCH SHALL BE 6'-6" MIN A.F.F.
6. FOR ELECTRICAL OUTLETS, REFER TO LATEST ELEC. CODE FOR ALL REQUIREMNTS INCLUDING HEIGHT, SPACING, ETC.

WALL TYPE LEGEND

NOTE: G.C. SHALL SUBMIT SHOP DRAWINGS TO ARCHITECT FOR REVIEW INDICATING SIZE, GAUGE AND SPACING OF ALL METAL STUDS AND REQUIRED...

SF-1	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-2	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-3	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
(0) NON RATED	
0-1	TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-2	PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 5 5/8" METAL STUDS @ 16" O.C. (@ APARTMENT PANEL)
0-3	CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-3.1	SUPPLY & RETURN CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 1 1/2" METAL STUDS @ 16" O.C.
0-5	FURRING @ INTERIOR CAST IN PLACE CONCRETE / CMU - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
0-6	TYPICAL EXTERIOR WALL PARTITION - (1) LAYER 5/8" TYPE "X" GYP BD ONE SIDE AND (1) LAYER "EXTERIOR GRADE" GYP ON OTHER SIDE OF 6" METAL STUDS WITH 3 1/2" (R-15) BATT INSULATION (UNFACED)
(1) 1 HR RATED	
1-1	TENANT SEPARATION PARTION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE AND (2) LAYERS OF 5/8" TYPE "X" GYPMPSUM BOARD ON THE OTHER SIDE OF 3 5/8" GALV METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF PLANK / SLAB & SEAL TIGHT TO UNDERSIDE OF PLANK AND/ OR ROOF DECK W/ CONT. FIRESTOP SEALANT (GA FILE #WP-1052)(STC 50-54)
(2) 2 HR RATED	
2-5	2-HOUR RATED SHAFT WALL - (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. W/ (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE. W/ 1" MINERAL FIBER INSULATION IN CAVITY - SEAL TOP OF WALL TO CONC. PLANK/SL
(2) 2HR RATED	
2-1	2 HOUR RATED PARTITION - (2) LAYERS TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 5/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO PLANK/ SLAB/ DECKING W/ CONT. FIRESTOP SEALANT & FIRESAFING (GA FILE #WP-1522)(STC 55-59)
2-2	2 HOUR RATED CHASE WALL - (2) ROWS OF (2) LAYERS OF 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO SLAB/ PLANK/ DECKING WITH CONT. FIRESTOP SEALANT. SEAL ALL PENITRATIONS THRU CHASE WALL WITH FIRE SAFING INSULATION AND CONT. FIRESTOP SEALANT AS REQ. (UL #V422)(PROVIDE INSULATION AS REQ TO ACHIEVE A MIN STC RATING OF 50)
2-4	2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE BLOCK COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE PLANK OR PLANK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK. (UL#U906)
(3) 3HR RATED	
3-1	3 HR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 7/8" METALHAT CHANNELS @ 24" O.C. OVER 2 HR RATED CMU/ POURED IN PLACE CONCRERE. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF PLANK/ SLAB ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK/SLAB. (UL #U914) (PROVIDE STC RATING OF 50-54 AT COMPACTOR CHUTE ENCLOSURE ADJACENT TO DWELLING UNITS.

PROPOSED DEVLOPMENT FOR

67 PRINCE STREET11201

67 PRINCE STREET11201
+ 202 TILLARY STREET
NEW YORK, NY 12345

BLOCK: 2050 LOT: 100

ARCHITECT:
AUFGANG ARCHITECTS LLC
74 LAFAYETTE AVE, SUITE 301
SUFFERN, NY
INFO@AUFGANG.COM 845.368.0004

AUFGANG ARCHITECTS

DEVELOPER
YYY BROOKLYN NY LLC
15 VERBENA AVENUE
SUITE 200
FLORAL PARK, NY 11217
516-821-2003

STRUCTURAL ENGINEER:
McNAMARA • SALVIA
45 WEST 45th STREET
10th FLOOR
NEW YORK, NY 10036

MEP ENGINEER:
CONSENTINI ASSOCIATES
498 SEVENTH AVENUE
NEW YORK, NY 10018
212-615-3887

CIVIL ENGINEER:
BROOKER ENGINEERING PLLC
74 LAFAYETTE AVE
SUITE 501
SUFFERN, NY 10901
(845) 357-4411

INTIRIOR DESIGNERS:
CHRIS SHAO STUDIO LLC
636 BROADWAY
SUITE 1218
NEW YORK, NEW YORK 10012
212-529-1595

FACADE CONSULTANT
HATFIELD GROUP
285 WEST BROADWAY
SUITE 410
NEW YORK, NY 10013
212-260-1513

DATE	SUBMISSIONS / REVISIONS

SHEET TITLE:

CELLAR FLOOR PLAN

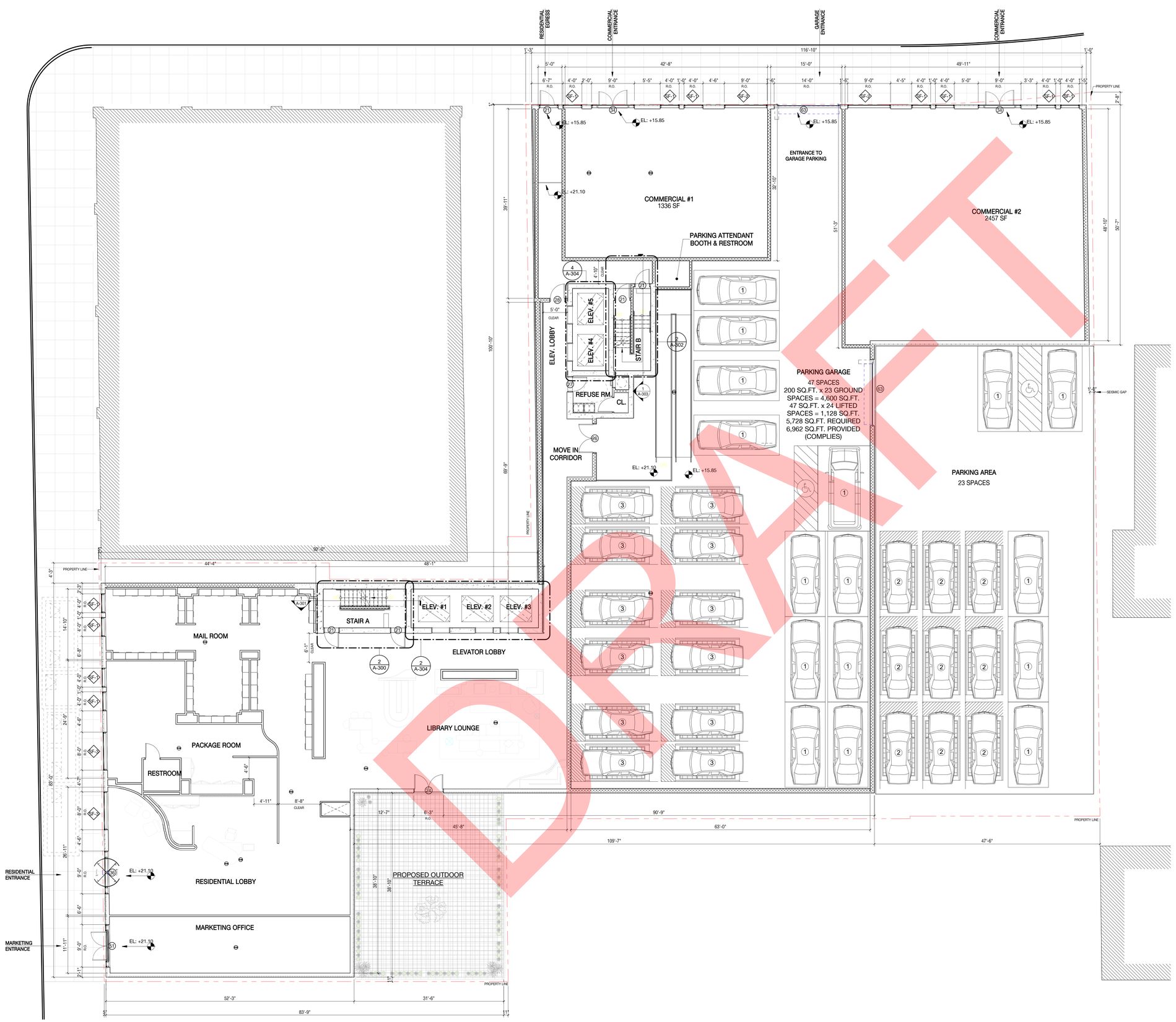
SEAL & SIGNATURE

ISSUE DATE:	PROJECT NO:
01/30/19	XXXX
DRAWN BY:	CHECKED BY:
Author	Checker
SCALE:	SHEET NO:
As indicated	OF

DRAWING NO:

A-100.00

NYC DOB NUMBER: 123456789



1ST FLOOR
1/8" = 1'-0"

PROPOSED DEVLOPMENT FOR

67 PRINCE STREET11201

67 PRINCE STREET11201
+ 202 TILLARY STREET
NEW YORK, NY 12345

BLOCK: 2050 LOT: 100

ARCHITECT:
AUFGANG ARCHITECTS LLC
74 LAFAYETTE AVE, SUITE 301
SUFFERN, NY
INFO@AUFGANG.COM 845.368.0004

DEVELOPER
YYY BROOKLYN NY LLC
15 VERBENA AVENUE
SUITE 200
FLORAL PARK, NY 11217
516-821-2003

STRUCTURAL ENGINEER:
McNAMARA • SALVIA
45 WEST 45th STREET
10th FLOOR
NEW YORK, NY 10036

MEP ENGINEER:
CONSENTINI ASSOCIATES
498 SEVENTH AVENUE
NEW YORK, NY 10018
212-615-3887

CIVIL ENGINEER:
BROOKER ENGINEERING PLLC
74 LAFAYETTE AVE
SUITE 501
SUFFERN, NY 10901
(845) 357-4411

INTIRIOR DESIGNERS:
CHRIS SHAO STUDIO LLC
636 BROADWAY
SUITE 1218
NEW YORK, NEW YORK 10012
212-529-1595

FACADE CONSULTANT
HATFIELD GROUP
285 WEST BROADWAY
SUITE 410
NEW YORK, NY 10013
212-260-1513

AUFGANG ARCHITECTS

LEGEND:

- CONCRETE FOUNTAION WALL - SEE STRUCTURAL DWG'S.
- CONCRETE BLOCK WALL (CMU) - SEE PLANS FOR SIZE
- MASONARY VENEER W/ RIGID INSULATION
- EIFS FINISH
- GYPSUM BOARD PARTITION (GYP BD.) - SEE PLAN FOR SIZE
- DOOR & FRAME- SEE DOOR SCHEDULE -DWG A-600
- PARTITION - SEE WALL TYPE LEGEND
- WINDOW - SEE WINDOW SCHEUDLEDWG - A-600
- EXIT LIGHT & SIGN
- SMOKE / CARBON MONOXIDE DETECTOR
- SUSPENDED GYPSUM BOARD CEILING
- ELECTRIC HOUSE PANEL - SEE ELEC. DWGS.
- APARTMENT DESIGNATION #(FLOOR) XX (APARTMENT NUMBER)
- APARTMENT TYPE
  - I.U. = INCLUSIONARY UNIT
  - A = MOBILITY IMPARIED UNIT
  - H.V.I = HEARING & VISUALLY IMPARED UNIT

I.U.	A	H.V.I.
TYPE-A18		
3BR		
150 SF		

"T" FLOOR TURNING SPACE

5-0" DIAMETER CLEAR FLOOR TURNING SPACE

30" X 48" CLEAR FLOOR SPACE

REMOVABLE KITCHEN BASE CABINET. 2'-6" WIDE X 2'-0" DEEP

GENERAL NOTES:
1. ALL PLAN DIMEMSIONS ARE TAKEN FINISH TO FINISH (U.O.N.)
2. FOR KITCEN AND TOILET ELEVATIONS SEE DWG'S A-5XX, A-5XX & A-5XX
3. G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN PLANK/ SLAB/ DECKING WITH MECHANICAL DWGS.
4. G.C. SHALL COORDINATE SIZE AND LOCATION OF ALL MASONARY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
5. BOTTOM OF DROPPED ARCH SHALL BE 6'-6" MIN A.F.F.
6. FOR ELECTRICAL OUTLETS, REFER TO LATEST ELEC. CODE FOR ALL REQUIREMNTS INCLUDING HEIGHT, SPACING, ETC.

WALL TYPE LEGEND

NOTE: G.C. SHALL SUBMIT SHOP DRAWINGS TO ARCHITECT FOR REVIEW INDICATING SIZE, GAUGE AND SPACING OF ALL METAL STUDS AND REQUIRED...

SF-1	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-2	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-3	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
(0) NON RATED	
0-1	TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-2	PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 5 5/8" METAL STUDS @ 16" O.C. (@ APARTMENT PANEL)
0-3	CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-3.1	SUPPLY & RETURN CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 1 1/2" METAL STUDS @ 16" O.C.
0-5	FURRING @ INTERIOR CAST IN PLACE CONCRETE / CMU - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
0-6	TYPICAL EXTERIOR WALL PARTITION - (1) LAYER 5/8" TYPE "X" GYP BD ONE SIDE AND (1) LAYER "EXTERIOR GRADE" GYP ON OTHER SIDE OF 6" METAL STUDS WITH 3 1/2" (R-15) BATT INSULATION (UNFACED)
(1) 1 HR RATED	
1-1	TENANT SEPARATION PARTION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE AND (2) LAYERS OF 5/8" TYPE "X" GYMPSUM BOARD ON THE OTHER SIDE OF 3 5/8" GALV METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION. EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF PLANK / SLAB & SEAL TIGHT TO UNDERSIDE OF PLANK AND/ OR ROOF DECK W/ CONT. FIRESTOP SEALANT (GA FILE #WP-1052)(STC 50-54)
(2) 2 HR RATED	
2-5	2-HOUR RATED SHAFT WALL - (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. W/ (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE. W/ 1" MINERAL FIBER INSULATION IN CAVITY - SEAL TOP OF WALL TO CONC. PLANK/SL
(2) 2HR RATED	
2-1	2 HOUR RATED PARTITION - (2) LAYERS TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 5/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO PLANK/ SLAB/ DECKING W/ CONT. FIRESTOP SEALANT & FIRESAFING (GA FILE #WP-1522)(STC 55-59)
2-2	2 HOUR RATED CHASE WALL - (2) ROWS OF (2) LAYERS OF 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO SLAB/ PLANK/ DECKING WITH CONT. FIRESTOP SEALANT. SEAL ALL PENITRATIONS THRU CHASE WALL WITH FIRE SAFING INSULATION AND CONT. FIRESTOP SEALANT AS REQ. (UL #V422)(PROVIDE INSULATION AS REQ TO ACHIEVE A MIN STC RATING OF 50)
2-4	2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE RENFORCING AT ALTERNATE BLOCK COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE PLANK OR PLANK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK. (UL#s905)
(3) 3HR RATED	
3-1	3 HR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 7/8" METALHAT CHANNELS @ 24" O.C. OVER 2 HR RATED CMU/ POURED IN PLACE CONCRBRE. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF PLANK/ SLAB ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK/SLAB. (UL #U914) (PROVIDE STC RATING OF 50-54 AT COMPACTOR CHUTE ENCLOSURE ADJACENT TO DWELLING UNITS.

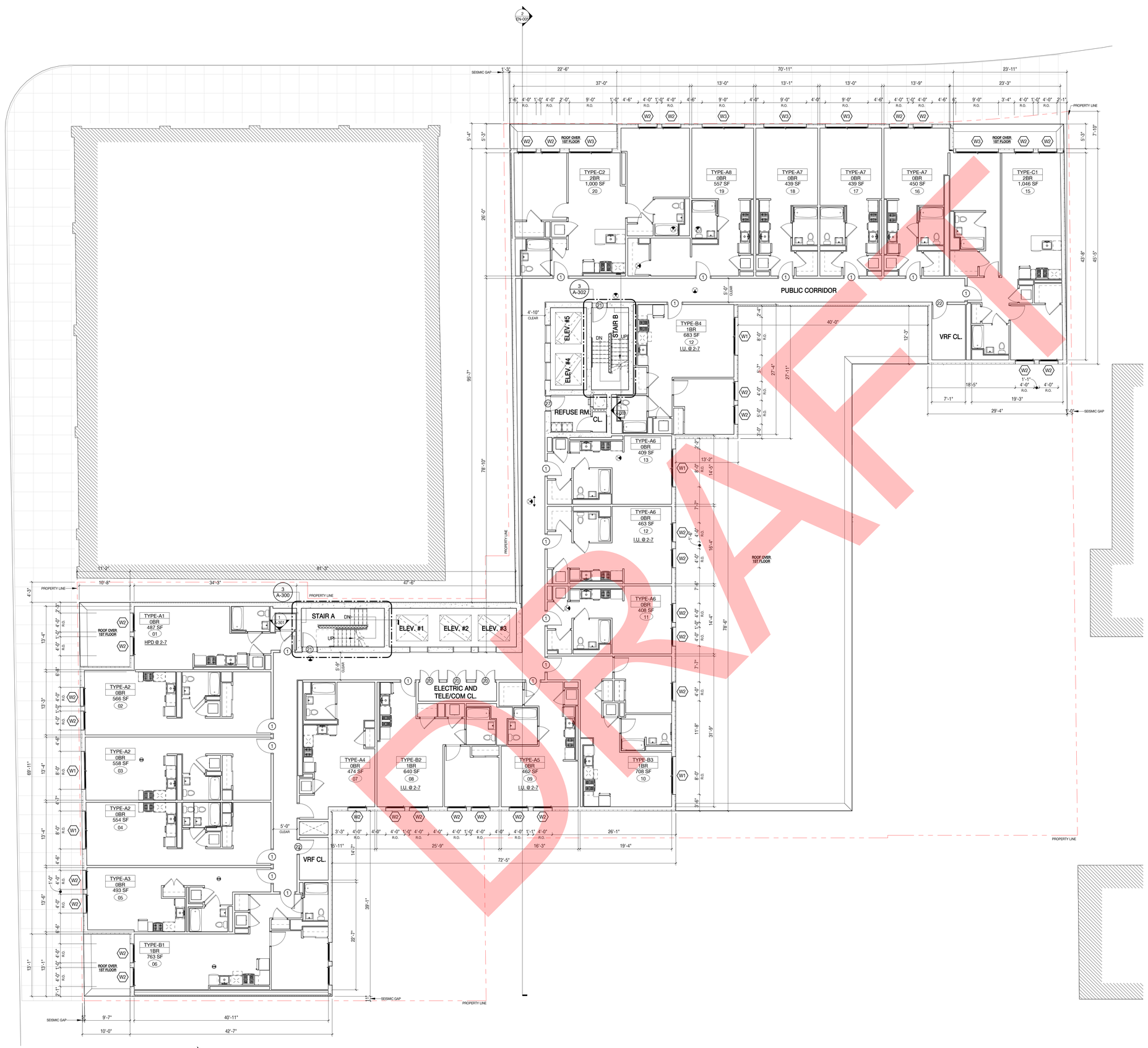
DATE	SUBMISSIONS / REVISIONS

SHEET TITLE:

1ST FLOOR PLAN

SEAL & SIGNATURE

ISSUE DATE: 04/05/21
PROJECT NO: XXXX
DRAWN BY: Author
CHECKED BY: Checker
SCALE: As indicated
SHEET NO: OF
DRAWING NO: A-101.00
NYC DOB NUMBER: 123456789



2ND FLOOR PLAN
1/8" = 1'-0"

LEGEND:

- CONCRETE FOUNTAION WALL - SEE STRUCTURAL DWG'S.
- CONCRETE BLOCK WALL (CMU) - SEE PLANS FOR SIZE
- MASONARY VENEER W/ RIGID INSULATION
- EIFS FINISH
- GYPSUM BOARD PARTITION (GYP BD.) - SEE PLAN FOR SIZE
- DOOR & FRAME- SEE DOOR SCHEDULE -DWG A-600
- X-X PARTITION - SEE WALL TYPE LEGEND
- WX WINDOW - SEE WINDOW SCHEUDLEDWG - A-600
- EXIT LIGHT & SIGN
- S SMOKE / CARBON MONOXIDE DETECTOR
- SUSPENDED GYPSUM BOARD CEILING
- ELECTRIC HOUSE PANEL - SEE ELEC. DWGS.
- #XX APARTMENT DESIGNATION #(FLOOR) XX (APARTMENT NUMBER)
- I.U. | A | H.V.I. TYPE-A18 3BR 150 SF — APARTMENT TYPE: I.U. = INCLUSIONARY UNIT; A = MOBILITY IMPARIED UNIT; H.V.I = HEARING & VISUALLY IMPARED UNIT

"T" FLOOR TURNING SPACE

5-0" DIAMETER CLEAR FLOOR TURNING SPACE

30" X 48" CLEAR FLOOR SPACE

REMOVABLE KITCHEN BASE CABINET. 2'-6" WIDE X 2'-0" DEEP

GENERAL NOTES:
1. ALL PLAN DIMEMSIONS ARE TAKEN FINISH TO FINISH (U.O.N.)
2. FOR KITCEN AND TOILET ELEVATIONS SEE DWG'S A-5XX, A-5XX & A-5XX
3. G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN PLANK/ SLAB/ DECKING WITH MECHANICAL DWGS.
4. G.C. SHALL COORDINATE SIZE AND LOCATION OF ALL MASONARY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
5. BOTTOM OF DROPPED ARCH SHALL BE 6'-6" MIN A.F.F.
6. FOR ELECTRICAL OUTLETS, REFER TO LATEST ELEC. CODE FOR ALL REQUIREMNTS INCLUDING HEIGHT, SPACING, ETC.

WALL TYPE LEGEND

NOTE: G.C. SHALL SUBMIT SHOP DRAWINGS TO ARCHITECT FOR REVIEW INDICATING SIZE, GAUGE AND SPACING OF ALL METAL STUDS AND REQUIRED...

SF-1	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-2	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-3	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
(0) NON RATED	
0-1	TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-2	PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 5 5/8" METAL STUDS @ 16" O.C. (@ APARTMENT PANEL)
0-3	CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-3.1	SUPPLY & RETURN CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 1 1/2" METAL STUDS @ 16" O.C.
0-5	FURRING @ INTERIOR CAST IN PLACE CONCRETE / CMU - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
0-6	TYPICAL EXTERIOR WALL PARTITION - (1) LAYER 5/8" TYPE "X" GYP BD ONE SIDE AND (1) LAYER "EXTERIOR GRADE" GYP ON OTHER SIDE OF 6" METAL STUDS WITH 3 1/2" (R-15) BATT INSULLATION (UNFACED)
(1) 1 HR RATED	
1-1	TENANT SEPARATION PARTION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE AND (2) LAYERS OF 5/8" TYPE "X" GYMPSUM BOARD ON THE OTHER SIDE OF 3 5/8" GALV METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION. EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF PLANK / SLAB & SEAL TIGHT TO UNDERSIDE OF PLANK AND/ OR ROOF DECK W/ CONT. FIRESTOP SEALANT (GA FILE #WP-1052)(STC 50-54)
(2) 2 HR RATED	
2-5	2-HOUR RATED SHAFT WALL - (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. W/ (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE. W/ 1" MINERAL FIBER INSULATION IN CAVITY - SEAL TOP OF WALL TO CONC. PLANK/SL
(2) 2HR RATED	
2-1	2 HOUR RATED PARTITION - (2) LAYERS TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 5/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO PLANK/ SLAB/ DECKING W/ CONT. FIRESTOP SEALANT & FIRESAFING (GA FILE #WP-1522)(STC 55-59)
2-2	2 HOUR RATED CHASE WALL - (2) ROWS OF (2) LAYERS OF 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO SLAB/ PLANK/ DECKING WITH CONT. FIRESTOP SEALANT. SEAL ALL PENITRATIONS THRU CHASE WALL WITH FIRE SAFING INSULATION AND CONT. FIRESTOP SEALANT AS REQ. (UL #V422)(PROVIDE INSULATION AS REQ TO ACHIEVE A MIN STC RATING OF 50)
2-4	2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE RENFORCING AT ALTERNATE BLOCK COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE PLANK OR PLANK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK. (UL#u906)
(3) 3HR RATED	
3-1	3 HR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 7/8" METALHAT CHANNELS @ 24" O.C. OVER 2 HR RATED CMU/ POURED IN PLACE CONCRERE. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF PLANK/ SLAB ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK/SLAB. (UL #U914) (PROVIDE STC RATING OF 50-54 AT COMPACTOR CHUTE ENCLOSURE ADJACENT TO DWELLING UNITS.

PROPOSED DEVLOPMENT FOR

67 PRINCE STREET11201

67 PRINCE STREET11201
+ 202 TILLARY STREET
NEW YORK, NY 12345

BLOCK: 2050 LOT: 100

ARCHITECT:
AUFGANG ARCHITECTS LLC
74 LAFAYETTE AVE, SUITE 301
SUFFERN, NY
INFO@AUFGANG.COM 845.368.0004

AUFGANG ARCHITECTS

DEVELOPER
YYY BROOKLYN NY LLC
15 VERBENA AVENUE
SUITE 200
FLORAL PARK, NY 11217
516-821-2003

STRUCTURAL ENGINEER:
McNAMARA • SALVIA
45 WEST 45th STREET
10th FLOOR
NEW YORK, NY 10036

MEP ENGINEER:
CONSENTINI ASSOCIATES
498 SEVENTH AVENUE
NEW YORK, NY 10018
212-615-3887

CIVIL ENGINEER:
BROOKER ENGINEERING PLLC
74 LAFAYETTE AVE
SUITE 501
SUFFERN, NY 10901
(845) 357-4411

INTIRIOR DESIGNERS:
CHRIS SHAO STUDIO LLC
636 BROADWAY
SUITE 1218
NEW YORK, NEW YORK 10012
212-529-1595

FACADE CONSULTANT
HATFIELD GROUP
285 WEST BROADWAY
SUITE 410
NEW YORK, NY 10013
212-260-1513

DATE	SUBMISSIONS / REVISIONS

SHEET TITLE:

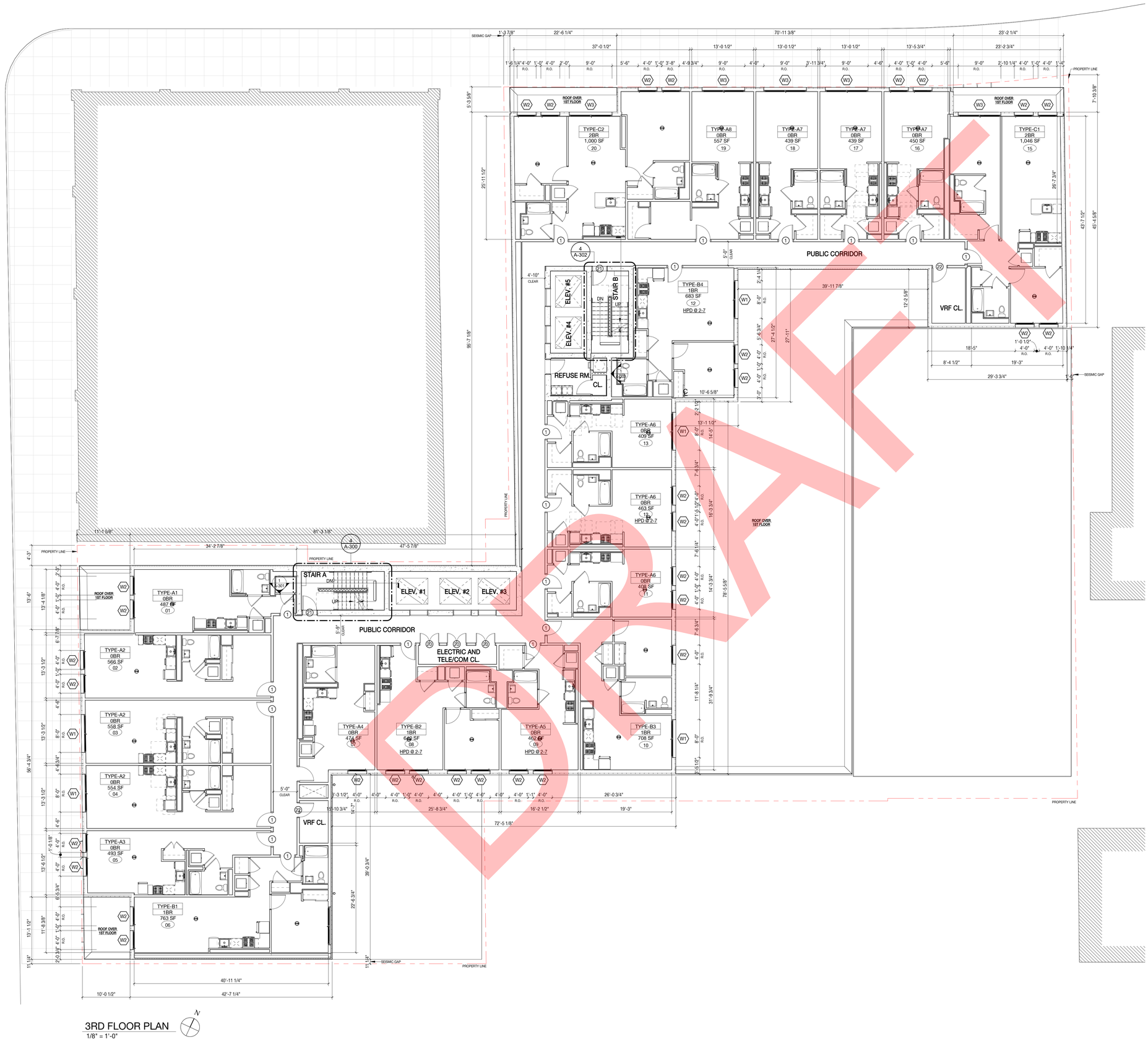
2ND FLOOR PLAN

SEAL & SIGNATURE

ISSUE DATE:	PROJECT NO:
04/05/21	XXXX
DRAWN BY:	CHECKED BY:
Author	Checker
SCALE:	SHEET NO:
As indicated	OF

DRAWING NO: **A-102.00**

NYC DOB NUMBER: 123456789



3RD FLOOR PLAN
1/8" = 1'-0"

LEGEND:

- CONCRETE FOUNTAION WALL - SEE STRUCTURAL DWG'S.
- CONCRETE BLOCK WALL (CMU) - SEE PLANS FOR SIZE
- MASONARY VENEER W/ RIGID INSULATION
- EIFS FINISH
- GYPSUM BOARD PARTITION (GYP BD.) - SEE PLAN FOR SIZE
- DOOR & FRAME- SEE DOOR SCHEDULE -DWG A-600
- PARTITION - SEE WALL TYPE LEGEND
- WINDOW - SEE WINDOW SCHEUDLEDWG - A-600
- EXIT LIGHT & SIGN
- SMOKE / CARBON MONOXIDE DETECTOR
- SUSPENDED GYPSUM BOARD CEILING
- ELECTRIC HOUSE PANEL - SEE ELEC. DWGS.
- APARTMENT DESIGNATION #(FLOOR) XX (APARTMENT NUMBER)
- APARTMENT TYPE
  - I.U. = INCLUSIONARY UNIT
  - A = MOBILITY IMPARIED UNIT
  - H.V.I = HEARING & VISUALLY IMPARED UNIT

I.U. | A | H.V.I.
TYPE-A18
3BR
150 SF

"T" FLOOR TURNING SPACE

5'-0" DIAMETER CLEAR FLOOR TURNING SPACE

30" X 48" CLEAR FLOOR SPACE

REMOVABLE KITCHEN BASE CABINET. 2'-6" WIDE X 2'-0" DEEP

GENERAL NOTES:
1. ALL PLAN DIMEMSIONS ARE TAKEN FINISH TO FINISH (U.O.N.)
2. FOR KITCEN AND TOILET ELEVATIONS SEE DWG'S A-5XX, A-5XX & A-5XX
3. G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN PLANK/ SLAB/ DECKING WITH MECHANICAL DWGS.
4. G.C. SHALL COORDINATE SIZE AND LOCATION OF ALL MASONARY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
5. BOTTOM OF DROPPED ARCH SHALL BE 6'-6" MIN A.F.F.
6. FOR ELECTRICAL OUTLETS, REFER TO LATEST ELEC. CODE FOR ALL REQUIREMNTS INCLUDING HEIGHT, SPACING, ETC.

