

ASTORIA COVE – BUILDINGS 3A & 3B
QUEENS, NEW YORK

Remedial Action Plan

OER Project Number 18TMP0938Q

Prepared For:

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REMEDIAL ACTION PLAN

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LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AWQS	Ambient Water Quality Standard
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
CHASP	Construction Health and Safety Plan
Cis-1,2-DCE	Cis-1,2-dichloroethene
COC	Certificate of Completion
1,1-DCE	1,1-Dichloroethene
ECs/ICs	Engineering Controls and Institutional Controls
ELAP	Environmental Laboratory Accreditation Program
Ft bgs	Feet Below Ground Surface
FEMA	Federal Emergency Management Agency
HAZWOPER	Hazardous Waste Operations Emergency Response
Mg/kg	Milligrams per Kilogram
µg/kg	Micrograms per Kilogram
µg/m ³	Micrograms per Cubic Meter
NOC	Notice of Completion
NYS DEC	New York State Department of Environmental Conservation
NYC DEP	New York City Department of Environmental Protection
NYC OER	New York City Office of Environmental Remediation
NYCRR	New York Codes Rules and Regulations
NYS DEC	New York State Department of Environmental Conservation
NYS DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
OSHA	United States Occupational Health and Safety Administration

PCBs	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PE	Professional Engineer
PFAS	Per- and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
PID	Photo Ionization Detector
PPM	Parts Per Million
QA/QC	Quality Assurance/Quality Control
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAP	Remedial Action Plan
RCA	Recycled Concrete Aggregate
RCR	Remedial Closure Report
RI	Remedial Investigation
RIR	Remedial Investigation Report
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SMMP	Soils Materials Management Plan
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
1,1,1-TCA	1,1,1-Trichloroethane
TCE	Trichloroethene
TCL	Target Compound List
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

CERTIFICATION

I, Gary A. Rozmus, P.E., 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 Astoria Cove – Buildings 3A & 3B site, site number 18TMP0938Q. 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 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 Plan and are of sufficient detail to enable proper construction.
- This Remedial Action Plan (RAP) 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 RAP has provisions to control nuisances during the remediation and all invasive work, including dust and odor suppression.

Gary A. Rozmus, P.E.

Name

056744

PE License Number

Signature

Date

PE Stamp

EXECUTIVE SUMMARY

Cape Astoria Cove JV, LLC is working with the NYC Office of Environmental Remediation (OER) in the E-Designation program to investigate and remediate a 73,141-square foot Site located at or proximate to 8-11 26th Avenue and 25-02 9th Street in Queens, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Plan (RAP). 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

The Site is located at 8-11 26th Avenue and 25-02 9th Street in the Astoria section in Queens, New York and is identified as Block 906 Lots 1 & 5 and part of Block 907 Lot 1 on the New York City Tax Map. Figure 1 shows the Site location. The Site is approximately 73,141-square feet and is bounded by the East River to the north, an unimproved segment of 26th Avenue to the south, 9th Street to the east, and an open lot to the west. An easement for 8th Street is present on the western boundary of the Site. A map of the Site boundary is shown in Figure 2. Currently, the Site is used for storage of equipment and materials by several contractors and contains two buildings, one of which is vacant, and the other is used to store taxi vehicles. Each contain small partial basements that extend approximately 10 feet below ground surface (ft bgs) at an elevation of approximated 10 ft NAVD88.

Summary of Redevelopment Plan

The proposed future use of the Site will consist of two new mixed-use buildings, designated Building 3A and Building 3B. Buildings 3A and 3B will be located on Block 906 Lots 1 & 5 and the 8th Street Mews will be located on a small portion of Block 907 Lot 1. Layout of the proposed Site development is presented in Figure 3. The current zoning designation is R7-3 with a C2-4 overlay. The proposed use is consistent with existing zoning for the property. The proposed development plans are included in Appendix 1.

Buildings 3A and 3B will consist of an 8-story and 26-story building, respectively, with a full cellar extending approximately 10 ft bgs on average, to an elevation of approximately 8.5 ft

NAVD88, and has a combined footprint of approximately 40,000 square feet, a combined gross floor area of approximately 446,000 square feet, and a combined zoning floor area of approximately 344,000 square feet. The cellar will be used for parking and mechanical rooms; the first floor will be used for parking, commercial retail space, and residential space; the second and third floors will be used for parking and residential space; and floors 4 through 26 will be used for residential space. The excavation for the cellar will extend to an elevation of approximately 8.5 ft NAVD88, which is approximately 4.5 to 12.5 ft bgs. The open spaces to the south and east of the building will be finished with sidewalks and the area to the west will be developed as the 8th Street Mews. The open space to the north of the building will be developed as a paved pedestrian walkway. All of these open spaces will also contain tree planters.

The unimproved portion of 26th Avenue will be improved and will connect to 9th Street and the 8th Street easement will be improved as the 8th Street Mews.

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

The development of Buildings 3A and 3B, as well as Buildings 4 and 5 which are addressed in separate RAPs, constitute the Phase I development plan for the Astoria Cove property. Phases 2 and 3 of development will occur on adjoining lots, which are also in the “E” Designation Program, at a later date.

Summary of Surrounding Property

Surrounding property usage at the Site is primarily residential and commercial. Adjoining the Site to the west and south are vacant lots used by contractors to store equipment and materials. Adjoining the Site to the east, across 9th Street, are residential buildings. The East River adjoins the Site to the north. There are no sensitive receptors (i.e., schools, hospitals, day care facilities) within a 250- to 500-foot radius of the Site. Figure 4 shows the surrounding land usage.

Summary of Past Site Uses and Areas of Concern

The Site was developed for industrial use in the 1930s to 1940s and has always been used for industrial, manufacturing, or commercial purposes.

The Areas of Concern (AOCs) identified for this Site include:

1. The past usage of the Site for industrial purposes.
2. The presence of historic fill material across the Site.
3. The possible presence of an underground storage tank (UST) on the northern side of the eastern building.

A map showing the location of the possible UST is presented in Figure 5.

Summary of Work Performed under the Remedial Investigation

Cape Astoria Cove JV, LLC performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e., structures, buildings, etc.).
2. Performed a geophysical survey across the entire Site to investigate for the presence of potential USTs, drums, etc. related to the former industrial use of the Site.
3. Installed 9 soil borings across the entire project Site and collected 18 soil samples for chemical analysis from the soil borings to evaluate soil quality.
4. Installed four groundwater monitoring wells throughout the Site to establish groundwater flow and collected four groundwater samples for chemical analysis to evaluate groundwater quality.
5. Installed six soil vapor probes around the Site perimeter and collected six samples for chemical analysis.

Summary of Findings of Remedial Investigation

1. Elevation of the property ranges from approximately 13 feet NAVD88 in the north along the East River to approximately 22 feet NAVD88 in the southern portion of the Site.
2. Depth to groundwater ranges from approximately 10 to 20 feet below grade.
3. Groundwater flow is generally from south to north beneath the Site towards the East River.
4. Depth to bedrock was encountered during a previous geotechnical investigation at approximately 75 to greater than 100 ft bgs at the Site.

5. The stratigraphy of the Site, from the surface down, consists of historic fill to a depth of 5 to 10 ft bgs underlain by glacial sands and gravel to the termination depths of the borings.
6. Soil/fill samples collected during the RI were compared to the Title 6 New York Codes, Rules, and Regulations (6NYCRR) Part 375-6.8 Unrestricted Use Soil Cleanup Objectives (SCOs) and the Restricted-Residential Use SCOs. The soil/fill samples showed the following:
 - Volatile organic compounds (VOCs) including acetone (max. of 0.12 milligrams per kilogram [mg/kg]), tetrachloroethene (PCE) (max. of 38 mg/kg), and trichloroethene (TCE) (at 0.86 mg/kg) were detected at concentrations exceeding their Unrestricted Use SCOs. Of these VOCs, PCE was also detected at a concentration exceeding its Restricted Residential Use SCOs.
 - Semivolatile organic compounds (SVOCs) including benzo(a)anthracene (max. of 3.4 mg/kg), benzo(a)pyrene (max. of 2.9 mg/kg), benzo(b)fluoranthene (max. of 4.2 mg/kg), benzo(k)fluoranthene (at 1.2 mg/kg), chrysene (max. of 3.1 mg/kg), dibenzo(a,h)anthracene (at 0.38 mg/kg), and indeno(1,2,3-cd)pyrene (max. of 2 mg/kg) were detected at concentrations exceeding their Unrestricted Use SCOs. Of these SVOCs, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were also detected at concentrations exceeding their Restricted Residential Use SCOs.
 - Pesticides including 4,4'-DDE (at 0.00562 mg/kg), 4,4'-DDD (at 0.0072 mg/kg), and 4,4'-DDT (at 0.0233 mg/kg) were detected at concentrations exceeding their Unrestricted Use SCOs.
 - Polychlorinated biphenyls (PCBs) including aroclor 1248 (max. of 3.21 mg/kg), aroclor 1254 (at 3.44 mg/kg), aroclor 1260 (at 0.117 mg/kg), aroclor 1268 (at 1.22 mg/kg), and total PCBs (max. of 3.44 mg/kg) were detected at concentrations exceeding their Unrestricted Use SCOs. Of these PCBs,

aroclor 1248, aroclor 1254, aroclor 1268, and total PCBs were also detected at concentrations exceeding their Restricted Residential Use SCOs.

- Metals including copper (max. of 156 mg/kg), lead (max. of 168 mg/kg), mercury (max. of 1.45 mg/kg), nickel (at 140 mg/kg), trivalent chromium (max. of 220 mg/kg), and zinc (max. of 265 mg/kg) were detected at concentrations exceeding their Unrestricted Use SCOs. Of these metals, mercury and trivalent chromium were also detected at concentrations exceeding their Restricted Residential Use SCOs.
- Emerging contaminants including perfluorooctanoic acid (PFOA) (at 0.000046 mg/kg), perfluorooctanesulfonic acid (PFOS) (at 0.00128 mg/kg), and perfluoroundecanoic acid (PFUnA) (at 0.000059 mg/kg) were detected in the soil samples. 1,4-dioxane was not detected in any of the soil samples.
- All of the soil samples with Restricted Residential Use SCO exceedances were collected from within the historic fill layer as well as the majority of the samples with Unrestricted Use SCO exceedances. No visual impacts (e.g., staining, odors, sheens, etc.) were identified and no photoionization detector (PID) readings above background were noted in the soil on-Site, indicating that the impacts are attributable to the historic fill and not indicative of a spill or release.

7. Groundwater samples collected during the RI were compared to the 6NYCRR Part 703.5 Class GA Ambient Water Quality Standards (AWQS). The groundwater samples showed the following:

- No pesticides were detected at concentrations above their AWQS.
- VOCs including PCE (at 11 micrograms per liter [$\mu\text{g/L}$]) and TCE (max. of 13 $\mu\text{g/L}$) were detected at concentrations exceeding their AWQS.
- SVOCs including benzo(a)anthracene (max. of 0.54 $\mu\text{g/L}$), benzo(a)pyrene (max. of 0.56 $\mu\text{g/L}$), benzo(b)fluoranthene (max. of 0.77 $\mu\text{g/L}$), benzo(k)fluoranthene (max. of 0.2 $\mu\text{g/L}$), chrysene (max. of 0.45 $\mu\text{g/L}$),

indeno(1,2,3-cd)pyrene (max. of 0.47 µg/L), and phenol (max. of 3.9 µg/L) were detected at concentrations exceeding their AWQS. Phenol was detected in the field blank sample (FB-020222) at a concentration of 2.4 µg/L, which is above the AWQS of 1 µg/L.

- PCBs including aroclor 1248 (at 1.01 µg/L), aroclor 1254 (at 1.13 µg/L), aroclor 1260 (at 0.145 µg/L), and total PCBs (at 2.29 µg/L) were detected at concentrations exceeding their AWQS.
- Dissolved metals including magnesium (max. of 494,000 µg/L), manganese (at 1,124 µg/L), and sodium (max. of 4,410,000 µg/L) were detected at concentrations exceeding their AWQS.
- Emerging contaminants including perfluorobutanoic acid (PFBA) (max. of 0.0131 µg/L), perfluoropentanoic acid (PFPeA) (max. of 0.0204 µg/L), perfluorobutanesulfonic acid (PFBS) (max. of 0.00727 µg/L), perfluorohexanoic acid (PFHxA) (max. of 0.0227 µg/L), perfluoroheptanoic acid (PFHpA) (max. of 0.0157 µg/L), perfluorohexanesulfonic acid (PFHxS) (max. of 0.0272 µg/L), PFOA (max. of 0.0409 µg/L), perfluoroheptanesulfonic acid (PFHpS) (max. of 0.00638 µg/L), perfluorononanoic acid (PFNA) (at 0.0026 µg/L), PFOS (max. of 0.038 µg/L), perfluorodecanoic acid (PFDA) (at 0.00081 µg/L), perfluorotetradecanoic acid (PFTA) (at 0.000508 µg/L), and 1,4-dioxane (max. of 0.425 µg/L) were detected in the groundwater samples.
- The exceedances of the AWQS do not appear related to a spill or release and are more likely the result of the fill unit present in the area and typical background conditions in an urban environment.

8. Soil vapor samples collected during the RI were compared to the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion matrices dated October 2006. The soil vapor samples showed the following:

- Soil vapor results indicated low levels of petroleum-related VOCs and elevated levels of chlorinated VOCs (CVOCs).
- The total concentration of petroleum-related VOCs (BTEX) ranged from 2.449 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) to $14.9 \mu\text{g}/\text{m}^3$.
- CVOCs including 1,1,1-trichloroethane (ranging from $7.15 \mu\text{g}/\text{m}^3$ to $606 \mu\text{g}/\text{m}^3$), methylene chloride (at $2.48 \mu\text{g}/\text{m}^3$), and TCE (at $23.2 \mu\text{g}/\text{m}^3$) were detected in the soil vapor samples. Other CVOCs including carbon tetrachloride, PCE, and vinyl chloride were not detected in any of the soil vapor samples.
- Acetone was detected in the soil vapor samples ranging from $69.8 \mu\text{g}/\text{m}^3$ to $3,470 \mu\text{g}/\text{m}^3$. Acetone is a common laboratory contaminant.

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:

1. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
2. Establishment of Site-specific SCOs.
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).

5. Excavation and removal of soil/fill exceeding Site Specific SCO's.

The entire footprint of Buildings 3A and 3B will be excavated to a depth of approximately 4.5 to 12.5 feet below grade, to an elevation of approximately 8.5 feet NAVD88, for development purposes. Some soil/fill will also be excavated for the construction of the 8th Street Mews as well as the shore public walkway area to the north of Buildings 3A and 3B. Excavation in the 8th Street Mews and public walkway areas to the north will be limited to grading as needed for construction.

Approximately 22,500 tons of soil/fill will be removed from the Site and properly disposed at an appropriately licensed or permitted facility.

6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
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 UST's 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 12 end-point samples to determine the performance of the remedy with respect to attainment of SCO's.
11. Demarcation of residual soil/fill in landscaped areas.
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. Construction of an engineered composite cover consisting of at a minimum the concrete building slabs with clean granular sub-base beneath all building areas;

concrete with clean granular sub-base in sidewalk areas, the 8th Street Mews, and the pedestrian walkway area; and at least two feet of clean soil in all tree planters and landscaped areas. The thicknesses of each composite layer will be provided at a later date. The thicknesses of each composite layer will be provided at a later date and included in a cross-section drawing.

14. Installation of a vapor barrier system consisting of vapor barrier beneath the building slab and outside of sub-grade foundation sidewalls to mitigate soil vapor migration into the building. The vapor barrier system will consist of a 20-mil Stego Wrap 20-mil Vapor Barrier or OER-approved equivalent below the slab throughout the full building area and outside all sub-grade foundation sidewalls to meet grade. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration. The vapor barrier system is an Engineering Control for the remedial action. The remedial engineer will certify in the Remedial Closure Report (RCR) that the vapor barrier system was designed and properly installed to mitigate soil vapor migration into the building. The vapor barrier will also be shown in a cross-section drawing to be provided at a later date.
15. Installation of a passive sub-slab depressurization system (SSDS) consisting of a network of horizontal pipe set in the middle of a gas permeable layer immediately beneath the building slab and vapor barrier system. The horizontal piping will consist of fabric-wrapped, perforated schedule 40 4-inch PVC pipe connected to a 4-inch steel riser pipe that is vented into the parking garage. The gas permeable layer will consist of a 6-inch thick layer of 2-inch trap rock stone. The passive SSDS is an Engineering Control for the remedial action. The remedial engineer will certify in the RCR that the passive SSDS was designed and properly installed to establish a vacuum in the gas permeable layer and a negative (decreasing outward) pressure gradient across the building slab to prevent vapor migration into the building.
16. Construction and operation of a cellar parking garage with high volume air exchange in conformance with NYC Building Code.

17. 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.
18. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
19. Submission of a RCR that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAP, and describes all Engineering and Institutional Controls to be implemented at the Site.
20. Submission of an approved SMP in the RCR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection, and certification of Engineering and Institutional Controls and reporting at a specified frequency.
21. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls 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 OER-approval.

COMMUNITY PROTECTION STATEMENT

The NYC OER provides governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action 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: Astoria Cove – Buildings 3A and 3B
- Site Address: 8-11 26th Avenue and 25-02 9th Street, Astoria, Queens, New York
- NYC OER Project Number: 18TMP0938Q

Project Contacts

- OER Project Manager: Samantha Catalanotto, 212-788-8841
- Site Project Manager: George Holmes, GEI Consultants Inc., 631-759-2972
- Site Safety Officer: To Be Determined
- Online Document Repository: <https://a002-epic.nyc.gov/app/workspace/5516/docrepository>

Remedial Investigation and Cleanup Plan

Under the oversight of the NYC OER, 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.

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 RAP are in compliance with applicable safety requirements of the United States Occupational Safety and Health Administration (OSHA). This RAP 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 a 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 or CAMP.

Results will be regularly reported to the NYC Office of Environmental Remediation. 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 onsite Project Manager or NYC Office of Environmental Remediation 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 Closure Report. This report will be submitted to the NYC Office of Environmental Remediation 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 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 NYC Department of Buildings.

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 NYC Office of Environmental Remediation Project Manager listed on the first page of this Community Protection Statement document or call 311 and mention the Site is in the NYC OER E-Designation Program.

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 NYC Department of Buildings 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. 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 report (called the Remedial Closure Report) 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 are 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 that calls for continued inspection of protective controls, such as Site covers. The Site Management Plan is evaluated and approved by the NYC Office of Environmental Remediation. 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 Department of Buildings. 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 PLAN

1.0 Project Background

Cape Astoria Cove JV, LLC is working with the NYC Office of Environmental Remediation (OER) in the “E” Designation Program to investigate and remediate a property located at or proximate to 8-11 26th Avenue and 25-02 9th Street in the Astoria section of Queens, New York (the “Site”). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Plan (RAP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAP 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 at or proximate to 8-11 26th Avenue and 25-02 9th Street in the Astoria section in Queens, New York and is identified as Block 906 Lots 1 & 5 and part of Block 907 Lot 1 on the New York City Tax Map. Figure 1 shows the Site location. The Site is approximately 73,141-square feet and is bounded by the East River to the north, an unimproved segment of 26th Avenue to the south, 9th Street to the east, and an open lot to the west. An easement for 8th Street is present on the western boundary of the Site. A map of the Site boundary is shown in Figure 2. Currently, the Site is used for storage of equipment and materials by several contractors and contains two buildings, one of which is vacant, and the other is used to store taxi vehicles, and each contain small partial basements that extend approximately 10 feet below ground surface (ft bgs) at an elevation of approximated 10 ft NAVD88.

1.2 Redevelopment Plan

The proposed future use of the Site will consist of two new mixed-use buildings, designated Building 3A and Building 3B. Buildings 3A and 3B will be located on Block 906 Lots 1 & 5 and the 8th Street Mews will be located on a small portion of Block 907 Lot 1. Layout of the proposed Site development is presented in Figure 3. The current zoning designation is R7-3 with

a C2-4 overlay. The proposed use is consistent with existing zoning for the property. The proposed development plans are included in Appendix 1.

Buildings 3A and 3B will consist of an 8-story and 26-story building, respectively, with a full cellar extending approximately 10 ft bgs on average, to an elevation of approximately 8.5 ft NAVD88, and has a combined footprint of approximately 40,000 square feet, a combined gross floor area of approximately 446,000 square feet, and a combined zoning floor area of approximately 344,000 square feet. The cellar will be used for parking and mechanical rooms; the first floor will be used for parking, commercial retail space, and residential space; the second and third floors will be used for parking and residential space; and floors 4 through 26 will be used for residential space. The excavation for the cellar will extend to an elevation of approximately 8.5 ft NAVD88, which is approximately 4.5 to 12.5 ft bgs. The open spaces to the south and east of the building will be finished with sidewalks and the area to the west will be developed as the 8th Street Mews. The open space to the north of the building will be developed as a paved pedestrian walkway. All of these open spaces will also contain tree planters.

The unimproved portion of 26th Avenue will be improved and will connect to 9th Street and the 8th Street easement will be improved as the 8th Street Mews.

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

The development of Buildings 3A and 3B, as well as Buildings 4 and 5 which are addressed in separate RAPs, constitute the Phase I development plan for the Astoria Cove property. Phases 2 and 3 of development will occur on adjoining lots, which are also in the “E” Designation Program, at a later date.

1.3 Description of Surrounding Property

Surrounding property usage at the Site is primarily residential and commercial. Adjoining the Site to the west and south are vacant lots used by contractors to store equipment and materials. Adjoining the Site to the east, across 9th Street, are residential buildings. The East River adjoins the Site to the north. There are no sensitive receptors (i.e., schools, hospitals, day care facilities) within a 250- to 500-foot radius of the Site. Figure 4 shows the surrounding land usage.

1.4 Summary of Past Site Uses and Areas of Concern

The Site was developed for industrial use in the 1930s to 1940s and has always been used for industrial, manufacturing, or commercial purposes.

The Areas of Concern (AOCs) identified for this Site include:

1. The past usage of the Site for industrial purposes.
2. The presence of historic fill material across the Site.
3. The possible presence of an underground storage tank (UST) on the northern side of the eastern building.

A map showing the location of the possible UST is presented in Figure 5.

1.5 Summary of Work Performed under the Remedial Investigation

Cape Astoria Cove JV, LLC performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e., structures, buildings, etc.).
2. Performed a geophysical survey across the entire Site to investigate for the presence of potential USTs, drums, etc. related to the former industrial use of the Site.
3. Installed 9 soil borings across the entire project Site and collected 18 soil samples for chemical analysis from the soil borings to evaluate soil quality.
4. Installed four groundwater monitoring wells throughout the Site to establish groundwater flow and collected four groundwater samples for chemical analysis to evaluate groundwater quality.
5. Installed six soil vapor probes around the Site perimeter and collected six 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, Astoria Cove, Queens, New York”, dated April 2022 (RIR). A map showing the RI sample locations is presented in Figure 5. The findings of the RIR are summarized as follows:

1. Elevation of the property ranges from approximately 13 feet NAVD88 in the north along the East River to approximately 22 feet NAVD88 in the southern portion of the Site.
2. Depth to groundwater ranges from approximately 10 to 20 feet below grade.
3. Groundwater flow is generally from south to north beneath the Site towards the East River.
4. Depth to bedrock was encountered during a previous geotechnical investigation at approximately 75 to greater than 100 ft bgs at the Site.
5. The stratigraphy of the Site, from the surface down, consists of historic fill to a depth of 5 to 10 ft bgs underlain by glacial sands and gravel to the termination depths of the borings.
6. Soil/fill samples collected during the RI were compared to the Title 6 New York Codes, Rules, and Regulations (6NYCRR) Part 375-6.8 Unrestricted Use Soil Cleanup Objectives (SCOs) and the Restricted-Residential Use SCOs. The soil/fill samples showed the following:
 - Volatile organic compounds (VOCs) including acetone (max. of 0.12 milligrams per kilogram [mg/kg]), tetrachloroethene (PCE) (max. of 38 mg/kg), and trichloroethene (TCE) (at 0.86 mg/kg) were detected at concentrations exceeding their Unrestricted Use SCOs. Of these VOCs, tetrachloroethene was also detected at a concentration exceeding its Restricted Residential Use SCOs.
 - Semivolatile organic compounds (SVOCs) including benzo(a)anthracene (max. of 3.4 mg/kg), benzo(a)pyrene (max. of 2.9 mg/kg), benzo(b)fluoranthene (max. of 4.2 mg/kg), benzo(k)fluoranthene (at 1.2 mg/kg), chrysene (max. of 3.1 mg/kg), dibenzo(a,h)anthracene (at 0.38 mg/kg), and indeno(1,2,3-cd)pyrene (max. of 2 mg/kg) were detected at concentrations exceeding their Unrestricted Use SCOs.

Of these SVOCs, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were also detected at concentrations exceeding their Restricted Residential Use SCOs.

- Pesticides including 4,4'-DDE (at 0.00562 mg/kg), 4,4'-DDD (at 0.0072 mg/kg), and 4,4'-DDT (at 0.0233 mg/kg) were detected at concentrations exceeding their Unrestricted Use SCOs.
- Polychlorinated biphenyls (PCBs) including aroclor 1248 (max. of 3.21 mg/kg), aroclor 1254 (at 3.44 mg/kg), aroclor 1260 (at 0.117 mg/kg), aroclor 1268 (at 1.22 mg/kg), and total PCBs (max. of 3.44 mg/kg) were detected at concentrations exceeding their Unrestricted Use SCOs. Of these PCBs, aroclor 1248, aroclor 1254, aroclor 1268, and total PCBs were also detected at concentrations exceeding their Restricted Residential Use SCOs.
- Metals including copper (max. of 156 mg/kg), lead (max. of 168 mg/kg), mercury (max. of 1.45 mg/kg), nickel (at 140 mg/kg), trivalent chromium (max. of 220 mg/kg), and zinc (max. of 265 mg/kg) were detected at concentrations exceeding their Unrestricted Use SCOs. Of these metals, mercury and trivalent chromium were also detected at concentrations exceeding their Restricted Residential Use SCOs.
- Emerging contaminants including perfluorooctanoic acid (PFOA) (at 0.000046 mg/kg), perfluorooctanesulfonic acid (PFOS) (at 0.00128 mg/kg), and perfluoroundecanoic acid (PFUnA) (at 0.000059 mg/kg) were detected in the soil samples. 1,4-dioxane was not detected in any of the soil samples.
- All of the soil samples with Restricted Residential Use SCO exceedances were collected from within the historic fill layer as well as the majority of the samples with Unrestricted Use SCO exceedances. No visual impacts (e.g., staining, odors, sheens, etc.) were identified and no photoionization detector (PID) readings above background were noted in the soil on-Site, indicating that the impacts are attributable to the historic fill and not indicative of a spill or release.

7. Groundwater samples collected during the RI were compared to the 6NYCRR Part 703.5 Class GA Ambient Water Quality Standards (AWQS). The groundwater samples showed the following:

- No pesticides were detected at concentrations above their AWQS.
- VOCs including PCE (at 11 micrograms per liter [$\mu\text{g/L}$]) and TCE (max. of 13 $\mu\text{g/L}$) were detected at concentrations exceeding their AWQS.
- SVOCs including benzo(a)anthracene (max. of 0.54 $\mu\text{g/L}$), benzo(a)pyrene (max. of 0.56 $\mu\text{g/L}$), benzo(b)fluoranthene (max. of 0.77 $\mu\text{g/L}$), benzo(k)fluoranthene (max. of 0.2 $\mu\text{g/L}$), chrysene (max. of 0.45 $\mu\text{g/L}$), indeno(1,2,3-cd)pyrene (max. of 0.47 $\mu\text{g/L}$), and phenol (max. of 3.9 $\mu\text{g/L}$) were detected at concentrations exceeding their AWQS. Phenol was detected in the field blank sample (FB-020222) at a concentration of 2.4 $\mu\text{g/L}$, which is above the AWQS of 1 $\mu\text{g/L}$.
- PCBs including aroclor 1248 (at 1.01 $\mu\text{g/L}$), aroclor 1254 (at 1.13 $\mu\text{g/L}$), aroclor 1260 (at 0.145 $\mu\text{g/L}$), and total PCBs (at 2.29 $\mu\text{g/L}$) were detected at concentrations exceeding their AWQS.
- Dissolved metals including magnesium (max. of 494,000 $\mu\text{g/L}$), manganese (at 1,124 $\mu\text{g/L}$), and sodium (max. of 4,410,000 $\mu\text{g/L}$) were detected at concentrations exceeding their AWQS.
- Emerging contaminants including perfluorobutanoic acid (PFBA) (max. of 0.0131 $\mu\text{g/L}$), perfluoropentanoic acid (PFPeA) (max. of 0.0204 $\mu\text{g/L}$), perfluorobutanesulfonic acid (PFBS) (max. of 0.00727 $\mu\text{g/L}$), perfluorohexanoic acid (PFHxA) (max. of 0.0227 $\mu\text{g/L}$), perfluoroheptanoic acid (PFHpA) (max. of 0.0157 $\mu\text{g/L}$), perfluorohexanesulfonic acid (PFHxS) (max. of 0.0272 $\mu\text{g/L}$), PFOA (max. of 0.0409 $\mu\text{g/L}$), perfluoroheptanesulfonic acid (PFHpS) (max. of 0.00638 $\mu\text{g/L}$), perfluorononanoic acid (PFNA) (at 0.0026 $\mu\text{g/L}$), PFOS (max. of 0.038 $\mu\text{g/L}$), perfluorodecanoic acid (PFDA) (at 0.00081 $\mu\text{g/L}$), perfluorotetradecanoic acid (PFTA) (at 0.000508 $\mu\text{g/L}$), and 1,4-dioxane (max. of 0.425 $\mu\text{g/L}$) were detected in the groundwater samples.

- The exceedances of the AWQS do not appear related to a spill or release and are more likely the result of the fill unit present in the area and typical background conditions in an urban environment.
8. Soil vapor samples collected during the RI were compared to the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion matrices dated October 2006. The soil vapor samples showed the following:
- Soil vapor results indicated low levels of petroleum-related VOCs and elevated levels of chlorinated VOCs (CVOCs).
 - The total concentration of petroleum-related VOCs (BTEX) ranged from 2.449 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) to 14.9 $\mu\text{g}/\text{m}^3$.
 - CVOCs including 1,1,1-trichloroethane (ranging from 7.15 $\mu\text{g}/\text{m}^3$ to 606 $\mu\text{g}/\text{m}^3$), methylene chloride (at 2.48 $\mu\text{g}/\text{m}^3$), and TCE (at 23.2 $\mu\text{g}/\text{m}^3$) were detected in the soil vapor samples. Other CVOCs including carbon tetrachloride, PCE, and vinyl chloride were not detected in any of the soil vapor samples.
 - Acetone was detected in the soil vapor samples ranging from 69.8 $\mu\text{g}/\text{m}^3$ to 3,470 $\mu\text{g}/\text{m}^3$. Acetone is a common laboratory contaminant.

For more detailed results, consult the RIR. Based on an evaluation of the data and information from the RIR and this RAP, 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.
- Prevent exposure to contaminants volatilizing from contaminated soil.
- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Groundwater

- Remove contaminant sources causing impact to groundwater.
- Prevent direct exposure to contaminated groundwater.
- Prevent exposure to contaminants volatilizing from 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 Action

3.1 Summary of Remedial Action

The remedial action a Track 4 remedial action and achieves protection of public health and the environment for the intended use of the property. The remedial action will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The remedial action is effective in both the short-term and long-term and reduces mobility, toxicity, and volume of contaminants. The remedial action alternative is cost effective and implementable and uses standard methods that are well established in the industry.

The proposed remedial action will consist of:

1. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
2. Establishment of Site-specific SCOs.
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).

5. Excavation and removal of soil/fill exceeding Site Specific SCOs.

The entire footprint of Buildings 3A and 3B will be excavated to a depth of approximately 4.5 to 12.5 feet below grade, to an elevation of approximately 8.5 feet NAVD88, for development purposes. Some soil/fill will also be excavated for the construction of the 8th Street Mews as well as the shore public walkway area to the north of Buildings 3A and 3B. Excavation in the 8th Street Mews and public walkway areas to the north will be limited to grading as needed for construction.

Approximately 22,500 tons of soil/fill will be removed from the Site and properly disposed at an appropriately licensed or permitted facility.

6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.

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 UST's that are encountered during soil/fill removal actions.
Registration of tanks and reporting of any petroleum spills associated with UST's 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 12 end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
11. Demarcation of residual soil/fill in landscaped areas.
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. Construction of an engineered composite cover consisting of at a minimum the concrete building slabs with clean granular sub-base beneath all building areas; concrete with clean granular sub-base in sidewalk areas, the 8th Street Mews, and the pedestrian walkway area; and at least two feet of clean soil in all tree planters and landscaped areas. The thicknesses of each composite layer will be provided at a later date. The thicknesses of each composite layer will be provided at a later date and included in a cross-section drawing.
14. Installation of a vapor barrier system consisting of vapor barrier beneath the building slab and outside of sub-grade foundation sidewalls to mitigate soil vapor migration into the building. The vapor barrier system will consist of a 20-mil Stego Wrap 20-mil Vapor Barrier or OER-approved equivalent below the slab throughout the full building area and outside all sub-grade foundation sidewalls to meet grade. All welds, seams and penetrations will be properly sealed to prevent preferential

pathways for vapor migration. The vapor barrier system is an Engineering Control for the remedial action. The remedial engineer will certify in the Remedial Closure Report (RCR) that the vapor barrier system was designed and properly installed to mitigate soil vapor migration into the building. The vapor barrier will also be shown in a cross-section drawing to be provided at a later date.

15. Installation of a passive sub-slab depressurization system (SSDS) consisting of a network of horizontal pipe set in the middle of a gas permeable layer immediately beneath the building slab and vapor barrier system. The horizontal piping will consist of fabric wrapped, perforated schedule 40 4-inch PVC pipe connected to a 4-inch steel riser pipe that is vented into the parking garage. The gas permeable layer will consist of a 6-inch thick layer of 2-inch trap rock stone. The passive SSDS is an Engineering Control for the remedial action. The remedial engineer will certify in the RCR that the passive SSDS was designed and properly installed to establish a vacuum in the gas permeable layer and a negative (decreasing outward) pressure gradient across the building slab to prevent vapor migration into the building.
16. Construction and operation of a cellar parking garage with high volume air exchange in conformance with NYC Building Code.
17. 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.
18. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
19. Submission of a RCR that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAP, and describes all Engineering and Institutional Controls to be implemented at the Site.
20. Submission of an approved SMP in the RCR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection,

and certification of Engineering and Institutional Controls and reporting at a specified frequency.

21. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls 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 OER-approval.

3.2 Soil Cleanup Objectives and Soil/ Fill Management

The following Track 4 Site-Specific SCOs will be utilized for this project:

<u>Contaminant</u>	<u>Site-Specific SCOs</u>
Total SVOCs	100 ppm
Lead	800 ppm
Mercury	1.5 ppm
PCE	Protection of Groundwater Standards
PCBs	Protection of Groundwater Standards

Soil and materials management on-Site and off-Site, including excavation, handling and disposal, will be conducted in accordance with the Soil/Materials Management Plan in Appendix 2. 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 Remedial Closure Report.

Soil/Fill Excavation and Removal

The entire footprint of Buildings 3A and 3B will be excavated to a depth of approximately 4.5 to 12.5 feet below grade, to an elevation of approximately 8.5 feet NAVD88, for development purposes. Some soil/fill will also be excavated for the construction of the 8th Street Mews as well as the shore public walkway area to the north of Buildings 3A and 3B. Excavation

in the 8th Street Mews and public walkway areas to the north will be limited to grading as needed for construction. The location of planned excavations is shown in Figure 6. The total quantity of soil/fill expected to be excavated and disposed off-Site is approximately 15,000 cubic yards. 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 OER prior to any transport and disposal of soil at a facility.

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

End-point Sampling

End-point samples will be analyzed for compounds for which Site-Specific SCOs have been established 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.
- PCBs by EPA Method 8082.

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

Confirmation End-point Sampling

Removal actions for development purposes under this plan will be performed in conjunction with confirmation end-point soil sampling. A total of 12 confirmation samples from Buildings 3A and 3B will be collected from the base of the excavation at locations to be determined by OER. Six additional confirmation samples will be taken from the 8th Street Mews and walkway areas. The proposed end-point sample locations are shown on Figure 7. To evaluate attainment of

Site-specific SCOs, analytes will include those for which SCOs have been developed, including SVOCs, lead, mercury, PCE, and PCBs according to analytical methods described above.

Hotspot End-point Sampling

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 end-point 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 end-point sample locations and depth 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 “finger print analysis” and required regulatory reporting (i.e. spills hotline) will be performed.

Quality Assurance/Quality Control

Quality Assurance/Quality Control (QA/QC) procedures will be used to provide performance information with regard to accuracy, precision, sensitivity, representation, completeness, and comparability associated with the sampling and analysis for documentation and soil sampling. Sampling equipment will be decontaminated by wiping clean, washing with Alconox solution, rinsing with deionized water and air drying prior to each use in order to ensure that cross-contamination between sampling locations does not occur. Decontamination procedures will be performed in an area segregated from any sampling areas. Each sample will be collected in pre-cleaned, laboratory supplied glassware, appropriately labeled, stored in a cooler with ice and submitted for analysis under proper chain of custody procedures to a NYSDOH ELAP-certified laboratory. Dedicated disposable sampling material 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 1 for every 20 samples collected. Decontamination of non-disposable 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

Import of Soils

Import of soils onto the property will be performed in conformance with the Soil/Materials Management Plan in Appendix 2. Imported soil will meet the lower of:

- Restricted Residential Use SCOs.

- Groundwater Protection Standards in Part 375-6.8.

The estimated quantity of soil to be imported into the Site for backfill and cover soil is approximately 100 cubic yards. The imported soil for backfill will be used as cover soil in the landscaped areas and tree planters throughout the Site.

Reuse of On-Site Soils

Soil reuse is not planned on this project.