WALL TYPE LEGEND

NOTE: G.C. SHALL SUBMIT SHOP DRAWINGS TO ARCHITECT FOR REVIEW INDICATING SIZE, GAUGE AND SPACING OF ALL METAL STUDS AND REQUIRED...

SF-1	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-2	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-3	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
(0) NON RATED	
0-1	TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-2	PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 5 5/8" METAL STUDS @ 16" O.C. (@ APARTMENT PANEL)
0-3	CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-3.1	SUPPLY & RETURN CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 1 1/2" METAL STUDS @ 16" O.C.
0-5	FURRING @ INTERIOR CAST IN PLACE CONCRETE / CMU - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
0-6	TYPICAL EXTERIOR WALL PARTITION - (1) LAYER 5/8" TYPE "X" GYP BD ONE SIDE AND (1) LAYER "EXTERIOR GRADE" GYP ON OTHER SIDE OF 6" METAL STUDS WITH 3 1/2" (R-15) BATT INSULLATION (UNFACED)
(1) 1 HR RATED	
1-1	TENANT SEPARATION PARTION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE AND (2) LAYERS OF 5/8" TYPE "X" GYMPSUM BOARD ON THE OTHER SIDE OF 3 5/8" GALV METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION. EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF PLANK / SLAB & SEAL TIGHT TO UNDERSIDE OF PLANK AND/ OR ROOF DECK W/ CONT. FIRESTOP SEALANT (GA FILE #WP-1052)(STC 50-54)
(2) 2 HR RATED	
2-5	2-HOUR RATED SHAFT WALL - (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. W/ (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE. W/ 1" MINERAL FIBER INSULATION IN CAVITY - SEAL TOP OF WALL TO CONC. PLANK/SL
(2) 2HR RATED	
2-1	2 HOUR RATED PARTITION - (2) LAYERS TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 5/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO PLANK/ SLAB/ DECKING W/ CONT. FIRESTOP SEALANT & FIRESAFING (GA FILE #WP-1522)(STC 55-59)
2-2	2 HOUR RATED CHASE WALL - (2) ROWS OF (2) LAYERS OF 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO SLAB/ PLANK/ DECKING WITH CONT. FIRESTOP SEALANT. SEAL ALL PENITRATIONS THRU CHASE WALL WITH FIRE SAFING INSULATION AND CONT. FIRESTOP SEALANT AS REQ. (UL #V422)(PROVIDE INSULATION AS REQ TO ACHIEVE A MIN STC RATING OF 50)
2-4	2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE RENFORCING AT ALTERNATE BLOCK COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE PLANK OR PLANK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK. (UL#u906)
(3) 3HR RATED	
3-1	3 HR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 7/8" METALHAT CHANNELS @ 24" O.C. OVER 2 HR RATED CMU/ POURED IN PLACE CONCRERE. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF PLANK/ SLAB ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK/SLAB. (UL #U914) (PROVIDE STC RATING OF 50-54 AT COMPACTOR CHUTE ENCLOSURE ADJACENT TO DWELLING UNITS.

PROPOSED DEVLOPMENT FOR

67 PRINCE STREET11201

67 PRINCE STREET11201
+ 202 TILLARY STREET
NEW YORK, NY 12345

BLOCK: 2050 LOT: 100

ARCHITECT:
AUFGANG ARCHITECTS LLC
74 LAFAYETTE AVE, SUITE 301
SUFFERN, NY
INFO@AUFGANG.COM 845.368.0004

AUFGANG ARCHITECTS

DEVELOPER
YYY BROOKLYN NY LLC
15 VERBENA AVENUE
SUITE 200
FLORAL PARK, NY 11217
516-821-2003

STRUCTURAL ENGINEER:
McNAMARA • SALVIA
45 WEST 45th STREET
10th FLOOR
NEW YORK, NY 10036

MEP ENGINEER:
CONSENTINI ASSOCIATES
498 SEVENTH AVENUE
NEW YORK, NY 10018
212-615-3887

CIVIL ENGINEER:
BROOKER ENGINEERING PLLC
74 LAFAYETTE AVE
SUITE 501
SUFFERN, NY 10901
(845) 357-4411

INTIRIOR DESIGNERS:
CHRIS SHAO STUDIO LLC
636 BROADWAY
SUITE 1218
NEW YORK, NEW YORK 10012
212-529-1595

FACADE CONSULTANT
HATFIELD GROUP
285 WEST BROADWAY
SUITE 410
NEW YORK, NY 10013
212-260-1513

DATE	SUBMISSIONS / REVISIONS

SHEET TITLE:

3RD THRU 7TH FLOOR PLAN

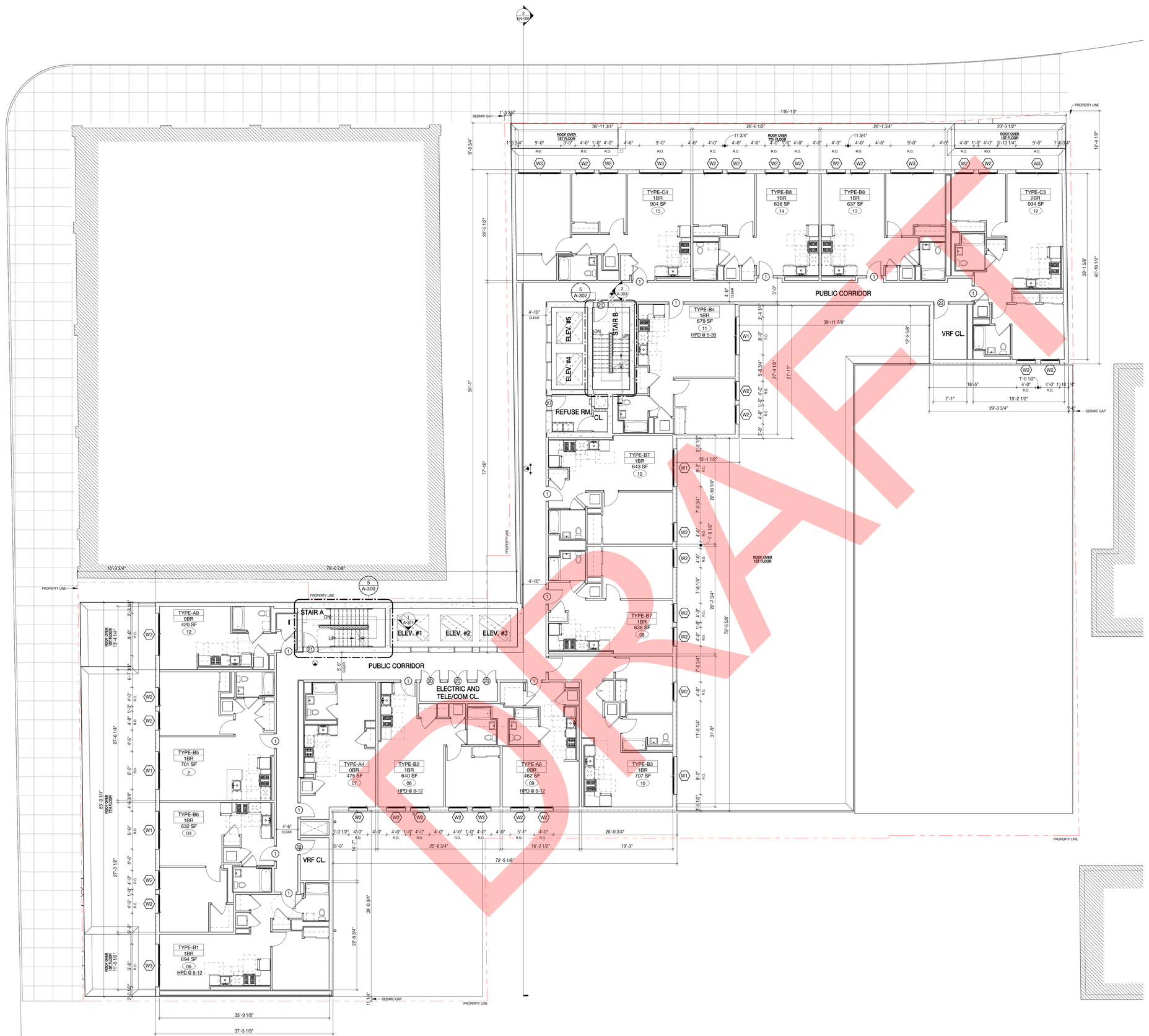
SEAL & SIGNATURE

ISSUE DATE:	PROJECT NO:
05/07/20	XXXX
DRAWN BY:	CHECKED BY:
Author	Checker
SCALE:	SHEET NO:
As indicated	OF

DRAWING NO:

A-103.00

NYC DOB NUMBER: 123456789



8TH FLOOR PLAN
1/8" = 1'-0"

LEGEND:

- CONCRETE FOUNTAION WALL - SEE STRUCTURAL DWG'S.
- CONCRETE BLOCK WALL (CMU) - SEE PLANS FOR SIZE
- MASONARY VENEER W/ RIGID INSULATION
- EIFS FINISH
- GYPSUM BOARD PARTITION (GYP BD.) - SEE PLAN FOR SIZE
- DOOR & FRAME- SEE DOOR SCHEDULE -DWG A-600
- PARTITION - SEE WALL TYPE LEGEND
- WINDOW - SEE WINDOW SCHEUDLEDWG - A-600
- EXIT LIGHT & SIGN
- SMOKE / CARBON MONOXIDE DETECTOR
- SUSPENDED GYPSUM BOARD CEILING
- ELECTRIC HOUSE PANEL - SEE ELEC. DWGS.
- APARTMENT DESIGNATION #(FLOOR) XX (APARTMENT NUMBER)
- APARTMENT TYPE
  - I.U. = INCLUSIONARY UNIT
  - A = MOBILITY IMPARIED UNIT
  - H.V.I = HEARING & VISUALLY IMPARED UNIT

Example: I.U. | A | H.V.I. — TYPE-A18 — 3BR — 150 SF

"T" FLOOR TURNING SPACE

5-0" DIAMETER CLEAR FLOOR TURNING SPACE

30" X 48" CLEAR FLOOR SPACE

REMOVABLE KITCHEN BASE CABINET. 2'-6" WIDE X 2'-0" DEEP

GENERAL NOTES:
1. ALL PLAN DIMEMSIONS ARE TAKEN FINISH TO FINISH (U.O.N.)
2. FOR KITCEN AND TOILET ELEVATIONS SEE DWG'S A-5XX, A-5XX & A-5XX
3. G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN PLANK/ SLAB/ DECKING WITH MECHANICAL DWGS.
4. G.C. SHALL COORDINATE SIZE AND LOCATION OF ALL MASONARY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
5. BOTTOM OF DROPPED ARCH SHALL BE 6'-6" MIN A.F.F.
6. FOR ELECTRICAL OUTLETS, REFER TO LATEST ELEC. CODE FOR ALL REQUIREMNTS INCLUDING HEIGHT, SPACING, ETC.

WALL TYPE LEGEND

NOTE: G.C. SHALL SUBMIT SHOP DRAWINGS TO ARCHITECT FOR REVIEW INDICATING SIZE, GAUGE AND SPACING OF ALL METAL STUDS AND REQUIRED...

SF-1	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-2	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-3	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
(0) NON RATED	
0-1	TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-2	PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 5 5/8" METAL STUDS @ 16" O.C. (@ APARTMENT PANEL)
0-3	CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-3.1	SUPPLY & RETURN CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 1 1/2" METAL STUDS @ 16" O.C.
0-5	FURRING @ INTERIOR CAST IN PLACE CONCRETE / CMU - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
0-6	TYPICAL EXTERIOR WALL PARTITION - (1) LAYER 5/8" TYPE "X" GYP BD ONE SIDE AND (1) LAYER "EXTERIOR GRADE" GYP ON OTHER SIDE OF 6" METAL STUDS WITH 3 1/2" (R-15) BATT INSULATION (UNFACED)
(1) 1 HR RATED	
1-1	TENANT SEPARATION PARTION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE AND (2) LAYERS OF 5/8" TYPE "X" GYMPSUM BOARD ON THE OTHER SIDE OF 3 5/8" GALV METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF PLANK / SLAB & SEAL TIGHT TO UNDERSIDE OF PLANK AND/ OR ROOF DECK W/ CONT. FIRESTOP SEALANT (GA FILE #WP-1052)(STC 50-54)
(2) 2 HR RATED	
2-5	2-HOUR RATED SHAFT WALL - (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. W/ (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE. W/ 1" MINERAL FIBER INSULATION IN CAVITY - SEAL TOP OF WALL TO CONC. PLANK/SL
(2) 2HR RATED	
2-1	2 HOUR RATED PARTITION - (2) LAYERS TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 5/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO PLANK/ SLAB/ DECKING W/ CONT. FIRESTOP SEALANT & FIRESAFING (GA FILE #WP-1522)(STC 55-59)
2-2	2 HOUR RATED CHASE WALL - (2) ROWS OF (2) LAYERS OF 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO SLAB/ PLANK/ DECKING WITH CONT. FIRESTOP SEALANT. SEAL ALL PENITRATIONS THRU CHASE WALL WITH FIRE SAFING INSULATION AND CONT. FIRESTOP SEALANT AS REQ. (UL #V422)(PROVIDE INSULATION AS REQ TO ACHIEVE A MIN STC RATING OF 50)
2-4	2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE BLOCK COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE PLANK OR PLANK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK. (ULR#906)
(3) 3HR RATED	
3-1	3 HR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 7/8" METAL/HAT CHANNELS @ 24" O.C. OVER 2 HR RATED CMU/ POURED IN PLACE CONCRERE. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF PLANK/ SLAB ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK/SLAB. (UL #U914) (PROVIDE STC RATING OF 50-54 AT COMPACTOR CHUTE ENCLOSURE ADJACENT TO DWELLING UNITS.

PROPOSED DEVLOPMENT FOR

67 PRINCE STREET11201

67 PRINCE STREET11201
+ 202 TILLARY STREET
NEW YORK, NY 12345

BLOCK: 2050 LOT: 100

ARCHITECT:
AUFGANG ARCHITECTS LLC
74 LAFAYETTE AVE, SUITE 301
SUFFERN, NY
INFO@AUFGANG.COM 845.368.0004

DEVELOPER
YYY BROOKLYN NY LLC
15 VERBENA AVENUE
SUITE 200
FLORAL PARK, NY 11217
516-821-2003

STRUCTURAL ENGINEER:
McNAMARA • SALVIA
45 WEST 45th STREET
10th FLOOR
NEW YORK, NY 10036

MEP ENGINEER:
CONSENTINI ASSOCIATES
498 SEVENTH AVENUE
NEW YORK, NY 10018
212-615-3887

CIVIL ENGINEER:
BROOKER ENGINEERING PLLC
74 LAFAYETTE AVE
SUITE 501
SUFFERN, NY 10901
(845) 357-4411

INTIRIOR DESIGNERS:
CHRIS SHAO STUDIO LLC
636 BROADWAY
SUITE 1218
NEW YORK, NEW YORK 10012
212-529-1595

FACADE CONSULTANT
HATFIELD GROUP
285 WEST BROADWAY
SUITE 410
NEW YORK, NY 10013
212-260-1513

AUFGANG ARCHITECTS

DATE	SUBMISSIONS / REVISIONS

SHEET TITLE:

8TH FLOOR PLAN

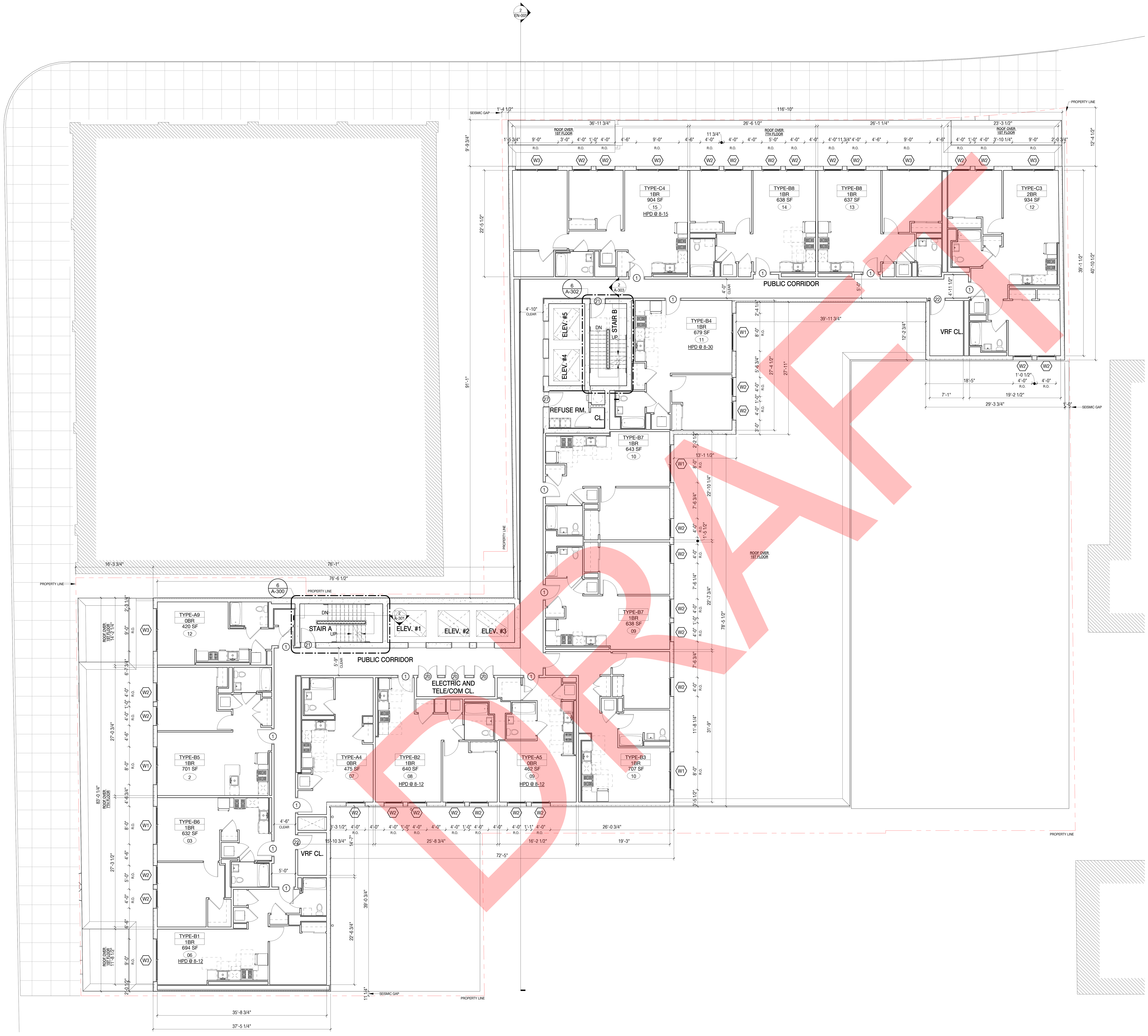
SEAL & SIGNATURE

ISSUE DATE:	PROJECT NO:
04/05/21	XXXX
DRAWN BY:	CHECKED BY:
Author	Checker
SCALE:	SHEET NO:
As indicated	OF

DRAWING NO:

A-104.00

NYC DOB NUMBER: 123456789



9TH THRU 30TH FLOORS PLAN
1/8" = 1'-0"

LEGEND:

- CONCRETE FOUNTAION WALL - SEE STRUCTURAL DWG'S.
- CONCRETE BLOCK WALL (CMU) - SEE PLANS FOR SIZE
- MASONARY VENEER W/ RIGID INSULATION
- EIFS FINISH
- GYPSUM BOARD PARTITION (GYP BD.) - SEE PLAN FOR SIZE
- (X) DOOR & FRAME- SEE DOOR SCHEDULE -DWG A-600
- (X-X) PARTITION - SEE WALL TYPE LEGEND
- (WX) WINDOW - SEE WINDOW SCHEUDLEDWG - A-600
- EXIT LIGHT & SIGN
- SMOKE / CARBON MONOXIDE DETECTOR
- SUSPENDED GYPSUM BOARD CEILING
- ELECTRIC HOUSE PANEL - SEE ELEC. DWGS.
- (#XX) APARTMENT DESIGNATION #(FLOOR) XX (APARTMENT NUMBER)
- I.U. | A | H.V.I. TYPE-A18 3BR 150 SF — APARTMENT TYPE
  - I.U. = INCLUSIONARY UNIT
  - A = MOBILITY IMPARIED UNIT
  - H.V.I = HEARING & VISUALLY IMPARED UNIT

"T" FLOOR TURNING SPACE

5-0" DIAMETER CLEAR FLOOR TURNING SPACE

30" X 48" CLEAR FLOOR SPACE

REMOVABLE KITCHEN BASE CABINET. 2'-6" WIDE X 2'-0" DEEP

GENERAL NOTES:

1. ALL PLAN DIMEMSIONS ARE TAKEN FINISH TO FINISH (U.O.N.)
2. FOR KITCEN AND TOILET ELEVATIONS SEE DWG'S A-5XX, A-5XX & A-5XX
3. G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN PLANK/ SLAB/ DECKING WITH MECHANICAL DWGS.
4. G.C. SHALL COORDINATE SIZE AND LOCATION OF ALL MASONARY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
5. BOTTOM OF DROPPED ARCH SHALL BE 6'-6" MIN A.F.F.
6. FOR ELECTRICAL OUTLETS, REFER TO LATEST ELEC. CODE FOR ALL REQUIREMNTS INCLUDING HEIGHT, SPACING, ETC.

WALL TYPE LEGEND

NOTE: G.C. SHALL SUBMIT SHOP DRAWINGS TO ARCHITECT FOR REVIEW INDICATING SIZE, GAUGE AND SPACING OF ALL METAL STUDS AND REQUIRED...

SF-1	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-2	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-3	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
(0) NON RATED	
0-1	TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-2	PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 5 5/8" METAL STUDS @ 16" O.C. (@ APARTMENT PANEL)
0-3	CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-3.1	SUPPLY & RETURN CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 1 1/2" METAL STUDS @ 16" O.C.
0-5	FURRING @ INTERIOR CAST IN PLACE CONCRETE / CMU - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
0-6	TYPICAL EXTERIOR WALL PARTITION - (1) LAYER 5/8" TYPE "X" GYP BD ONE SIDE AND (1) LAYER "EXTERIOR GRADE" GYP ON OTHER SIDE OF 6" METAL STUDS WITH 3 1/2" (R-15) BATT INSULLATION (UNFACED)
(1) 1 HR RATED	
1-1	TENANT SEPARATION PARTION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE AND (2) LAYERS OF 5/8" TYPE "X" GYMPSUM BOARD ON THE OTHER SIDE OF 3 5/8" GALV METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION. EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF PLANK / SLAB & SEAL TIGHT TO UNDERSIDE OF PLANK AND/ OR ROOF DECK W/ CONT. FIRESTOP SEALANT (GA FILE #WP-1052)(STC 50-54)
(2) 2 HR RATED	
2-5	2-HOUR RATED SHAFT WALL - (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. W/ (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE. W/ 1" MINERAL FIBER INSULATION IN CAVITY - SEAL TOP OF WALL TO CONC. PLANK/SL
(2) 2HR RATED	
2-1	2 HOUR RATED PARTITION - (2) LAYERS TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 5/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO PLANK/ SLAB/ DECKING W/ CONT. FIRESTOP SEALANT & FIRESAFING (GA FILE #WP-1522)(STC 55-59)
2-2	2 HOUR RATED CHASE WALL - (2) ROWS OF (2) LAYERS OF 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO SLAB/ PLANK/ DECKING WITH CONT. FIRESTOP SEALANT. SEAL ALL PENITRATIONS THRU CHASE WALL WITH FIRE SAFING INSULATION AND CONT. FIRESTOP SEALANT AS REQ. (UL #V422)(PROVIDE INSULATION AS REQ TO ACHIEVE A MIN STC RATING OF 50)
2-4	2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE RENFORCING AT ALTERNATE BLOCK COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE PLANK OR PLANK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK. (UL#u906)
(3) 3HR RATED	
3-1	3 HR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 7/8" METALHAT CHANNELS @ 24" O.C. OVER 2 HR RATED CMU/ POURED IN PLACE CONCRERE. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF PLANK/ SLAB ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK/SLAB. (UL #U914) (PROVIDE STC RATING OF 50-54 AT COMPACTOR CHUTE ENCLOSURE ADJACENT TO DWELLING UNITS.