3.3 Engineering Controls

Engineering Controls will be employed in the remedial action to address residual contamination remaining at the Site. The Site has three primary Engineering Control Systems. These are:

- (1) Composite Cover System
- (2) Soil Vapor Barrier System
- (3) Passive Sub-Slab Depressurization System
- (4) Sub-grade Ventilated Garage

Composite Cover System

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. This composite cover system will be comprised of at a minimum the concrete building slabs with clean granular sub-base beneath all building areas; concrete with clean granular sub-base in sidewalk areas, the 8th Street Mews, and the pedestrian walkway area; and at least two feet of clean soil in all tree planters and landscaped areas. The thicknesses of each composite layer will be provided at a later date and included on a cross-section drawing. Figure 8 shows the location of each cover type built at the Site.

The composite cover system will be a permanent engineering control. The system will be inspected, and its performance certified at specified intervals as required by this RAP and the SMP. A Soil and Materials Management Plan will be included in the SMP and will outline the procedures to be followed in the event that the composite cover system and underlying residual soil/fill is disturbed after the remedial action is complete. Maintenance of this composite cover system will be described in the SMP in the RCR.

Vapor Barrier System

Migration of soil vapor from on-Site or off-Site sources into the building will be mitigated with a combination of building slab and vapor barrier. The vapor barrier will consist of a 20-mil Stego Wrap Vapor Barrier or OER-approved equivalent below the slab throughout the full building area and outside all sub-grade foundation sidewalls to meet grade. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration.

The vapor barrier will extend throughout the area occupied by the footprint of the new building and up the foundation sidewalls and will be installed in accordance with manufacturer specifications. The vapor barrier will be shown on a cross-section figure to be provided at a later date.

A plan view showing the location of the proposed vapor barrier system is provided in Figure 9 and details are provided on Figure 10. Product specification sheets are provided in Appendix 4. The RCR will include as-built drawings and diagrams; manufacturer documentation; and photographs.

The Vapor Barrier System is a permanent engineering control and will be inspected and its performance certified at specified intervals as required by this RAP and the SMP. A Soil and Materials Management Plan will be included in the SMP and will outline the procedures to be followed in the event that the composite cover system and underlying vapor barrier system is disturbed after the remedial action is complete. Maintenance of these systems will be described in the SMP in the RCR.

Sub-Slab Depressurization System

The sub-slab depressurization system (SSDS) will include a network of horizontal pipe set in the middle of a gas permeable layer immediately beneath the building slab and vapor barrier system. Details of the system are provided on Figure 10. The horizontal piping will consist of fabric wrapped, perforated schedule 40 4-inch PVC pipe connected to a 4-inch steel riser pipe that is vented into the parking garage. The gas permeable layer will consist of a 6-inch thick layer of 2-inch trap rock stone. The system will be designed to passively vent any vapors that may

accumulate beneath the building foundation in an area of soil vapor impacts identified during the RI.

Sub-grade Ventilated Garage

The installation of a parking garage in the building cellar with ventilation systems installed to current NYC Building code for high-volume air exchange will add additional protection for any building occupants from potential soil vapor encroachment conditions. These conditions will primarily be mitigated by the vapor barrier and the SSDS described above. The SSDS will be allowed to vent into the garage, due to the ventilation and high-volume air exchange.

3.4 Institutional Controls

A series of Institutional Controls (ICs) are required under this Remedial Action to assure permanent protection of public health by elimination of exposure to residual materials. These ICs define the program to operate, maintain, inspect, and certify the performance of Engineering Controls (ECs) and IC on this property. ICs would be implemented in accordance with an SMP included in the final RCR. ICs would be:

- Continued registration of the E-Designation for the property. This RAP 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 an SMP in the RCR 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(1)(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 mixed-use residential and commercial use and will not be used for a higher level of use without prior approval by OER.

3.5 Site Management Plan

Site Management is the last phase of remediation and begins with the approval of the RCR and issuance of the Notice of Satisfaction (NOS) for the Remedial Action. The SMP describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by this RAP. The SMP is submitted as part of the RCR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. 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 E-Designation with OER. This includes a plan for: 1) implementation of EC's and ICs; 2) operation and maintenance of EC's; 3) inspection and certification of IC's and EC's.

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

4.0 Remedial Action Management

4.1 Project Organization and Oversight

Principal personnel who will participate in the remedial action include George Holmes, P.G., the QEP, and Gary Rozmus, P.E., the Professional Engineer (PE).

4.2 Site Security

Site access will be controlled through gated entrances to the fenced property.

4.3 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.

4.4 Construction Health and Safety Plan

The CHASP is included in Appendix 3. The Site Safety Coordinator will be determined prior to the start of the Remedial Action. Remedial work performed under this RAP 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 CHASP and applicable laws and regulations. The CHASP 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 CHASP 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 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 CAMP will be reported to the OER Project Manager and included in the Daily Report.

VOC Monitoring, Response Levels, and Actions

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 shut down.

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 OER personnel to review.

4.6 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 RAP by OER does not constitute satisfaction of these requirements and will not be a substitute for any required permit.

4.7 Site Preparation

Pre-Construction Meeting

OER 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 in compliance 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 RAP. 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 RAP.

Dewatering

Dewatering is not anticipated during remediation and construction.

Equipment and Material Staging

Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations.

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 OER 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 NYS DEC within 2 hours of identification and consistent with State regulations. Emergency and spill conditions will also be reported to OER. 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 OER will be notified, and corrective measure plan designed to remove and clean dislocated material will be submitted to OER and implemented following approval by OER and granting of Site access by the property owner. Impacted off-Site areas may require characterization based on Site conditions, at the discretion of OER. If on-Site petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYS DEC's spill hotline at DEC 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 NYS DEC.

Storm Response Reporting

A Site inspection report will be submitted to OER at the completion of Site inspection. An inspection report established by OER is available on OER'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 OER project manager and will include the Site name,

address, tax block and lot, Site primary and alternate contact name and phone number. Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the Site was dislocated and whether any of the soil left the Site; estimates of the volume of soil that left the Site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of on-Site or off-Site exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYS DEC; description of corrective actions; schedule for corrective actions. This report should be completed and submitted to OER project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

4.8 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 26th Avenue to 3rd Street to 27th Avenue to 8th Street south to Astoria Boulevard.

4.9 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.
- 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.

4.10 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 OER Project Manager by the end of the following business day. Those reports will include:

- Project number, statement of the activities, an update of progress made, locations of excavation, and other remedial work performed.
- Quantities of material imported and exported from the Site.
- Status of on-Site soil/fill stockpiles.
- A summary of 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 OER project manager based on planned project tasks. Daily email reports are not intended to be the primary mode of communication for notification to OER of emergencies (accidents, spills), requests for changes to the RAP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RAP will be communicated directly to the OER project manager by personal communication. Daily reports will be included as an Appendix in the RCR.

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 OER 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 RCR in digital format (i.e., jpeg files).

4.11 Complaint Management

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

4.12 Deviations From The Remedial Action Plan

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

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

5.0 Remedial Closure Report

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

- Information required by this RAP.
- Text description with thorough detail of all engineering and institutional controls (if Unrestricted Use remedial action is not achieved).
- As-built drawings for all constructed remedial elements;
- Manifests for all soil or fill disposal.
- Photographic documentation of remedial work performed under this remedy;
- Site Management Plan (if Unrestricted Use remedial action is not achieved).
- Description of any changes in the remedial action from the elements provided in this RAP 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 end-point 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 NYC Department of Buildings (if Unrestricted Use remedial action is not achieved).
- The RAP and RIR will be included as appendices to the RCR.

- Reports and supporting material will be submitted in digital form and final PDF's will include bookmarks for each appendix.

Remedial Closure Report Certification

I, [name], certify the following:

- I 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 [OER project number].
- 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 Plan for this site.
If a Track 1 or a Track 2 Restricted Residential Remedial Action was achieved (without an active SSDS), substitute the following passage for above:

The [list protective elements like vapor barrier, passive SSDS, composite cover system implemented as part of construction] constructed during this remedial action were designed by me or a person under my direct supervision and achieve the goals established in the Remedial Action 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 Plan and (2) are accurately reflected in the text and drawings for as-built design reported in this Remedial Closure Report.

If a Track 1 or a Track 2 Restricted Residential Remedial Action was achieved (without an active SSDS), substitute the following passage for above:

The [list protective elements like vapor barrier, passive SSDS, composite cover system implemented as part of construction] constructed during this remedial action were professionally observed by me or by a person under my direct supervision are accurately reflected in the text and drawings for as-built design reported in this Remedial Closure Report.

- The OER-approved Remedial Action 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, liquid or other material from the property was taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

Name

PE License Number

Signature

Date

PE Stamp

I, [name], certify the following:

- I am a Qualified Environmental Professional. I had primary direct responsibility for implementation of the remedial program for the [site name (address)] site, site number [OER project number].
- The OER-approved Remedial Action 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, liquid or other material from the property was taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

QEP Name

QEP Signature

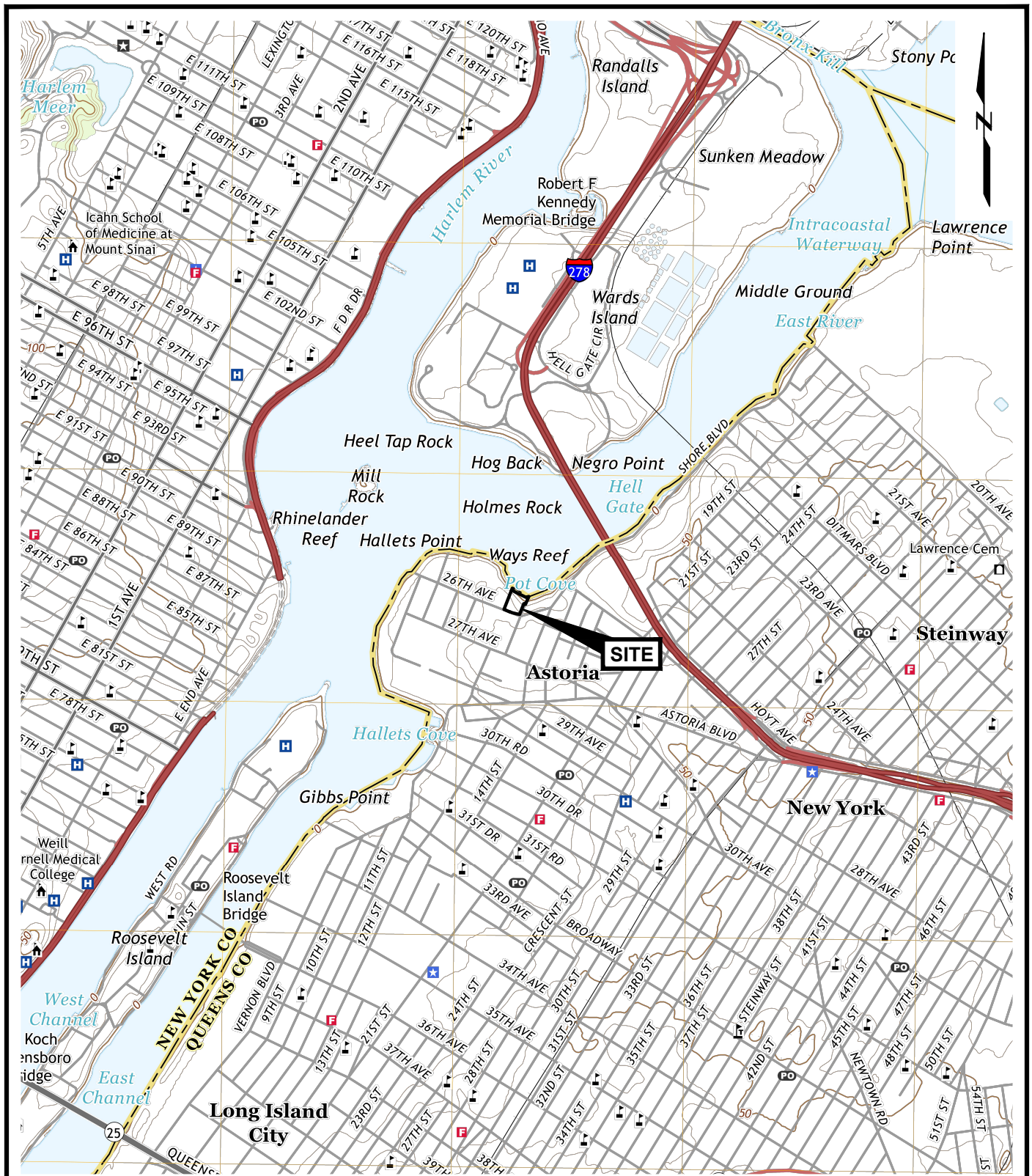
Date

6.0 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 7-month remediation period is anticipated.

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAP	2	2
Mobilization	5	2
Remedial Excavation	21	16
Demobilization	23	2
Submit Remedial Closure Report	29	6

FIGURES



SOURCE:

MAP CREATED WITH CENTRAL PARK QUADRANGLE, NY - NJ,
7.5-MINUTE USGS TOPOGRAPHIC MAP, 2019.

0 2000 4000



SCALE: 1" = 2000'

Remedial Action Work Plan - Building 3A/B
8-01 & 8-51 26th Avenue
Astoria, New York

Cape Astoria Cove JV, LLC
New York, New York

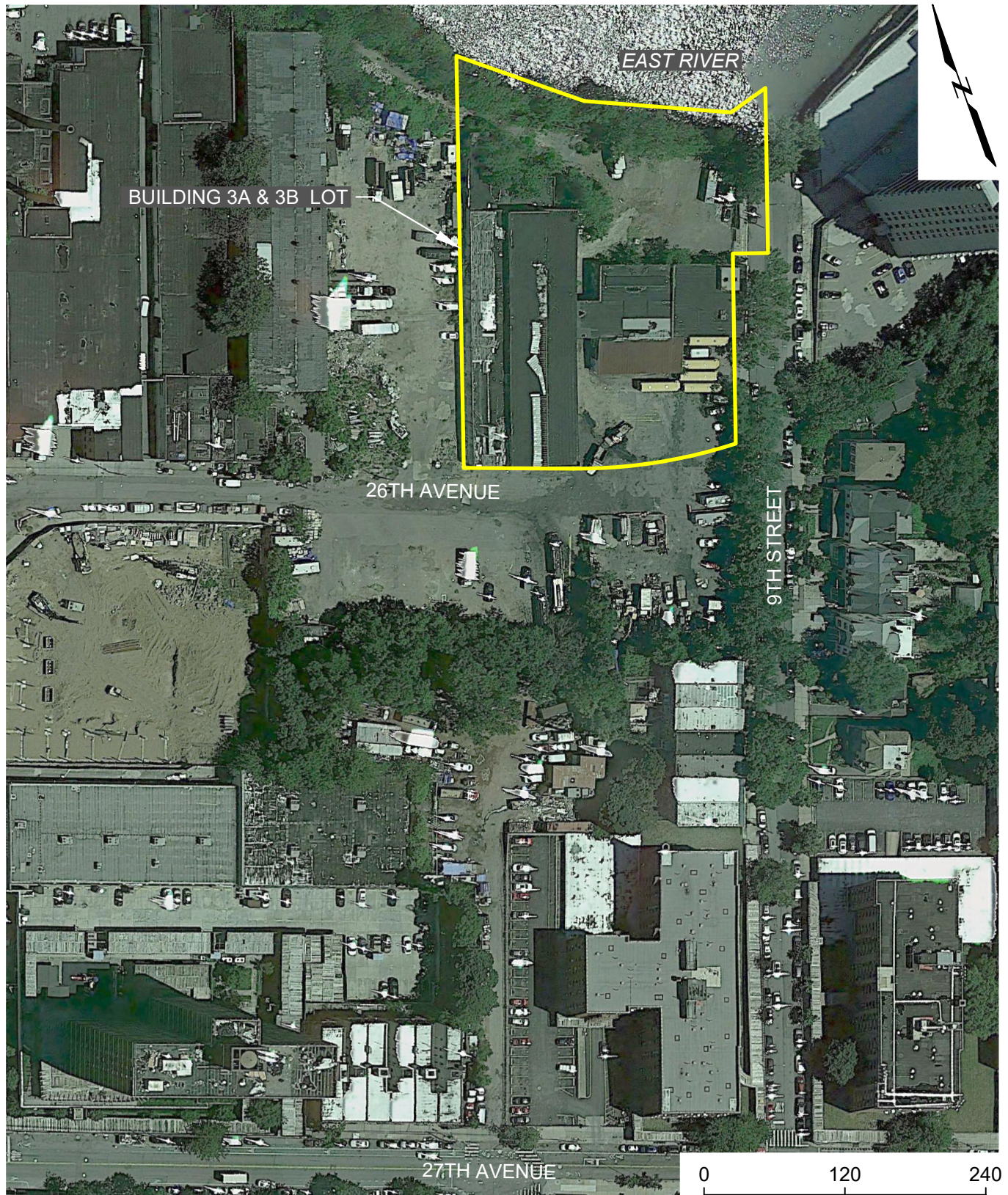


Project 2104337

SITE LOCATION MAP

May 2022

Fig. 1



SOURCE:

GOOGLE EARTH PRO, IMAGERY DATE 6/22/2021.