PROPOSED DEVLOPMENT FOR

67 PRINCE STREET11201

67 PRINCE STREET11201
+ 202 TILLARY STREET
NEW YORK, NY 12345

BLOCK: 2050 LOT: 100

ARCHITECT:
AUFGANG ARCHITECTS LLC
74 LAFAYETTE AVE, SUITE 301
SUFFERN, NY
INFO@AUFGANG.COM 845.368.0004

AUFGANG ARCHITECTS

DEVELOPER
YYY BROOKLYN NY LLC
15 VERBENA AVENUE
SUITE 200
FLORAL PARK, NY 11217
516-821-2003

STRUCTURAL ENGINEER:
McNAMARA • SALVIA
45 WEST 45th STREET
10th FLOOR
NEW YORK, NY 10036

MEP ENGINEER:
CONSENTINI ASSOCIATES
498 SEVENTH AVENUE
NEW YORK, NY 10018
212-615-3887

CIVIL ENGINEER:
BROOKER ENGINEERING PLLC
74 LAFAYETTE AVE
SUITE 501
SUFFERN, NY 10901
(845) 357-4411

INTIRIOR DESIGNERS:
CHRIS SHAO STUDIO LLC
636 BROADWAY
SUITE 1218
NEW YORK, NEW YORK 10012
212-529-1595

FACADE CONSULTANT
HATFIELD GROUP
285 WEST BROADWAY
SUITE 410
NEW YORK, NY 10013
212-260-1513

DATE	SUBMISSIONS / REVISIONS

SHEET TITLE:

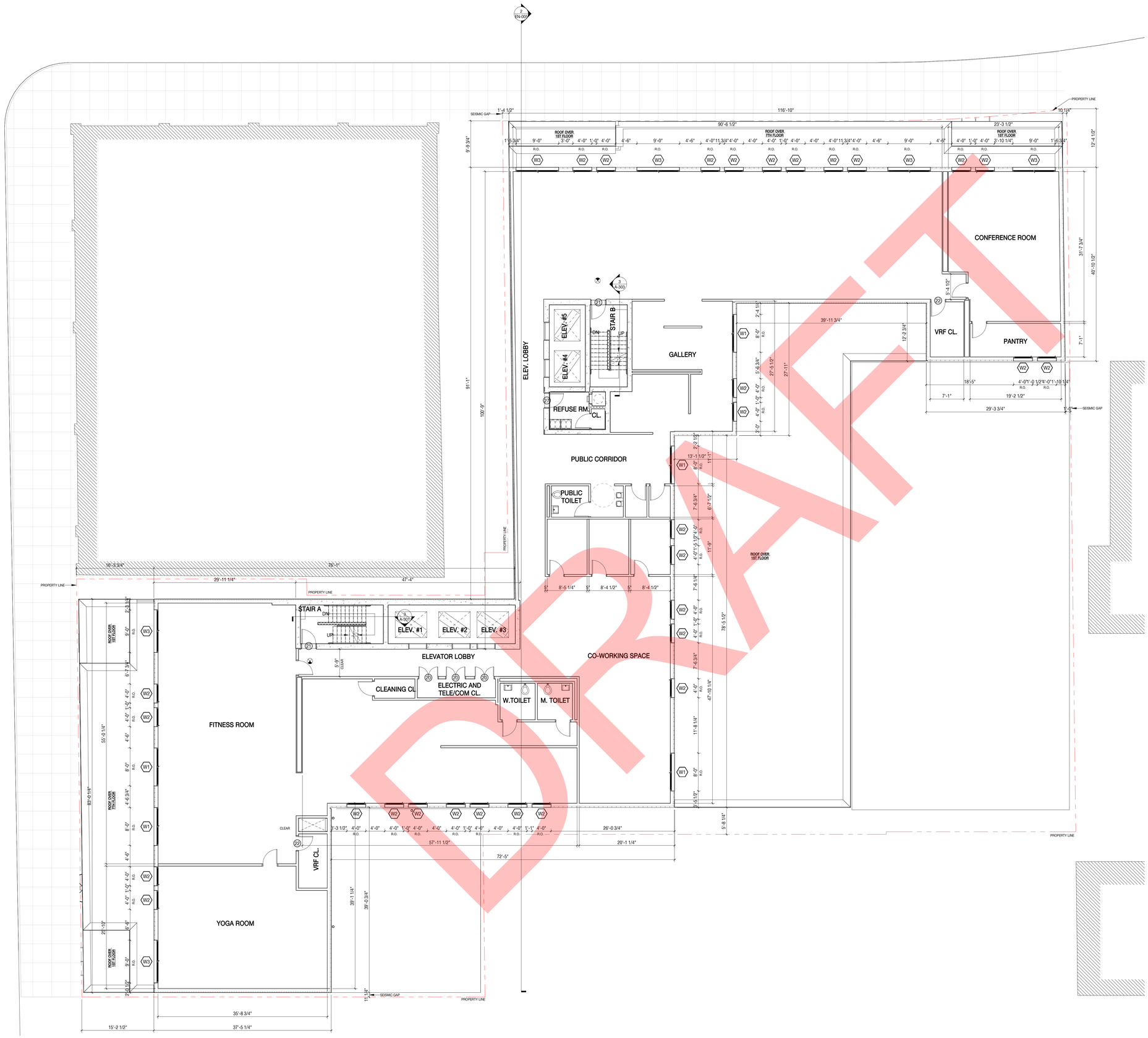
9TH THRU 30TH FLOOR PLAN

SEAL & SIGNATURE

ISSUE DATE: 04/05/21	PROJECT NO: XXXX
DRAWN BY: Author	CHECKED BY: Checker
SCALE: As indicated	SHEET NO: OF

DRAWING NO: A-105.00

NYC DOB NUMBER: 123456789



31ST FLOOR PLAN - AMENITY

1/8" = 1'-0"

LEGEND:

- CONCRETE FOUNTAION WALL - SEE STRUCTURAL DWG'S.
- CONCRETE BLOCK WALL (CMU) - SEE PLANS FOR SIZE
- MASONARY VENEER W/ RIGID INSULATION
- EIFS FINISH
- GYPSUM BOARD PARTITION (GYP BD.) - SEE PLAN FOR SIZE
- DOOR & FRAME- SEE DOOR SCHEDULE -DWG A-600
- PARTITION - SEE WALL TYPE LEGEND
- WINDOW - SEE WINDOW SCHEUDLEDWG - A-600
- EXIT LIGHT & SIGN
- SMOKE / CARBON MONOXIDE DETECTOR
- SUSPENDED GYPSUM BOARD CEILING
- ELECTRIC HOUSE PANEL - SEE ELEC. DWGS.
- APARTMENT DESIGNATION #(FLOOR) XX (APARTMENT NUMBER)
- APARTMENT TYPE
  - I.U. = INCLUSIONARY UNIT
  - A = MOBILITY IMPARIED UNIT
  - H.V.I = HEARING & VISUALLY IMPARED UNIT

I.U. | A | H.V.I.
TYPE-A18
3BR
150 SF

"T" FLOOR TURNING SPACE

5'-0" DIAMETER CLEAR FLOOR TURNING SPACE

30" X 48" CLEAR FLOOR SPACE

REMOVABLE KITCHEN BASE CABINET. 2'-6" WIDE X 2'-0" DEEP

GENERAL NOTES:
1. ALL PLAN DIMEMSIONS ARE TAKEN FINISH TO FINISH (U.O.N.)
2. FOR KITCEN AND TOILET ELEVATIONS SEE DWG'S A-5XX, A-5XX & A-5XX
3. G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN PLANK/ SLAB/ DECKING WITH MECHANICAL DWGS.
4. G.C. SHALL COORDINATE SIZE AND LOCATION OF ALL MASONARY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
5. BOTTOM OF DROPPED ARCH SHALL BE 6'-6" MIN A.F.F.
6. FOR ELECTRICAL OUTLETS, REFER TO LATEST ELEC. CODE FOR ALL REQUIREMNTS INCLUDING HEIGHT, SPACING, ETC.

WALL TYPE LEGEND

NOTE: G.C. SHALL SUBMIT SHOP DRAWINGS TO ARCHITECT FOR REVIEW INDICATING SIZE, GAUGE AND SPACING OF ALL METAL STUDS AND REQUIRED...

SF-1	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-2	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-3	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
(0) NON RATED	
0-1	TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-2	PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 5 5/8" METAL STUDS @ 16" O.C. (@ APARTMENT PANEL)
0-3	CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-3.1	SUPPLY & RETURN CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 1 1/2" METAL STUDS @ 16" O.C.
0-5	FURRING @ INTERIOR CAST IN PLACE CONCRETE / CMU - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
0-6	TYPICAL EXTERIOR WALL PARTITION - (1) LAYER 5/8" TYPE "X" GYP BD ONE SIDE AND (1) LAYER "EXTERIOR GRADE" GYP ON OTHER SIDE OF 6" METAL STUDS WITH 3 1/2" (R-15) BATT INSULATION (UNFACED)
(1) 1 HR RATED	
1-1	TENANT SEPARATION PARTION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE AND (2) LAYERS OF 5/8" TYPE "X" GYPMSUM BOARD ON THE OTHER SIDE OF 3 5/8" GALV METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF PLANK / SLAB & SEAL TIGHT TO UNDERSIDE OF PLANK AND/ OR ROOF DECK W/ CONT. FIRESTOP SEALANT (GA FILE #WP-1052)(STC 50-54)
(2) 2 HR RATED	
2-5	2-HOUR RATED SHAFT WALL - (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. W/ (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE. W/ 1" MINERAL FIBER INSULATION IN CAVITY - SEAL TOP OF WALL TO CONC. PLANK/SL
(2) 2HR RATED	
2-1	2 HOUR RATED PARTITION - (2) LAYERS TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 5/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO PLANK/ SLAB/ DECKING W/ CONT. FIRESTOP SEALANT & FIRESAFING (GA FILE #WP- 1522)(STC 55-59)
2-2	2 HOUR RATED CHASE WALL - (2) ROWS OF (2) LAYERS OF 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO SLAB/ PLANK/ DECKING WITH CONT. FIRESTOP SEALANT. SEAL ALL PENITRATIONS THRU CHASE WALL WITH FIRE SAFING INSULATION AND CONT. FIRESTOP SEALANT AS REQ. (UL #V422)(PROVIDE INSULATION AS REQ TO ACHIEVE A MIN STC RATING OF 50)
2-4	2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE BLOCK COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE PLANK OR PLANK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK. (UL#u906)
(3) 3HR RATED	
3-1	3 HR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 7/8" METALHAT CHANNELS @ 24" O.C. OVER 2 HR RATED CMU/ POURED IN PLACE CONCRERE. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF PLANK/ SLAB ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK/SLAB. (UL #U914) (PROVIDE STC RATING OF 50-54 AT COMPACTOR CHUTE ENCLOSURE ADJACENT TO DWELLING UNITS.

PROPOSED DEVLOPMENT FOR

67 PRINCE STREET11201

67 PRINCE STREET11201
+ 202 TILLARY STREET
NEW YORK, NY 12345

BLOCK: 2050 LOT: 100

ARCHITECT:
AUFGANG ARCHITECTS LLC
74 LAFAYETTE AVE, SUITE 301
SUFFERN, NY
INFO@AUFGANG.COM 845.368.0004

AUFGANG ARCHITECTS

DEVELOPER
YYY BROOKLYN NY LLC
15 VERBENA AVENUE
SUITE 200
FLORAL PARK, NY 11217
516-821-2003

STRUCTURAL ENGINEER:
McNAMARA • SALVIA
45 WEST 45th STREET
10th FLOOR
NEW YORK, NY 10036

MEP ENGINEER:
CONSENTINI ASSOCIATES
498 SEVENTH AVENUE
NEW YORK, NY 10018
212-615-3887

CIVIL ENGINEER:
BROOKER ENGINEERING PLLC
74 LAFAYETTE AVE
SUITE 501
SUFFERN, NY 10901
(845) 357-4411

INTIRIOR DESIGNERS:
CHRIS SHAO STUDIO LLC
636 BROADWAY
SUITE 1218
NEW YORK, NEW YORK 10012
212-529-1595

FACADE CONSULTANT
HATFIELD GROUP
285 WEST BROADWAY
SUITE 410
NEW YORK, NY 10013
212-260-1513

DATE	SUBMISSIONS / REVISIONS

SHEET TITLE:

31ST FLOOR PLAN

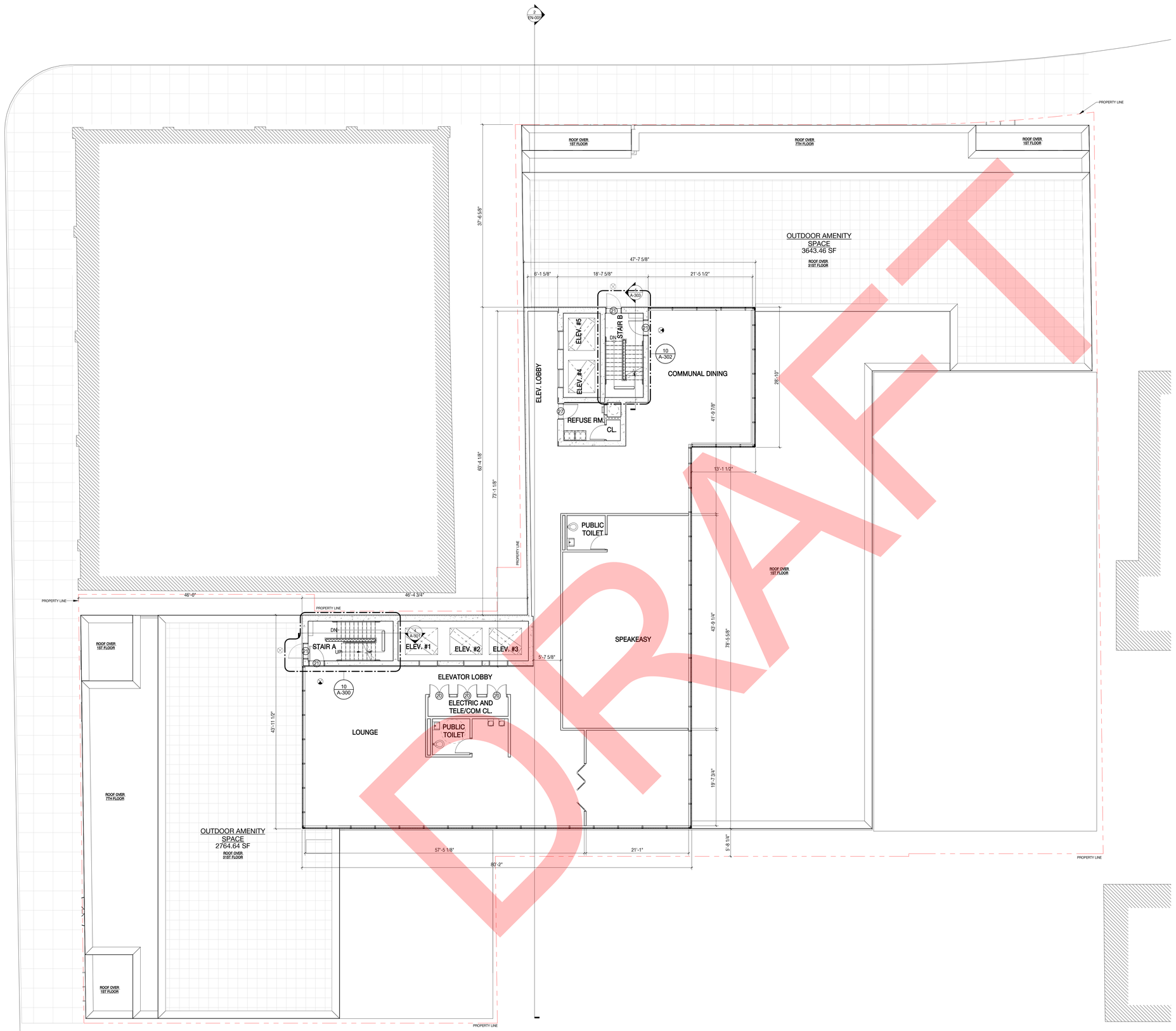
SEAL & SIGNATURE

ISSUE DATE:	PROJECT NO:
04/05/21	XXXX
DRAWN BY:	CHECKED BY:
Author	Checker
SCALE:	SHEET NO:
As indicated	OF

DRAWING NO:

A-106.00

NYC DOB NUMBER: 123456789



32ND FLOOR PLAN - AMENITY
1/8" = 1'-0"

N

LEGEND:

- CONCRETE FOUNTAION WALL - SEE STRUCTURAL DWG'S.
- CONCRETE BLOCK WALL (CMU) - SEE PLANS FOR SIZE
- MASONARY VENEER W/ RIGID INSULATION
- EIFS FINISH
- GYPSUM BOARD PARTITION (GYP BD.) - SEE PLAN FOR SIZE
- DOOR & FRAME- SEE DOOR SCHEDULE -DWG A-600
- X-X PARTITION - SEE WALL TYPE LEGEND
- WX WINDOW - SEE WINDOW SCHEUDLEDWG - A-600
- EXIT LIGHT & SIGN
- S SMOKE / CARBON MONOXIDE DETECTOR
- SUSPENDED GYPSUM BOARD CEILING
- ELECTRIC HOUSE PANEL - SEE ELEC. DWGS.
- #XX APARTMENT DESIGNATION #(FLOOR) XX (APARTMENT NUMBER)
- 1.U. | A | H.V.I. TYPE-A18 3BR 150 SF — APARTMENT TYPE
  - I.U. = INCLUSIONARY UNIT
  - A = MOBILITY IMPARIED UNIT
  - H.V.I = HEARING & VISUALLY IMPARED UNIT

"T" FLOOR TURNING SPACE

5-0" DIAMETER CLEAR FLOOR TURNING SPACE

30" X 48" CLEAR FLOOR SPACE

REMOVABLE KITCHEN BASE CABINET. 2'-6" WIDE X 2'-0" DEEP

GENERAL NOTES:
1. ALL PLAN DIMEMSIONS ARE TAKEN FINISH TO FINISH (U.O.N.)
2. FOR KITCEN AND TOILET ELEVATIONS SEE DWG'S A-5XX, A-5XX & A-5XX
3. G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN PLANK/ SLAB/ DECKING WITH MECHANICAL DWGS.
4. G.C. SHALL COORDINATE SIZE AND LOCATION OF ALL MASONARY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
5. BOTTOM OF DROPPED ARCH SHALL BE 6'-6" MIN A.F.F.
6. FOR ELECTRICAL OUTLETS, REFER TO LATEST ELEC. CODE FOR ALL REQUIREMNTS INCLUDING HEIGHT, SPACING, ETC.

WALL TYPE LEGEND

NOTE: G.C. SHALL SUBMIT SHOP DRAWINGS TO ARCHITECT FOR REVIEW INDICATING SIZE, GAUGE AND SPACING OF ALL METAL STUDS AND REQUIRED...

SF-1	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-2	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-3	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
(0) NON RATED	
0-1	TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-2	PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 5 5/8" METAL STUDS @ 16" O.C. (@ APARTMENT PANEL)
0-3	CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-3.1	SUPPLY & RETURN CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 1 1/2" METAL STUDS @ 16" O.C.
0-5	FURRING @ INTERIOR CAST IN PLACE CONCRETE / CMU - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
0-6	TYPICAL EXTERIOR WALL PARTITION - (1) LAYER 5/8" TYPE "X" GYP BD ONE SIDE AND (1) LAYER "EXTERIOR GRADE" GYP ON OTHER SIDE OF 6" METAL STUDS WITH 3 1/2" (R-15) BATT INSULATION (UNFACED)
(1) 1 HR RATED	
1-1	TENANT SEPARATION PARTION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE AND (2) LAYERS OF 5/8" TYPE "X" GYMPSUM BOARD ON THE OTHER SIDE OF 3 5/8" GALV METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF PLANK / SLAB & SEAL TIGHT TO UNDERSIDE OF PLANK AND/ OR ROOF DECK W/ CONT. FIRESTOP SEALANT (GA FILE #WP-1052)(STC 50-54)
(2) 2 HR RATED	
2-5	2-HOUR RATED SHAFT WALL - (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. W/ (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE. W/ 1" MINERAL FIBER INSULATION IN CAVITY - SEAL TOP OF WALL TO CONC. PLANK/SL
(2) 2HR RATED	
2-1	2 HOUR RATED PARTITION - (2) LAYERS TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 5/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO PLANK/ SLAB/ DECKING W/ CONT. FIRESTOP SEALANT & FIRESAFING (GA FILE #WP-1522)(STC 55-59)
2-2	2 HOUR RATED CHASE WALL - (2) ROWS OF (2) LAYERS OF 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO SLAB/ PLANK/ DECKING WITH CONT. FIRESTOP SEALANT. SEAL ALL PENITRATIONS THRU CHASE WALL WITH FIRE SAFING INSULATION AND CONT. FIRESTOP SEALANT AS REQ. (UL #W22G(PROVIDE INSULATION AS REQ TO ACHIEVE A MIN STC RATING OF 50)
2-4	2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE BLOCK COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE PLANK OR PLANK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK. (UL#U906)
(3) 3HR RATED	
3-1	3 HR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 7/8" METALHAT CHANNELS @ 24" O.C. OVER 2 HR RATED CMU/ POURED IN PLACE CONCRERE. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF PLANK/ SLAB ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK/SLAB. (UL #U914) (PROVIDE STC RATING OF 50-54 AT COMPACTOR CHUTE ENCLOSURE ADJACENT TO DWELLING UNITS.

PROPOSED DEVLOPMENT FOR
67 PRINCE STREET11201

67 PRINCE STREET11201
+ 202 TILLARY STREET
NEW YORK, NY 12345

BLOCK: 2050 LOT: 100

ARCHITECT:
AUFGANG ARCHITECTS LLC
74 LAFAYETTE AVE, SUITE 301
SUFFERN, NY
INFO@AUFGANG.COM 845.368.0004

DEVELOPER
YYY BROOKLYN NY LLC
15 VERBENA AVENUE
SUITE 200
FLORAL PARK, NY 11217
516-821-2003

STRUCTURAL ENGINEER:
McNAMARA • SALVIA
45 WEST 45th STREET
10th FLOOR
NEW YORK, NY 10036

MEP ENGINEER:
CONSENTINI ASSOCIATES
498 SEVENTH AVENUE
NEW YORK, NY 10018
212-615-3887

CIVIL ENGINEER:
BROOKER ENGINEERING PLLC
74 LAFAYETTE AVE
SUITE 501
SUFFERN, NY 10901
(845) 357-4411

INTIRIOR DESIGNERS:
CHRIS SHAO STUDIO LLC
636 BROADWAY
SUITE 1218
NEW YORK, NEW YORK 10012
212-529-1595

FACADE CONSULTANT
HATFIELD GROUP
285 WEST BROADWAY
SUITE 410
NEW YORK, NY 10013
212-260-1513

AUFGANG ARCHITECTS

DATE	SUBMISSIONS / REVISIONS

SHEET TITLE:

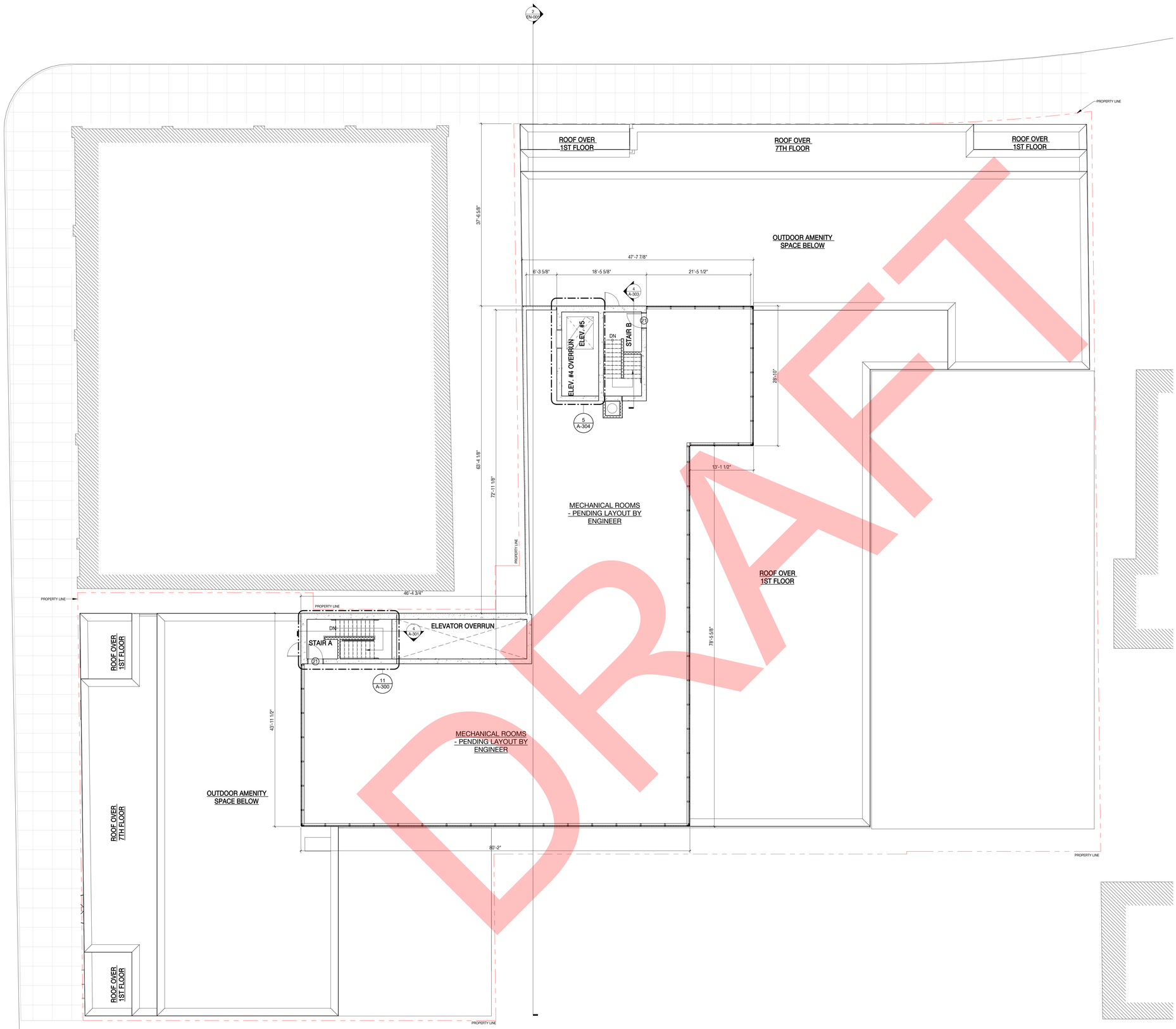
32ND FLOOR

SEAL & SIGNATURE

ISSUE DATE:	PROJECT NO:
04/05/21	XXXX
DRAWN BY:	CHECKED BY:
Author	Checker
SCALE:	SHEET NO:
As indicated	OF

DRAWING NO: A-107.00

NYC DOB NUMBER: 123456789



MECHANICAL FLOOR PLAN
1/8" = 1'-0"

N

LEGEND:

- CONCRETE FOUNTAION WALL - SEE STRUCTURAL DWG'S.
- CONCRETE BLOCK WALL (CMU) - SEE PLANS FOR SIZE
- MASONARY VENEER W/ RIGID INSULATION
- EIFS FINISH
- GYPSUM BOARD PARTITION (GYP BD.) - SEE PLAN FOR SIZE
- DOOR & FRAME- SEE DOOR SCHEDULE -DWG A-600
- X-X PARTITION - SEE WALL TYPE LEGEND
- WX WINDOW - SEE WINDOW SCHEUDLEDWG - A-600
- EXIT LIGHT & SIGN
- S SMOKE / CARBON MONOXIDE DETECTOR
- SUSPENDED GYPSUM BOARD CEILING
- ELECTRIC HOUSE PANEL - SEE ELEC. DWGS.
- #XX APARTMENT DESIGNATION #(FLOOR) XX (APARTMENT NUMBER)
- 1.U. | A | H.V.I. TYPE-A18 3BR 150 SF APARTMENT TYPE
  - I.U. = INCLUSIONARY UNIT
  - A = MOBILITY IMPARIED UNIT
  - H.V.I = HEARING & VISUALLY IMPARED UNIT

"T" FLOOR TURNING SPACE

5-0" DIAMETER CLEAR FLOOR TURNING SPACE

30" X 48" CLEAR FLOOR SPACE

REMOVABLE KITCHEN BASE CABINET. 2'-6" WIDE X 2'-0" DEEP

GENERAL NOTES:
1. ALL PLAN DIMEMSIONS ARE TAKEN FINISH TO FINISH (U.O.N.)
2. FOR KITCEN AND TOILET ELEVATIONS SEE DWG'S A-5XX, A-5XX & A-5XX
3. G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN PLANK/ SLAB/ DECKING WITH MECHANICAL DWGS.
4. G.C. SHALL COORDINATE SIZE AND LOCATION OF ALL MASONARY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
5. BOTTOM OF DROPPED ARCH SHALL BE 6'-6" MIN A.F.F.
6. FOR ELECTRICAL OUTLETS, REFER TO LATEST ELEC. CODE FOR ALL REQUIREMNTS INCLUDING HEIGHT, SPACING, ETC.

WALL TYPE LEGEND

NOTE: G.C. SHALL SUBMIT SHOP DRAWINGS TO ARCHITECT FOR REVIEW INDICATING SIZE, GAUGE AND SPACING OF ALL METAL STUDS AND REQUIRED...