Remedial Action Work Plan - Building 3A/B
8-01 & 8-51 26th Avenue
Astoria, New York

Cape Astoria Cove JV, LLC
New York, New York

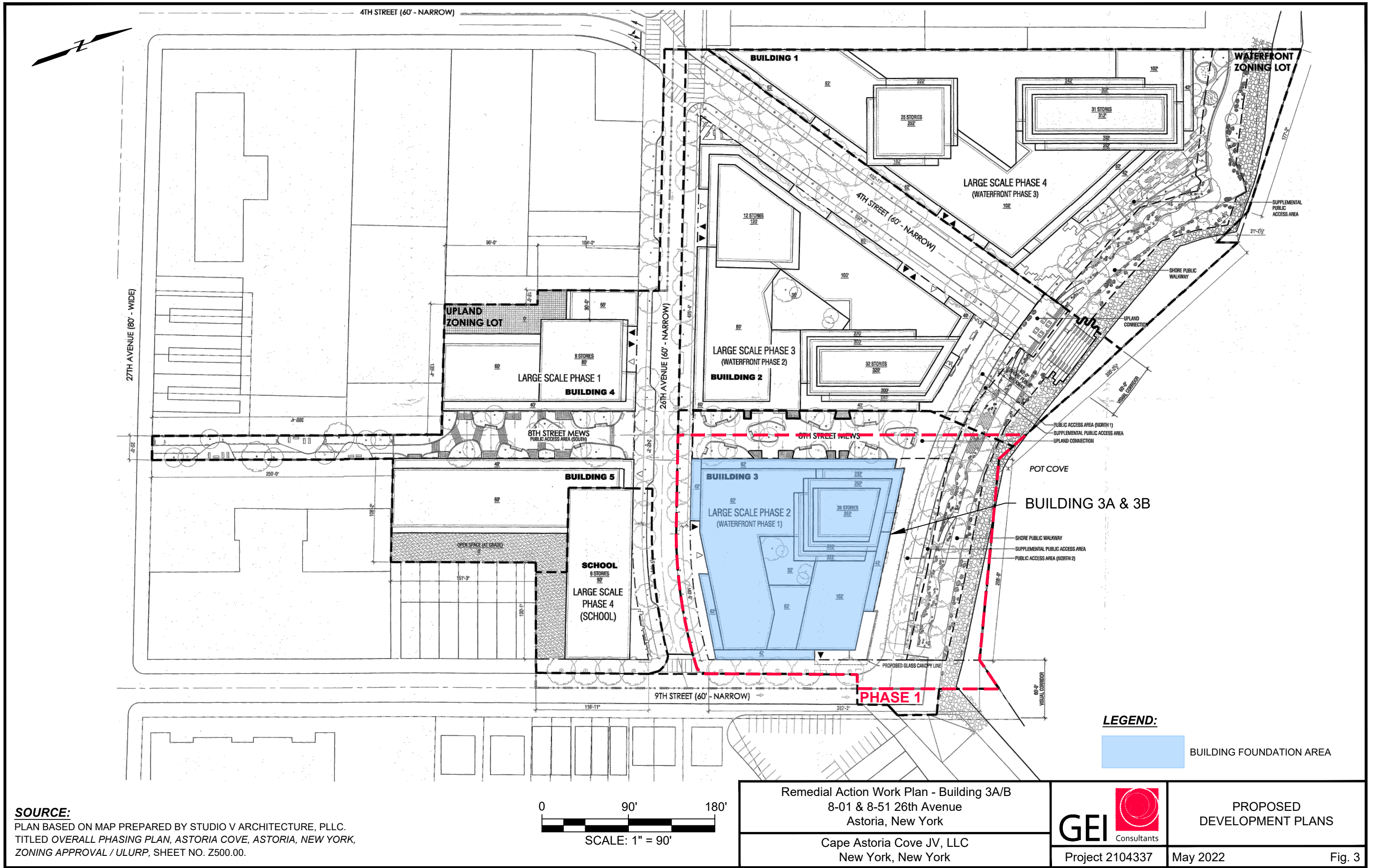


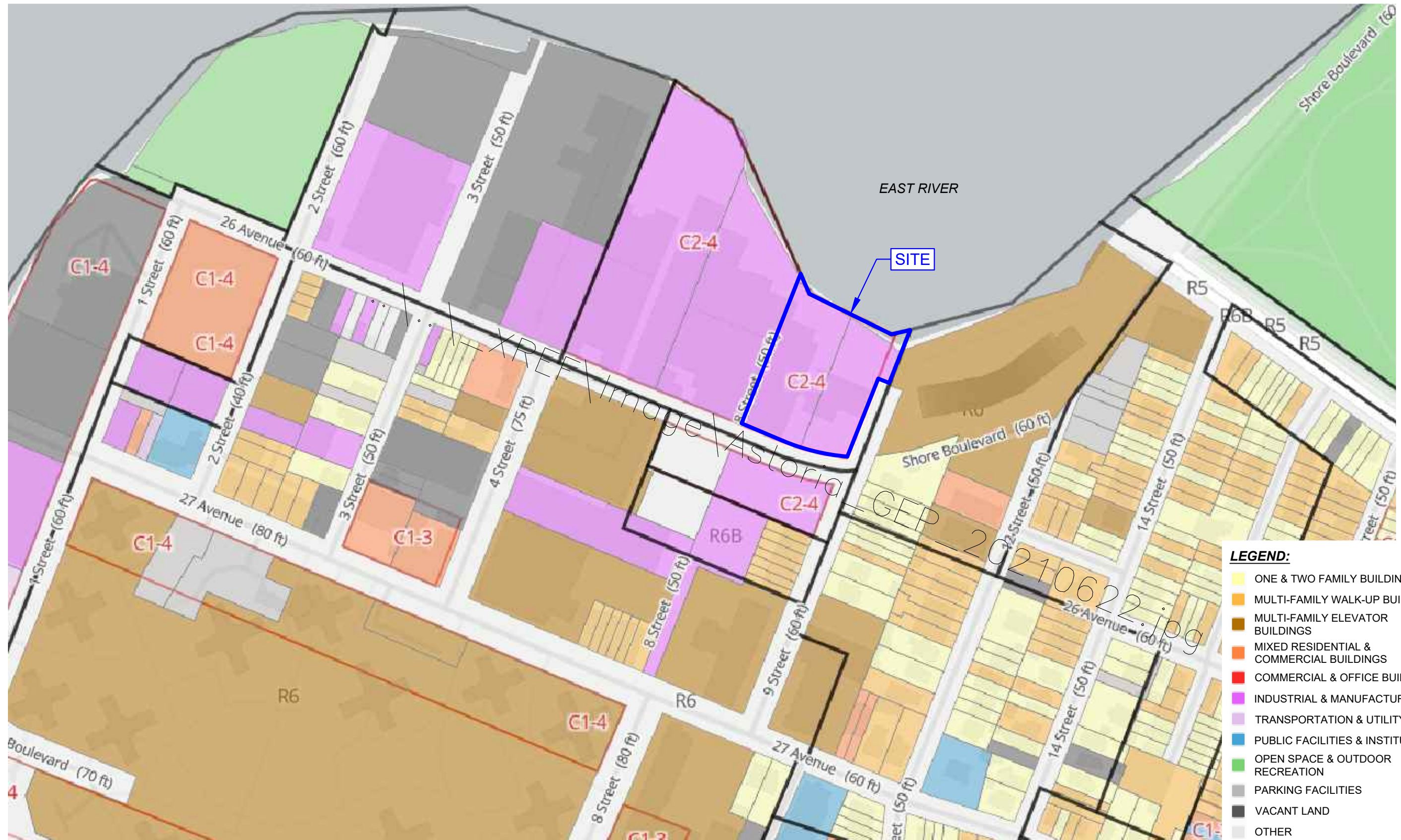
Project 2104337

SITE BOUNDARY

May 2022

Fig. 2





Remedial Action Work Plan - Building 3A/B
8-01 & 8-51 26th Avenue
Astoria, New York