SF-1	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-2	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-3	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
(0) NON RATED	
0-1	TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-2	PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 5 5/8" METAL STUDS @ 16" O.C. (@ APARTMENT PANEL)
0-3	CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-3.1	SUPPLY & RETURN CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 1 1/2" METAL STUDS @ 16" O.C.
0-5	FURRING @ INTERIOR CAST IN PLACE CONCRETE / CMU - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
0-6	TYPICAL EXTERIOR WALL PARTITION - (1) LAYER 5/8" TYPE "X" GYP BD ONE SIDE AND (1) LAYER "EXTERIOR GRADE" GYP ON OTHER SIDE OF 6" METAL STUDS WITH 3 1/2" (R-15) BATT INSULATION (UNFACED)
(1) 1 HR RATED	
1-1	TENANT SEPARATION PARTION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE AND (2) LAYERS OF 5/8" TYPE "X" GYPMSUM BOARD ON THE OTHER SIDE OF 3 5/8" GALV METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF PLANK / SLAB & SEAL TIGHT TO UNDERSIDE OF PLANK AND/ OR ROOF DECK W/ CONT. FIRESTOP SEALANT (GA FILE #WP-1052)(STC 50-54)
(2) 2 HR RATED	
2-5	2-HOUR RATED SHAFT WALL - (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. W/ (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE. W/ 1" MINERAL FIBER INSULATION IN CAVITY - SEAL TOP OF WALL TO CONC. PLANK/SL
(2) 2HR RATED	
2-1	2 HOUR RATED PARTITION - (2) LAYERS TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 5/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO PLANK/ SLAB/ DECKING W/ CONT. FIRESTOP SEALANT & FIRESAFING (GA FILE #WP-1522)(STC 55-59)
2-2	2 HOUR RATED CHASE WALL - (2) ROWS OF (2) LAYERS OF 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO SLAB/ PLANK/ DECKING WITH CONT. FIRESTOP SEALANT. SEAL ALL PENITRATIONS THRU CHASE WALL WITH FIRE SAFING INSULATION AND CONT. FIRESTOP SEALANT AS REQ. (UL #V422)(PROVIDE INSULATION AS REQ TO ACHIEVE A MIN STC RATING OF 50)
2-4	2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE BLOCK COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE PLANK OR PLANK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK. (UL#U906)
(3) 3HR RATED	
3-1	3 HR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 7/8" METALHAT CHANNELS @ 24" O.C. OVER 2 HR RATED CMU/ POURED IN PLACE CONCRERE. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF PLANK/ SLAB ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK/SLAB. (UL #U914) (PROVIDE STC RATING OF 50-54 AT COMPACTOR CHUTE ENCLOSURE ADJACENT TO DWELLING UNITS.

PROPOSED DEVLOPMENT FOR

67 PRINCE STREET11201

67 PRINCE STREET11201
+ 202 TILLARY STREET
NEW YORK, NY 12345

BLOCK: 2050 LOT: 100

ARCHITECT:
AUFGANG ARCHITECTS LLC
74 LAFAYETTE AVE, SUITE 301
SUFFERN, NY
INFO@AUFGANG.COM 845.368.0004

AUFGANG ARCHITECTS

DEVELOPER
YYY BROOKLYN NY LLC
15 VERBENA AVENUE
SUITE 200
FLORAL PARK, NY 11217
516-821-2003

STRUCTURAL ENGINEER:
McNAMARA • SALVIA
45 WEST 45th STREET
10th FLOOR
NEW YORK, NY 10036

MEP ENGINEER:
CONSENTINI ASSOCIATES
498 SEVENTH AVENUE
NEW YORK, NY 10018
212-615-3887

CIVIL ENGINEER:
BROOKER ENGINEERING PLLC
74 LAFAYETTE AVE
SUITE 501
SUFFERN, NY 10901
(845) 357-4411

INTIRIOR DESIGNERS:
CHRIS SHAO STUDIO LLC
636 BROADWAY
SUITE 1218
NEW YORK, NEW YORK 10012
212-529-1595

FACADE CONSULTANT
HATFIELD GROUP
285 WEST BROADWAY
SUITE 410
NEW YORK, NY 10013
212-260-1513

DATE	SUBMISSIONS / REVISIONS

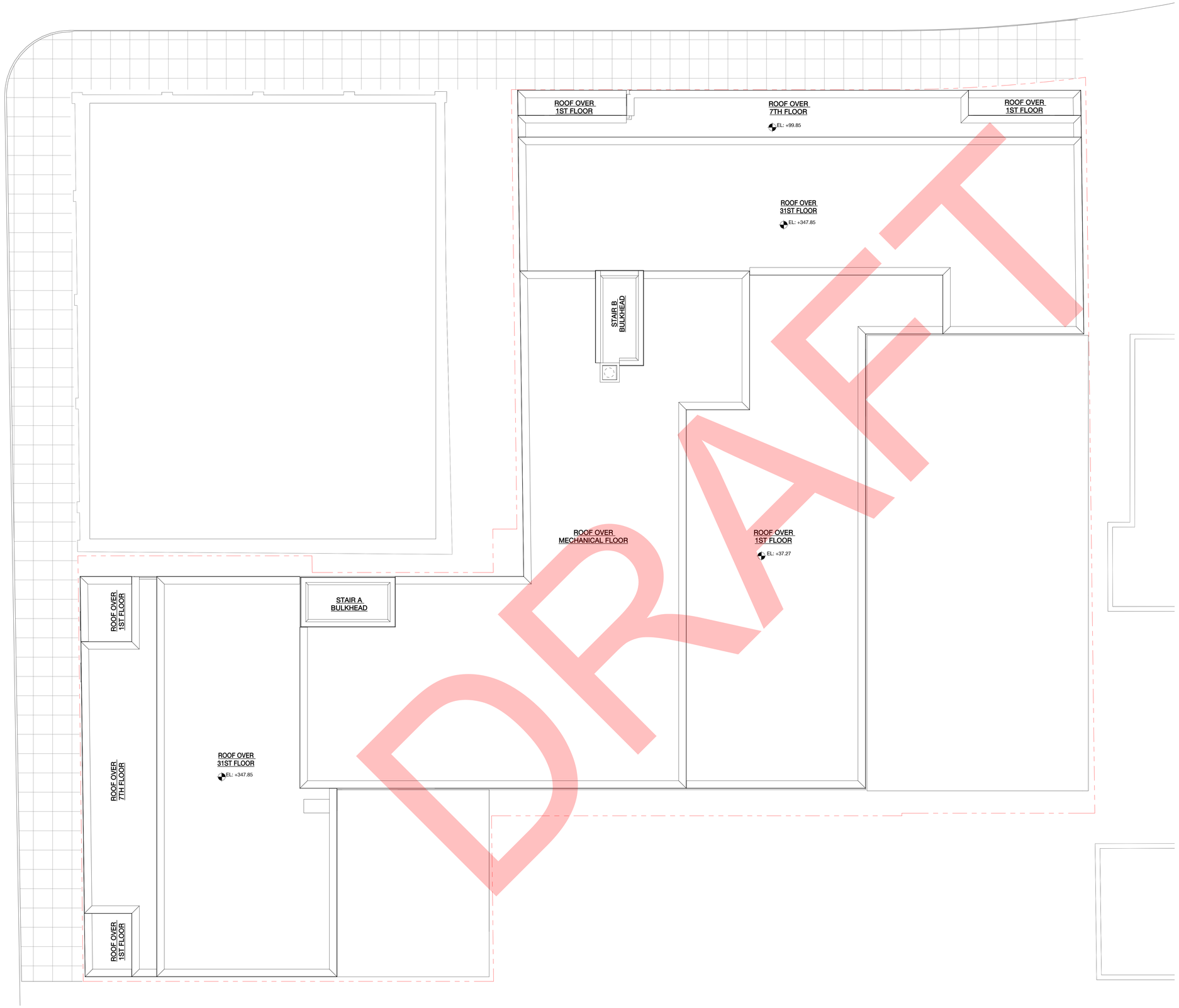
SHEET TITLE:

MECH FLOOR PLAN

SEAL & SIGNATURE

ISSUE DATE: 04/05/21
PROJECT NO: XXXX
DRAWN BY: Author
CHECKED BY: Checker
SCALE: As indicated
SHEET NO: OF
DRAWING NO: A-108.00

NYC DOB NUMBER: 123456789



ROOF PLAN
1/8" = 1'-0"

N

LEGEND:

- CONCRETE FOUNTAION WALL - SEE STRUCTURAL DWG'S.
- CONCRETE BLOCK WALL (CMU) - SEE PLANS FOR SIZE
- MASONARY VENEER W/ RIGID INSULATION
- EIFS FINISH
- GYPSUM BOARD PARTITION (GYP BD.) - SEE PLAN FOR SIZE
- DOOR & FRAME- SEE DOOR SCHEDULE -DWG A-600
- X-X PARTITION - SEE WALL TYPE LEGEND
- WX WINDOW - SEE WINDOW SCHEUDLEDWG - A-600
- EXIT LIGHT & SIGN
- S SMOKE / CARBON MONOXIDE DETECTOR
- SUSPENDED GYPSUM BOARD CEILING
- ELECTRIC HOUSE PANEL - SEE ELEC. DWGS.
- #XX APARTMENT DESIGNATION #(FLOOR) XX (APARTMENT NUMBER)
- APARTMENT TYPE
  - I.U. = INCLUSIONARY UNIT
  - A = MOBILITY IMPARIED UNIT
  - H.V.I = HEARING & VISUALLY IMPARED UNIT

I.U.	A	H.V.I.
TYPE-A18		
3BR		
150 SF		

"T" FLOOR TURNING SPACE

5-0" DIAMETER CLEAR FLOOR TURNING SPACE

30" X 48" CLEAR FLOOR SPACE

REMOVABLE KITCHEN BASE CABINET. 2'-6" WIDE X 2'-0" DEEP

GENERAL NOTES:
1. ALL PLAN DIMEMSIONS ARE TAKEN FINISH TO FINISH (U.O.N.)
2. FOR KITCEN AND TOILET ELEVATIONS SEE DWG'S A-5XX, A-5XX & A-5XX
3. G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN PLANK/ SLAB/ DECKING WITH MECHANICAL DWGS.
4. G.C. SHALL COORDINATE SIZE AND LOCATION OF ALL MASONARY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
5. BOTTOM OF DROPPED ARCH SHALL BE 6'-6" MIN A.F.F.
6. FOR ELECTRICAL OUTLETS, REFER TO LATEST ELEC. CODE FOR ALL REQUIREMNTS INCLUDING HEIGHT, SPACING, ETC.

WALL TYPE LEGEND

NOTE: G.C. SHALL SUBMIT SHOP DRAWINGS TO ARCHITECT FOR REVIEW INDICATING SIZE, GAUGE AND SPACING OF ALL METAL STUDS AND REQUIRED...

SF-1	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-2	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
SF-3	2-1/2" x 6" outside glazed pressure plate system; An economical stock length, outside glaze pressure wall system with option for SSG verticals. Shear block construction utilizing concealed fasteners. Ideal for low-rise applications up to 4 stories.
(0) NON RATED	
0-1	TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-2	PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 5 5/8" METAL STUDS @ 16" O.C. (@ APARTMENT PANEL)
0-3	CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
0-3.1	SUPPLY & RETURN CHASE WALL - (1) LAYER 5/8" TYPS "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 1 1/2" METAL STUDS @ 16" O.C.
0-5	FURRING @ INTERIOR CAST IN PLACE CONCRETE / CMU - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
0-6	TYPICAL EXTERIOR WALL PARTITION - (1) LAYER 5/8" TYPE "X" GYP BD ONE SIDE AND (1) LAYER "EXTERIOR GRADE" GYP ON OTHER SIDE OF 6" METAL STUDS WITH 3 1/2" (R-15) BATT INSULLATION (UNFACED)
(1) 1 HR RATED	
1-1	TENANT SEPARATION PARTION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE AND (2) LAYERS OF 5/8" TYPE "X" GYMPSUM BOARD ON THE OTHER SIDE OF 3 5/8" GALV METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF PLANK / SLAB & SEAL TIGHT TO UNDERSIDE OF PLANK AND/ OR ROOF DECK W/ CONT. FIRESTOP SEALANT (GA FILE #WP-1052)(STC 50-54)
(2) 2 HR RATED	
2-5	2-HOUR RATED SHAFT WALL - (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. W/ (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE. W/ 1" MINERAL FIBER INSULATION IN CAVITY - SEAL TOP OF WALL TO CONC. PLANK/SL
(2) 2HR RATED	
2-1	2 HOUR RATED PARTITION - (2) LAYERS TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 5/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO PLANK/ SLAB/ DECKING W/ CONT. FIRESTOP SEALANT & FIRESAFING (GA FILE #WP-1522)(STC 55-59)
2-2	2 HOUR RATED CHASE WALL - (2) ROWS OF (2) LAYERS OF 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL STUDS @ 16" O.C. EXTEND GYPSUM BOARD AND STUDS UP TO UNDERSIDE OF FLOOR/ ROOF. SEAL TIGHT TO SLAB/ PLANK/ DECKING WITH CONT. FIRESTOP SEALANT. SEAL ALL PENITRATIONS THRU CHASE WALL WITH FIRE SAFING INSULATION AND CONT. FIRESTOP SEALANT AS REQ. (UL #V422(PROVIDE INSULATION AS REQ TO ACHIEVE A MIN STC RATING OF 50)
2-4	2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE BLOCK COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE PLANK OR PLANK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK. (ULI#u906)
(3) 3HR RATED	
3-1	3 HR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 7/8" METALHAT CHANNELS @ 24" O.C. OVER 2 HR RATED CMU/ POURED IN PLACE CONCRERE. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF PLANK/ SLAB ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF PLANK/SLAB. (UL #U914) (PROVIDE STC RATING OF 50-54 AT COMPACTOR CHUTE ENCLOSURE ADJACENT TO DWELLING UNITS.

PROPOSED DEVLOPMENT FOR

67 PRINCE STREET11201

67 PRINCE STREET11201
+ 202 TILLARY STREET
NEW YORK, NY 12345

BLOCK: 2050 LOT: 100

ARCHITECT:
AUFGANG ARCHITECTS LLC
74 LAFAYETTE AVE, SUITE 301
SUFFERN, NY
INFO@AUFGANG.COM 845.368.0004

AUFGANG ARCHITECTS

DEVELOPER
YYY BROOKLYN NY LLC
15 VERBENA AVENUE
SUITE 200
FLORAL PARK, NY 11217
516-821-2003

STRUCTURAL ENGINEER:
McNAMARA • SALVIA
45 WEST 45th STREET
10th FLOOR
NEW YORK, NY 10036

MEP ENGINEER:
CONSENTINI ASSOCIATES
498 SEVENTH AVENUE
NEW YORK, NY 10018
212-615-3887

CIVIL ENGINEER:
BROOKER ENGINEERING PLLC
74 LAFAYETTE AVE
SUITE 501
SUFFERN, NY 10901
(845) 357-4411

INTIRIOR DESIGNERS:
CHRIS SHAO STUDIO LLC
636 BROADWAY
SUITE 1218
NEW YORK, NEW YORK 10012
212-529-1595

FACADE CONSULTANT
HATFIELD GROUP
285 WEST BROADWAY
SUITE 410
NEW YORK, NY 10013
212-260-1513

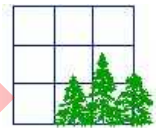
DATE	SUBMISSIONS / REVISIONS

SHEET TITLE:

ROOF FLOOR PLAN

SEAL & SIGNATURE

ISSUE DATE: 04/05/21
PROJECT NO: XXXX
DRAWN BY: Author
CHECKED BY: Checker
SCALE: As indicated
SHEET NO: OF
DRAWING NO: A-109.00
NYC DOB NUMBER: 123456789



APPENDIX II

APPENDIX II

CITIZEN PARTICIPATION PLAN

The NYCOER and YYY Brooklyn NY LLC c/o Maddd Equities, LLC have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Voluntary Cleanup Program. This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYCVCP, YYY Brooklyn NY LLC c/o Maddd Equities, LLC will maintain a repository for project documents and provide public notice at specified times throughout the remedial program. This Plan also takes into account potential environmental justice concerns in the community that surrounds the project Site. Under this Citizen Participation Plan, project documents and work plans are made available to the public in a timely manner. Public comment on work plans is strongly encouraged during public comment periods. Work plans are not approved by the NYCOER until public comment periods have expired and all comments are formally reviewed. An explanation of cleanup plans in the form of a public meeting or informational session is available upon request to NYCOER's project manager assigned to this Site, Kestana Anokye, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 788-8841.

Project Contact List: OER has established a Site Contact List for this project to provide public notices in the form of fact sheets to interested members of the Community. Communications will include updates on important information relating to the progress of the cleanup program at the Site as well as to request public comments on the cleanup plan. The Project Contact List includes owners and occupants of adjacent buildings and homes, principal administrators of nearby schools, hospitals and day care centers, the public water supplier that serves the area, established document repositories, the representative Community Board, City Council members, other elected representatives and any local Brownfield Opportunity Area (BOA) grantee organizations. Any member of the public or organization will be added to the Site Contact List on request. A copy of the Site Contact List is maintained by OER's project

manager. If you would like to be added to the Project Contact List, contact NYC OER at (212) 788-8841 or by email at brownfields@cityhall.nyc.gov.

Repositories: A document repository is maintained online. Internet access to view OER's document repositories is available at public libraries. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project. The library nearest the Site is:

Brooklyn Public Library – Walt Whitman Branch
93 St. Edwards Street, Brooklyn, New York
(718) 935-0244
Monday, Wednesday, Friday, Saturday: 10:00 am – 4:00 pm
Tuesday, Thursday: 1:00 pm – 7:00 pm

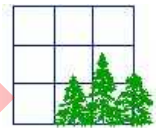
Digital Documentation: NYC OER requires the use of digital documents in our repository as a means of minimizing paper use while also increasing convenience in access and ease of use.

Issues of Public Concern: No issues of public concern were identified.

Public Notice and Public Comment: Public notice to all members of the Project Contact List is required at three major steps during the performance of the cleanup program (listed below) and at other points that may be required by NYCOER. Notices will include Fact Sheets with descriptive project summaries, updates on recent and upcoming project activities, repository information, and important phone and email contact information. All notices will be reviewed and approved by NYCOER prior to distribution and mailed by the Enrollee. Public comment is solicited in public notices for all work plans developed under the NYCVCP. Final review of all work plans by NYCOER will consider all public comments. Approval will not be granted until the public comment period has been completed.

Citizen Participation Milestones: Public notice and public comment activities occur at several steps during a typical NYCVCP project. These steps include:

- **Public Notice of the availability of the Remedial Investigation Report and Remedial Action Work Plan and a 30-day public comment period on the Remedial Action Work Plan:** Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the availability of the Remedial Investigation Report and Remedial Action Work Plan and the initiation of a 30-day public comment period on the Remedial Action Work Plan. The Fact Sheet summarizes the findings of the RIR and provides details of the RAWP. The public comment period will be extended an additional 15 days upon public request. A public meeting or informational session will be conducted by OER upon request.
- **Public Notice announcing the approval of the RAWP and the start of remediation:** Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the approval of the RAWP and the start of remediation.
- **Public Notice announcing the completion of remediation, designation of Institutional and Engineering Controls and issuance of the Notice of Completion:** Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the completion of remediation, providing a list of all Institutional and Engineering Controls implemented for to the Site and announcing the issuance of the Notice of Completion.



APPENDIX III

APPENDIX 3

SUSTAINABILITY STATEMENT

This Sustainability Statement documents sustainable activities and green remediation efforts planned under this remedial action.

Reuse of Clean, Recyclable Materials and Reduced Consumption of Non-Renewable Resources: Reuse of clean, locally-derived recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction.

An estimate of the quantity (in tons) of clean, non-virgin materials (reported by type of material) reused under this plan will be quantified and reported in the RAR.

Reduced Energy Consumption and Promotion of Greater Energy Efficiency: Reduced energy consumption lowers greenhouse gas emissions, improves local air quality, lessens in-city power generation requirements, can lower traffic congestion, and provides substantial cost savings.

Best efforts will be made to quantify energy efficiencies achieved during the remediation and will be reported in the RAR. Where energy savings cannot be easily quantified, a gross indicator of the amount of energy saved or the means by which energy savings was achieved will be reported.

Conversion to Clean Fuels: Use of clean fuel improves NYC's air quality by reducing harmful emissions.

Natural gas will be utilized for fuel in the new building. An estimate of the volume of clean fuels used during remedial activities will be quantified and reported in the RAR.

Recontamination Control: Recontamination after cleanup and redevelopment is completed undermines the value of work performed, may result in a property that is less protective of public health or the environment, and may necessitate additional cleanup work later or impede future redevelopment. Recontamination can arise from future releases that occur within the property or by influx of contamination from off-Site.

A composite cover system including a vapor barrier membrane and a sub-grade ventilated parking garage will be installed across the entire building footprint. These components will protect the Site by aiding in eliminating the risk of future migration of soil vapor contamination from currently unknown off-site sources and by preventing the occurrence of new contamination. An estimate of the area of the Site that utilizes recontamination controls under this plan will be reported in the RAR in square feet.

Stormwater Retention: Stormwater retention improves water quality by lowering the rate of combined stormwater and sewer discharges to NYC's sewage treatment plants during periods of precipitation, and reduces the volume of untreated influent to local surface waters.

An estimate of the enhanced stormwater retention capability of the redevelopment project will be included in the RAR.

Linkage with Green Building: Green buildings provide a multitude of benefits to the city across a broad range of areas, such as reduction of energy consumption, conservation of resources, and reduction in toxic materials use.

The number of Green Buildings that are associated with this brownfield redevelopment property will be reported in the RAR. The total square footage of green building space created as a

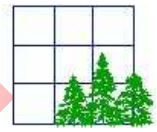
function of this brownfield redevelopment will be quantified for residential, commercial and industrial/manufacturing uses.

Paperless Voluntary Cleanup Program: YYY Brooklyn NY LLC c/o Maddd Equities, LLC is participating in NYCOER's Paperless Voluntary Cleanup Program. Under this program, submission of electronic documents will replace submission of hard copies for the review of project documents, communications and milestone reports.

Low-Energy Project Management Program: YYY Brooklyn NY LLC c/o Maddd Equities, LLC is participating in OER's low-energy project management program. Under this program, whenever possible, meetings are held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation.

Trees and Plantings: Trees and other plantings provide habitat and add to NYC's environmental quality in a wide variety of ways. Native plant species and native habitat provide optimal support to local fauna, promote local biodiversity, and require less maintenance.

According to the redevelopment plans, multiple trees will be in the first floor outdoor terrace area of the Site. An estimate of the land area that will be vegetated, including the number of trees planted or preserved, will be reported in square feet in the RAR.



APPENDIX IV

APPENDIX 4

SOIL/MATERIALS MANAGEMENT PLAN

1.1 Soil Screening Methods

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional and will be reported in the final remedial report. Soil screening will be performed during invasive work performed during the remedy and development phases prior to issuance of final signoff by NYCOER.

1.2 Stockpile Methods

Excavated soil from suspected areas of contamination (e.g., hotspots, USTs, drains, etc.) will be stockpiled separately and will be segregated from clean soil and construction materials. Stockpiles will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, and before and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYCOER. Excavated soils will be stockpiled on, at minimum, double layers of 8-mil minimum sheeting, will be kept covered at all times with appropriately anchored plastic tarps, and will be routinely inspected. Broken or ripped tarps will be promptly replaced.

All stockpile activities will be compliant with applicable laws and regulations. Soil stockpile areas will be appropriately graded to control run-off in accordance with applicable laws and regulations. Stockpiles of excavated soils and other materials shall be located at least of 50 feet from the property boundaries, where possible. Hay bales or equivalent will surround soil stockpiles except for areas where access by equipment is required. Silt fencing and hay bales will be used as needed near catch basins, surface waters and other discharge points.

1.3 Characterization of Excavated Materials

Soil/fill or other excavated media that is transported off-Site for disposal will be sampled in a manner required by the receiving facility, and in compliance with applicable laws and regulations. Soils proposed for reuse on-Site will be managed as defined in this plan.

1.4 Materials Excavation, Load-Out, and Departure

The PE/QEP overseeing the remedial action will:

- oversee remedial work and the excavation and load-out of excavated material;
- ensure that there is a party responsible for the safe execution of invasive and other work performed under this work plan;
- ensure that Site development activities and development-related grading cuts will not interfere with, or otherwise impair or compromise the remedial activities proposed in this RAWP;
- ensure that the presence of utilities and easements on the Site has been investigated and that any identified risks from work proposed under this plan are properly addressed by appropriate parties;
- ensure that all loaded outbound trucks are inspected and cleaned if necessary before leaving the Site;
- ensure that all egress points for truck and equipment transport from the Site will be kept clean of Site-derived materials during Site remediation.

Locations where vehicles exit the Site shall be inspected daily for evidence of soil tracking off premises. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

Open and uncontrolled mechanical processing of historical fill and contaminated soil on-Site will not be performed without prior OER approval.

1.5 Off-Site Materials Transport

Loaded vehicles leaving the Site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with

applicable laws and regulations, including use of licensed haulers in accordance with 6 NYCRR Part 364. If loads contain wet material capable of causing leakage from trucks, truck liners will be used. Queuing of trucks will be performed on-Site, when possible in order to minimize off Site disturbance. Off-Site queuing will be minimized.

Outbound truck transport routes are described in the remedial report. This routing takes into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c) minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

1.6 Materials Disposal Off-Site

The following documentation will be established and reported by the PE/QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE/QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in New York City under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Enrollee. The letter will include as an attachment a summary of all chemical data for the material being transported; and (2) a letter from each disposal facility stating it is in receipt of the correspondence (1, above) and is approved to accept the material. These documents will be included in the final remedial report.

The Remedial Action Report will include an itemized account of the destination of all material removed from the Site during this remedial action. Documentation associated with disposal of all material will include records and approvals for receipt of the material. This information will be presented in the final remedial report.

All impacted soil/fill or other waste excavated and removed from the Site will be managed as regulated material and will be disposed in accordance with applicable laws and regulations. Historic fill and contaminated soils taken off-Site will be handled as solid waste and will not be disposed at a Part 360-16 Registration Facility (also known as a Soil Recycling Facility).

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the final remedial report. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the final remedial report. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e., clean soil removed for development purposes), including transport to a Part 360-16 Registration Facility, a formal request will be made for approval by NYCOER with an associated plan compliant with 6NYCRR Part 360-16. This request and plan will include the location, volume and a description of the material to be recycled, including verification that the material is not impacted by site uses and that the material complies with receipt requirements for recycling under 6NYCRR Part 360. This material will be appropriately handled on-Site to prevent mixing with impacted material.

1.7 Materials Reuse On-Site

Soil and fill that is derived from the property that meets the SCOs established in this plan may be reused on-Site. The SCOs for on-Site reuse are listed in Section 4.2 of this cleanup plan. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on land with comparable levels of contaminants in soil/fill material, compliant with applicable laws and regulations, and addressed pursuant to the NYCVCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this remedial plan are followed. The expected location for placement of reused material is shown in Section 4.2.

Organic matter (wood, roots, stumps, etc.) or other waste derived from clearing and grubbing of the Site will not be buried on-Site. Soil or fill excavated from the site for grading or other purposes will not be reused within a cover soil layer or within landscaping berms.

1.8 Demarcation

After completion of hotspot removal and any other invasive remedial activities, and prior to backfilling, the top of the residual soil/fill will be defined by one of three methods: (1) placement of a demarcation layer. The demarcation layer will consist of geosynthetic fencing or equivalent material to be placed on the surface of residual soil/fill to provide an observable reference layer. A description or map of the approximate depth of the demarcation layer will be provided in the SMP; or (2) a land survey of the top elevation of residual soil/fill before the placement of cover soils, pavement and associated sub-soils, or other materials or structures or, (3) all materials beneath the approved cover will be considered impacted and subject to site management after the remedy is complete. Demarcation may be established by one or any combination of these three methods. As appropriate, a map showing the method of demarcation for the Site and all associated documentation will be presented in the RAR.

This demarcation will constitute the top of the site management horizon. Materials within this horizon require adherence to special conditions during future invasive activities as defined in the Site Management Plan.

1.9 Import of Backfill Soil From Off-Site Sources

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. Imported soils will not exceed groundwater protection standards established in Part 375. Imported soils for Track 1 remedial action projects will not exceed Track 1 SCO's.

A process will be established to evaluate sources of backfill and cover soil to be imported to the Site, and will include an examination of source location, current and historical use(s), and any applicable documentation. Material from industrial sites, spill sites, environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

The following potential sources may be used pending attainment of backfill and cover soil quality objectives:

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with applicable laws and regulations;
- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYS DEC.
- All materials received for import to the Site will be approved by a PE/QEP and will be in compliance with provisions in this remedial plan. The final remedial report will report the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where backfill or soil cover was placed.
- All material will be subject to source screening and chemical testing.
- Inspection of imported fill material will include visual, olfactory and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:
- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and
- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

Composite samples of imported material will be taken at a minimum frequency of one sample for every 500 cubic yards of material. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

Recycled concrete aggregate (RCA) will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the final remedial report. A PE/QEP is responsible to ensure that the facility is compliant with 6NYCRR Part 360 registration and permitting

requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require additional testing, unless required by NYSDEC under its terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete. RCA material is not acceptable for, and will not be used as cover material.