Cape Astoria Cove JV, LLC
New York, New York

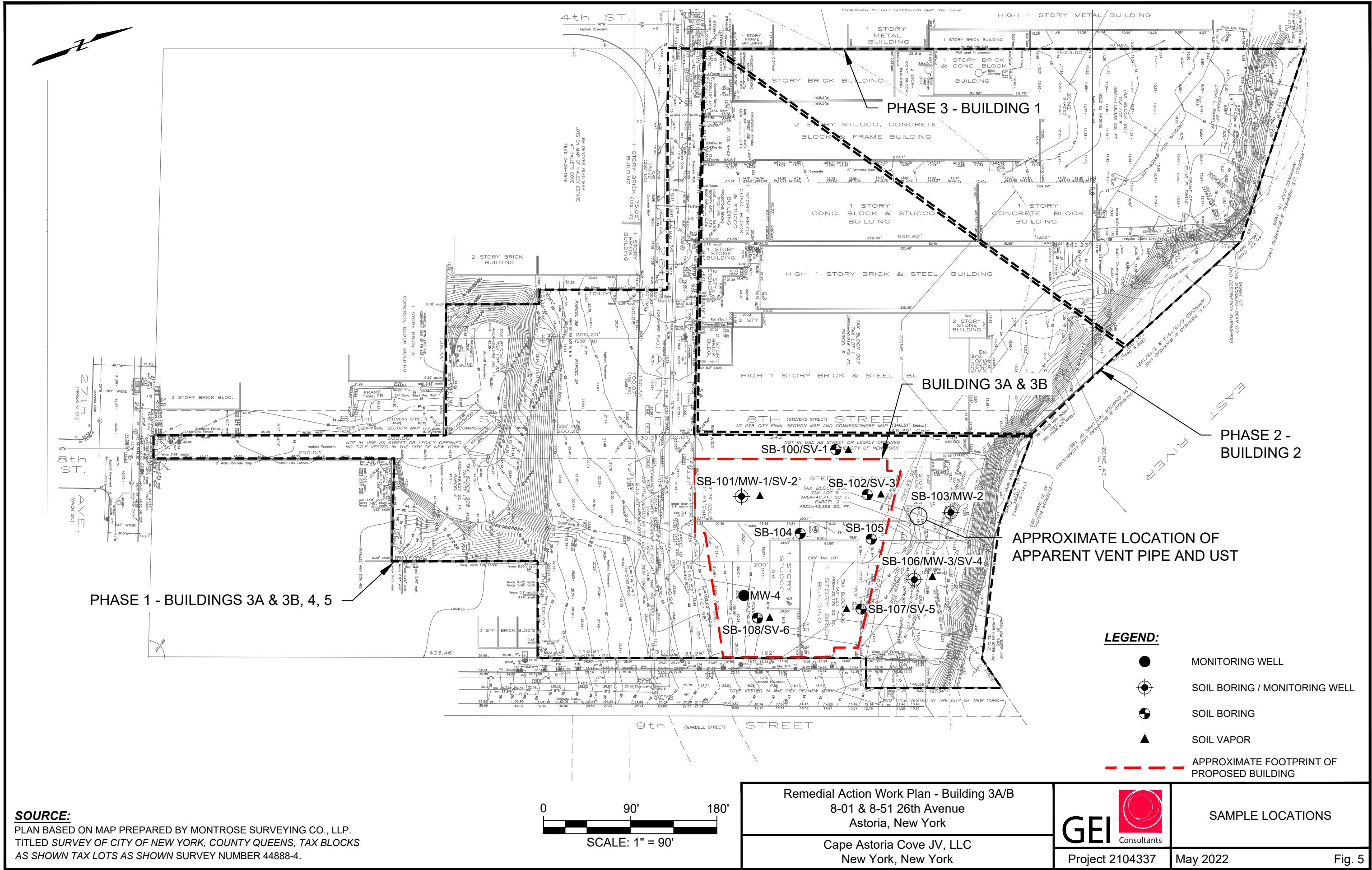


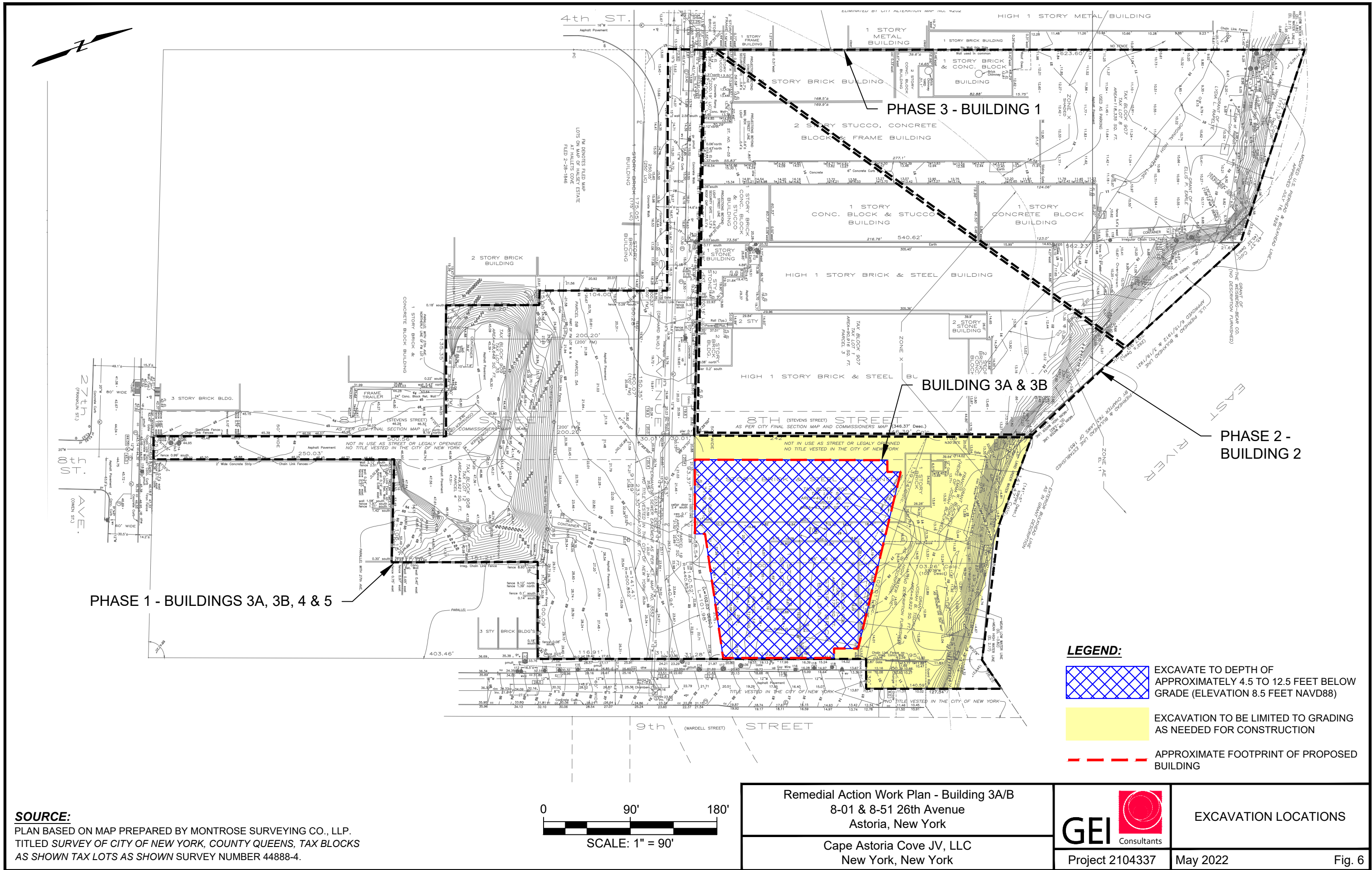
Project 2104337

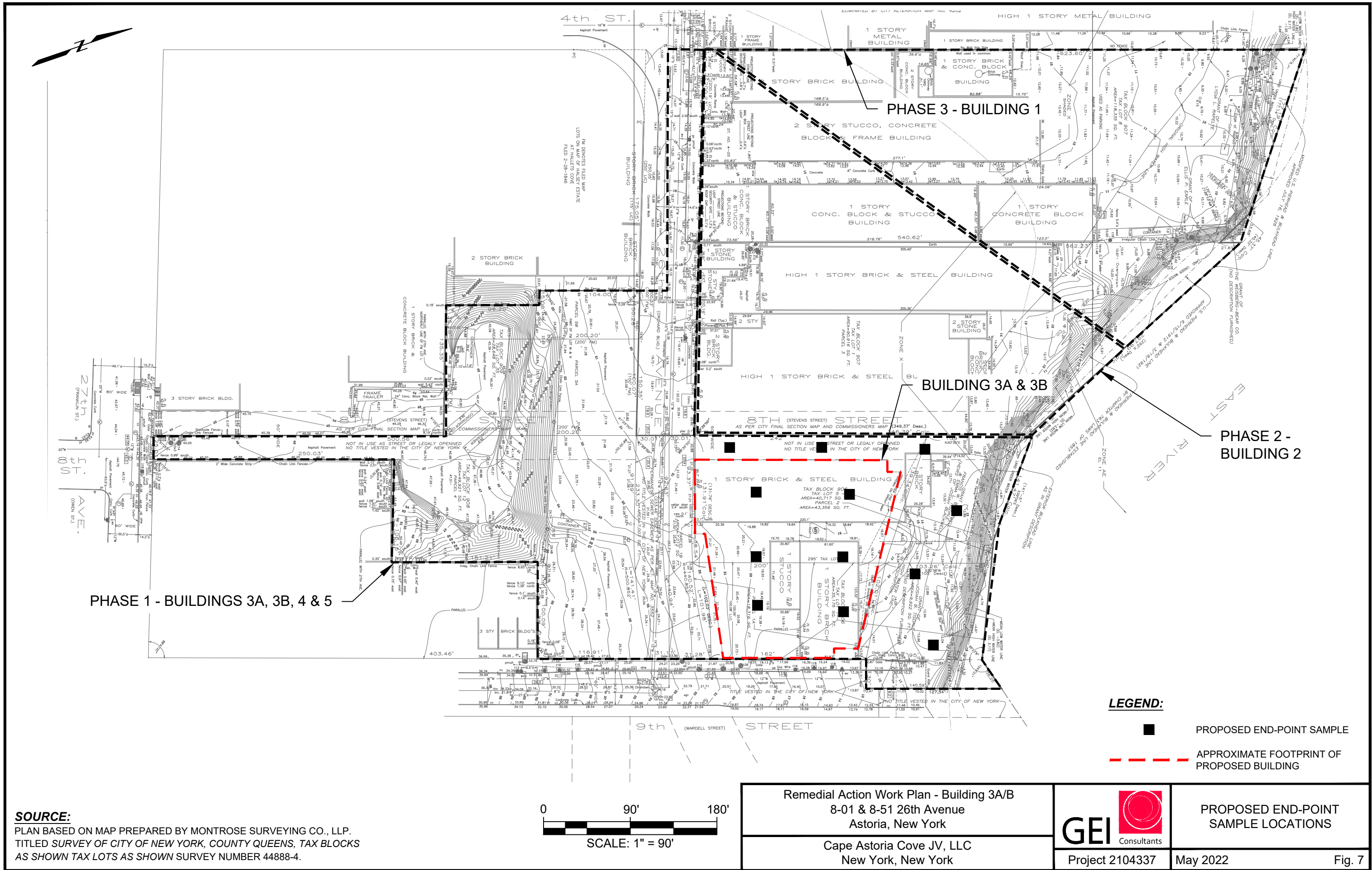
SURROUNDING LAND USE

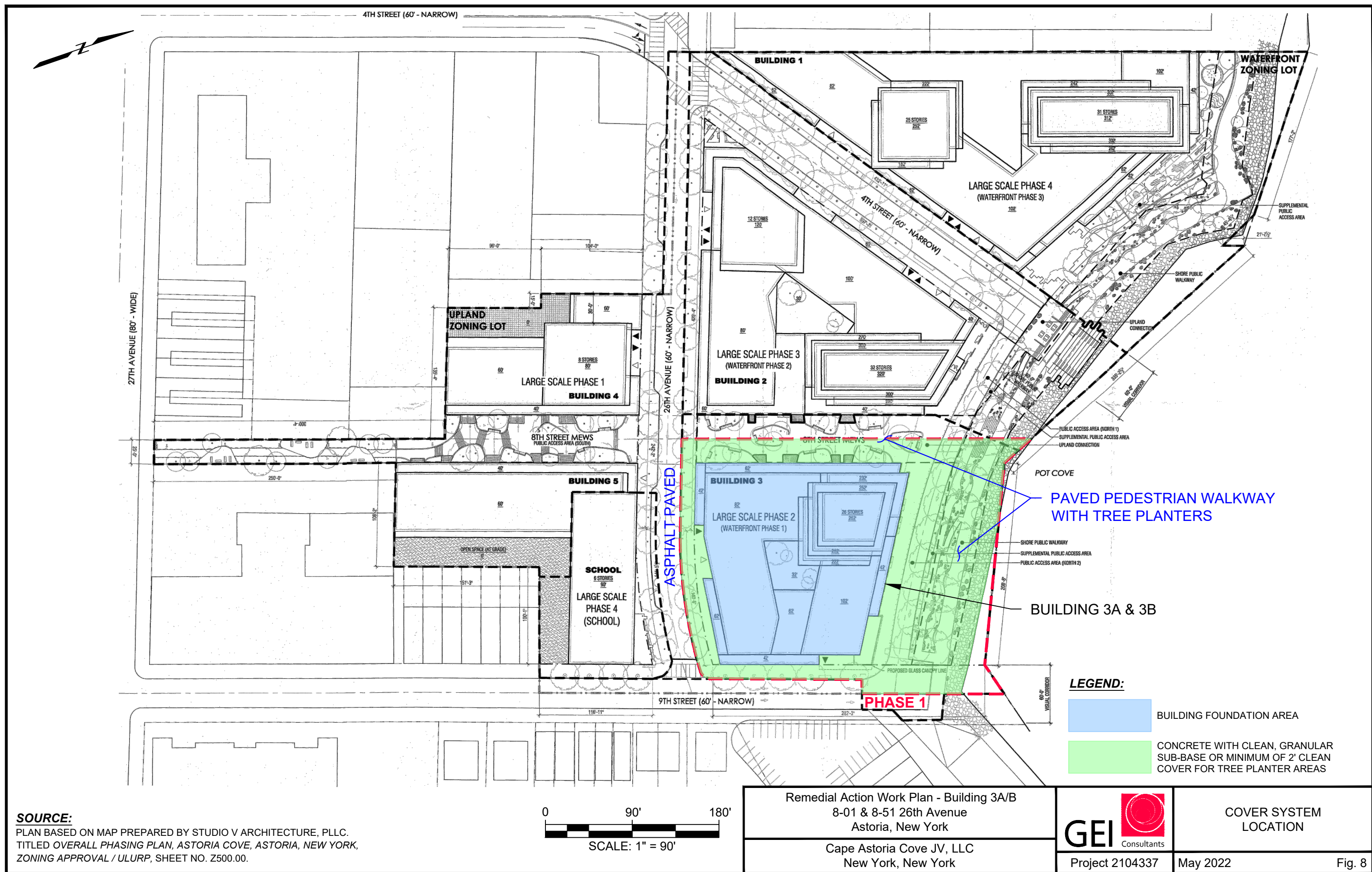
May 2022

Fig. 4

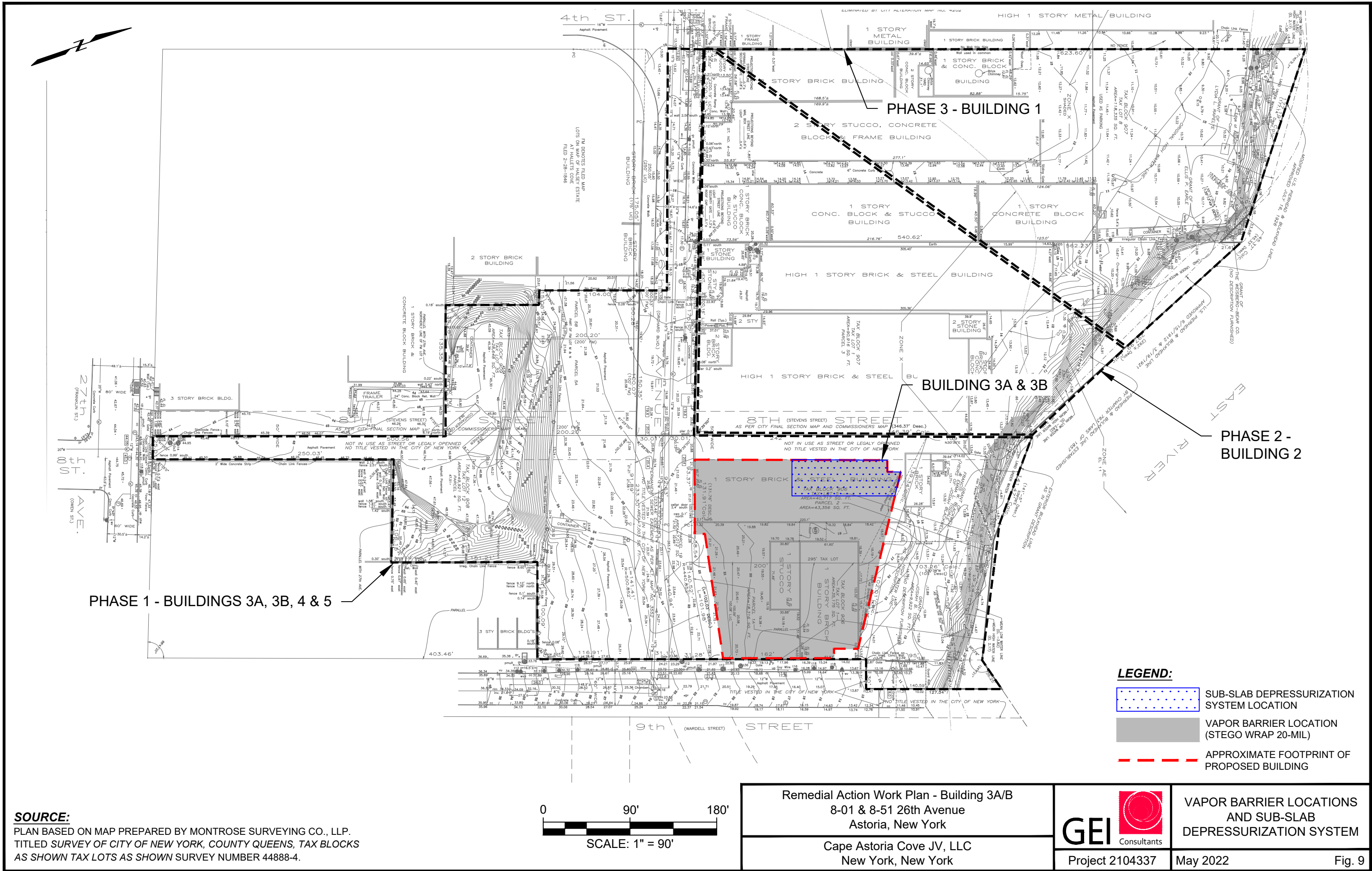


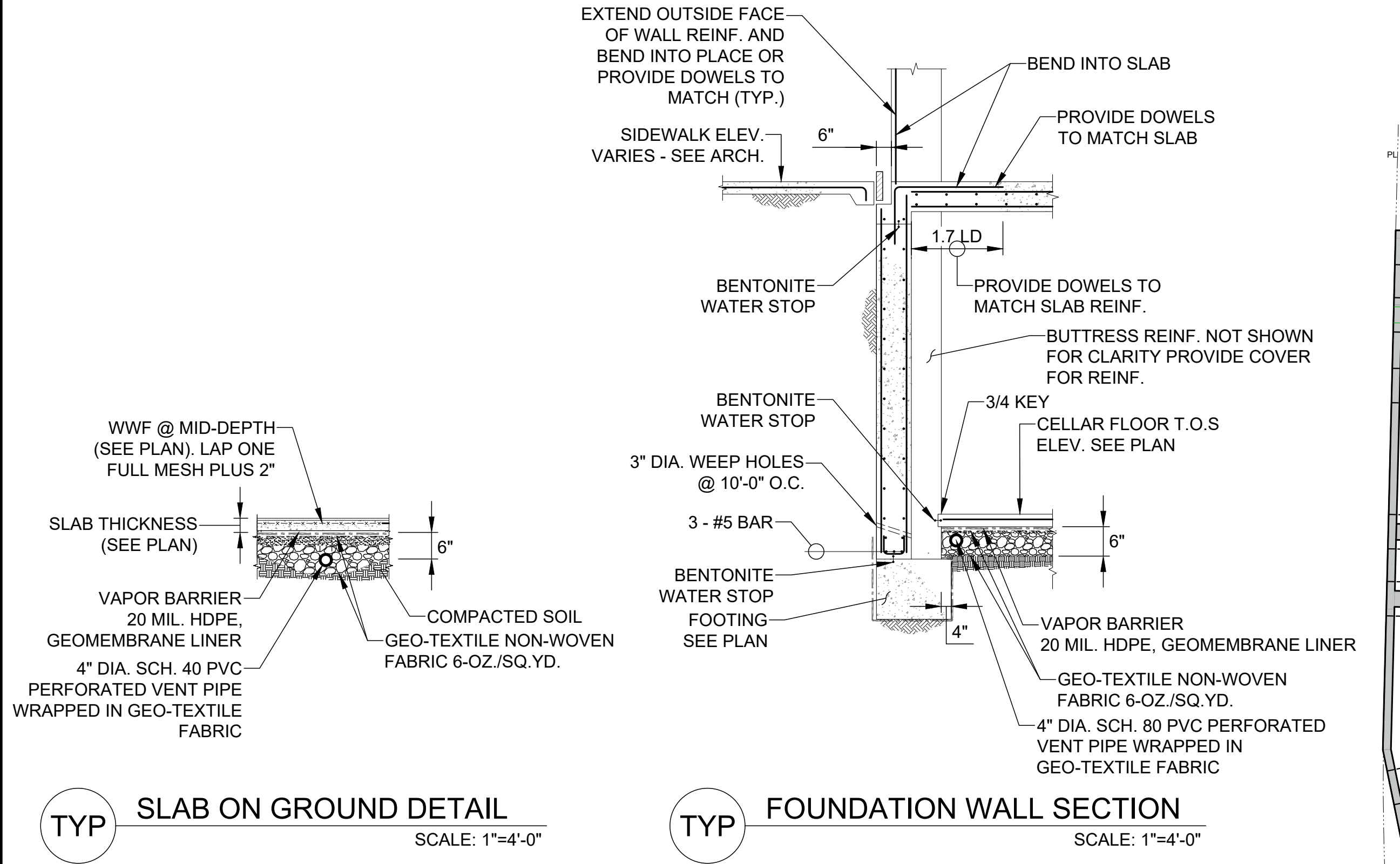






SOURCE:
PLAN BASED ON MAP PREPARED BY STUDIO V ARCHITECTURE, PLLC.
TITLED OVERALL PHASING PLAN, ASTORIA COVE, ASTORIA, NEW YORK,
ZONING APPROVAL / ULURP, SHEET NO. Z500.00.





LEGEND:

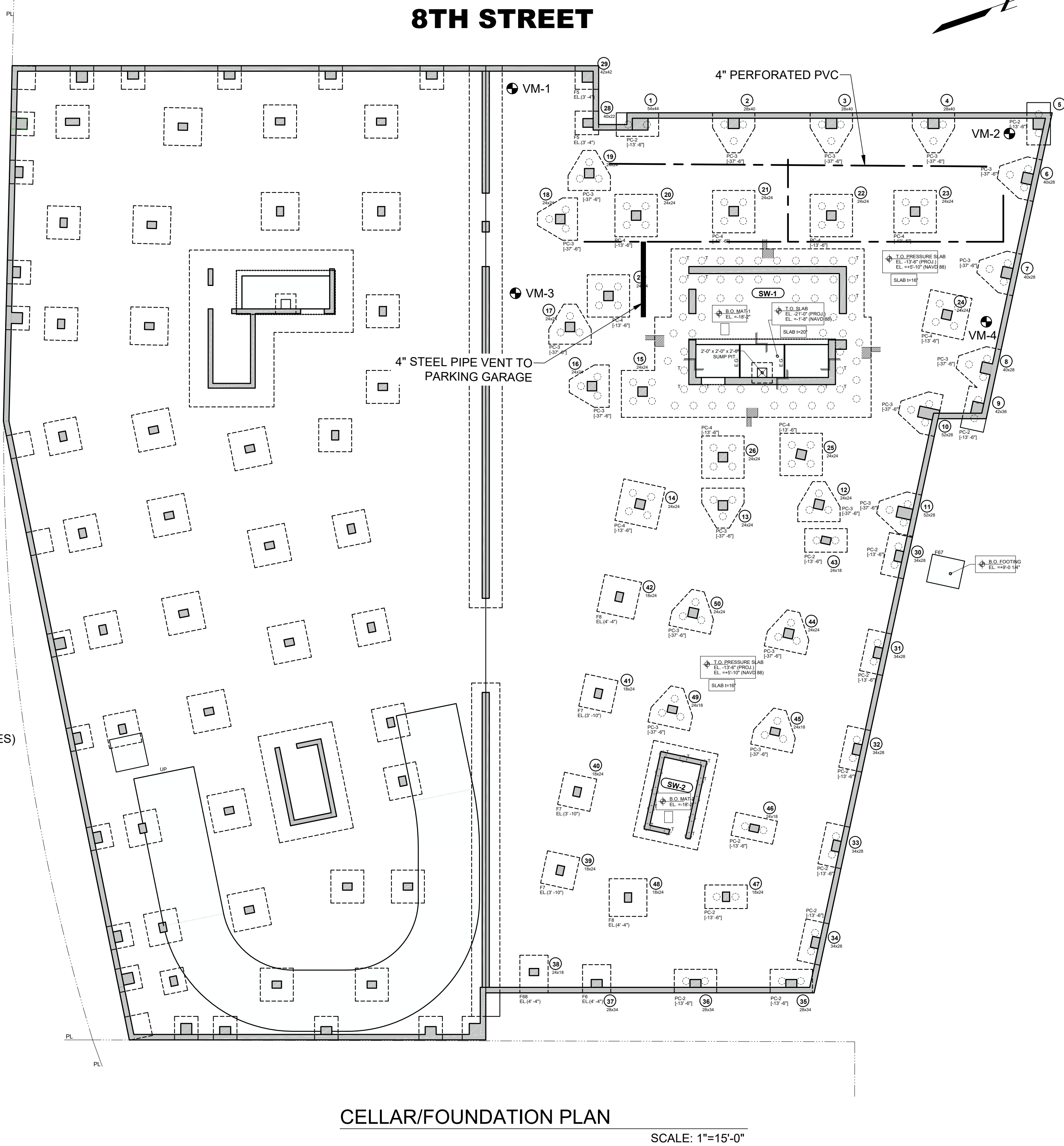
- 2-IN. TRAP ROCK STONE
- VM-1 VAPOR MONITORING POINT
- 4" DIA. VENT PIPE
- 20-MIL HDPE GEOMEMBRANE WITH 6-OZ GEOTEXTILES (BOTH SIDES)
- 4" DIA. PERFORATED PIPE

NOTES:

1. FINE MASON SAND SHALL BE USED AS BEDDING FOR THE LINER ON BOTH SIDES.
2. THE LINER SHALL BE PROTECTED WITH A GEO-TEXTILE NON-WOVEN FABRIC @ 6-OZ./SQ.YD. ON BOTH SIDES.
3. THE PERFORATED VENT PIPES SHALL BE CAREFULLY INSTALLED MANUALLY IN A SECURE COMPACTED BED OF ROUND GRAVEL TO PROVIDE GOOD SUPPORT WITHOUT DAMAGE TO PIPING.
4. THE PERFORATED PIPING SHALL BE PROTECTED WITH A LAYER OF GEO-TEXTILE NON-WOVEN FABRIC @ 6-OZ./SQ.YD.
5. THE VERTICAL RISER PIPING SHALL BE INSTALLED WITHIN. CONTRACTOR SHALL USE EITHER A PVC OR CAST IRON (CI) PIPING AS DIRECTED BY THE GEOTECH. PLEASE REFER TO STRUCTURAL DRAWINGS DESIGNED BY OTHERS.

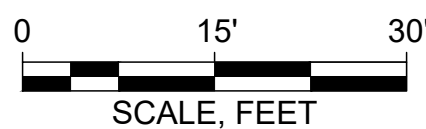
NOTES:

1. ALL ELEVATIONS ARE RELATIVE TO THE TOP OF PROPOSED SLAB WHICH IS ARBITRARILY ASSUMED TO BE AT 0'-0" EL.
2. THE VAPOR BARRIER DESIGN IS INDEPENDENT OF THE ACTUAL TYPE OF FOUNDATION CONSTRUCTED AT THE SITE.
3. THE ASSEMBLY OF THE VAPOR BARRIER AND PASSIVE VENTING SYSTEM CAN BE MODIFIED WITH RESPECT TO THE DEPTH OF THE FOUNDATION.
4. THE VENT FOR THE SSDS SYSTEM WILL BE THROUGH THE FLOOR INTO THE PARKING GARAGE.
5. THE TRENCH FOR THE PERFORATED PIPING SYSTEM SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM STANDARDS.
6. THE PERFORATED VENT PIPE SHALL BE CAREFULLY INSTALLED MANUALLY IN A SECURE COMPACTED BED OF ROUND GRAVEL TO PROVIDE SUPPORT WITHOUT DAMAGE TO PIPING.
7. THE PERFORATED VENT PIPES SHALL BE COVERED WITH 6-OZ. GEOTEXTILE MEMBRANE TO PROTECT AND DAMAGES ON THE PIPE.
8. FOR FOUNDATION DETAILS, PLEASE REFER TO STRUCTURAL DRAWINGS DESIGNED BY OTHERS.



SOURCE:

1. PLAN BASED ON MAP PREPARED BY



REMEDIATION ACTION WORK PLAN - BUILDING 3A/B
8-01 & 8-51 26th Avenue
Astoria, New York

Cape Astoria Cove JV, LLC
New York, New York

GEI Consultants

Project 2104337

VAPOR BARRIER & SSDS SYSTEM DETAILS

December 2023

Fig. 10

APPENDIX 1

PROPOSED DEVELOPMENT PLANS

BUILDING 3A
ASTORIA COVE
ASTORIA, NY 11217

FILING SET
DECEMBER 17TH, 2021

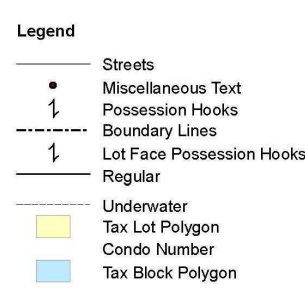
ARCHITECTURE

Building #3A: Block: 906, Lot: 1: Q00646754-I1

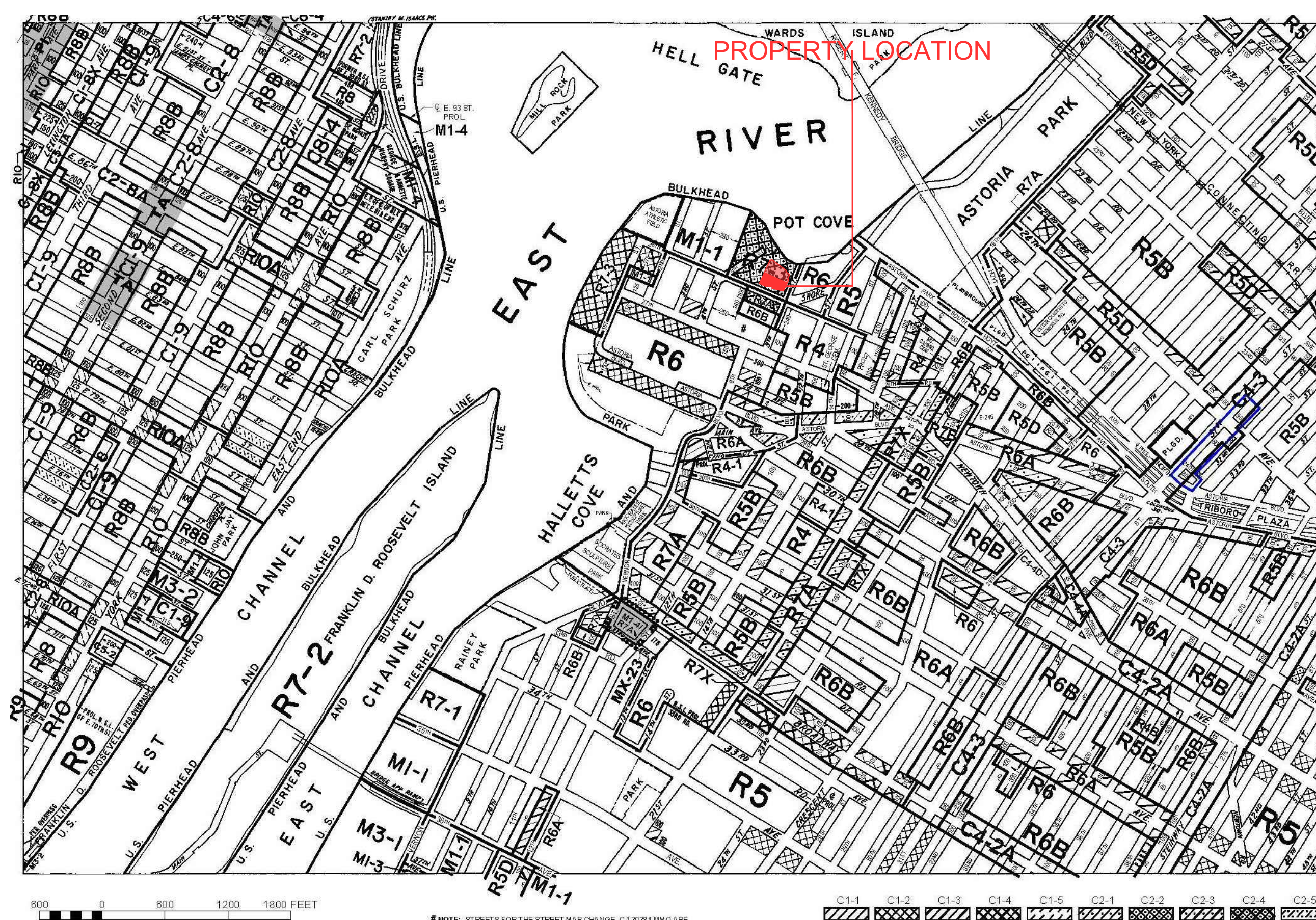
Building #3B: Block: 906, Lot: 5: Q00646756-I1

Building #4: Block: 909, Lot: 35: Q00646746-I1

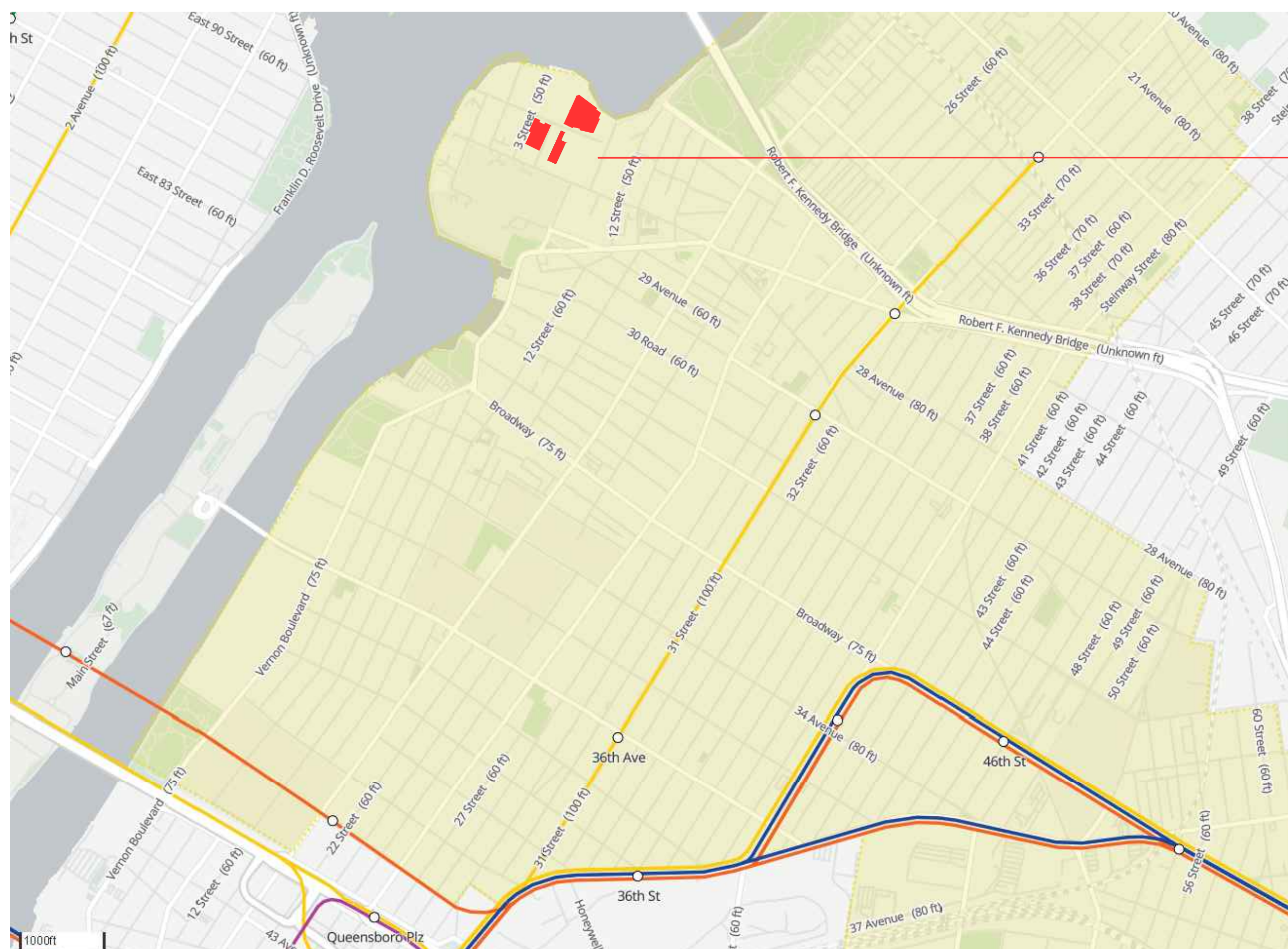
Building #5: Block: 908, Lot: 12: Q00646751-I1



SCALE: N.T.S.



SCALE: N.T.S.



SCALE: N.T.S.

BUILDING LIMITATIONS					
CATEGORY		CODE SECTION		CRITERIA	
1. APPLICABLE BUILDING CODES: HANDICAPPED LAWS AND GUIDELINES				TITLE 28 OF THE ADMINISTRATIVE CODE THE NEW YORK CITY CONSTRUCTION CODES (2008) LL 58.87 HANDICAPPED ACCESSIBILITY, ANSI 117.1 ALL DWELLING UNITS - TYPE B. ALL TOILET AND BATHING FACILITIES TO COMPLY WITH APPENDIX-P	
2. BUILDING OCCUPANCY		28.2-310.1.2		GROUP R-2: APARTMENT GROUP M: RETAIL	
3. CONSTRUCTION CLASSIFICATION		BC 602 TABLE 601		TYPE 1B	
4. HEIGHT LIMITATIONS, GROUP R-2, CONSTRUCTION TYPE 1-B		BC 503 TABLE 503		UNLIMITED STORIES	
5. NATURAL LIGHT		BC 1205		LIGHTING	
6. NATURAL VENTILATION		BC 1203		VENTILATION	
7. FIRE RESISTANCE RATING REQUIREMENT (TABLE 601 & 602)					
CONSTRUCTION ELEMENT				RATING IN HOURS	
STRUCTURAL FRAMING (INC. COLUMNS, GIRDERS, TRUSSES)				3	
BEARING WALLS _ EXTERIOR BEARING WALLS _ INTERIOR				3 3	
NONBEARING WALLS & PARTITIONS EXTERIOR				SEE TABLE 602	
(a) ROOF SUPPORTS: FIRE RESISTANCE RATINGS OF STRUCTURAL FRAME AND BEARING WALLS ARE PERMITTED TO BE REDUCED BY 1 HOUR WHERE SUPPORTING ROOF ONLY.					
NONBEARING WALLS & PARTITIONS INTERIOR				0	
FLOOR CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS				2	
ROOF CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS				1 ^{b,c}	
SHAFT ENCLOSURE				2	
8. SPRINKLERS		FULLY SPRINKLERED ALL FLOORS			
9. INTERIOR FINISH CLASS		VERTICAL EXITS AND EXIT PASSAGEWAYS EXIT ACCESS CORRIDORS		CLASS B	
BC 803 TABLE 803.5		ROOMS AND ENCLOSED SPACES		CLASS B CLASS C (R2) CLASS B (M)	
10. EGRESS REQUIREMENTS (FULLY SPRINKLERED)					
OCC. CLASS	TRAVEL DIST.	CAPACITY		CORRIDORS	
R2	200'	NO. OF OCCUPANTS 0.2" PER OCC 0.3" PER OCC		MIN WIDTH	DEAD END
M	200'	DOORS STAIRS		44"	80'
		180	120		
11. EXIT ACCESS TRAVEL DISTANCE		200' FOR R2, M & B, CONSTRUCTION TYPE I-A. TABLE 1016.1			
12. LOCATION OF EXITS 1015.2.1.3		R2: DOOR OPENINGS TO VERT EXITS SHALL BE 15' (MIN) DIST. FROM EACH OTHER			
13. EXIT DOORS 1008.1.1.1		MAX WIDTH 48" (PER LEAF) MIN WIDTH 36" (SINGLE DOOR)			
14. STAIRS 1009.1		STAIRWAY WIDTH SHALL NOT BE LESS THAN 44"			
15. FIRE WALL RESISTANCE RATING PER TABLE 706.4		NO LESS THAN 3 HR-RATED PER R-2 GROUP "A" WALLS SHALL NOT BE LESS THAN 2 HR RATED IN TYPE 2 CONSTRUCTIONS			
16. HORIZONTAL CONTINUITY PER 706.5		FIRE WALLS SHALL BE CONTINUOUS FROM EXTERIOR WALL TO EXTERIOR WALL AND SHALL EXTEND AT LEAST 18 INCHES (457 MM) BEYOND THE EXTERIOR SURFACE OF EXTERIOR WALLS.			
17. VERTICAL CONTINUITY PER 706.6		FIRE WALLS SHALL EXTEND FROM THE FOUNDATION THROUGH THE ROOF, TO FORM A PARAPET AT LEAST 30 INCHES (762 MM) IN HEIGHT.			
18. OPENINGS PROTECTION PER TABLE 715.4		APPROVED FIRE DOOR AND FIRE SHUTTER ASSEMBLIES SHALL BE CONSTRUCTED OF ANY MATERIAL OR ASSEMBLY OF COMPONENT MATERIALS THAT CONFORMS TO THE TEST REQUIREMENTS OF SECTION 715.4.1, 715.4.2 OR 715.4.3 AND THE FIRE PROTECTION RATING INDICATED IN TABLE 715.4.			
19. POSTING OF OCCUPANT LOAD PER 1004.3		EVERY SPACE THAT IS AN ASSEMBLY OCCUPANCY SHALL HAVE THE OCCUPANT LOAD OF THE SPACE POSTED IN A CONSPICUOUS PLACE NEAR THE MAIN EXIT OR EXIT ACCESS DOORWAY FROM THE SPACE. POSTED SIGNS SHALL BE OF AN APPROVED LEGIBLE DESIGN AND SHALL BE MAINTAINED BY OWNER OR AUTHORIZED AGENT.			

CONTROLLED INSPECTIONS

- THE FOLLOWING MATERIALS, OPERATIONS AND EQUIPMENT RELATED TO THE WORK DESCRIBED IN THESE DOCUMENTS AND SUBJECT TO SPECIAL INSPECTION AS DESCRIBED BY THE NEW YORK CITY BUILDING CODE 2014.

NEW BUILDING APPLICATION - SPECIAL INSPECTION ITEMS		
A.	STRUCTURAL STEEL - WELDING	BC1704.3.1
B.	STRUCTURAL STEEL - DETAILS	BC1704.3.2
C.	STRUCTURAL STEEL - HIGH STRENGTH BOLTING	BC1704.3.3
D.	CONCRETE - CAST-IN-PLACE	BC1704.4
E.	MASONRY	BC1704.5
F.	SUB-GRADE INSPECTION	BC1704.7.1
G.	SUBSURFACE INVESTIGATIONS (BORING/TEST PITS)	BC1704.7.4
H.	WALL PANELS, CURTAIN WALLS, AND VENEERS	BC1704.10

F.	EXCAVATIONS-SHEETING, SHORING, & BRACING	BC1704.20.2	
G.	MECHANICAL SYSTEMS	BC1704.16	
H.	EXCAVATIONS - SHEETING, SHORING, AND BRACING	BC1704.20.2	
I.	PRIVATE ON-SITE STORM WATER DRAINAGE DISPOSAL SYSTEMS, AND DETENTION FACILITIES INSTALLATION	BC1704.21.1.2	
J.	SPRINKLER SYSTEMS	BC1704.21	
K.	STANDPIPE SYSTEMS		
L.	HEATING SYSTEMS	BC1704.23	
M.	FIRE-RESISTANT PENETRATIONS AND JOINTS	BC1704.25	
N.	CONCRETE DESIGN MIX	BC1905.3	(TR3)

O.	CONCRETE SAMPLING AND TESTING	BC1910.6 (TR2)
P.	ALTERNATIVE MATERIALS	OTCR BB2015-01 (TR1)

P. ALTERNATIVE MATERIALS

PROGRESS INSPECTION ITEMS			
Q.	FOOTING AND FOUNDATION	BC110.3.1	
R.	ENERGY CODE COMPLIANCE INSPECTIONS	BC110.3.5	(TR8)
S.	FIRE RESISTANCE RATED CONSTRUCTION	BC110.3.5	

ENERGY CODE PROGRESS INSPECTION ITEMS		
A.	PROTECTION OF FOUNDATION INSULATION	IA1, IIA1
B.	INSULATION PLACEMENT AND R-VALUES	IA2, IIA2
C.	FENESTRATION THERMAL VALUES AND RATINGS	IA3, IIA3
D.	FENESTRATION RATINGS OF AIR LEAKAGE	IA4, IIA4
E.	FENESTRATION AREAS	IA5, IIA5
F.	AIR SEALING AND INSULATION - VISUAL	IA6, IIA6
G.	VESTIBULES	IA9, IIA9
H.	SHUTOFF DAMPERS	IB3, IIB2
I.	HVAC AND SERVICE WATER HEATING EQUIP.	IB3, IIB3
J.	HVAC AND SERVICE WATER HEATING SYS. CONTROLS	IB4, IIB4
K.	DUCT PLENUM & PIPING INSULATION & SEALS	IB5, IIB5
L.	ELECTRICAL METERING	IC1, IIC1
M.	LIGHTING IN DWELLING UNITS	IC2, IIC2
N.	INTERIOR LIGHTING POWER	IC3
O.	EXTERIOR LIGHTING POWER	IC4
P.	LIGHTING CONTROLS	IC5
Q.	EXIT SIGNS	IC6
R.	ELECTRIC MOTORS	IC7
S.	MAINTENANCE INFORMATION	ID1, IID1

2. VERIFY IN FIELD ALL EXISTING CONDITIONS AND CONTACT THE ARCHITECT WHEN A CONDITION IN THE FIELD DOES NOT COMPLY WITH THESE DOCUMENTS, INCLUDING ANY AND ALL DEVIATIONS OF DIMENSIONS SHOWN HERE-IN. THESE DEVIATIONS MUST BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO INSTALLATION OF SAME.
3. THE COMMISSIONER MAY ACCEPT SIGNED STATEMENTS BY ARCHITECTS AND ENGINEERS RETAINED BY THE CONTRACTOR AND SUPPORTING INSPECTIONS AND TEST REPORTS SUPPLIED BY THE CONTRACTOR WITHOUT VERIFYING INSPECTION OR TEST BY DEPARTMENT INSPECTORS PER C27-209.
4. EQUIPMENT REQUIRING USE OF PERMITS SHALL BE INSPECTED AND TESTED TO DETERMINE PROPER FUNCTIONING AND COMPLIANCE WITH THE BUILDING CODE AND OTHER APPLICABLE LAWS AND REGULATIONS. ALL INSPECTIONS AND TESTS SHALL BE CONDUCTED IN ACCORDANCE WITH THE REQUIRED INSPECTION AND OF HEATING SYSTEM, A SIGNED STATEMENT BY ARCHITECT OR ENGINEER RETAINED BY THE CONTRACTOR SHALL TEST PROCEDURES AND SIGNED COPIES OF REQUIRED INSPECTIONS AND TEST BE SUBMITTED WITH THE PERMIT APPLICATION, STATING THAT THE SYSTEM HAS REPORTS SHALL BE FILED WITH THE DEPARTMENT OF BUILDINGS AND FORM BEEN OPERATED AND FUNCTIONS SATISFACTORILY, AND THAT TO THE BEST OF PART OF THE PAPERS ACCOMPANYING THE PERMIT APPLICATION. IN THE CASE HIS KNOWLEDGE AND BELIEF, THE SYSTEM WILL MEET THE CODE TEMPERATURE REQUIREMENT.
5. ALL DRAWINGS AND CALCULATIONS PREPARED BY THE OWNER'S CONTROLLED INSPECTING AGENT SHALL BEAR AN ORIGINAL SIGNATURE AND SEAL INDICATING THE INSPECTOR'S NEW YORK STATE REGISTRATION. DUPLICATE COPIES OF ALL DRAWINGS AND CALCULATIONS SHALL BE FORWARDED TO THE OWNER PRIOR TO COMMENCING ANY OF THE TEMPORARY WORK REPRESENTED IN THOSE DOCUMENTS. THE OWNER WILL IN TURN, TRANSMIT THOSE DOCUMENTS TO THE STRUCTURAL ENGINEER OF RECORD FOR HIS REVIEW.
6. THE STRUCTURAL ENGINEER OF RECORD WILL ONLY REVIEW THE DOCUMENTS FOR HOW THE SHORING, BRACING AND OTHER TEMPORARY CONSTRUCTION INTERACTS AND AFFECTS THE EXISTING STRUCTURE. THE STRUCTURAL ENGINEER OF RECORD REVIEW SHALL NOT BE CONSTRUED AS COMPLETE CHECK, NOR RELIEVE THE OWNER'S CONTROLLED INSPECTING AGENT FROM RESPONSIBILITY FOR ERRORS OF ANY SORT NOR FROM THE NECESSITY OF FURNISHING ANY ADDITIONAL DETAILS OR CALCULATIONS WHICH MAY HAVE BEEN OMITTED OR REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION.