1.10 Fluids Management

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable laws and regulations. Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYC DEP). The NYC DEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. Discharge to the New York City sewer system will require an authorization and sampling data demonstrating that the groundwater meets the City's discharge criteria. The dewatering fluid will be pretreated as necessary to meet the NYC DEP discharge criteria. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility.

Discharge of water generated during remedial construction to surface waters (i.e. a stream or river) is prohibited without a SPDES permit issued by New York State Department of Environmental Conservation.

1.11 Stormwater Pollution Prevention

Applicable laws and regulations pertaining to stormwater pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this remedial plan (silt fences and barriers, and hay bale checks) will be installed around the entire perimeter of the remedial construction area and inspected once a week and after every storm event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. Undercutting or

erosion of the silt fence toe anchor will be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

1.12 Contingency Plan for Unknown Contamination Sources

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to OER's Project Manager. Petroleum spills will be reported to the NYS DEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

1.13 Odor, Dust, and Nuisance Control

Odor Control

All necessary means will be employed to prevent on- and off-Site odor 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) use of foams to cover exposed odorous soils. If odors develop and cannot otherwise be controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; and (e) use of chemical odorants in spray or misting systems.

This odor control plan is capable of controlling emissions of nuisance odors. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. OER will be notified of all odor complaint events. Implementation of all odor controls, including halt of work, will be the responsibility of the PE/QEP's certifying this remedial plan.

Dust Control

Dust management during invasive on-Site work will include, at a minimum:

- Use of a dedicated water spray methodology for roads, excavation areas and stockpiles.
- Use of properly anchored tarps to cover stockpiles.
- Exercise extra care during dry and high-wind periods.
- Use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface.

This dust control plan is capable of controlling emissions of dust. If nuisance dust emissions are identified, work will be halted and the source of dusts will be identified and corrected. Work will not resume until all nuisance dust emissions have been abated. OER will be notified of all dust complaint events. Implementation of all dust controls, including halt of work, will be the responsibility of the PE/QEP's responsible for certifying this remedial plan.

Other Nuisances

Noise control will be exercised during the remedial program. All remedial work will conform, at a minimum, to NYC noise control standards.

Rodent control will be provided during Site clearing and grubbing and during the remedial program, as necessary, to prevent nuisances.

APPENDIX V

APPENDIX 4

SOIL/MATERIALS MANAGEMENT PLAN

1.1 Soil Screening Methods

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional and will be reported in the final remedial report. Soil screening will be performed during invasive work performed during the remedy and development phases prior to issuance of final signoff by NYCOER.

1.2 Stockpile Methods

Excavated soil from suspected areas of contamination (e.g., hotspots, USTs, drains, etc.) will be stockpiled separately and will be segregated from clean soil and construction materials. Stockpiles will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, and before and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYCOER. Excavated soils will be stockpiled on, at minimum, double layers of 8-mil minimum sheeting, will be kept covered at all times with appropriately anchored plastic tarps, and will be routinely inspected. Broken or ripped tarps will be promptly replaced.

All stockpile activities will be compliant with applicable laws and regulations. Soil stockpile areas will be appropriately graded to control run-off in accordance with applicable laws and regulations. Stockpiles of excavated soils and other materials shall be located at least of 50 feet from the property boundaries, where possible. Hay bales or equivalent will surround soil stockpiles except for areas where access by equipment is required. Silt fencing and hay bales will be used as needed near catch basins, surface waters and other discharge points.

1.3 Characterization of Excavated Materials

Soil/fill or other excavated media that is transported off-Site for disposal will be sampled in a manner required by the receiving facility, and in compliance with applicable laws and regulations. Soils proposed for reuse on-Site will be managed as defined in this plan.

1.4 Materials Excavation, Load-Out, and Departure

The PE/QEP overseeing the remedial action will:

- oversee remedial work and the excavation and load-out of excavated material;
- ensure that there is a party responsible for the safe execution of invasive and other work performed under this work plan;
- ensure that Site development activities and development-related grading cuts will not interfere with, or otherwise impair or compromise the remedial activities proposed in this RAWP;
- ensure that the presence of utilities and easements on the Site has been investigated and that any identified risks from work proposed under this plan are properly addressed by appropriate parties;
- ensure that all loaded outbound trucks are inspected and cleaned if necessary before leaving the Site;
- ensure that all egress points for truck and equipment transport from the Site will be kept clean of Site-derived materials during Site remediation.

Locations where vehicles exit the Site shall be inspected daily for evidence of soil tracking off premises. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

Open and uncontrolled mechanical processing of historical fill and contaminated soil on-Site will not be performed without prior OER approval.

1.5 Off-Site Materials Transport

Loaded vehicles leaving the Site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with

applicable laws and regulations, including use of licensed haulers in accordance with 6 NYCRR Part 364. If loads contain wet material capable of causing leakage from trucks, truck liners will be used. Queuing of trucks will be performed on-Site, when possible in order to minimize off Site disturbance. Off-Site queuing will be minimized.

Outbound truck transport routes are described in the remedial report. This routing takes into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c) minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

1.6 Materials Disposal Off-Site

The following documentation will be established and reported by the PE/QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE/QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in New York City under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Enrollee. The letter will include as an attachment a summary of all chemical data for the material being transported; and (2) a letter from each disposal facility stating it is in receipt of the correspondence (1, above) and is approved to accept the material. These documents will be included in the final remedial report.

The Remedial Action Report will include an itemized account of the destination of all material removed from the Site during this remedial action. Documentation associated with disposal of all material will include records and approvals for receipt of the material. This information will be presented in the final remedial report.

All impacted soil/fill or other waste excavated and removed from the Site will be managed as regulated material and will be disposed in accordance with applicable laws and regulations. Historic fill and contaminated soils taken off-Site will be handled as solid waste and will not be disposed at a Part 360-16 Registration Facility (also known as a Soil Recycling Facility).

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the final remedial report. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the final remedial report. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e., clean soil removed for development purposes), including transport to a Part 360-16 Registration Facility, a formal request will be made for approval by NYCOER with an associated plan compliant with 6NYCRR Part 360-16. This request and plan will include the location, volume and a description of the material to be recycled, including verification that the material is not impacted by site uses and that the material complies with receipt requirements for recycling under 6NYCRR Part 360. This material will be appropriately handled on-Site to prevent mixing with impacted material.

1.7 Materials Reuse On-Site

Soil and fill that is derived from the property that meets the SCOs established in this plan may be reused on-Site. The SCOs for on-Site reuse are listed in Section 4.2 of this cleanup plan. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on land with comparable levels of contaminants in soil/fill material, compliant with applicable laws and regulations, and addressed pursuant to the NYCVCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this remedial plan are followed. The expected location for placement of reused material is shown in Section 4.2.

Organic matter (wood, roots, stumps, etc.) or other waste derived from clearing and grubbing of the Site will not be buried on-Site. Soil or fill excavated from the site for grading or other purposes will not be reused within a cover soil layer or within landscaping berms.

1.8 Demarcation

After completion of hotspot removal and any other invasive remedial activities, and prior to backfilling, the top of the residual soil/fill will be defined by one of three methods: (1) placement of a demarcation layer. The demarcation layer will consist of geosynthetic fencing or equivalent material to be placed on the surface of residual soil/fill to provide an observable reference layer. A description or map of the approximate depth of the demarcation layer will be provided in the SMP; or (2) a land survey of the top elevation of residual soil/fill before the placement of cover soils, pavement and associated sub-soils, or other materials or structures or, (3) all materials beneath the approved cover will be considered impacted and subject to site management after the remedy is complete. Demarcation may be established by one or any combination of these three methods. As appropriate, a map showing the method of demarcation for the Site and all associated documentation will be presented in the RAR.

This demarcation will constitute the top of the site management horizon. Materials within this horizon require adherence to special conditions during future invasive activities as defined in the Site Management Plan.

1.9 Import of Backfill Soil From Off-Site Sources

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. Imported soils will not exceed groundwater protection standards established in Part 375. Imported soils for Track 1 remedial action projects will not exceed Track 1 SCO's.

A process will be established to evaluate sources of backfill and cover soil to be imported to the Site, and will include an examination of source location, current and historical use(s), and any applicable documentation. Material from industrial sites, spill sites, environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

The following potential sources may be used pending attainment of backfill and cover soil quality objectives:

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with applicable laws and regulations;
- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYS DEC.
- All materials received for import to the Site will be approved by a PE/QEP and will be in compliance with provisions in this remedial plan. The final remedial report will report the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where backfill or soil cover was placed.
- All material will be subject to source screening and chemical testing.
- Inspection of imported fill material will include visual, olfactory and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:
- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and
- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

Composite samples of imported material will be taken at a minimum frequency of one sample for every 500 cubic yards of material. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

Recycled concrete aggregate (RCA) will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the final remedial report. A PE/QEP is responsible to ensure that the facility is compliant with 6NYCRR Part 360 registration and permitting

requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require additional testing, unless required by NYSDEC under its terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete. RCA material is not acceptable for, and will not be used as cover material.

1.10 Fluids Management

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable laws and regulations. Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYC DEP). The NYC DEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. Discharge to the New York City sewer system will require an authorization and sampling data demonstrating that the groundwater meets the City's discharge criteria. The dewatering fluid will be pretreated as necessary to meet the NYC DEP discharge criteria. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility.

Discharge of water generated during remedial construction to surface waters (i.e. a stream or river) is prohibited without a SPDES permit issued by New York State Department of Environmental Conservation.

1.11 Stormwater Pollution Prevention

Applicable laws and regulations pertaining to stormwater pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this remedial plan (silt fences and barriers, and hay bale checks) will be installed around the entire perimeter of the remedial construction area and inspected once a week and after every storm event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. Undercutting or

erosion of the silt fence toe anchor will be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

1.12 Contingency Plan for Unknown Contamination Sources

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to OER's Project Manager. Petroleum spills will be reported to the NYS DEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

1.13 Odor, Dust, and Nuisance Control

Odor Control

All necessary means will be employed to prevent on- and off-Site odor 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) use of foams to cover exposed odorous soils. If odors develop and cannot otherwise be controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; and (e) use of chemical odorants in spray or misting systems.

This odor control plan is capable of controlling emissions of nuisance odors. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. OER will be notified of all odor complaint events. Implementation of all odor controls, including halt of work, will be the responsibility of the PE/QEP's certifying this remedial plan.

Dust Control

Dust management during invasive on-Site work will include, at a minimum:

- Use of a dedicated water spray methodology for roads, excavation areas and stockpiles.
- Use of properly anchored tarps to cover stockpiles.
- Exercise extra care during dry and high-wind periods.
- Use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface.

This dust control plan is capable of controlling emissions of dust. If nuisance dust emissions are identified, work will be halted and the source of dusts will be identified and corrected. Work will not resume until all nuisance dust emissions have been abated. OER will be notified of all dust complaint events. Implementation of all dust controls, including halt of work, will be the responsibility of the PE/QEP's responsible for certifying this remedial plan.

Other Nuisances

Noise control will be exercised during the remedial program. All remedial work will conform, at a minimum, to NYC noise control standards.

Rodent control will be provided during Site clearing and grubbing and during the remedial program, as necessary, to prevent nuisances.

APPENDIX VI

SITE-SPECIFIC CONSTRUCTION HEALTH AND SAFETY PLAN

202-208 Tillary Street
Block 2050, Lot 100
Brooklyn, New York 11201

1.0 INTRODUCTION

This Site-Specific Construction Health and Safety Plan (CHASP) was prepared in accordance with the requirements and guidelines of the applicable Occupational Safety and Health Administration (OSHA) requirements in 29 Code of Federal Regulations (CFR) Part 1910.120. This CHASP has been prepared for the property located at 202-208 Tillary Street, Brooklyn, New York. The CHASP will be available for inspection and review by site workers and regulatory personnel during soil excavation and disposal activities. Site workers are required to comply with this CHASP when conducting the site activities listed in Section 2.0. Site workers will notify the Site Safety Officer of matters regarding health, safety, and security.

All personnel and subcontractors must familiarize themselves with the material contained herein, including special conditions and facilities located near each project as listed on the following pages. The information contained in this CHASP pertains to excavation and disposal of the urban historic fill.

2.0 ENTRY OBJECTIVES

The objective of entry to the Work Area is to conduct soil excavation and site grading associated with the development of a residential use building. Entrance will be gained to the property on Bruckner Boulevard. Work performed at the site will be completed in accordance with 29 CFR 1926, Subpart P, and all other appropriate federal and state regulations.

3.0 ON-SITE ORGANIZATION AND COORDINATION

Key project personnel and their responsibilities to carry out the stated job function at the site are discussed below.

VHB, Inc. (VHB) will provide health and safety support associated with environmental issues. The contact information for the designated person to provide Health and Safety support for this project is:

Robert Hazard, Health and Safety Officer
VHB, Inc.
1805 Atlantic Avenue, Manasquan, New Jersey 08736
Phone: (732) 223-2225, Fax: (732) 223-3666

The Construction Health and Safety Officer for overall administration of this CHASP during the soil excavation and removal activities, installation of piles and footings is designated below. The Construction Health and Safety Officer's responsibilities will include overall project safety and health monitoring for the work to be performed. The Construction Health and Safety Officer will enforce and audit the effectiveness of the CHASP on a continuing basis and make changes to ensure that the intent of the CHASP is maintained.

To Be Determined, Member
Joy Construction
2069 Bruckner Boulevard, New York, New York 10472
Phone: (212) 766-9651

4.0 ON-SITE CONTROL

The Environmental Site Safety Officer is designated to coordinate access control and security on site during soil excavation operations. A safe perimeter will be established at the subject property. Unauthorized personnel will be excluded from this area. The Environmental Consultant will perform air monitoring and oversight during excavation operations and make determinations if dust control is required or if evidence of hazardous materials is present and/or the level of Personnel Protective Equipment (PPE) should be raised.

Excavating Precautions (Utilities)

1. A utility markout of all underground utilities will be completed prior to the inception of ground-intrusive work, in compliance with 29 CFR 1926.651. The utility markout will utilize the One Call system prior to the commencement of operations at the site. Work will commence less than 10 business days after contacting the One Call system.
2. Visually inspect all utility markout locations on site.
3. Operations in the vicinity of overhead power lines will be conducted in accordance with 29 CFR 1910.333 (c)(3).
4. Conduct all excavations and subsequent soil sampling in the vicinity of a utility with caution.
5. If a utility line is damaged, call the utility company immediately.
6. If unsure of the utility company, call NYC ONE CALL (1-800-272-4480).

Dust Prevention and Control (Track out onto Paved Public Roadways)

1. Vehicles leaving the site should be cleaned/decontaminated prior to exiting.
2. Promptly remove mud, dirt, or similar debris from the paved road.
3. Water flush and/or vacuum sweep the paved road.
4. Prepare unpaved site ingress and egress points by applying gravel to the surface to control track out and erosion.
5. The surface of the ingress and egress points must be kept adequately wet with water.

Dust Prevention and Control (General Procedures for Unpaved Areas)

1. Apply gravel to entrance, exit, and other areas of the site that are likely to see heavy vehicular traffic.
2. Limit vehicle traffic to required vehicles.
3. Limit vehicle speeds on unpaved areas of the site. Placement of signs near the site entrance that denote site speed restrictions is advised.
4. Apply sufficient water to unpaved surfaces that are likely to be disturbed to keep them adequately wet. According to 40 CFR Part 61, adequately wet means sufficiently mixed or penetrated with liquid to prevent the release of particulates. Visibly detectable dust emissions are the primary indication that the unpaved work area has not been kept adequately wet.

Dust Prevention and Control (Procedures for Grading and Excavation)

1. When soil is to be moved or stockpiled, the drop height of the soil should be reduced as much as possible.
2. Limit the height of soil stockpiles.
3. Limit the disturbance of soil stockpiles.
4. Keep the surface of stockpiles adequately wet.
5. All stockpiled soil shall be covered with plastic sheeting or other suitable cover material.
6. RECORD AND MONITOR ALL DUST PREVENTION/CONTROL ACTIVITIES. Recording this information will provide a superior method of monitoring and evaluating the success of the dust prevention and control plan.

In the event that visible dust is observed, associated work activities are to stop immediately and measures to mitigate commence as soon as possible (i.e., wetting down material with water).

5.0 HAZARD EVALUATION

The Environmental Site Safety Officer is responsible for administering the Contractor's Hazard Communication Program. OSHA HAZWOPER standards (29 CFR 1910.120 and 1926.65) require that site personnel, subcontractors, and visitors must be informed of hazards associated with the site. Additionally, the Site Safety Officer will be responsible for determining safety precautions, changes to the PPE program, or other modifications to this CHASP that would be appropriate in response to unanticipated chemical hazards.

5.1 Environmental Hazards

At present, suspected contaminants in the subsurface soil constitute an environmental hazard. Various chemical compounds have been identified in the soil. If encountered in the soil at higher concentrations than anticipated, exposure concerns could become a health issue. The following are known or suspected to be present at the site.

5.1.1 Volatile Organic Compounds (VOCs)

Several volatile organic compounds (VOCs) were detected in soil vapor samples. Should VOCs be detected during excavation, monitoring of the air using a photoionization detector (PID) will be performed. VOCs may cause chronic liver and kidney damage, and some are suspected human carcinogens. The primary route of exposure to VOCs is through inhalation; therefore, air monitoring and respiratory protection are the primary controls against exposure to VOCs.

5.1.2 Urban Historic Fill

Urban historic fill has been identified on the property. The urban historic fill is impacted with three (3) pesticides, several semi-volatile organic compounds (SVOCs), and several metals exceeding the New York State Department of Conservation (NYSDEC) Subpart 375-6 Unrestricted Use Soil Cleanup Objectives (SCO).

A complete list of Material Safety Data Sheets (MSDSs) for such compounds and analytes analyzed as part of the environmental investigations conducted at the site are provided as **Attachment I**.

5.2 Physical Hazards

The work to be completed at the site in conjunction with this CHASP consists of soil excavation and removal activities and installation of piles and footings. Additional physical hazards expected on site include: buried utilities; slip, trip, and fall hazards; and, hazards associated with heavy machinery.

6.0 HAZARD MONITORING

6.1 Air Monitoring Using a PID

Periodic air monitoring, visual, and olfactory inspection of soil during site-wide excavation, soil disposal, and well and pile installation will be conducted. A PID will be used to screen both the soil and ambient air for the presence of VOCs.

The following are the Short Term (ST) Exposure Limits on a 15-minute time weighted average and the Immediate Danger to Life and Health (IDLH) conditions for VOCs which may be present in the subsurface soil. The levels are presented in parts per million (ppm).

Compound	ST	IDLH
Benzene	5 ppm	500 ppm
Ethyl benzene	100 ppm	500 ppm
Toluene	150 ppm	500 ppm
Xylenes	150 ppm	900 ppm

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area exceeds five (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 five (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 five (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 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less (but in no case less than 20 feet) is below five (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.

All 15-minute readings will be recorded and be available for review. Instantaneous readings used for decision purposes, if any, will also be recorded.

6.2 Air Monitoring Using a Dust Trak Monitor

Particulate concentrations will be monitored periodically both in the upwind and downwind directions at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment such as the Dust Trak Aerosol Monitor, Model 8530, capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work will be stopped and a reevaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings will be recorded and will be available for review.

6.3 Personal Protective Equipment (PPE)

Based upon evaluation of potential hazards, the following levels of personal protection have been designated for the Work Area:

Location	Job Function	Level of Protection
Entire Site	Excavation	A B C D

If VOCs are detected which indicate a need to upgrade the PPE, the Health and Safety Officer will stop all work and evaluate the level of protection required to complete the project. A determination will be made regarding the safety of the situation and the type of PPE that will be required. *At no time will work be conducted in an environment where an IDLH condition could be present.*

The following is the monitoring level for which a change in the level of protection or evacuation of the work area would be implemented. If the work area is evacuated, procedures such as the use of ventilation would be utilized if possible to lower monitoring levels to below the threshold for raising the level of protection.

PID 150 ppm

It should be noted that the work proposed will not be performed in a level of PPE other than Level D. Procedures would have to be put in place to lower the PPE requirement to Level D should conditions suggest an increase in the level of PPE required.

Precautions will be implemented to limit direct contact with the soil or inhalation of dust. At a minimum, nitrile gloves are to be worn when handling soil, dust control procedures used if necessary, and thorough hand washing prior to handing food.

Specific protective equipment for potential levels of protection is as follows:

6.3.1 Levels A and B

Since levels A and B are for IDLH environments, they are not applicable to this project.

6.3.2 Level C

The concentration(s) and type(s) of airborne substance(s) is (are) known and the criteria for using air-purifying respirators are met. The following constitute Level C equipment:

- National Institute for Occupational Safety and Health (NIOSH)-approved full-face or half-face air purifying respirators;
- Chemical-resistant clothing (overalls, chemical-splash suit, disposable chemical-resistant overalls);
- Gloves, outer and inner, chemical-resistant;

- Boots, outer, chemical-resistant, with steel toe and shank;
- Optional chemical resistant boot covers;
- Hard hat;
- Safety glasses with side shields;
- Face shield and safety glasses when not wearing a full face respirator; and,
- Hearing protection when working in noise hazardous areas or near operating heavy equipment.

6.3.3 Level D

A work uniform providing no respiratory protection is used only for prevention of skin contamination. The following constitute Level D equipment:

- Coveralls or other skin-protective clothing (long-sleeve shirts and long pants);
- Gloves;
- Boots or shoes, chemical-resistant, steel toe and shank;
- Optional chemical resistant boot covers;
- Safety glasses or chemical splash goggles;
- Hard hat;
- Hearing protection when working in noise-hazardous areas or near operating heavy equipment; and,
- High-visibility safety vest.

NO CHANGES TO THE SPECIFIED LEVELS OF PROTECTION SHALL BE MADE WITHOUT THE APPROVAL OF THE CONSTRUCTION SITE SAFETY OFFICER.

7.0 COMMUNICATION PROCEDURES

The following standard hand signals will be used in case of emergency:

Message	Interpretation(s)
Hands gripping throat	Out of air; can't breathe.
Grip partner's wrist	Leave area immediately.
Hands on top of head	Need assistance.
Thumbs up	OK; I am all right; I understand.
Thumbs down	No; Negative.

8.0 DECONTAMINATION PROCEDURES

Should hazardous materials be encountered, a decontamination procedure will be implemented. Generated waste, such as disposable PPE, will be disposed of in accordance with applicable local, state, and federal regulations. The decontamination protocol shall be used with the following decontamination stations:

(1) Equipment drop;

(2) Detergent and Water Rinse (optional); and,

(3) Remove PPE (if utilized) and place in waste container

Decontamination of equipment is not anticipated to be required for this project.

9.0 MEDICAL MONITORING

As per 29 CFR 1910.120 (b)(4)(ii)(D) and in accordance with 29 CFR 1910.120 (f), persons engaging in on-site activities during which they are or may be exposed to hazardous substances or health hazards at or above the permissible exposure limits or published exposure levels for 30 days or more a year are included in a Medical Surveillance Program.

The timing and location of this project may be such that heat/cold stress could pose a threat to the health and safety of site personnel. Work/rest regimens will be employed as deemed necessary by the Site Safety Officer so site workers do not suffer adverse effects from heat/cold stress. Special clothing and an appropriate diet and fluid intake will be recommended to all on-site personnel to further reduce these temperature-related hazards. Site workers should stop work and notify the Site Safety Officer when they observe symptoms of heat/cold stress in themselves or co-workers.

9.1 Heat Stress Monitoring

Heat stress monitoring of personnel wearing protective clothing (i.e., impermeable fabric) should be considered when the ambient temperature is 70 degrees Fahrenheit or above. To monitor the worker, one of the following methods should be employed:

- Heart rate should be measured by the radial pulse for a 30-second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work cycle by one-third (0.3) and keep the rest period the same. If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following cycle by one-third (0.3).
- Oral temperature should be measured at the end of the work period (before drinking). If oral temperature exceeds 99.6 degrees Fahrenheit, shorten the next work cycle by one-third (0.3) without changing the rest period. If the oral temperature still exceeds 99.6 degrees Fahrenheit at the beginning of the next rest period, shorten the next work cycle by one-third (0.3). Do not permit a worker to wear a semipermeable or impermeable garment when his/her oral temperature exceeds 100.6 degrees Fahrenheit.

9.2 Cold Stress Monitoring

Work/rest schedules must be altered to minimize the potential for cold stress. Cold stress is defined as a decrease in core body temperature to 96.8 degrees Fahrenheit and/or cold injury to body extremities. Decreases in core body temperature are associated with reduced mental alertness, reduction in rational decision-making, or loss of consciousness in severe cases. Symptoms of cold stress include pain in extremities (i.e., hands and feet) and severe shivering.

10.0 MEDICAL EMERGENCIES

10.1 Emergency Medical Care

- First Aid & Rescue Squad (Call 911).
- Emergency Department – The Brooklyn Hospital Center, Brooklyn, Phone: (718) 250-8000

10.2 Directions to The Brooklyn Hospital Center

The Brooklyn Hospital Center is located at 121 Dekalb Avenue, Brooklyn, New York, and is 0.8 miles south of the Site. See **Attachment II** for turn by turn driving directions and map.

10.3 List of Emergency Phone Numbers

Agency/Facility	Phone Number
All Services	911
Police	911
Fire Emergency	911
Brooklyn Hospital Center	(718) 250-8000

10.4 First Aid Equipment

First aid equipment is available on site at the following locations:

Equipment	Location
First Aid Kit	Field Vehicle
Fire Extinguisher	Field Vehicle

11.0 EMERGENCY PROCEDURES

On-site personnel will use the following standard emergency procedures. The Construction Health and Safety Officer shall be notified of on-site emergencies and be responsible for ensuring that the appropriate procedures are followed.

11.1 Personnel Injury in the Work Area

Upon notification of an injury in the Work Area, the Construction Health and Site Safety Officer will assess the nature of the injury. For a true emergency, 911 shall be called and local emergency services personnel shall initiate the appropriate first aid and contact the designated medical facility, if required.

If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue with the local emergency services personnel initiating the appropriate first aid and necessary follow-up, as stated above. If the injury increases the risk to others, the designated emergency signal shall be sounded and all site personnel shall move to the site entrance for further instructions. Activities on site will stop until the added risk is removed or minimized. No persons shall reenter the Work Area until the cause of the symptoms or injury is determined by the Construction Health and Safety Officer.

11.2 Fire/Explosion

Upon notification of a fire or explosion on site, the designated emergency signal (three [3] horn blasts) shall be sounded, and all site personnel shall be assembled at the site entrance. The fire department shall be alerted, and all personnel shall be moved to a safe distance from the involved area.

11.3 PPE Failure

If utilization of PPE is necessitated by conditions in the Work Area and a site worker experiences a failure or alteration of protective equipment which affects the protection factor, that person shall immediately leave the Work Area. Reentry shall not be permitted until the equipment has been repaired or replaced.

11.4 Other Equipment Failure

If other equipment on site fails to operate properly, the Construction Health and Safety Officer shall be notified and then determine the effect of this failure on continuing operations. If the failure affects the safety of personnel or prevents completion of the planned tasks, all personnel shall leave the Work Area until the situation is evaluated and appropriate actions taken.

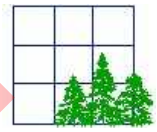
In all situations, when an on-site emergency results in evacuation of the Work Area, personnel shall not reenter until:

1. The conditions resulting in the emergency have been corrected.
2. The hazards have been reassessed.
3. The CHASP has been revised.
4. Site personnel have been briefed regarding changes in the CHASP.

12.0 SITE PERSONNEL SIGNATURE PAGE

ALL SITE PERSONNEL HAVE READ THE ABOVE HEALTH AND SAFETY PLAN AND ARE FAMILIAR AND WILL COMPLY WITH ITS PROVISIONS, AS EVIDENCED BY SIGNATURE BELOW.

Name	Signature	Date



ATTACHMENT I

Minnesota Department of Health Fact Sheet

September 2005

Volatile Organic Compounds - VOCs

What are VOCs?

Volatile Organic Compounds (VOCs) are chemicals that evaporate easily at room temperature. The term "organic" indicates that the compounds contain carbon. VOC exposures are often associated with an odor while other times there is no odor. Both can be harmful. There are thousands of different VOCs produced and used in our daily lives. Some examples are:

- Benzene
- Toluene
- Methylene
- Chloride
- Formaldehyde
- Xylene
- Ethylene glycol
- Texanol
- 1,3-butadiene

Where do VOCs come from?

Many products emit or "off-gas" VOCs. Some examples of VOC emission sources are:

- Paints
- Varnishes
- Moth balls
- Solvents
- Gasoline
- Newspaper
- Cooking
- Cleaning Chemicals
- Vinyl floors
- Carpets
- Photocopying
- Upholstery Fabrics
- Adhesives
- Sealing Caulks
- Cosmetics
- Air Fresheners
- Fuel Oil
- Vehicle Exhaust
- Pressed wood furniture
- Environmental Tobacco Smoke (Secondhand smoke)

What levels of VOC are typical in the home?

As of July, 2003 neither Minnesota nor the federal government have set standards for VOC levels in non-occupational settings. However, some guidelines are available. MDH has established Health Risk Values (HRVs) for some contaminants in air for several different exposure situations. For more information on these HRVs go to MDH Health Risk Values Website.

Many studies have shown VOC levels are higher in indoor air than outdoor air. The U.S. Environmental Protection Agency (EPA) Total Exposure Assessment Methodology (TEAM) studies have found indoor VOC levels that were 2 to 5 times higher than outdoors.

Levels of VOC exposure in indoor air vary widely depending on:

- the volume of air in the room/building
- the rate at which the VOC is off-gassed
- the building ventilation rate
- outdoor concentrations

Along with the concentration of VOCs in a given environment, the time an individual spends in that environment is important in determining exposure.

What are the health effects of VOC exposure?

Acute

- Eye irritation / watering
- Nose irritation
- Throat irritation
- Headaches
- Nausea / Vomiting
- Dizziness
- Asthma exacerbation

Chronic

- Cancer
- Liver damage
- Kidney damage
- Central Nervous System damage.

MINNESOTA MDH DEPARTMENT of HEALTH

Indoor Air Unit
P.O. Box 64975
St, Paul, MN, 55164-0975
651-201-4601 or 800-798-9050
www.health.state.mn.us/divs/eh/air

Volatile Organic Compounds - VOCs – page 2

Most studies to date have been conducted on single chemicals. Less is know about the health effects of combined chemical exposure. The best health protection measure is to limit your exposure to products and materials that contain VOCs when possible. If you think you may be having health problems caused by VOC exposure consult an occupational/environmental health physician who specializes in this area

Are some people at greater risk from VOC exposure than others?

Persons with respiratory problems such as asthma, young children, elderly, and persons with heightened sensitivity to chemicals may be more susceptible to illness from VOC exposure.

How can I tell what levels of VOC are in my home?

Some home screening kits are available to measure total volatile organic compound (TVOC) levels, and some individual VOCs. These home sampling kits should be viewed as providing "ballpark" amount of VOCs in the indoor air. Conditions such as ventilation, temperature and humidity can cause VOC concentrations to fluctuate daily

Prior to testing conduct an inspection of your home for some common sources of VOCs such as:

- New carpeting
- New furniture
- Idling automobile in attached garage
- Recent painting
- Chemicals stored in the home
- Recently applied adhesives
- New plastic or electronic devices

Once you determine the probable source of VOCs, steps can be taken to reduce your exposure. If you are unable to determine the source, a professional indoor air quality investigator / industrial hygienist can be consulted. MDH has a service provider list along with recommendations on selection. MDH also has a guidance document that can be used for investigating possible VOC contamination entitled "Indoor Air Sampling at VOC contaminated sites"

How do I reduce the levels of VOCs in my home?

Most products containing VOCs will off-gas within a short period of time although some will continue to give off trace amounts of VOCs for a long period of time. The best means of reducing VOC exposure is to eliminate products containing VOCs or use low emitting VOC products.

Some steps you can take to reduce your exposure to VOC in the home are:

- Source control
  - eliminate products from home that have high levels of VOCs
  - purchase new products that contain low or no VOCs (environmentally preferable purchasing)
- Ventilation – open doors and windows, use fans.
- Control climate – as temperature and humidity increase some chemicals will off gas more.
- Treat the source – airtight sealers can be used to coat over some products. However, caution is advised in choosing the coating product as this could introduce new VOCs into the air while controlling for others.
- Air cleaners – look for ones with activated charcoal filtration designed to remove chemicals from the air.
- Remove unused chemicals from the home. Check with city or county for household hazardous waste collection sites.
- Perform renovations when home is unoccupied.

For more information on VOCs or other Indoor Air Quality Issues Contact:

The Minnesota Department of Health
Indoor Air Unit
625 Robert Street North, PO Box 64975
St. Paul, MN 55164-0975
651/201-4601 or 800/798-9050
View the Air Quality web page at:
www.health.state.mn.us/divs/eh/air

To require this document in another form contact:
Call 651/201-4601. TTY: 651/201-5797 or Minnesota Relay Service TTY: 1- 800/627-3529.

IC#141-1381
Revised 9/05
Printed on recycled paper.

SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs)

U.S. Environmental Protection Agency

Mid-Atlantic Brownfields

Serving: Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia

Semi-Volitile Organic Compounds

This Fact Sheet is presented by the U. S. Environmental Protection Agency, Region III (EPA) to assist in the selection of analytical parameters and the associated Quality Assurance and Quality Control (QA/QC) procedures to be utilized in Phase II Environmental Assessments under the U.S. Environmental Protection Agency (EPA) Brownfields initiative. This fact sheet is presented for informational purposes only, and should not be construed as a federal policy or directive. The Brownfields Coordinator for this region may be reached at 215-814-5000.

A semivolatile organic compound is an organic compound which has a boiling point higher than water and which may vaporize when exposed to temperatures above room temperature. Semivolatile organic compounds include phenols and polynuclear aromatic hydrocarbons (PAH).

LIST OF SEMIVOLATILE ORGANIC COMPOUNDS *

- Phenol
- Bis(2-chloroethyl)ether
- 2-Chlorophenol
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- 1,2-Dichlorobenzene
- 2-Methylphenol
- Bis(2-chloroisopropyl)ether
- 4-Methylphenol
- n-Nitroso-di-n-propylamine
- Hexachloroethane
- Nitrobenzene
- Isophorone
- 2-Nitrophenol
- 2,4-Dimethylphenol
- Bis(2-chloroethoxy)methane
- 2,4-Dichlorophenol
- 1,2,4-Trichlorobenzene
- Naphthalene
- 4-Chloroaniline
- Hexachlorobutadiene
- 4-Chloro-3-methylphenol
- 2-Methlynaphthalene
- Hexachlorocyclopentadiene
- 2,4,6-Trichlorophenol
- 2,4,5-Trichlorophenol
- 2-Chloronaphthalene
- 2-Nitroaniline
- Dimethylphthalate
- Acenaphthylene
- 2,6-Dinitrotoluene

- 3-Nitroaniline
- Acenaphthene
- 2,4-Dinitrophenol
- 4-Nitrophenol
- 4-Bromophenyl-phenylether
- Hexachlorobenzene
- Pentachlorophenol
- Phenanthrene
- Anthracene
- Carbazole
- Di-n-butylphthalate
- Fluoranthene
- Pyrene
- Butylbenzylphthalate
- 3,3'-Dichlorobenzidine
- Benzo(a)anthracene
- Chrysene
- Bis(2-ethylhexyl)phthalate
- Di-n-octylphthalate
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Benzo(a)pyrene
- Indeno(1,2,3-cd)pyrene
- Dibenz(a,h)anthracene
- Benzo(g,h,i)perylene

* Please note: The list above corresponds to the EPA Contract Laboratory Program (CLP) semivolatile organic list, and is not a complete list of all toxic semivolatile organic compounds. If the site history suggests a semivolatile organic compound may be present which is not on this list, the compound should be included in the requested analysis.

ANALYSIS METHODS

Please note that the methods listed below are EPA approved and the most commonly used by EPA and their contractors. However, they are not the only methods for the analysis of semivolatile organic compounds. In addition, these are not drinking water test methods.

METHOD	APPLICABLE MATRICES
EPA 625 or 1625 (1)	Aqueous
EPA SW-846 3010 or 3020/8250 or 8270 (2)	Aqueous
EPA SW-846 3500 or 3550/8250 or 8270 (2)	Soil/Sediment & Waste
EPA CLP Statement of Work 3/90	Aqueous & Soil/Sediment
EPA SW-846 8100 or 8310 (2) 610 (1)	Water and Soil/Sediment for PAH
EPA SW-846 8040 (2) or 604 (1)	Water and Soil/Sediment for Phenols

1. U.S. Environmental Protection Agency (EPA). 1992. *Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.* Washington, D.C. July.
2. EPA. 1986. *Test Methods for Evaluating Solid Waste.* SW-846. Washington, D.C. September.

COLLECTION MEDIA/VOLUME

Listed below are the EPA-recommended preservation and holding times as well as suggested glassware.

MATRIX	GLASSWARE	VOLUME	PRESERVATIVE	HOLDING TIME
Soil/Sediment	8-oz wide mouthed jar	1 8-oz jar	ice to 4° C	14 days
Aqueous	32-oz amber bottle	2 amber bottles	ice to 4° C	7 days
Waste	8-oz wide mouth jar	1 8-oz jar	none required (ice preferred)	none (try not to exceed 14 days)

MINIMUM LABORATORY QUALITY CONTROL MEASURES

The laboratory should have Standard Operating Procedures available for review for the semivolatile organic compound analyses and for all associated methods needed to complete the semivolatile analysis, such as total solids, instrument maintenance, sample handling, and sample documentation procedures. In addition, the laboratory should have a Laboratory Quality Assurance/Quality Control Statement available for review which includes all key personnel qualifications.

QC TYPE	FREQUENCY OF ANALYSIS	ACCEPTABLE LIMITS
Gas Chromatograph/Mass Spectrometer (GC/MS) Tuning	Once per day or more frequently if required by method	See method criteria for acceptable limits
Initial Calibration	Prior to analysis of samples (minimum three concentration levels for every compound and an instrument blank)	% Relative Standard Deviation of Response Factors of $\leq$ 30 (see method for any allowable variations), and a minimum Response Factor of $\geq$ 0.05 (see method for calculation)
Continuing Calibration	Once per day (mid-level standard containing all compounds) or more frequently if required by method	% Difference for Response Factor of $\leq$ 25 (see method for any allowable variations), and a minimum Response Factor of $\geq$ 0.05 (see method for calculation)
Method Blank	Once per extraction batch	See method for allowable limits
Internal Standards	Six per sample (see method for suggested internal standard compounds)	-50% to + 100% of Daily standard area and retention time shift (limits depend if packed or capillary column, see method)

Matrix Spike/Matrix Spike Duplicate	One set of MS/MSD per 20 samples or analysis set	See method for allowable limits
Surrogate Spikes	Added to each sample (see method for suggested surrogate compounds)	Report recovery

MINIMUM DATA PACKAGE REQUIREMENTS

- Sample results in a tabular form (if soil or sediment) reported on a dry weight basis.
- Report % moisture or % solids for all soil and sediment samples.
- Report sample volumes or weights, as well as any dilution factors, for each sample analysis.
- Return copy of the chain of custody form sent with the samples with laboratory receipt acknowledgment, and the internal or laboratory chain of custody forms.
- Method blank results.
- GC/MS tuning data summary.
- GC/MS initial and continuing calibration data summary forms.
- GC/MS internal standard data for samples and associated daily standard.
- Surrogate spike recoveries, either on a separate table or with the results, including laboratory QC limits.
- Matrix spike recovery tables, including laboratory recovery and relative percent difference QC limits.
- Date samples were analyzed, on a separate sheet, tune sheet, or results page.
- Optional: sample, standard and blank chromatograms, quantitation sheets, mass spectra, instrument run logs, and total solids logs.

Note: The optional QC must be maintained by laboratory for at least one year for possible future QC audits.

[Region 3 HSCD | Region 3 | EPA Superfund]

United States Environmental Protection Agency, 1650 Arch Street, Philadelphia, PA 19103-2029
Phone: (800) 438-2474

EPA Home | Privacy and Security Notice | Contact Us

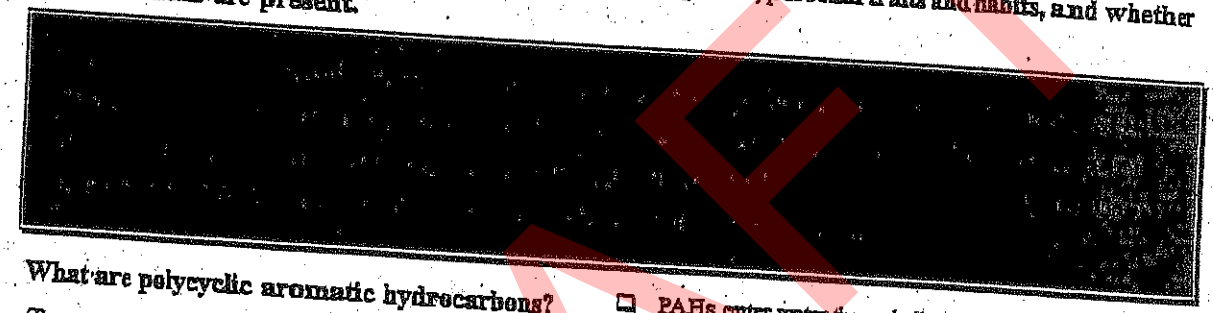
Last updated on Wednesday, September 28th, 2005
URL: http://www.epa.gov/reg3hwmd/bfs/regional/analytical/semi-volitile.htm

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)

Agency for Toxic Substances and Disease Registry ToxFAQs — September 1996

This fact sheet answers the most frequently asked health questions (FAQs) about polycyclic aromatic hydrocarbons (PAHs). For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.



What are polycyclic aromatic hydrocarbons?

(Pronounced pŏl'ē-sī'klĭk ăr'ə-măt'ĭk hī'drə-kär'bənz)

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

What happens to PAHs when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks.
- PAHs enter water through discharges from industrial and wastewater treatment plants.
- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

How might I be exposed to PAHs?

- Breathing air containing PAHs in the workplace of coking, coal-tar, and asphalt production plants; smokehouses; and municipal trash incineration facilities.
- Breathing air containing PAHs from cigarette smoke, wood smoke, vehicle exhausts, asphalt roads, or agricultural burn smoke.
- Coming in contact with air, water, or soil near hazardous waste sites.
- Eating grilled or charred meats; contaminated cereals, flour, bread, vegetables, fruits, meats; and processed or pickled foods.
- Drinking contaminated water or cow's milk.

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

JTBaker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada

All non-emergency questions should be directed to Customer

ANTHRACENE

1. Product Identification

Synonyms: Paranaphthalene; Green Oil; Anthracene 90-95%
CAS No.: 120-12-7
Molecular Weight: 178.23
Chemical Formula: (C6H4CH)2
Product Codes: B490

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	H
Anthracene	120-12-7	99 - 100%	

3. Hazards Identification

Emergency Overview

WARNING! MAY CAUSE IRRITATION TO SKIN, EYES, AND

unconscious person. Get medical attention.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists.

Eye Contact:

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Call a physician if irritation persists.

5. Fire Fighting Measures

Fire:

Flash point: 121C (250F) CC

Low fire hazard when exposed to heat or flames.

Explosion:

Above the flash point, explosive vapor-air mixtures may be formed. Will burst into flame on contact with chromic acid.

Fire Extinguishing Media:

Water spray, dry chemical, alcohol foam, or carbon dioxide.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

Material Safety Data Sheet
Pyrene, 98+%(gc)

ACC# 27452

Section 1 - Chemical Product and Company Identification

MSDS Name: Pyrene, 98+%(gc)
Catalog Numbers: AC180830000, AC180830250, AC180831000, AC180832500
Synonyms: Benzo[def]phenanthrene
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
129-00-0	Pyrene, ca	96.0	204-927-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow powder.
Danger! Cancer hazard. May be fatal if inhaled. Causes respiratory tract irritation. May be harmful if swallowed. Causes skin irritation. May cause eye irritation. May cause cancer based on animal studies. The toxicological properties of this material have not been fully investigated.
Target Organs: None known.

Potential Health Effects
Eye: May cause eye irritation.
Skin: Causes skin irritation. Prolonged and/or repeated contact may cause irritation and/or dermatitis. Dermal applications may cause hyperemia (an excess of blood in a part), weight loss, and hematopoietic changes.
Ingestion: May cause digestive tract disturbances. The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed.
Inhalation: May be fatal if inhaled. Causes respiratory tract irritation. Inhalation of dust may cause respiratory tract irritation.
Chronic: May cause cancer according to animal studies. Chronic effects may include leukocytosis and lengthened chronaxy of the leg muscle flexors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Pyrene, ca	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (as benzene soluble fraction) (listed under Coal tar pitches).

OSHA Vacated PELs: Pyrene, ca: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Powder
Appearance: yellow
Odor: None reported.
pH: Not available.
Vapor Pressure: < 1 mm Hg @20C
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 404 deg C @ 760.00mmHg
Freezing/Melting Point:156 deg C
Decomposition Temperature: Not available.
Solubility: 1.271
Specific Gravity/Density: Not available.
Molecular Formula:C16H10
Molecular Weight:202.25

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Physical: No information available.
Other: Reported BCF: rainbow trout, 72); goldfish, 457; fathead minnow, 600-970. Based on these values, minimal to moderate bioconcentration of pyrene in aquatic organisms would be expected.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DOT regulated - small quantity provisions apply (see 49CFR173.4)	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 129-00-0 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 129-00-0: Effective 6/1/87, Sunset 6/1/97
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
CAS# 129-00-0: 5000 lb final RQ; 2270 kg final RQ
SARA Section 302 Extremely Hazardous Substances
CAS# 129-00-0: 1000 lb TPQ (lower threshold); 10000 lb TPQ (upper thre shold)

SARA Codes
CAS # 129-00-0: acute, chronic.
Section 313 No chemicals are reportable under Section 313.
Clean Air Act:

International Chemical Safety Cards

BENZ(a)ANTHRACENE

ICSC: 0385

BENZ(a)ANTHRACENE
1,2-Benzoanthracene
Benzo(a)anthracene
2,3-Benzphenanthrene
Naphthanthracene
$C_{18}H_{12}$
Molecular mass: 228.3

CAS # 56-55-3
RTECS # CV9275000
ICSC # 0385
EC # 601-033-00-9

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.		Water spray, powder. In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		AVOID ALL CONTACT!	
• INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
• SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
• EYES		Safety goggles, face shield, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING

ENVIRONMENTAL DATA	In the food chain important to humans, bioaccumulation takes place, specifically in seafood.

NOTES

This substance is one of many polycyclic aromatic hydrocarbons - standards are usually established for them as mixtures, e.g., coal tar pitch volatiles. However, it may be encountered as a laboratory chemical in its pure form. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken. Do NOT take working clothes home. Tetraphene is a common name.

ADDITIONAL INFORMATION

ICSC: 0385

BENZ(a)ANTHRACENE

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.
Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.
Flash Point: Not applicable.
Autoignition Temperature: Not available.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: ; Flammability: 1; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash hands before eating. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Avoid breathing dust.
Storage: Store in a tightly closed container. Store in a cool, dry area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Conditions to Avoid: Dust generation.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 218-01-9: GC0700000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 218-01-9:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** carcinogen, initial date 1/1/90
- **NTP:** Suspect carcinogen (listed as Polycyclic aromatic hydrocarbons).
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Neurotoxicity: No information available.
Mutagenicity: Chrysene was mutagenic to S. Typhimurium in the presence of an exogenous metabolic system.
Other Studies: Genotoxicity : Salmonella typhimurium TA97,TA98,TA100 with metabolic activation positive (Sakai.M.et al Mutat.Res1985); Saccharomyces cerrevisae (Miotic recombination) D3 strain 330mg/kg negative.

Section 12 - Ecological Information

Ecotoxicity: Water flea LC50 = 1.9 mg/L; 2 Hr.; Unspecified Fish toxicity : LC50 (96hr) Neauthes arenacedentata >1ppm.(Rossi,S.S. et al Marine Pollut. Bull. 1978) Invertebrate toxicity : lethal treshold concentration (24hr) Daphnia Magna 0,7æg/l.(* Newsted,J.L. et al Environ. Toxicol. Chem. 1987) Bioaccumulation : 24hr Daphnia Magna log bioconcentration factor 3.7845 (*)
Environmental: Degradation studies : biodegradated by white rot fungus (Proc.Annu.Meet.Am.Wood-Preserv.Assoc.1989) May be utilised by axenic cultures of microorganisms e.g. Pseudomonas pancimobilis EPA505, which may have novel degradative systems(Mueller,J.G. et al ppl.Environ.Microbiol.1990; Mueller, J.G. et al Environ.Sci.Technol.1991).
Physical: Not found.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. CAS# 218-01-9 is listed as a Priority Pollutant under the Clean Water Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 218-01-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Chrysene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 218-01-9: 0.35 æg/day NSRL (oral)

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 45 May cause cancer.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

WGK (Water Danger/Protection)

CAS# 218-01-9: No information available.

Canada - DSL/NDSL

CAS# 218-01-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

Canadian Ingredient Disclosure List

CAS# 218-01-9 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 6/30/1999

Material Safety Data Sheet
Benzo[a]pyrene, 98%

ACC# 37175

Section 1 - Chemical Product and Company Identification

MSDS Name: Benzo[a]pyrene, 98%
Catalog Numbers: AC105600000, AC105600010, AC105601000, AC377200000, AC377200010, AC377201000 AC377201000
Synonyms: 3,4-Benzopyrene; 3,4-Benzpyrene; Benzo[def]chrysene.
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
50-32-8	Benzo[a]pyrene	>96	200-028-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to brown powder.
Danger! May cause heritable genetic damage. Cancer hazard. May cause harm to the unborn child. May impair fertility. May cause eye, skin, and respiratory tract irritation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Target Organs: Reproductive system.

Potential Health Effects
Eye: May cause eye irritation.
Skin: May cause skin irritation. May be harmful if absorbed through the skin.
Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed.
Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. May be harmful if inhaled.
Chronic: May cause cancer in humans. May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Benzo[a]pyrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (as benzene soluble fraction) (listed under Coal tar pitches).

OSHA Vacated PELs: Benzo[a]pyrene: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Powder
Appearance: yellow to brown
Odor: faint aromatic odor
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 495 deg C @ 760 mm Hg
Freezing/Melting Point:175 - 179 deg C
Decomposition Temperature: Not available.
Solubility: 1.60x10-3 mg/l @25°C
Specific Gravity/Density: Not available.
Molecular Formula:C20H12
Molecular Weight:252.31

RCRA U-Series:
CAS# 50-32-8: waste number U022.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Benzo{a} pyrene)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Benzo{a} pyrene)
Hazard Class:	9	9
UN Number:	UN3077	UN3077
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 50-32-8 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
CAS# 50-32-8: 1 lb final RQ; 0.454 kg final RQ
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 50-32-8: acute, chronic.
Section 313
This material contains Benzo[a]pyrene (CAS# 50-32-8, >96%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA. CAS# 50-32-8 is listed as a Priority Pollutant under the Clean Water Act.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 50-32-8 can be found on the following state right to know lists: California,

shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY CAUSE ALLERGIC SKIN REACTION. MAY AFFECT LIVER, KIDNEY, BLOOD AND CENTRAL NERVOUS SYSTEM. COMBUSTIBLE.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 2 - Moderate
Reactivity Rating: 0 - None
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:
Inhalation of dust or vapors can cause headache, nausea, vomiting, extensive sweating, and disorientation. The predominant reaction is delayed intravascular hemolysis with symptoms of anemia, fever, jaundice, and kidney or liver damage.

Ingestion:
Toxic. Can cause headache, profuse perspiration, listlessness, dark urine, nausea, vomiting and disorientation. Intravascular hemolysis may also occur with symptoms similar to those noted for inhalation. Severe cases may produce coma with or without convulsions. Death may result from renal failure.

Skin Contact:
Can irritate the skin and, on prolonged contact, may cause rashes and allergy. "Sensitized" individuals may suffer a severe dermatitis.

Eye Contact:
Vapors and solid causes irritation, redness and pain. Very high exposures can damage the nerves of the eye.

Chronic Exposure:
Has led to cataract formation in eyes. May cause skin allergy.

Aggravation of Pre-existing Conditions:
Persons with pre-existing skin, blood or vascular disorders or impaired respiratory function may be more susceptible to the effects of the substance. Particularly susceptible individuals are found in the general population, most commonly in dark skinned races.

manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Keep away from moisture and oxidizers. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
- OSHA Permissible Exposure Limit (PEL):
10 ppm, 50 mg/m3.

- ACGIH Threshold Limit Value (TLV):
TWA= 10 ppm, 52 mg/m3
STEL= 15 ppm, 79 mg/m3.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, a half-face respirator with an organic vapor cartridge and particulate filter (NIOSH type P95 or R95 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with an organic vapor cartridge and particulate filter (NIOSH P100 or R100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. Please note that N series filters are not recommended for this material. For emergencies or instances where the exposure levels are not known, use

Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong oxidizers, strong alkalis and strong mineral acids, mixtures of aluminum trichloride and benzoyl chloride. Reacts violently with chromic anhydride. Melted naphthalene will attack some forms of plastics, rubber, and coatings.
Conditions to Avoid:
Avoid heat, sparks, flames and other ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50: 490 mg/kg;
Inhalation rat LC50: 340 mg/m3, 1 hour;
Skin rabbit LD50: > 20 g/kg;
Irritation data: skin (open Draize) rabbit 495 mg, mild; eye (standard Draize) rabbit 100 mg, mild;
Investigated as a tumorigen, mutagen and reproductive effector.

--------\Cancer Lists\----------

Ingredient	NTP Carcinogen		IARC Categ
	Known	Anticipated	
Naphthalene (91-20-3)	No	No	None

12. Ecological Information

Environmental Fate:
When released into the soil, this material may biodegrade to a moderate extent. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released to water, this material is expected to quickly evaporate. When released into water, this material may biodegrade to a moderate extent. When released into the water, this material is expected to have a half-life between 1 and 10 days. This material may bioaccumulate to some extent. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life of less than 1 day.
Environmental Toxicity:
No information found.

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Naphthalene (91-20-3)	Yes	Yes	No	Yes

\Federal, State & International Regulations - Part 1\

Ingredient	-SARA 302- RQ	TPQ	-------SARA 313---- List	Chemical C
Naphthalene (91-20-3)	No	No	Yes	No

\Federal, State & International Regulations - Part 2\

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Naphthalene (91-20-3)	100	U165	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: 2Z
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 2 Flammability: 2 Reactivity: 0
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY CAUSE ALLERGIC SKIN REACTION. MAY AFFECT LIVER, KIDNEY, BLOOD AND CENTRAL NERVOUS SYSTEM. COMBUSTIBLE.
Label Precautions:
Avoid contact with eyes, skin and clothing.
Avoid prolonged or repeated contact with skin.
Avoid breathing dust.
Avoid breathing vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

This information was last updated on July 15, 2004. We have tried to make it as accurate and useful as possible, but can take no responsibility for its use, misuse, or accuracy. We have not verified this information, and cannot guarantee that it is up-to-date.

given here.)

ORL-RAT LDLO 1500 mg kg^{-1}

IPR-RAT LDLO 250 mg kg^{-1}

ITR-RAT LDLO 25 mg kg^{-1}

IPR-MUS LDLO 100 mg kg^{-1}

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)

Hazard class 4.1. Packing group III. UN No 1325.

Personal protection

Safety glasses and gloves. Good ventilation and an inert atmosphere if working with powdered material.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

given here.)

IPR-MUS LD50 3.5 mg kg^{-1}

Risk phrases
(The meaning of any risk phrases which appear in this section is given here.)
R11 R36 R37 R38 (all for the powdered material only).

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
UN Nos: 3089 (very fine powder), 3077 (fine powder); otherwise considered non-hazardous for air, sea and road freight.

Personal protection

Suitable ventilation if handling powder.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

spontaneously. May react violently with titanium, ammonium nitrate, potassium perchlorate, hydrazoic acid. Incompatible with acids, oxidizing agents, sulfur.

Toxicology

Carcinogen. Toxic by all routes of entry. May cause sensitization by skin contact. Typical TLV 0.05 mg/m3

Toxicity data
(The meaning of any toxicological abbreviations which appear in this section is given here.)

IPR-RAT LD50 250 mg kg^{-1}

Risk phrases
(The meaning of any risk phrases which appear in this section is given here.)
R10 R17 R36 R37 R38 R40 R42 R43.

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
UN No 3089. Packing group II. Hazard class 4.1.

Personal protection

Good ventilation. Wear gloves and safety glasses when handling the powder.

Safety phrases
(The meaning of any safety phrases which appear in this section is given here.)
S16 S22 S26 S36.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

PESTICIDES AND PCBs

Assessing Health Risks from Pesticides

January 1999
735-F-99-002

The Federal Government, in cooperation with the States, carefully regulates pesticides to ensure that they do not pose unreasonable risks to human health or the environment. As part of that effort, the Environmental Protection Agency (EPA) requires extensive test data from pesticide producers that demonstrate pesticide products can be used without posing harm to human health and the environment. EPA scientists and analysts carefully review these data to determine whether to register (license) a pesticide product or a use and whether specific restrictions are necessary. This fact sheet is a brief overview of EPA's process for assessing potential risks to human health when evaluating pesticide products.