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architecture | interiors

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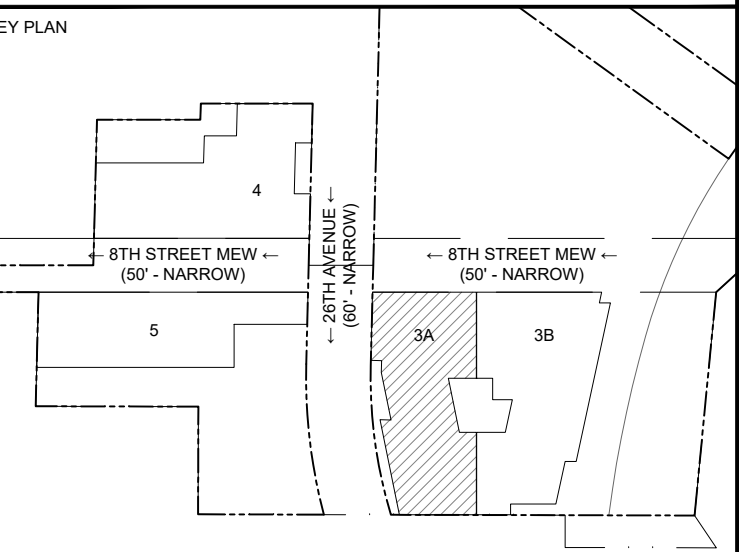
DOE CONSULTANT / EXPEDITOR

JAM CONSULTANTS INC
104 WEST 29TH STREET, 9TH FLOOR
NEW YORK, NY 10001

REAL & SIGNATURE



KEY PLAN



[illegible]

1	12.17.2021	DOB FOUNDATION FILING
2.	DATE	ISSUE
PROJECT		

**BUILDING 3A
ASTORIA COVE
QUEENS, NY 11217**
BLOCK 906, LOT 1

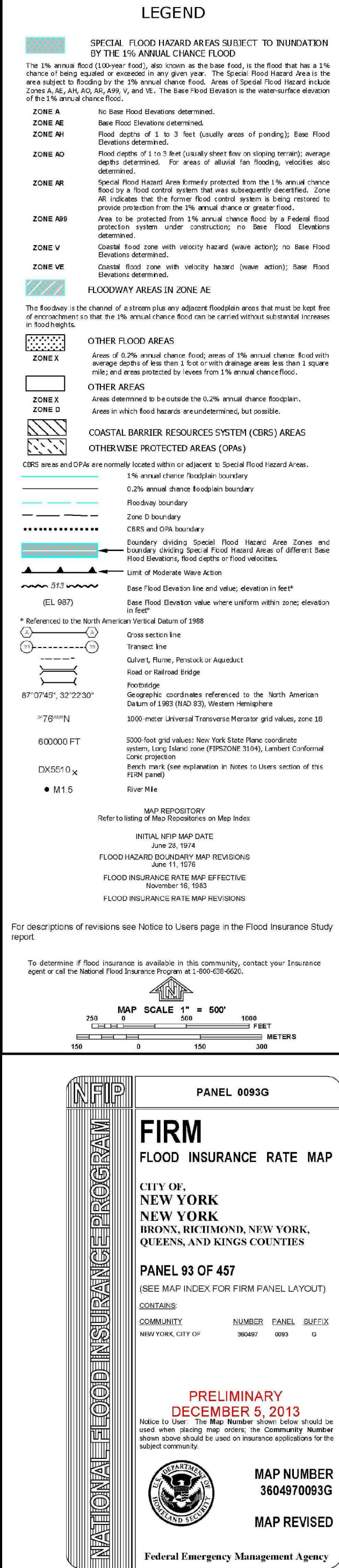
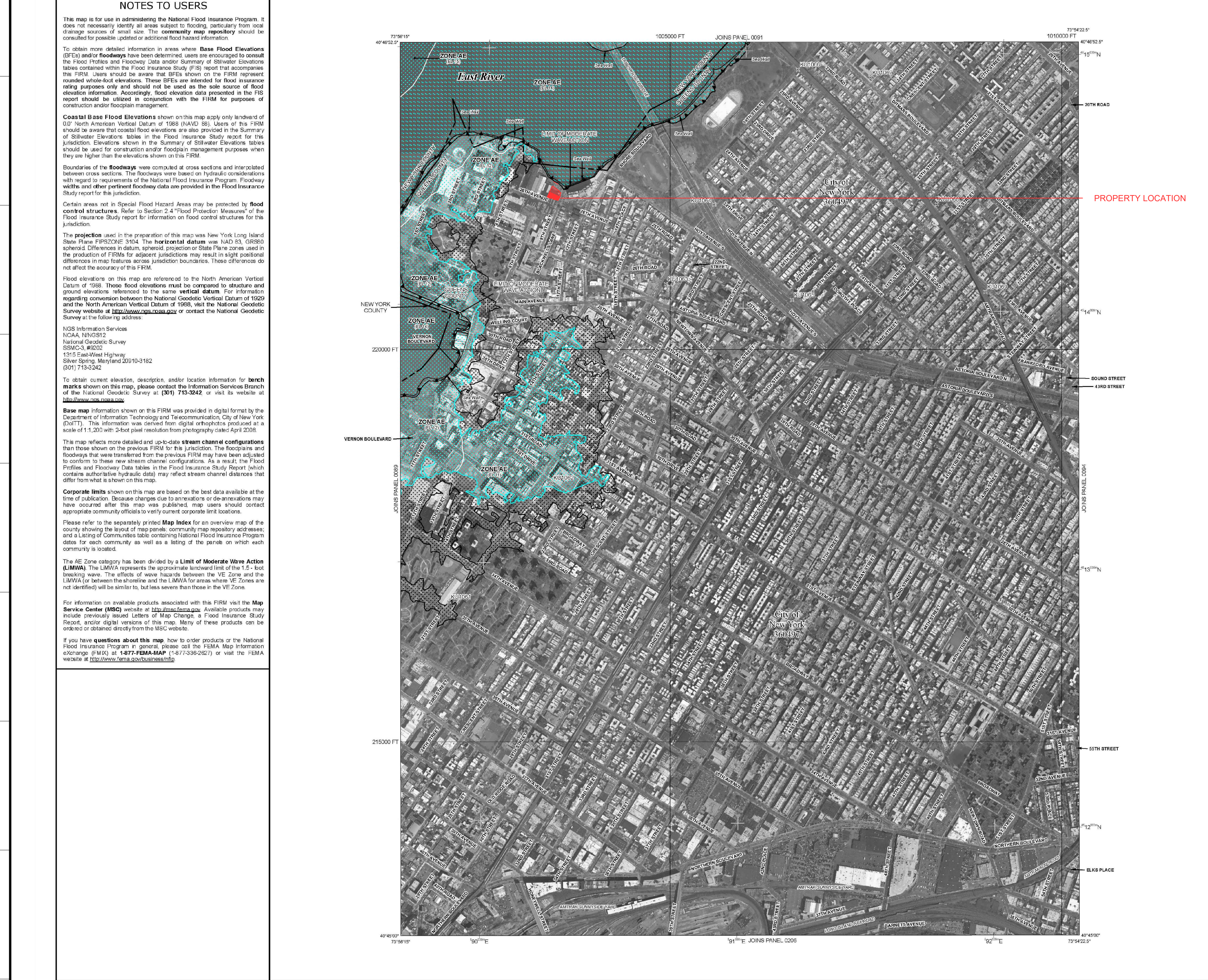
DOB NOW #Q00646754-I1

TITLE SHEET

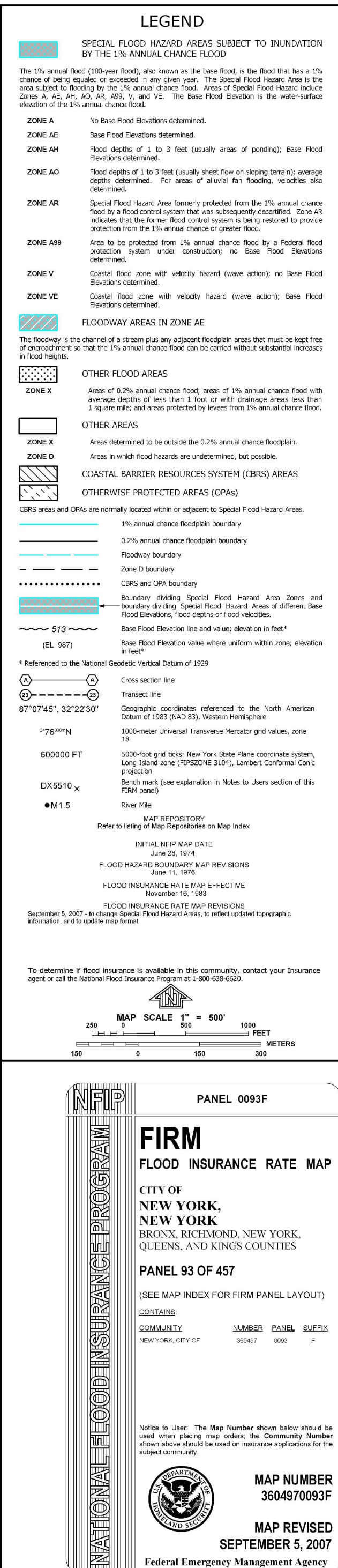
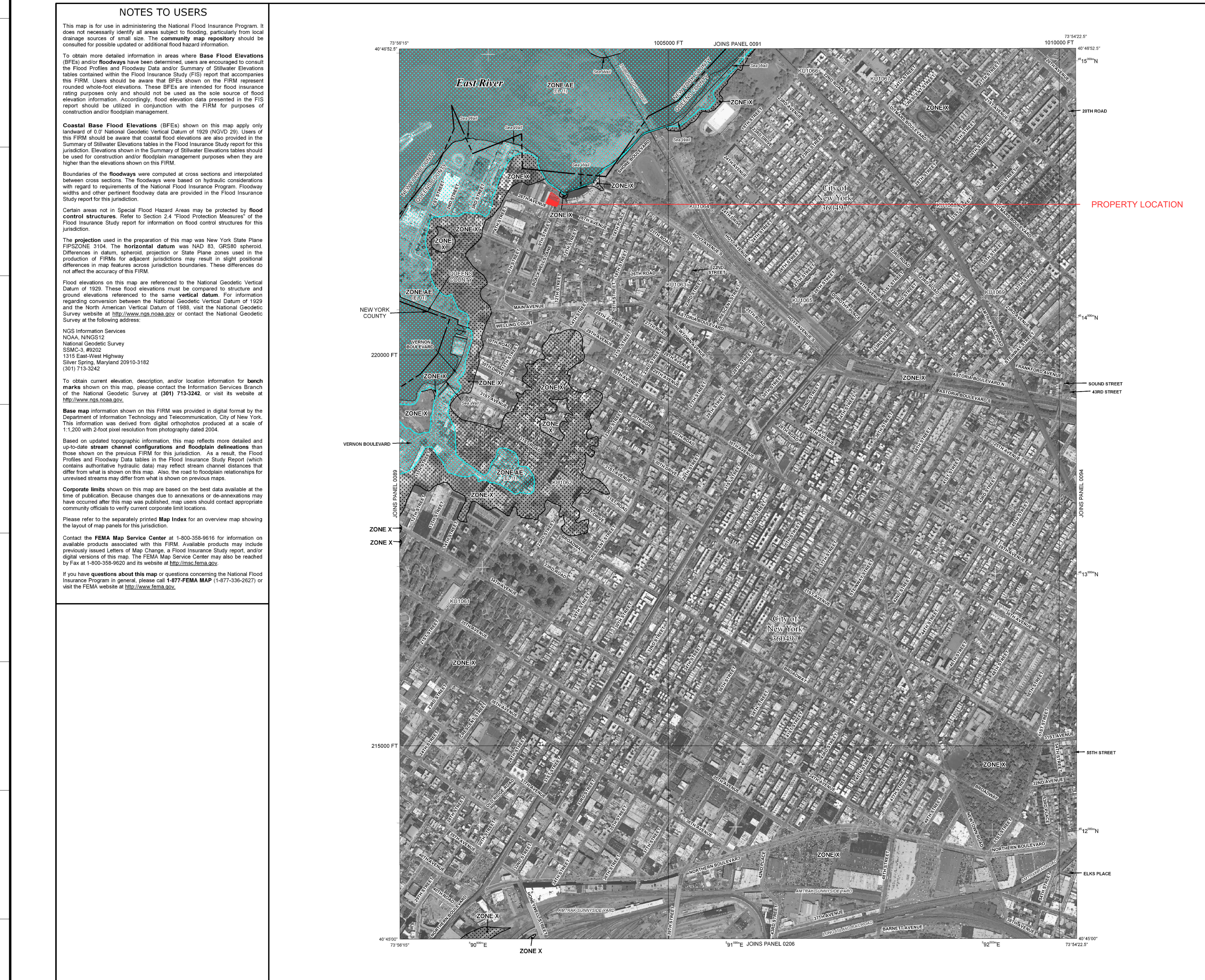
DATE (MM-DD-YY):	2022-01-12
PROJECT No.:	CAPE_09003
DRAWING BY:	FFA
CHECK BY:	FFA