Background

There are more than 865 active ingredients registered as pesticides, which are formulated into thousands of pesticide products that are available in the marketplace. About 350 pesticides are used on the foods we eat, and to protect our homes and pets.

EPA plays a critical role in evaluating these chemicals prior to registration, and in reevaluating older pesticides already on the market, to ensure that they can be used with a reasonable certainty of no harm. The process EPA uses for evaluating the health impacts of a pesticide is called risk assessment.

EPA uses the National Research Council's four-step process for human health risk assessment:

Step One: Hazard Identification
Step Two: Dose-Response Assessment
Step Three: Exposure Assessment
Step Four: Risk Characterization

Step One: Hazard Identification (Toxicology)

The first step in the risk assessment process is to identify potential health effects that may occur from different types of pesticide exposure. EPA considers the full spectrum of a pesticide's potential health effects.

Generally, for human health risk assessments, many toxicity studies are conducted on animals by pesticide companies in independent laboratories and evaluated for acceptability by EPA scientists. EPA evaluates pesticides for a wide range of adverse effects, from eye and skin irritation to cancer and birth defects in laboratory animals. EPA may also consult the public literature or other sources of supporting information on any aspect of the chemical.

Step Two: Dose-Response Assessment

Paracelsus, the Swiss physician and alchemist, the "father" of modern toxicology (1493-1541) said,

> "The dose makes the poison."

In other words, **the amount of a substance a person is exposed to** is as important as **how toxic the chemical might be**. For example, small doses of aspirin can be beneficial to people, but at very high doses, this common medicine can be deadly. In some individuals, even at very low doses, aspirin may be deadly.

Dose-response assessment involves considering the dose levels at which adverse effects were observed in test animals, and using these dose levels to calculate an equal dose in humans.

Step Three: Exposure Assessment

People can be exposed to pesticides in three ways:

1. Inhaling pesticides (inhalation exposure),
2. Absorbing pesticides through the skin (dermal exposure), and
3. Getting pesticides in their mouth or digestive tract (oral exposure).

Depending on the situation, pesticides could enter the body by any one or all of these routes. Typical sources of pesticide exposure include:

- **Food**
  Most of the foods we eat have been grown with the use of pesticides. Therefore, pesticide residues may be present inside or on the surfaces of these foods.

- **Home and Personal Use Pesticides**
  You might use pesticides in and around your home to control insects.

EPA: Pesticides - Assessing Health Risks from Pesticides
Page 2 of 5

Step Two: Dose-Response Assessment

Paracelsus, the Swiss physician and alchemist, the "father" of modern toxicology (1493-1541) said,

"The dose makes the poison."

In other words, the amount of a substance a person is exposed to is as important as how toxic the chemical might be. For example, small doses of aspirin can be beneficial to people, but at very high doses, this common medicine can be deadly. In some individuals, even at very low doses, aspirin may be deadly.

Dose-response assessment involves considering the dose levels at which adverse effects were observed in test animals, and using these dose levels to calculate an equal dose in humans.

Step Three: Exposure Assessment

People can be exposed to pesticides in three ways:

considered, and broad conclusions are made. EPA's role is to evaluate both toxicity and exposure and to determine the risk associated with use of the pesticide.

Simply put,

RISK = TOXICITY x EXPOSURE.

This means that the risk to human health from pesticide exposure depends on both the toxicity of the pesticide and the likelihood of people coming into contact with it. At least *some* exposure and *some* toxicity are required to result in a risk. For example, if the pesticide is very poisonous, but no people are exposed, there is no risk. Likewise, if there is ample exposure but the chemical is non-toxic, there is no risk. However, usually when pesticides are used, there is some toxicity and exposure, which results in a potential risk.

EPA recognizes that effects vary between animals of different species and from person to person. To account for this variability, *uncertainty factors* are built into the risk assessment. These uncertainty factors create an additional margin of safety for protecting people who may be exposed to the pesticides. FQPA requires EPA to use an extra 10-fold safety factor, if necessary, to protect infants and children from effects of the pesticide.

Types of Toxicity Tests EPA Requires for Human Health Risk Assessments

EPA evaluates studies conducted over different periods of time and that measure specific types of effects. These tests are evaluated to screen for potential health effects in infants, children and adults.

Acute Testing: Short-term exposure; a single exposure (dose).

- Oral, dermal (skin), and inhalation exposure
- Eye irritation
- Skin irritation
- Skin sensitization
- Neurotoxicity

Sub-chronic Testing: Intermediate exposure; repeated exposure over a longer period of time (i.e., 30-90 days).

- Oral, dermal (skin), and inhalation
- Neurotoxicity (nerve system damage)

Chronic Toxicity Testing: Long-term exposure; repeated exposure lasting for most of the test animal's life span. Intended to determine the effects of a pesticide after prolonged and repeated exposures.

- Chronic effects (non-cancer)
- Carcinogenicity (cancer)

Developmental and Reproductive Testing: Identify effects in the fetus of an exposed pregnant female (birth defects) and how pesticide exposure affects the ability of a test animal to successfully reproduce.

Mutagenicity Testing: Assess a pesticide's potential to affect the cell's genetic components.

Hormone Disruption: Measure effects for their potential to disrupt the endocrine system. The endocrine system consists of a set of glands and the hormones they produce that help guide the development, growth, reproduction, and behavior of animals including humans.

Risk Management

Once EPA completes the risk assessment process for a pesticide, we use this information to determine if (when used according to label directions), there is a reasonable certainty that the pesticide will not harm a person's health.

Using the conclusions of a risk assessment, EPA can then make a more informed decision regarding whether to approve a pesticide chemical or use, as proposed, or whether additional protective measures are necessary to limit occupational or non-occupational exposure to a pesticide. For example, EPA may prohibit a pesticide from being used on certain crops because consuming too much food treated with the pesticide may result in an unacceptable risk to consumers. Another example of protective measures is requiring workers to wear personal protective equipment (PPE) such as a respirator or chemical resistant gloves, or not allowing workers to enter treated crop fields until a specific period of time has passed.

If, after considering all appropriate risk reduction measures, the pesticide still does not meet EPA's safety standard, the Agency will not allow the proposed chemical or use. Regardless of the specific measures enforced, EPA's primary goal is to ensure that legal uses of the pesticide are protective of human health, especially the health of children, and the environment.

Human Health Risk Assessment and the Law

Federal law requires detailed evaluation of pesticides to protect human health and the environment. In 1996, Congress made significant changes to strengthen pesticide laws through the Food Quality Protection Act (FQPA). Many of these changes are key elements of the current risk assessment process. FQPA required that EPA consider:

- **A New Safety Standard**: FQPA strengthened the safety standard that pesticides must meet before being approved for use. EPA must ensure with a reasonable certainty that no harm will result from the legal uses of the pesticide.
- **Exposure from All Sources**: In evaluating a pesticide, EPA must estimate the combined risk from that pesticide from all non-occupational sources, such as:
  - Food Sources
  - Drinking Water Sources
  - Residential Sources
- **Cumulative Risk**: EPA is required to evaluate pesticides in light of similar toxic effects that different pesticides may share, or "a common mechanism of toxicity." At this time, EPA is developing a methodology for this type of assessment.
- **Special Sensitivity of Children to Pesticides**: EPA must ascertain whether there is an increased susceptibility from exposure to the pesticide to infants and children. EPA must build an additional 10-fold safety factor into risk assessments to ensure the protection of infants and children, unless it is determined that a lesser margin of safety will be safe for infants and children.

For More Information

If you would like more information about EPA's pesticide programs, contact the Communication Service Branch at (703) 305-5017 or visit the Pesticides Web site.

For more information on specific pesticides, or to inquire about the symptoms of pesticide poisoning, call the National Pesticide Information Center (NPIC), a toll-free hotline information at: 1-800-858-7378, or visit their Web site [EXIT Disclaimer].

Last updated on Monday, May 19th, 2003
URL: http://www.epa.gov/pesticides/factsheets/riskassess.htm

What is a Pesticide?

A pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. Pests can be insects, mice and other animals, unwanted plants (weeds), fungi, or microorganisms like bacteria and viruses. Though often misunderstood to refer only to *insecticides*, the term pesticide also applies to herbicides, fungicides, and various other substances used to control pests. Under United States law, a pesticide is also any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.

Many household products are pesticides. Did you know that all of these common products are considered pesticides?

- Cockroach sprays and baits
- Insect repellents for personal use.
- Rat and other rodent poisons.
- Flea and tick sprays, powders, and pet collars.
- Kitchen, laundry, and bath disinfectants and sanitizers.
- Products that kill mold and mildew.
- Some lawn and garden products, such as weed killers.
- Some swimming pool chemicals.

By their very nature, most pesticides create some risk of harm to humans, animals, or the environment because they are designed to kill or otherwise adversely affect living organisms. At the same time, pesticides are useful to society because of their ability to kill potential disease-causing organisms and control insects, weeds, and other pests. In the United States, the Office of Pesticide Programs of the Environmental Protection Agency is chiefly responsible for regulating pesticides. Biologically-based pesticides, such as pheromones and microbial pesticides, are becoming increasingly popular and often are safer than traditional chemical pesticides.

Here are some common kinds of pesticides and their function:

Algicides
Control algae in lakes, canals, swimming pools, water tanks, and other sites.

Antifouling agents
Kill or repel organisms that attach to underwater surfaces, such as boat bottoms.

Antimicrobials
Kill microorganisms (such as bacteria and viruses).

Attractants
Attract pests (for example, to lure an insect or rodent to a trap). (However, food is not onsidered a pesticide when used as an attractant.)

Biocides
Kill microorganisms.

Disinfectants and sanitizers
Kill or inactivate disease-producing microorganisms on inanimate objects.

Fungicides
Kill fungi (including blights, mildews, molds, and rusts).

Fumigants
Produce gas or vapor intended to destroy pests in buildings or soil.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

POLYCHLORINATED BIPHENYLS

Division of Toxicology ToxFAQs™

February 2001

This fact sheet answers the most frequently asked health questions (FAQs) about polychlorinated biphenyls. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

What are polychlorinated biphenyls?

Polychlorinated biphenyls are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor.

PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors, and old microscope and hydraulic oils.

What happens to PCBs when they enter the environment?

- PCBs entered the air, water, and soil during their manufacture, use, and disposal; from accidental spills and leaks during their transport; and from leaks or fires in products containing PCBs.
- PCBs can still be released to the environment from hazardous waste sites; illegal or improper disposal of industrial wastes and consumer products; leaks from old electrical transformers containing PCBs; and burning of some wastes in incinerators.
- PCBs do not readily break down in the environment and thus may remain there for very long periods of time. PCBs can travel long distances in the air and be deposited in areas far away from where they were released. In water, a small amount of PCBs may remain dissolved, but most stick to organic particles and bottom sediments. PCBs also bind strongly to soil.
- PCBs are taken up by small organisms and fish in water. They are also taken up by other animals that eat these aquatic animals as food. PCBs accumulate in fish and marine mammals, reaching levels that may be many thousands of times higher than in water.

How might I be exposed to PCBs?

- Using old fluorescent lighting fixtures and electrical devices and appliances, such as television sets and refrigerators, that were made 30 or more years ago. These items may leak small amounts of PCBs into the air when they get hot during operation, and could be a source of skin exposure.
- Eating contaminated food. The main dietary sources of PCBs are fish (especially sportfish caught in contaminated lakes or rivers), meat, and dairy products.
- Breathing air near hazardous waste sites and drinking contaminated well water.
- In the workplace during repair and maintenance of PCB transformers; accidents, fires or spills involving transformers, fluorescent lights, and other old electrical devices; and disposal of PCB materials.

How can PCBs affect my health?

The most commonly observed health effects in people exposed to large amounts of PCBs are skin conditions such as acne and rashes. Studies in exposed workers have shown changes in blood and urine that may indicate liver damage. PCB exposures in the general population are not likely to result in skin and liver effects. Most of the studies of health effects of PCBs in the general population examined children of mothers who were exposed to PCBs.

Animals that ate food containing large amounts of PCBs for short periods of time had mild liver damage and some died. Animals that ate smaller amounts of PCBs in food over several weeks or months developed various kinds of health effects, including anemia; acne-like skin conditions; and liver, stomach, and thyroid gland injuries. Other effects

of PCBs in animals include changes in the immune system, behavioral alterations, and impaired reproduction. PCBs are not known to cause birth defects.

How likely are PCBs to cause cancer?

Few studies of workers indicate that PCBs were associated with certain kinds of cancer in humans, such as cancer of the liver and biliary tract. Rats that ate food containing high levels of PCBs for two years developed liver cancer. The Department of Health and Human Services (DHHS) has concluded that PCBs may reasonably be anticipated to be carcinogens. The EPA and the International Agency for Research on Cancer (IARC) have determined that PCBs are probably carcinogenic to humans.

How can PCBs affect children?

Women who were exposed to relatively high levels of PCBs in the workplace or ate large amounts of fish contaminated with PCBs had babies that weighed slightly less than babies from women who did not have these exposures. Babies born to women who ate PCB-contaminated fish also showed abnormal responses in tests of infant behavior. Some of these behaviors, such as problems with motor skills and a decrease in short-term memory, lasted for several years. Other studies suggest that the immune system was affected in children born to and nursed by mothers exposed to increased levels of PCBs. There are no reports of structural birth defects caused by exposure to PCBs or of health effects of PCBs in older children. The most likely way infants will be exposed to PCBs is from breast milk. Transplacental transfers of PCBs were also reported. In most cases, the benefits of breast-feeding outweigh any risks from exposure to PCBs in mother's milk.

How can families reduce the risk of exposure to PCBs?

❑ You and your children may be exposed to PCBs by eating fish or wildlife caught from contaminated locations. Certain states, Native American tribes, and U.S. territories have issued advisories to warn people about PCB-contaminated fish and fish-eating wildlife. You can reduce your family's exposure to PCBs by obeying these advisories.

❑ Children should be told not play with old appliances, electrical equipment, or transformers, since they may contain PCBs.

❑ Children should be discouraged from playing in the dirt near hazardous waste sites and in areas where there was a transformer fire. Children should also be discouraged from eating dirt and putting dirty hands, toys or other objects in their mouths, and should wash hands frequently.

❑ If you are exposed to PCBs in the workplace it is possible to carry them home on your clothes, body, or tools. If this is the case, you should shower and change clothing before leaving work, and your work clothes should be kept separate from other clothes and laundered separately.

Is there a medical test to show whether I've been exposed to PCBs?

Tests exist to measure levels of PCBs in your blood, body fat, and breast milk, but these are not routinely conducted. Most people normally have low levels of PCBs in their body because nearly everyone has been environmentally exposed to PCBs. The tests can show if your PCB levels are elevated, which would indicate past exposure to above-normal levels of PCBs, but cannot determine when or how long you were exposed or whether you will develop health effects.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 0.0005 milligrams of PCBs per liter of drinking water (0.0005 mg/L). Discharges, spills or accidental releases of 1 pound or more of PCBs into the environment must be reported to the EPA. The Food and Drug Administration (FDA) requires that infant foods, eggs, milk and other dairy products, fish and shellfish, poultry and red meat contain no more than 0.2-3 parts of PCBs per million parts (0.2-3 ppm) of food. Many states have established fish and wildlife consumption advisories for PCBs.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological profile for polychlorinated biphenyls (PCBs). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

METALS

Heavy Metals

Introduction

The **term heavy** metal refers to any metallic chemical element that h and is toxic or poisonous at low concentrations. Examples of heavy m (Hg), cadmium (Cd), arsenic (As), chromium (Cr), thallium (Tl), and le

Heavy metals are natural components of the Earth's crust. They cannot be degraded or destroyed. enter our bodies via food, drinking water and air. As trace elements, some heavy metals (e.g. coppe essential to maintain the metabolism of the human body. However, at higher concentrations they ca metal poisoning could result, for instance, from drinking-water contamination (e.g. lead pipes), higl concentrations near emission sources, or intake via the food chain.

Heavy metals are dangerous because they tend to **bioaccumulate**. Bioaccumulation means an incr of a chemical in a biological organism over time, compared to the chemical's concentration in the er accumulate in living things any time they are taken up and stored faster than they are broken down excreted.

Heavy metals can enter a water supply by industrial and consumer waste, or even from acidic rain b releasing heavy metals into streams, lakes, rivers, and groundwater.

Environmental and health risks.

Now we are going to describe the effects of the heavy metals in the environment. The three most p Lead, Cadmium, and Mercury.

Effects of Antimony on the environment

Antimony is a metal used in the compound antimony trioxide, a flame retardant. It can also be foun and ceramics and glass. Exposure to high levels of antimony for short periods of time causes nause There is little information on the effects of long-term antimony exposure, but it is a suspected huma antimony compounds do not bioaccumulate in aquatic life.

Effects of Cadmium on the environment

Cadmium derives its toxicological properties from its chemical similarity to zinc an essential micronu and humans. Cadmium is biopersistent and, once absorbed by an organism, remains resident for m for humans) although it is eventually excreted.

In humans, long-term exposure is associated with renal disfunction. High exposure can lead to obst has been linked to lung cancer, although data concerning the latter are difficult to interpret due to c Cadmium may also produce bone defects (*osteomalacia*, *osteoporosis*) in humans and animals. In a linked to increased blood pressure and effects on the myocardium in animals, although most human findings.

The average daily intake for humans is estimated as 0.15µg from air and 1µg from water. Smoking can lead to the inhalation of around 2-4µg of cadmium, but levels may vary widely.

In what form is emitted Cadmium?

Cadmium is produced as an inevitable by-product of zinc (or occasionally lead) refining, since these within the raw ore. However, once collected the cadmium is relatively easy to recycle.

The most significant use of cadmium is in nickel/cadmium batteries, as rechargeable or secondary p high output, long life, low maintenance and high tolerance to physical and electrical stress. Cadmiur corrosion resistance, particularly in high stress environments such as marine and aerospace applicat reliability is required; the coating is preferentially corroded if damaged. Other uses of cadmium are PVC, in alloys and electronic compounds. Cadmium is also present as an impurity in several product fertilisers, detergents and refined petroleum products.

In the general, non-smoking population the major exposure pathway is through food, via the additic agricultural soil from various sources (atmospheric deposition and fertiliser application) and uptake Additional exposure to humans arises through cadmium in ambient air and drinking water.

Effects of Chromium on the environment

Chromium is used in metal alloys and pigments for paints, cement, paper, rubber, and other materi can irritate the skin and cause ulceration. Long-term exposure can cause kidney and liver damage, circulatory and nerve tissue. Chromium often accumulates in aquatic life, adding to the danger of e been exposed to high levels of chromium.

Effects of Copper on the environment

Copper is an essential substance to human life, but in high doses it can cause anemia, liver and kidr and intestinal irritation. People with Wilson's disease are at greater risk for health effects from overe Copper normally occurs in drinking water from copper pipes, as well as from additives designed to c

Effects of Lead on the environment

In humans exposure to lead can result in a wide range of biological effects depending on the level a Various effects occur over a broad range of doses, with the developing foetus and infant being more High levels of exposure may result in toxic biochemical effects in humans which in turn cause proble haemoglobin, effects on the kidneys, gastrointestinal tract, joints and reproductive system, and acu the nervous system.

Lead poisoning, which is so severe as to cause evident illness, is now very rare indeed. At intermedi however, there is persuasive evidence that lead can have small, subtle, subclinical effects, particula developments in children. Some studies suggest that there may be a loss of up to 2 IQ points for a from 10 to 20µg/dl in young children.

Average daily lead intake for adults in the UK is estimated at 1.6µg from air, 20µg from drinking wa Although most people receive the bulk of their lead intake from food, in specific populations other s(important, such as water in areas with lead piping and plumbosolvent water, air near point of sourc(paint flakes in old houses or contaminated land. Lead in the air contributes to lead levels in food thr and rain containing the metal, on crops and the soil. For the majority of people in the UK, however, well below the provisional tolerable weekly intake recommended by the UN Food and Agriculture Or Health Organisation.

In what form is emitted lead?

Lead in the environment arises from both natural and anthropogenic sources. Exposure can occur th food, air, soil and dust from old paint containing lead. In the general non-smoking, adult population pathway is from food and water. Food, air, water and dust/soil are the major potential exposure pat young children. For infants up to 4 or 5 months of age, air, milk formulae and water are the signific

Lead is among the most recycled non-ferrous metals and its secondary production has therefore gre declining lead prices. Its physical and chemical properties are applied in the manufacturing, constru industries. It is easily shaped and is malleable and ductile. There are eight broad categories of use: (no longer allowed in the EU), rolled and extruded products, alloys, pigments and compounds, cable ammunition.

Effects of Mercury on the environment

Mercury is a toxic substance which has no known function in human biochemistry or physiology and in living organisms. Inorganic mercury poisoning is associated with tremors, gingivitis and/or minor together with spontaneous abortion and congenital malformation.

Monomethylmercury causes damage to the brain and the central nervous system, while foetal and p given rise to abortion, congenital malformation and development changes in young children.

In what form is emitted Mercury?

Mercury is a global pollutant with complex and unusual chemical and physical properties. The major is the degassing of the Earth's crust, emissions from volcanoes and evaporation from natural bodies

World-wide mining of the metal leads to indirect discharges into the atmosphere. The usage of merc industrial processes and in various products (e.g. batteries, lamps and thermometers). It is also wic amalgam for fillings and by the pharmaceutical industry. Concern over mercury in the environment toxic forms in which mercury can occur.

Mercury is mostly present in the atmosphere in a relatively unreactive form as a gaseous element. T lifetime (of the order of 1 year) of its gaseous form means the emission, transport and deposition of

Natural biological processes can cause methylated forms of mercury to form which bioaccumulate o concentrate in living organisms, especially fish. These forms of mercury: monomethylmercury and c toxic, causing neurotoxicological disorders. The main pathway for mercury to humans is through the inhalation.

The main sources of mercury emissions in the UK are from the manufacture of chlorine in mercury c production, coal combustion and crematoria. UK emissions of mercury are uncertain and it is estima 13 to 36 tonnes per year (DERA). Emissions are estimated to have declined by around ¾'s between due to improved controls on mercury cells and their replacement, and the fall in coal use.

Whilst there has been a decline in the level of European emissions of mercury, emissions from outsi to increase – increasing the level of ambient concentrations in the continent.

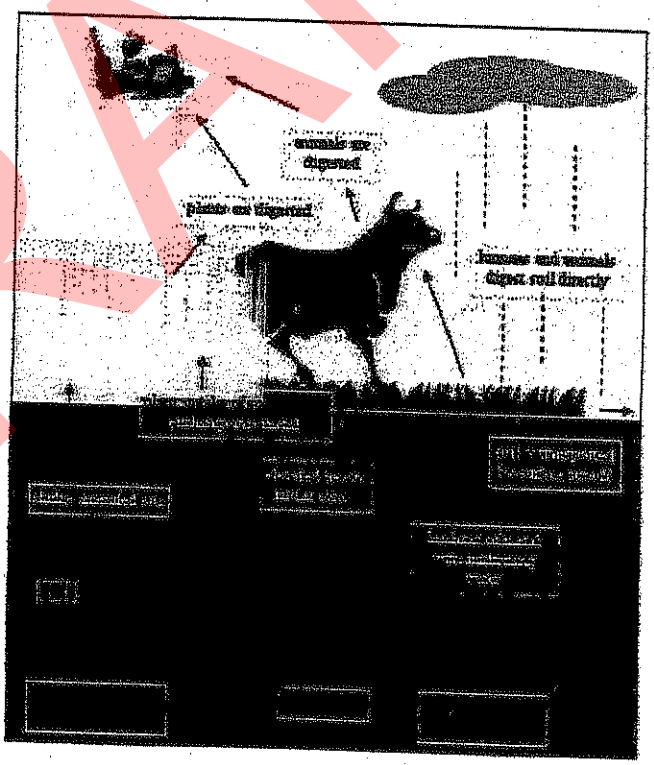
effects of Nickel on the environment

Small amounts of Nickel are needed by the human body to produce red blood cells, however, in exc become mildly toxic. Short-term overexposure to nickel is not known to cause any health problems, can cause decreased body weight, heart and liver damage, and skin irritation. The EPA does not cur levels in drinking water. Nickel can accumulate in aquatic life, but its presence is not magnified alon

Effects of Selenium on the environment

Selenium is needed by humans and other animals in small amounts, but in larger amounts can caus system, fatigue, and irritability. Selenium accumulates in living tissue, causing high selenium conter organisms, and causing greater health problems in human over a lifetime of overexposure. These h and fingernail loss, damage to kidney and liver tissue, damage to circulatory tissue, and more sever system.

Heavy Metals adsorption process:



In the picture we can observe the way that follows the havy metals from the first step of the polluti human body by menas the food.

The most importants disasters with heavy metals:

1932

Minamata
Sewage containing mercury is released by Chisso's chemicals works into Minimata Bay in Japan. The mercury accumulates in sea creatures, leading eventually to mercury poisoning in the population.
1952
Minamata Syndrome
In 1952, the first incidents of mercury poisoning appear in the population of Minimata Bay in Japan, caused by consumption of fish polluted with mercury, bringing over 500 fatalities. Since then, Japan has had the strictest environmental laws in the industrialised world.
1986-11-01
Sandoz
Water used to extinguish a major fire carries c. 30 t fungicide containing mercury into the Upper Rhine. Fish are killed over a stretch of 100 km. The shock drives many FEA projects forwards. See also "Pollution of the Rhine at Basel / Sandoz".
1998-04
Spanish nature reserve contaminated after environmental disaster
Toxic chemicals in water from a burst dam belonging to a mine contaminate the Coto de Donana nature reserve in southern Spain. C. 5 million m_ of mud containing sulphur, lead, copper, zinc and cadmium flow down the Rio Guadimar. Experts estimate that Europe's largest bird sanctuary, as well as Spain's agriculture and fisheries, will suffer permanent damage from the pollution.

Suggested reading for Heavy Metals

[Home] [Back] [More Info][Electrolysis][Metallyse]

Rotterdamseweg 402 M
2629 HH Delft, The Netherlands
tel: (+31)(0)15 26.10.900
fax: (+31)(0)15 26.16.289
e-mail: info@lenntech.com

MSDS Number: A7441 * * * * * *Effective Date: 11/12/03* * * * * *Supercedes: 02/23/01*

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

JTBaker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

ARSENIC, 1,000 UG/ML OR 10,000 UG/ML

1. Product Identification

Synonyms: None
CAS No.: Not applicable to mixtures.
Molecular Weight: Not applicable to mixtures.
Chemical Formula: Not applicable to mixtures.
Product Codes: 5704, 5718, 6442

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Arsenic	7440-38-2	0.1 - 1%	Yes
Nitric Acid	7697-37-2	< 4%	Yes
Water	7732-18-5	> 95%	No

3. Hazards Identification

Emergency Overview

DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. AFFECTS LIVER, KIDNEYS, LUNGS AND TEETH. CANCER HAZARD. CONTAINS INORGANIC ARSENIC WHICH CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Cancer Causing)
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Nitric acid is extremely hazardous; it is corrosive, reactive, an oxidizer, and a poison. The health effects from exposure to diluted forms of this chemical are not well documented. They are expected to be less severe than those for concentrated forms which are referenced in the descriptions below.

Inhalation:
Corrosive! Inhalation of vapors can cause breathing difficulties and lead to pneumonia and pulmonary edema, which may be fatal. Other symptoms may include coughing, choking, and irritation of the nose, throat, and respiratory tract. Arsenic may cause inflammation of the mucous membranes with cough and foamy sputum, restlessness, dyspnea, cyanosis, and rales. Symptoms like those from ingestion exposure may follow. May cause pulmonary edema.

Ingestion:
Corrosive! Swallowing nitric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract. Arsenic is highly toxic! May cause burning in esophagus, vomiting, and bloody diarrhea. Symptoms of cold and clammy skin, low blood pressure, weakness, headache, cramps, convulsions, and coma may follow. May cause damage to liver and kidneys. A suspected fetal toxin. Death may occur from circulatory failure. Estimated lethal dose 120 milligrams.

Skin Contact:
Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and stain skin a yellow or yellow-brown color.

Eye Contact:
Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.

Chronic Exposure:
Long-term exposure to concentrated vapors may cause erosion of teeth and lung damage. Long-term exposures seldom occur due to the corrosive properties of the acid. Arsenic on repeated or prolonged skin contact may cause bronzing of the skin, edema, dermatitis, and lesions. Repeated or prolonged inhalation of dust may cause damage to the nasal septum. Chronic exposure from inhalation or ingestion may cause hair and weight loss, a garlic odor

to the breath and perspiration, excessive salivation and perspiration, central nervous system damage, hepatitis, gastrointestinal disturbances, cardiovascular damage, and kidney and liver damage. Arsenic compounds are known human carcinogens and may be teratogenic based on effects in laboratory animals.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders, eye disease, or cardiopulmonary diseases may be more susceptible to the effects of this substance.

---

4. First Aid Measures

Immediate first aid treatment reduces the health effects of this substance. First aid procedures given apply to concentrated solutions. Exposures to dilute solutions may not require these extensive first aid procedures.

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

If swallowed, give large quantities of water to drink and get medical attention immediately. Never give anything by mouth to an unconscious person.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately. Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to this substance.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:

If emesis if unsuccessful after two doses of Ipecac, consider gastric lavage. Monitor urine arsenic level. Alkalization of urine may help prevent disposition of red cell breakdown products in renal tubular cells. If acute exposure is significant, maintain high urine output and monitor volume status, preferably with central venous pressure line. Abdominal X-rays should be done routinely for all ingestions. Chelation therapy with BAL, followed by n-penicillamine is recommended, but specific dosing guidelines are not clearly established.

---

5. Fire Fighting Measures

Fire:

Not combustible, but concentrated material is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.

Explosion:

Concentrated material reacts explosively with combustible organic or readily oxidizable materials such as: alcohols, turpentine, charcoal, organic refuse, metal powder, hydrogen sulfide, etc. Reacts with most metals to release hydrogen gas which can form explosive

mixtures with air.
Fire Extinguishing Media:
If involved in a fire, use water spray.
Special Information:
Increases the flammability of combustible, organic and readily oxidizable materials. In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® or TEAM® 'Low Na+' acid neutralizers are recommended for spills of this product.

---

7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
For Nitric Acid:

OSHA Permissible Exposure Limit (PEL):
2 ppm (TWA)
ACGIH Threshold Limit Value (TLV):
2 ppm (TWA); 4 ppm (STEL)
For Inorganic Arsenic compounds (as As):
- OSHA Permissible Exposure Limit (PEL):
10 ug/m3 (TWA), 5 ug/m3(Action Level), cancer hazard.
- ACGIH Threshold Limit Value (TLV):
0.01 mg/m3 (TWA), A1, confirmed human carcinogen.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Canister-type respirators using sorbents are ineffective.

Skin Protection:
Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Other Control Measures:
Any area where inorganic arsenic is stored, handled, used, etc., must be established as a 'Regulated Area' with controlled access, limited to authorized persons. Containers of inorganic arsenic and Regulated Areas must be labeled to show a CANCER SUSPECT AGENT is present. Eating, drinking, and smoking should not be permitted in areas where solids or liquids containing arsenic or lead compounds are handled, processed, or stored. See OSHA substance-specific standard for more information on personal protective equipment, engineering and work practice controls, medical surveillance, record keeping, and reporting requirements. (arsenic: 29 CFR 1910 .1018; lead: 29 CFR 1910.1025).

---

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.

Odor:
Odorless.

Solubility:
Infinitely soluble.

Specific Gravity:
No information found.

pH:
No information found.

% Volatiles by volume @ 21C (70F):

> 99
Boiling Point:
No information found.
Melting Point:
No information found.
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Containers may burst when heated.
Hazardous Decomposition Products:
When heated to decomposition, emits toxic nitrogen oxides fumes and hydrogen nitrate. Emits toxic fumes of arsenic when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
A dangerously powerful oxidizing agent, concentrated nitric acid is incompatible with most substances, especially strong bases, metallic powders, carbides, hydrogen sulfide, turpentine, and combustible organics.
Conditions to Avoid:
Heat, incompatibles.

11. Toxicological Information

Toxicological Data:
For arsenic: oral rat LD50: 763 mg/kg. Investigated as a tumorigen, mutagen, reproductive effector. For Nitric Acid: Investigated as a mutagen and reproductive effector.
Carcinogenicity:
For arsenic and inorganic arsenic compounds:
Regulated by OSHA as a carcinogen.
EPA / IRIS classification: Group A - Known human carcinogen.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Arsenic (7440-38-2)	Yes	No	1
Nitric Acid (7697-37-2)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

---

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID)
Hazard Class: 8
UN/NA: UN3264
Packing Group: III
Information reported for product/size: 500ML

International (Water, I.M.O.)

Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID)
Hazard Class: 8
UN/NA: UN3264
Packing Group: III
Information reported for product/size: 500ML

International (Air, I.C.A.O.)

Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID)
Hazard Class: 8
UN/NA: UN3264
Packing Group: III
Information reported for product/size: 500ML

---

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia
Arsenic (7440-38-2)	Yes	Yes	No	Yes
Nitric Acid (7697-37-2)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\----------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Arsenic (7440-38-2)	Yes	Yes	No	Yes
Nitric Acid (7697-37-2)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Arsenic (7440-38-2)	No	No	Yes	Arsenic comp
Nitric Acid (7697-37-2)	1000	1000	Yes	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Arsenic (7440-38-2)	1	No	No
Nitric Acid (7697-37-2)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

WARNING:
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: None allocated.
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: 3 Flammability: 0 Reactivity: 0
Label Hazard Warning:
DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL

BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. AFFECTS LIVER, KIDNEYS, LUNGS AND TEETH. CANCER HAZARD. CONTAINS INORGANIC ARSENIC WHICH CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Use only with adequate ventilation.
Wash thoroughly after handling.
Keep container closed.

Label First Aid:
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, give large amounts of water to drink. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.

Product Use:
Laboratory Reagent.

Revision Information:
No Changes.

Disclaimer:
****

Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.
****

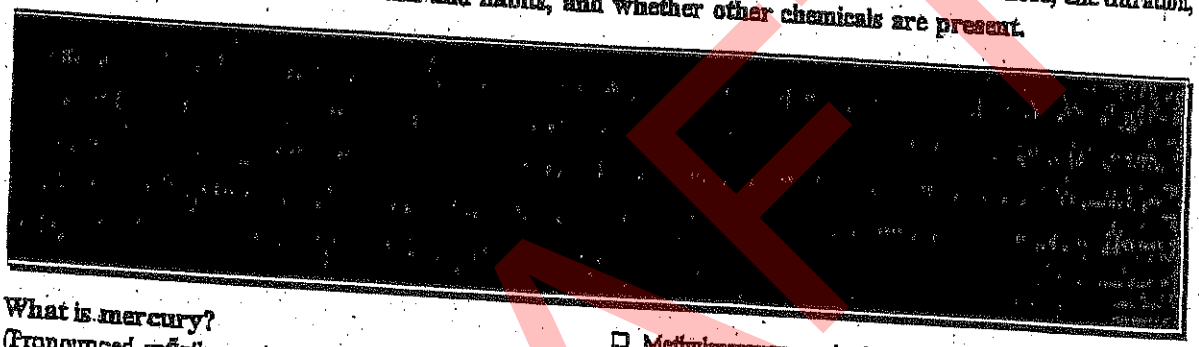
Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

MERCURY
CAS # 7439-97-6

Agency for Toxic Substances and Disease Registry ToxFAQs
April 1999

This fact sheet answers the most frequently asked health questions (FAQs) about mercury. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.



What is mercury?

(Pronounced mŭr'kye-rē)

Mercury is a naturally occurring metal which has several forms. The metallic mercury is a shiny, silver-white, odorless liquid. If heated, it is a colorless, odorless gas.

Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or "salts," which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds. The most common one, methylmercury, is produced mainly by microscopic organisms in the water and soil. More mercury in the environment can increase the amounts of methylmercury that these small organisms make.

Metallic mercury is used to produce chlorine gas and caustic soda, and is also used in thermometers, dental fillings, and batteries. Mercury salts are sometimes used in skin lightening creams and as antiseptic creams and ointments.

What happens to mercury when it enters the environment?

- Inorganic mercury (metallic mercury and inorganic mercury compounds) enters the air from mining ore deposits, burning coal and waste, and from manufacturing plants.
- It enters the water or soil from natural deposits, disposal of wastes, and volcanic activity.
- Methylmercury may be formed in water and soil by small organisms called bacteria.
- Methylmercury builds up in the tissues of fish. Larger and older fish tend to have the highest levels of mercury.

How might I be exposed to mercury?

- Eating fish or shellfish contaminated with methylmercury.
- Breathing vapors in air from spills, incinerators, and industries that burn mercury-containing fuels.
- Release of mercury from dental work and medical treatments.
- Breathing contaminated workplace air or skin contact during use in the workplace (dental, health services, chemical, and other industries that use mercury).
- Practicing rituals that include mercury.

How can mercury affect my health?

The nervous system is very sensitive to all forms of mercury. Methylmercury and metallic mercury vapors are more harmful than other forms, because more mercury in these forms reaches the brain. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems.

Short-term exposure to high levels of metallic mercury vapors may cause effects including lung damage, nausea,

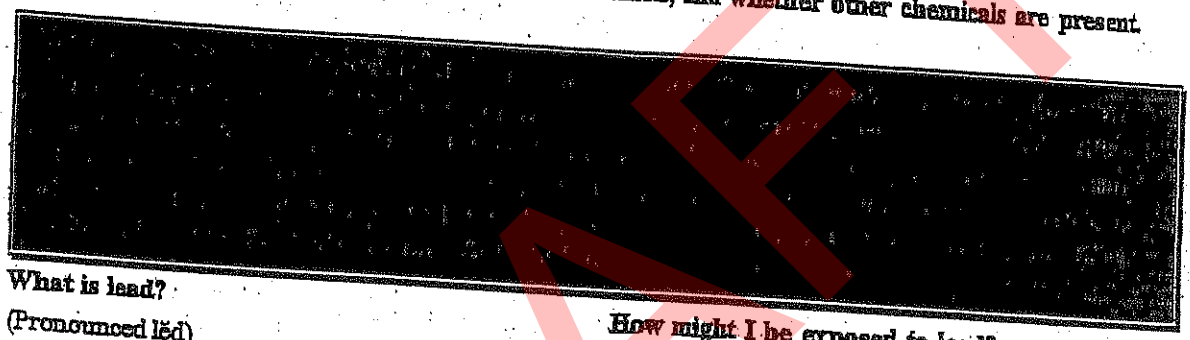
ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

LEAD
CAS # 7439-92-1

Agency for Toxic Substances and Disease Registry ToxFAQs

June 1999

This fact sheet answers the most frequently asked health questions (FAQs) about lead. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.



What is lead?

(Pronounced lĕd)

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing.

Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays.

Because of health concerns, lead from gasoline, paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years.

What happens to lead when it enters the environment?

- Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.
- When lead is released to the air, it may travel long distances before settling to the ground.
- Once lead falls onto soil, it usually sticks to soil particles.
- Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil.
- Much of the lead in inner-city soils comes from old houses painted with lead-based paint.

How might I be exposed to lead?

- Eating food or drinking water that contains lead.
- Spending time in areas where lead-based paints have been used and are deteriorating.
- Working in a job where lead is used.
- Using health-care products or folk remedies that contain lead.
- Engaging in certain hobbies in which lead is used (for example, stained glass).

How can lead affect my health?

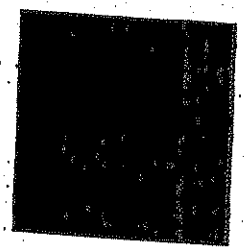
Lead can affect almost every organ and system in your body. The most sensitive is the central nervous system, particularly in children. Lead also damages kidneys and the reproductive system. The effects are the same whether it is breathed or swallowed.

At high levels, lead may decrease reaction time, cause weakness in fingers, wrists, or ankles, and possibly affect the memory. Lead may cause anemia, a disorder of the blood. It can also damage the male reproductive system. The connection between these effects and exposure to low levels of lead is uncertain.

How likely is lead to cause cancer?

The Department of Health and Human Services has determined that lead acetate and lead phosphate may reasonably

Safety (MSDS) data for beryllium



General

Synonyms: glucinium
Molecular formula: Be
CAS No: 7440-41-7
EINECS No: 231-150-7
EU No: 004-001-00-7

Physical data

Appearance: silvery solid or grey foil
Melting point: 1278 C
Boiling point: 2970 C
Vapour density:
Vapour pressure:
Density (g cm^{-3}): 1.85
Flash point:
Explosion limits:
Autoignition temperature:
Water solubility: insoluble

Stability

Stable. Incompatible with acids, bases, oxidizing agents, halogen

pH:
No information found.
% Volatiles by volume @ 21C (70F):
0
Boiling Point:
340C (644F)
Melting Point:
217C (423F)
Vapor Density (Air=1):
6.15
Vapor Pressure (mm Hg):
1 @ 145C (293F) (sublimes)
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Darkens on exposure to light.
Hazardous Decomposition Products:
Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Fluorine, chromic acid, oxidizing agents.
Conditions to Avoid:
No information found.

11. Toxicological Information

Oral mouse LD: > 17,000 mg/kg. Irritation skin, Draize mouse: 118 ug mild. Investigated as a tumorigen and mutagen. IARC 3.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Categ
Anthracene (120-12-7)	No	No	3

12. Ecological Information

Anthracene (120-12-7) No No Yes No

\Federal, State & International Regulations - Part 2\

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Anthracene (120-12-7)	5000	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 1 Flammability: 1 Reactivity: 0
Label Hazard Warning:
WARNING! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT. MAY CAUSE ALLERGIC SKIN REACTION.
Label Precautions:
Keep container closed.
Use with adequate ventilation.
Avoid breathing dust.
Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.
Label First Aid:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician. In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. Call a physician if irritation develops or persists.
Product Use:
Laboratory Reagent.
Revision Information:
No Changes.
Disclaimer:
****

Safety (MSDS) data for zinc

Click here for data on zinc in student-friendly format, from the HSci project

General

Synonyms: zinc dust, zinc powder, blue powder, granular zinc, zinc foil, LS 2, LS 6, merrillite, zinc metal
Molecular formula: Zn
CAS No: 7440-66-6
EINECS No: 231-175-3
EC number: 030-001-00-1

Physical data

Appearance: silver or blueish-white foil or powder
Melting point: 420 C
Boiling point: 908 C
Vapour density:
Vapour pressure:
Density (g cm^{-3}): 7.14
Flash point:
Explosion limits:
Autoignition temperature:
Water solubility:

Stability

Stable. Incompatible with amines, cadmium, sulfur, chlorinated solvents, strong acids, strong bases. Air and moisture sensitive. **Powder or dust is very flammable.**

Abbreviations used in Toxicity data

The table below gives the main abbreviations which will be found in the toxicity data for chemicals listed on these (and many other) web pages.

asn	Aspergillus nidulans
ast	Ascites tumor
bcs	Bacillus subtilis
bfa	body fluid assay
bmr	bone marrow
brd	bird (domestic or lab)
bwd	wild bird species
chd	child
ckn	chicken
CL	ceiling concentration
clr	Chlamydomonas reinhardi
ctl	cattle
cyt	cytogenetic analysis
D	day
dck	duck
dlt	cominant lethal test
dmg	Drosophila melanogaster
dnd	DNA damage
dni	DNA inhibition
dnr	nNA repair
dns	unscheduled DNA synthesis
dom	domestic animal (goat, sheep)
dpo	Drcsophila pseudo-obscura
emb	embryo
esc	Escherichia cold
eug	Euglena gracilis

itt	intratesticular
iu	international unit
iut	intrauterine
ivg	intravaginal
ivn	intravenous
kdy	kidney
kg	kilogram
klp	Klebsiella pneumoniae
L	liter
LC50	lethal concentration 50 percent kill
LCLo	lowest published lethal concentration
LD50	lethal dose 50 percent kill
LDlo	lowest published lethal dose
leu	leukocyte
Liq	liquid
lng	lung
lvr	liver
lym	lymphocyte
M	minute
m3	cubic meter
mam	mammal (species unspecified)
man	man
ug	microgram
umol	micromole
mg	milligram
mky	monkey
mL	milliliter
MLD	mild irritation effects
mma	microsomal mutagenicity assay
mmo	mutation in microorganisms
mmol	millimole
mmr	mammary gland
mnt	micronucleus test
MOD	moderate irritation effects

ppt	parts per trillion (v/v)
preg	pregnant
qal	quail
rat	rat
rbt	rabbit
rec	rectal
rns	rinsed with water
S	second
sal	salmon
sat	Salmonella typhimurium
sce	sister chromatic exchange
scu	subcutaneous
SEV	severe irritation effects
skn	administration onto skin
sln	sex chromosome loss and nondisjunction
slt	specific locus test
slw	silkworm
smc	Saccharomyces cerevisiae
spm	sperm morphology
spr	sperm
sql	squirrel
srm	Serratia marcescens
ssp	Schizosaccharomyces pombe
STEL	short term exposure limit
TC	toxic concentration (other than lowest concentration)
TCLo	lowest published toxic concentration
TD	toxic dose (other than lowest toxic dose)
TDLo	lowest published toxic dose
tes	testis
TLV	Threshold Limit Value
tod	toad
trk	turkey
trn	heritable translocation test
TWA	time weighted average

Risk Phrases

Chemical data sheets available in many countries now contain codes for certain "risk phrases", shown as R23, R45 etc. These risk phrase codes have the following meanings:

- R1 Explosive when dry.
- R2 Risk of explosion by shock, friction, fire or other source of ignition.
- R3 Extreme risk of explosion by shock, friction, fire or other sources of ignition.
- R4 Forms very sensitive explosive metallic compounds.
- R5 Heating may cause an explosion.
- R6 Explosive with or without contact with air.
- R7 May cause fire.
- R8 Contact with combustible material may cause fire.
- R9 Explosive when mixed with combustible material.
- R10 Flammable.
- R11 Highly flammable.
- R12 Extremely flammable.
- R13 Extremely flammable liquefied gas
- R14 Reacts violently with water.
- R15 Contact with water liberates extremely flammable gases.
- R16 Explosive when mixed with oxidizing substances.
- R17 Spontaneously flammable in air.
- R18 In use, may form inflammable/explosive vapour-air mixture.
- R19 May form explosive peroxides.
- R20 Harmful by inhalation.
- R21 Harmful in contact with skin.
- R22 Harmful if swallowed.
- R23 Toxic by inhalation.
- R24 Toxic in contact with skin.
- R25 Toxic if swallowed.

- R61 May cause harm to the unborn child.
- R62 Risk of impaired fertility.
- R63 Possible risk of harm to the unborn child.
- R64 May cause harm to breastfed babies.
- R65 Harmful: may cause lung damage if swallowed.
- R66 Repeated exposure may cause skin dryness or cracking.
- R67 Vapours may cause drowsiness and dizziness.
- R68 Possible risk of irreversible effects.

It is current safety policy at Oxford University that a written COSHH assessment **must** be provided when a substance to be used has been assigned any of the risk phrases R42, R43, R45, R46, R48, R49, R60 or R61. Other hazards may also dictate the preparation of a suitable COSHH assessment.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

- Class 8 Corrosive substances
- Class 9 Miscellaneous dangerous substances

See also Packing Group.
For further details on the transport of dangerous goods, see the OECD Directorate web site.

Return to the Safety Glossary.
Return to the Safety home page of the Physical and Theoretical Chemistry Laboratory, Oxford University.

- S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S27 Take off immediately all contaminated clothing.
- S28 After contact with skin, wash immediately with plenty of soap-suds.
- S29 Do not empty into drains.
- S30 Never add water to this product.
- S33 Take precautionary measures against static discharges.
- S35 This material and its container must be disposed of in a safe way.
- S36 Wear suitable protective clothing.
- S37 Wear suitable gloves.
- S38 In case of insufficient ventilation, wear suitable respiratory equipment.
- S39 Wear eye / face protection.
- S40 To clean the floor and all objects contaminated by this material, use .... (there follows suitable cleaning material).
- S41 In case of fire and / or explosion do not breathe fumes.
- S42 During fumigation / spraying wear suitable respiratory equipment.
- S43 In case of fire use ... (there follows the type of fire-fighting equipment to be used.)
- S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible.)
- S46 If swallowed, seek medical advice immediately and show this container or label.
- S47 Keep at temperature not exceeding...
- S48 To be kept wet with (there follows a material name).
- S49 Keep only in the original container.
- S50 Do not mix with ...
- S51 Use only in well ventilated areas.
- S52 Not recommended for interior use on large surface areas

MSDS *Material Safety Data Sheet*

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS

J.T.Baker

24 Hour Emergency Telephone: [illegible]
CHEMTREC: [illegible]

National Response in Canada
CANUTEC: [illegible]

Outside U.S. and Canada
Chemtrec: [illegible]

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service ([illegible]) for assistance.

COPPER METAL

MSDS Number: C5170 — *Effective Date: 05/17/01*

1. Product Identification

Synonyms: C.I. 77400; Arwood Copper
CAS No.: 7440-50-8
Molecular Weight: 63.546
Chemical Formula: Cu
Product Codes:
J.T. Baker: 1714, 1720, 1732, 1736
Mallinckrodt: 1733, 4649

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Copper	7440-50-8	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS THE LIVER AND KIDNEYS. CHRONIC EXPOSURE MAY CAUSE TISSUE DAMAGE.

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard since the bulk solid does not burn, but very finely divided particles (ultra-fine powder) may burn in air.
Explosion:
Not considered to be an explosion hazard. Reactions with incompatibles may pose an explosion hazard. Liquid copper explodes on contact with water. High concentrations of finely divided copper particles in the air may present an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Avoid exposure to air and moisture. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
Copper Dust and Mists, as Cu:
- OSHA Permissible Exposure Limit (PEL) -
1 mg/m3 (TWA)
- ACGIH Threshold Limit Value (TLV) -

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Copper becomes dull when exposed to air; on exposure to moist air it gradually converts to the carbonate. On long standing, a white, highly explosive peroxide deposit may form.
Hazardous Decomposition Products:
No information found.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Copper is incompatible with oxidizers, alkalis, acetylene, chlorine plus oxygen difluoride, phosphorus, nitric acid, potassium peroxide, 1-bromo-2-propyne, sulfur plus chlorates. Reacts violently with ammonium nitrate, bromates, iodates, chlorates, ethylene oxide, hydrozoic acid, potassium oxide, dimethyl sulfoxide plus trichloroacetic acid, hydrogen peroxide, sodium peroxide, sodium azide, sulfuric acid, hydrogen sulfide plus air, and lead azide. A potentially explosive reaction occurs with acetylenic compounds. Copper ignites on contact with chlorine, fluorine (above 121C), chlorine trifluoride, and hydrazinium nitrate (above 70C). An incandescent reaction occurs with potassium dioxide.
Conditions to Avoid:
Incompatibles and prolonged exposure to air and moisture.

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.
Investigated as a tumorigen and a reproductive effector.

--------\Cancer Lists\----------

Ingredient	NTP Carcinogen: Known	NTP Carcinogen: Anticipated	IARC Category
Copper (7440-50-8)	No	No	None

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

13. Disposal Considerations

or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
CHROMIUM

Product Identification: CHROMIUM
Date of MSDS: 11/01/1993 **Technical Review Date:** 11/10/1995
FSC: 6810 **NIIN:** **LIIN:** 00N066370
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: HIGH-PURITY STANDARDS
Post Office Box: 30188
Manufacturer's Address1:
Manufacturer's Address2: CHARLESTON, SC 29417
Manufacturer's Country: US
General Information Telephone: 803-556-3411
Emergency Telephone: 803-556-3411
Emergency Telephone: 803-556-3411
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 0YZE5
Special Project Code: N

Contractor Information

Contractor's Name: HIGH-PURITY STANDARDS INC
Post Office Box: 30180
Contractor's Address1: 2040 SAVAGE RD
Contractor's Address2: CHARLESTON, SC 29417
Contractor's Telephone: 803-556-3411
Contractor's CAGE: 0YZE5

Section 2 - Compositon/Information on Ingredients
CHROMIUM

METALS, HYDROXIDES, CARBONATES, CYANIDES.

Hazardous Decomposition Products:
NO, NO*2.

Hazardous Polymerization Indicator: NO

Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
CHROMIUM

Toxicological Information:
N/P

Section 12 - Ecological Information
CHROMIUM

Ecological Information:
N/P

Section 13 - Disposal Considerations
CHROMIUM

Waste Disposal Methods:
FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS FOR ACID WASTE.

Section 14 - MSDS Transport Information
CHROMIUM

Transport Information:
N/P

Section 15 - Regulatory Information
CHROMIUM

SARA Title III Information:
N/P

Federal Regulatory Information:
N/P

State Regulatory Information:
N/P

Section 16 - Other Information
CHROMIUM

Other Information:
N/P

HAZCOM Label Information

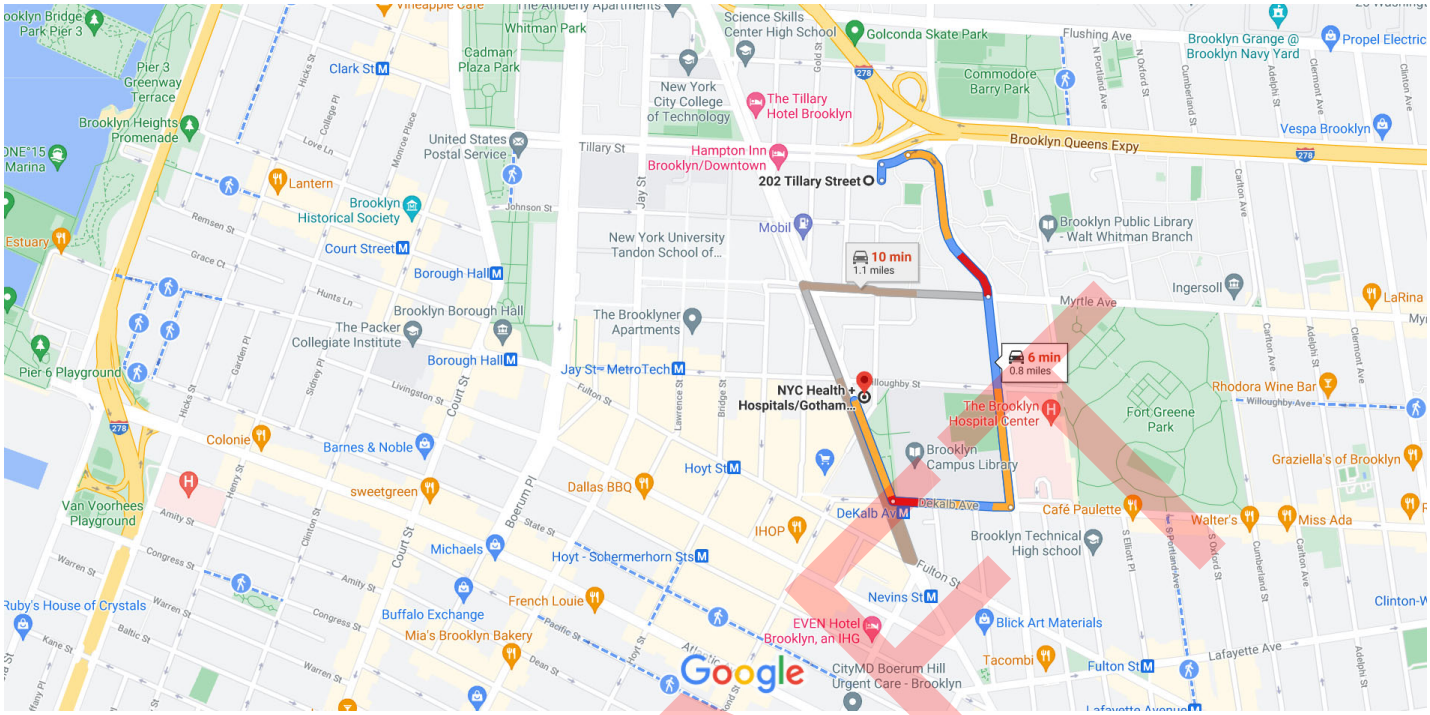
Product Identification: CHROMIUM
CAGE: 0YZE5
Assigned Individual: N
Company Name: HIGH-PURITY STANDARDS INC
Company PO Box: 30180
Company Street Address1: 2040 SAVAGE RD
Company Street Address2: CHARLESTON, SC 29417 US
Health Emergency Telephone: 803-556-3411
Label Required Indicator: Y
Date Label Reviewed: 11/10/1995
Status Code: C
Manufacturer's Label Number:
Date of Label: 11/10/1995
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: CAUTION
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None

ATTACHMENT II

Google Maps

202 Tillary St, Brooklyn, NY 11201 to NYC Health + Hospitals/Gotham Health, Fort Greene

Drive 0.8 mile, 6 min



Map data ©2021 Google 500 ft

202 Tillary St

Brooklyn, NY 11201

1. Head north toward Tillary St — 102 ft
2. Turn right onto Tillary St — 180 ft
3. Turn right onto Navy St — 0.2 mi
4. Continue onto Ashland Pl — 0.3 mi
5. Turn right onto Dekalb Ave — 0.1 mi
6. Turn right onto Flatbush Ave/Flatbush Ave Ext — 0.1 mi

   Destination will be on the right

NYC Health + Hospitals/Gotham Health, Fort Greene

295 Flatbush Ave, Brooklyn, NY 11201

These directions are for planning purposes only.
You may find that construction projects, traffic,

weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.