T-001.00

GENERAL NOTES				HOUSING MAINTENANCE & MULTIPLE DWELLING LAWS				ABBREVIATIONS				DRAFTING SYMBOLS				MATERIAL SYMBOLS											
<p>1. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL WORK PERMITS, SIDEWALK SHED PERMIT, LICENSES, TESTS AND ALL OTHER REQUIRED CERTIFICATES FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK.</p> <p>2. THE CONTRACTOR SHALL OBTAIN ALL SIGN-OFFS FROM APPLICABLE MUNICIPAL AGENCIES FOR ALL WORK COMPLETED.</p> <p>3. MAINTAIN A CURRENT AND COMPLETE SET OF CONTRACT DOCUMENTS AT THE JOB SITE.</p> <p>4. MAINTAIN A TELEPHONE AND FAX MACHINE WITH WORKING PHONE LINES THROUGHOUT THE PROGRESS OF THE WORK.</p> <p>5. ERECT AND MAINTAIN, AS REQUIRED BY EXISTING FIELD CONDITIONS THROUGHOUT THE ENTIRE PROGRESS OF THE WORK, ALL SAFEGUARDS AND BARRICADES FOR SAFETY INCLUDING POSTING WARNING SIGNS ENFORCING REGULATIONS AND PROTECTION OF PROPERTY.</p> <p>6. VERIFY EXISTING CONDITIONS. NOTIFY ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES BEFORE COMMENCEMENT OF WORK.</p> <p>7. CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATELY BRACING AND PROTECTING ALL WORK DURING CONSTRUCTION AGAINST DAMAGES, BREAKAGES, COLLAPSE, DISTORTIONS AND OFF-ALIGNMENT ACCORDING TO APPLICABLE CODES, STANDARDS AND GOOD PRACTICE.</p> <p>8. ALL NOTES HEREIN MENTIONED WITH THOSE ON THE VARIOUS DRAWINGS SHALL APPLY TO ALL DRAWINGS AND FORM PART OF THE CONTRACT.</p> <p>9. EACH CONTRACTOR WILL BE HELD STRICTLY RESPONSIBLE FOR HIS WORK. ANY DISCREPANCIES ON THE PLANS OR DETAILS SHALL BE CALLED TO THE ATTENTION OF THE ARCHITECT.</p> <p>10. PRIOR TO CLOSING OF ANY CEILINGS, ALL MECHANICAL SYSTEMS (E.G. HVAC, PLUMBING, SPRINKLER AND ELECTRICAL) ARE TO BE INSPECTED AND WHERE REQUIRED, TESTED BY LOCAL AUTHORITIES AND/OR TESTING AGENCIES HAVING JURISDICTION TO INSURE THEIR PROPER INSTALLATION AND FUNCTION.</p> <p>11. CEILING HEIGHTS ARE DIMENSIONED IN RELATIONSHIP TO THE FINISHED FLOOR, UNLESS SPECIFICALLY NOTED.</p> <p>12. LIGHT FIXTURES SHOWN IN ACOUSTICAL TILE CEILING ARE TO BE LOCATED IN THE CENTER OF THE NEAREST LOCATED TILE, UNLESS OTHERWISE NOTED IN PLANS.</p> <p>13. ALL ELECTRICAL WORK IS TO BE COORDINATED WITH HVAC WORK, PLUMBING, WOODWORK, PARTITIONS, AND ALL OTHER WORK.</p> <p>14. COORDINATE ALL TELEPHONE WORK WITH OWNERS REPRESENTATIVE AND LOCAL TELEPHONE COMPANY BEFORE STARTING WORK.</p> <p>15. SHOP DRAWINGS ARE REQUIRED FOR ALL TRADES. SEE SPECIFICATIONS FOR FURTHER INFORMATION.</p> <p>16. ALL WORK SHOWN ON THESE DRAWINGS IS INCLUDED IN THIS CONTRACT UNLESS SPECIFICALLY NOTED OTHERWISE.</p> <p>17. ALL GYPSUM BOARD (INCLUDING BUT NOT LIMITED TO CEILINGS, SOFFITS, FASCIAS, COLUMN ENCLOSURES, ETC.) ARE TO BE TAPE, SANDED, PRIMED AND PAINTED, UNLESS NOTED OTHERWISE.</p> <p>18. CHECK ALL HEIGHTS AND POSSIBLE CEILING CONDITIONS FOR CLEARANCE OF DUCTWORK AND ALL OTHER CONSTRAINTS TO ASSURE THE LOCATION AND SIZE OF ALL SYSTEMS TO BE INSTALLED. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT IN WRITING IMMEDIATELY BEFORE PROCEEDING WITH THE WORK.</p> <p>19. CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND ARCHITECT'S OFFICE MUST BE NOTIFIED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN BY THESE DRAWINGS.</p> <p>20. ALL CONSTRUCTION, DIMENSIONS AND DETAILS SHALL CONCUR WITH AND BE DETERMINED FROM THESE DRAWINGS ONLY.</p> <p>21. DRAWINGS ARE NOT TO BE SCALED FOR INFORMATION.</p> <p>22. ALL PERMITS ISSUED BY THE DEPARTMENT OF BUILDINGS SHALL BE POSTED IN A CONSPICUOUS PLACE OPEN TO PUBLIC INSPECTION FOR THE ENTIRE TIME OF THE PROSECUTION OF THE WORK OF THE USE AND OPERATION OF THE EQUIPMENT OR UNTIL THE EXPIRATION OF THE PERMIT.</p> <p>23. ALL ELEVATIONS REFER TO NAVD83 DATUM.</p> <p>24. BY 2014 BC 3301 TO BE FOLLOWED DURING DEMOLITION AND CONSTRUCTION.</p> <p>25. NB APPLICATION - XXXXXXXXXX.</p> <p>26. RELATED APPLICATIONS FILED WITH DOB NOW: MS - XXXXXXXXXX PL - XXXXXXXXXX SP/SD - XXXXXXXXXX ST - XXXXXXXXXX SC - XXXXXXXXXX BPP - XXXXXXXXXX</p>				<p>26. EXIT SIGNS SHALL BE INTERNALLY LIGHTED, HAVING AN INITIAL BRIGHTNESS OF THE LETTERS OF AT LEAST 25 FOOT LAMBERTS. LETTERS SHALL BE RED. THE BACKGROUND SHALL BE WHITE. LETTERS SHALL BE BLOCK LETTERING, AT LEAST 8" HIGH WITH 3/4" STROKES. ALSO ALL EXIT SIGNS SHALL CONFORM WITH SECTIONS 27-385 - 27-387, 27-941 & 27-346(a).</p> <p>27. ALL INTERIOR TOILETS SHALL BE MECHANICALLY VENTILATED IN ACCORDANCE WITH SECTION C27-759 OF THE BUILDING CODE.</p> <p>28. THE ELEVATOR AND ALL STAIR SIGNS SHALL CONFORM TO SECTION 27-390 THROUGH 27-393.</p> <p>29. CEILINGS THAT CONTRIBUTE TO THE REQUIRED FIRE RESISTANCE RATING OF A FLOOR OR ROOF ASSEMBLY SHALL BE CONTINUOUS BETWEEN FIRE DIVISIONS, FIRE SEPARATIONS OR VERTICAL PARTITIONS HAVING THE SAME FIRE RESISTANCE RATING AS THE CEILING CONCEALED SPACE ABOVE SUCH CEILING. UNLESS SPRINKLERED, SHALL BE FIRESTOPPED INTO AREAS NOT EXCEEDING 3,000 SQ. FT. ACCESS TO SUCH SPACES MAY BE THROUGH ONE OR MORE OPENINGS NOT EXCEEDING 9 SQ.FT. AND PROTECTED BY SELF-CLOSING OPENING PROTECTIVES (C27-327).</p> <p>30. SUSPENDED CEILINGS SHALL COMPLY WITH SECTION C27-350 OF THE BUILDING CODE, WITH METAL HANGERS, PURLINS AND RUNNERS AS REQUIRED.</p> <p>31. WALLS TO BE ANCHORED TO COLUMNS AS PER RS10-1.</p> <p>32. PARTITIONS SHALL REST DIRECTLY UPON THE CONCRETE FLOOR CONSTRUCTION AND MAY EXTEND TO THE CONCRETE CONSTRUCTION OF THE FLOOR OR ROOF ABOVE. SEE PARTITION TYPE SHEET.</p> <p>33. ALL COMBUSTIBLE FLOORING TO HAVE FLAME SPREAD RATING IN ACCORDANCE WITH SUB-ARTICLE C27-348.</p> <p>34. INTERIOR WALLS, PARTITIONS, FLOOR AND CEILING CONSTRUCTION AND MECHANICAL EQUIPMENT SHALL BE DESIGNED AND CONSTRUCTED TO PROVIDE MINIMUM PROTECTION FOR RESIDENTIAL BUILDINGS WITHIN 10' FROM EXTRANEOUS NOISES EMANATING FROM EXTERIOR MECHANICAL EQUIPMENT AND SHALL CONFORM TO THE NOISE-REDUCTION REQUIREMENTS OF SUB-ARTICLE C27-770.</p> <p>35. FLOOR NUMBERS TO BE PROVIDED ON ALL FLOORS IN STAIR HALL AND AT ELEVATOR LANDINGS IN ACCORDANCE WITH SECTION D26-21.05 AND RULES OF THE DEPARTMENT OF BUILDINGS.</p> <p>36. EXIT DOORS SHALL BE READILY OPENABLE AT ALL TIMES FROM THE SIDE FROM WHICH EGRESS IS TO BE MADE. DOORS OPENING INTO INTERIOR ENCLOSED STAIR SHALL NOT BE LOCKED FROM EITHER SIDE EXCEPT THAT DOORS MAY BE LOCKED TO PREVENT ACCESS TO THE STAIR FROM THE OUTDOORS AT THE STREET LEVEL.</p> <p>37. ALL DOORS TO REQUIRED EXIT STAIRS SHALL BE 3'-0" WIDE EXCEPT IF OTHERWISE NOTED.</p> <p>38. ALL DOORS SHALL BE 7'-0" HIGH UNLESS OTHERWISE NOTED.</p> <p>39. DOORS AND ASSEMBLIES SHALL HAVE THE FOLLOWING FIRE RESISTIVE RATINGS: C27-371, DOORS TO STAIRS 3-4 HOURS, EXCEPT WHERE OTHERWISE NOTED. DOORS TO ELEVATOR SHAFTS 1 1/2 HOUR.</p> <p>40. ALL WIRE GLASS IN RATED DOORS AND WINDOWS WILL BE OF A TYPE APPROVED BY THE B.S.A.</p> <p>41. CORRIDORS AND EXIT PASSAGEWAYS SHALL HAVE A MIN. CLEAR HEIGHT OF 7'-6" FOR AT LEAST 75% OF THE FLOOR AREA WITH NO POINT LESS THAN 7 FT. IN HEIGHT (C27-375). PROJECTION BELOW THE CEILING SHALL NOT OBSTRUCT FULL VIEW OF EXIT SIGNS (C27-369).</p> <p>42. CONCRETE CINDER BLOCKS SHALL BE TYPE APPROVED BY THE BOARD OF STANDARDS AND APPEALS.</p> <p>43. INTERIOR REQUIRED STAIR SHALL BE ENCLOSED WITH CONSTRUCTION FOR 2 HOUR FIRE RATING IN ACCORDANCE WITH NEW YORK CITY BUILDING CODE - TABLE 3-4, (27-375).</p> <p>44. ALL VENT DUCT SHAFTS SHALL BE ENCLOSED WITH 2 HOUR ENCLOSURE. NO DUCT VENTS TO PASS THROUGH STAIR ENCLOSURES. 1 1/2 HOUR AUTOMATIC SELF-CLOSING FIRE DAMPERS TO BE INSTALLED IN VENT DUCTS WHEN THEY PIERCE PUBLIC CORRIDORS.</p> <p>45. INTERIOR REQUIRED STAIR SHALL BE ENCLOSED WITH CONSTRUCTION FOR 2 HOUR FIRE RATING IN ACCORDANCE WITH NEW YORK CITY BUILDING CODE - TABLE 3-4, (27-375).</p> <p>46. ALL VENT DUCT SHAFTS SHALL BE ENCLOSED WITH 2 HOUR ENCLOSURE. NO DUCT VENTS TO PASS THROUGH STAIR ENCLOSURES. 1 1/2 HOUR AUTOMATIC SELF-CLOSING FIRE DAMPERS TO BE INSTALLED IN VENT DUCTS WHEN THEY PIERCE PUBLIC CORRIDORS.</p> <p>47. NO WORK TO BE DONE BEYOND THE BUILDING LINES WITHOUT THE APPROVAL OF THE DEPARTMENT OF HIGHWAYS.</p> <p>48. FIRESTOPPING: CONCEALED SPACES WITHIN PARTITIONS, WALLS, FLOORS, ROOFS, STAIRS, FURRING PIPE SPACES, COLUMN ENCLOSURES, ETC. SHALL BE FIRESTOPPED (EXCEPT WHERE CONCEALED SPACE IS SPRINKLERED OR IS CONSTRUCTED AS A SHAFT) AS FOLLOWS:</p> <p>49. CONSTRUCTION GROUP 1: WITH NON-COMBUSTIBLE MATERIAL THAT CAN BE SHAPED AS ACCEPTED BY A.S.T.M. E-814 THROUGH PENETRATION FIRE STOP SYSTEM.</p> <p>50. NON-COMBUSTIBLE FIRESTOPPING MAY BE MASONRY SET IN MORTAR, CONCRETE 3/4" MORTAR OR PLASTER ON NON-COMBUSTIBLE LATH, PLASTER BOARD AT LEAST 3/8" THICK, SHEET METAL OF AT LEAST 0.002" THICK, SOLID WELD METAL STRUCTURAL MEMBERS, 1/4" MINIMUM FIREPROOF CEMENT BOARD OR EQUIVALENT MATERIALS, MINERAL SLAG, OR ROCKWOOL, WHEN COMPACTED INTO CONFINE SPACE (C27-348).</p> <p>51. FIREPROOFING: THE VARIOUS OCCUPANCIES REQUIRED TO BE SEPARATED FROM EACH OTHER BY FIRE SEPARATING OR DIVISIONS AS PER C27-340 SHALL BE SO SEPARATED BY PARTITIONS HAVING THE REQUIRED FIRE RATING IN ACCORDANCE WITH C27-339.</p> <p>52. THE CONSTRUCTION CLASSIFICATION OF THE BUILDING IS CONSTRUCTION GROUP 1 NON-COMBUSTIBLE CLASS 102. THE CONSTRUCTION ELEMENTS SHALL BE OF THE REQUIRED MINIMUM FIRE RESISTANCE RATINGS AS OUTLINED IN TABLE 3-4 AND DEFINED IN SUB-ARTICLE C27-318 TO C27-354.</p> <p>53. CONDUITS IN FIRE-RATED PARTITIONS SHALL NOT EXCEED 3/4 INCH DIAMETER. OUTLETS IN SUCH PARTITIONS WILL BE BACKED UP WITH APPROVED MATERIALS.</p> <p>54. PENETRATION OF OPENINGS IN WALLS, PARTITIONS OR FLOORS FOR PIPE SLEEVES, ELECTRIC DEVICES, ETC., SHALL BE PACKED SEALED.</p> <p>55. WHERE GLASS FACING IS USED, THICKNESS AND AREA COMPLIES WITH SUB-ARTICLE (C27-643 - C27-651).</p> <p>56. FIRE PREVENTION APPLICATIONS WILL BE FILED IF REQUIRED FOR ALL INSTALLATIONS.</p> <p>57. FIRE EXTINGUISHING EQUIPMENT:</p> <p>57-A. PER C27-933(C), INSPECTIONS AND TESTS OF STANDPIPES ARE SUBJECT TO CONTROLLED INSPECTION, IF CONTRACTOR'S ENGINEER DOES NOT CHOOSE TO HAVE TESTS WITNESSED BY REPRESENTATIVE OF DEPARTMENTS.</p> <p>57-B. PER C27-967, C27-933(C), INSPECTIONS AND TESTS OF SPRINKLER SYSTEMS ARE SUBJECT TO CONTROLLED INSPECTION, IF CONTRACTORS APPLICANT ENGINEER DOES NOT CHOOSE TO HAVE TESTS WITNESSED BY REPRESENTATIVE OF THE DEPARTMENT.</p> <p>58. NO CONDUITS, PIPES, MEDICINE CABINETS, ETC. SHALL ENCRACH ON PARTITIONS ENCLOSING STAIRS OR ELEVATOR SHAFTS OR OTHER RELATED PARTITIONS.</p> <p>59. RADIO AND TV WIRES AND ANTENNAE SHALL COMPLY WITH SECTION 62 M.D.L. AND SHALL BE REPLACED A MIN. OF 10'-0" ABOVE HIGHEST POINT ON ROOF.</p> <p>60. MASONRY MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF RS10-1, SECTION 3, AND TO COMPLY WITH C27-601 FOR CERTIFICATION.</p> <p>61. ALL MASONRY LOAD BEARING AND NON-LOAD BEARING WALLS SHALL BE BONDED IN ACCORDANCE WITH SECTION 7, RS 10-1.</p> <p>62. LINTELS SUPPORTING MASONRY WALL OVER 4 FEET IN WIDTH SHALL BE FIRE PROTECTED WITH MATERIALS HAVING THE REQUIRED FIRE RESISTANCE RATING OF THE WALL SUPPORTED (C27-326).</p> <p>63. MECHANICAL VENTILATION, AIR CONDITIONING AND REFRIGERATION: ALL FINAL INSPECTION AND TESTS OF A REQUIRED VENTILATING SYSTEM SHALL BE MADE AS PER C27-779, BY AN ENGINEER PROVIDED BY THE CONTRACTOR.</p> <p>64. ALL INSPECTION AND TESTS OF A REFRIGERATION SYSTEM SHALL BE MADE AS PER C27-781, BY THE CONTRACTOR.</p> <p>65. ALL INTERIOR OCCUPIED SPACES SHALL BE MECHANICALLY VENTILATED IN ACCORDANCE WITH SUB-ARTICLE 12.</p> <p>66. HEATING AND COMBUSTION EQUIPMENT: ALL FINAL INSPECTIONS AND TESTS FOR BOILERS SHALL BE SUBJECT TO THE PROVISIONS FOR CONTROLLED INSPECTION (SUCH INSPECTIONS AND TESTS, HOWEVER, MAY BE MADE BY DEPARTMENT INSPECTORS OR BY A DULY AUTHORIZED INSURANCE COMPANY INSPECTOR) PER C27-781(A).</p> <p>67. ALL APPLICATIONS FOR EQUIPMENT USE PERMIT FOR HEATING SYSTEMS SHALL BE ACCOMPANIED BY A SIGNED STATEMENT BY AN ARCHITECT OR ENGINEER RETAINED BY THE CONTRACTOR STATING THAT THE SYSTEM HAS BEEN OPERATED AND FUNCTIONS SATISFACTORILY AND THAT TO THE BEST OF HIS KNOWLEDGE AND BELIEF THE SYSTEM WILL MEET THE CODE TEMPERATURE REQUIREMENTS PER C27-187.</p> <p>68. GAS APPLIQUES TO COMPLY WITH SECTION 54 M.D.L. C27-879.</p>				<p>@ AT AC AIR CONDITIONING ACT ACOUSTICAL CEILING TILE AD AREA DRAIN ADJ ADJUSTABLE AFF ABOVE FINISHED FLOOR APP ABOVE FOLDING PARTITION AGG AGGREGATE ALT ALTERNATE AL ALUMINUM AP ACCESS PANEL APPROX APPROXIMATE AR ACID RESISTANT ARCH ARCHITECTURAL ASPH ASPHALT AV AUDIOVISUAL AWG AMERICAN WIRE GAUGE AWT ACOUSTICAL WALL TREATMENT L AND BIT BITUMINOUS BLDG BUILDING BLKG BLOCKING BM BENCH MARK/BANK BOS BOTTOM OF STEEL BOT BOTTOM BRG BEARING BRK BRICK BUR BUILT-UP ROOF CAB CABINET CAR CARPET CAT CATALOG CB CHALKBOARD/CATCH BASIN CFM CUBIC FEET PER MINUTE CH CABINET HEATER CI CAST IRON CJ CONTROL JOINT CL CENTERLINE CLR CLEAR CLG CEILING CMP CORRUGATED METAL PIPE CMT CERAMIC MOSAIC TILE CMU CONCRETE MASONRY UNIT CO CLEAN OUT COL COLUMN COMP COMPACTED CONC CONCRETE CONSTR CONSTRUCTION CONT CONTINUOUS/CONTINUE CONTR CONTRACTOR CORR CORRUGATED CPT CARPET CT CERAMIC TILE C TO C CENTER TO CENTER CSK COUNTER SINK CU FT/CU CUBIC FEET CU IN/CI CUBIC INCH CU YD/CY CUBIC YARD CUSP CUSPIDOR CW COLD WATER OWF CEMENTITIOUS WOOD FIBER d PENNY (NAILS, ETC.) D DEPTH/DEEP D DEGREE DC DISPLAY CASE DEPT DEPARTMENT DET DETAIL DF DRINKING FOUNTAIN DIA/DI DIAMETER DIM DIMENSION DIV DIVISION DL DEAD LOAD DNG DRAWING DS DOWN SPOUT DWG DRINKING WATER COOLER E EAST EA EACH EF EACH FACE EJ EXPANSION JOINT EL ELEVATION ELEC ELECTRICAL ELEV ELEVATOR ENGR ENGINEER EP ELECTRICAL PANELBOARD EQ EQUIPMENT EQW EACH WAY EXT EXISTING INSULATION & FINISH SYSTEM EXH EXHAUST EXIST EXISTING EXP EXPANSION EXT EXTERIOR EXTN EXTENSION FDR FLOOR DRAIN FNC FIRE HOSE CABINET FN FINISH FIN FL FINISH FLOOR FLR FLOOR FND FOUNDATION FSR FLEXIBLE SHEET ROOFING FSBK FLOOR SERVICE SINK FTG FOOTING FE FIRE EXTINGUISHER FEC FIRE EXTINGUISHER CABINET GA GAUGE GALV GALVANIZED GB GRAB BAR GL GLASS GWB GYPSUM WALLBOARD H HEIGHT/HIGH HB HOSE BIBB HDWE HARDWARE HM HOLLOW METAL HORIZ HORIZONTAL HPT HIGH POINT HS HIGH STRENGTH HTG HEATING HVAC HEATING/VENTILATING/ AIR CONDITIONING HPDL HIGH PRESSURE DECORATIVE LAM. HW HOLLOW HWY HIGHWAY ID INSIDE DIAMETER INCH INCH INCL INCLUDE(D), (ING) INFO INFORMATION INSUL INSULATION/INSULATED INTR INTERFER INVR INFERT JS JOIST SUBSTITUTE JST JOIST JT JOINT KIT KITCHEN L LENGTH LAM LAMINATE(D) LAV LAVATORY LBW POUND LKR LOCKER LL LIVE LOAD LLH LONG LEG HORIZONTAL LLV LONG LEG VERTICAL LVR LUGGER</p>				<p>METER/THOUSAND MASONRY MATERIAL MAXIMUM MARKER BOARD MECHANICAL MEZZANINE MANUFACTURER MANHOLE MINIMUM MISCELLANEOUS MILLIMETER MASONRY OPENING METAL NORTH NOT IN CONTRACT NUMBER NOMINAL NOT TO SCALE ON CENTER OUTSIDE DIAMETER OPENING OPPOSITE OPPOSITE HAND OUT TO OUT OPERABLE WALL OPEN WEB STEEL JOIST OUNCE PUBLIC ADDRESS PERFORATED PLATE/PROPERTY LINE PLASTER PLASTIC LAMINATE PLUMBING PLYWOOD PREFABRICATED PROJECTION SCREEN POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH PENCIL SHARPENER SUPPORT POLYVINYL CHLORIDE PAVEMENT QUARRY TILE RISER RETURN AIR RADIUS RESILIENT BASE REINFORCED CONCRETE PIPE ROOF DRAIN ROLL DOWN GRILLE ROLL DOWN SHUTTER REFERENCE REFRIGERATOR REINFORCING REQUIRED REVISION(S) ROOM ROUGH OPENING RIGHT-OF-WAY SOUTH SUPPLY AIR SANITARY SCHEDULE SD STORM DRAINSMOKE DETECTOR SECT SECTION SEW SEWER SOFT SOFT SHEET SHEET SIMILAR SPACE SPEC(S) SPECIFICATIONS SPEAKER SQ SQUARE SQ FT/SF SQUARE FEET SQ IN/SI SQUARE INCHES SQ YD/SY SQUARE YARDS SST STAINLESS STEEL ST STORM/STREET STD STANDARD STL STEEL STRUCT. STRUCTURAL SUSP SUSPENDED SW SHORT WAY/SIDEWALK SYMB SYMBOL SYMM SYMMETRY(ICAL) SYNTH SYNTHETIC TAB TOP AND BOTTOM TAG TONGUE AND GROOVE TA TOILET ACCESSORY(ES) TB TACK BOARD TC TOP OF CURB TEL TELEPHONE TER TERRAZZO TOC TOP OF CONCRETE TOF TOP OF FOOTING TOS TOP OF STEEL TOM TOP OF MASONRY TT TERRAZZO TILE TV TELEVISION TYP TYPICAL TWG TACKABLE WALL SURFACE UNLESS OTHERWISE NOTED UV UNIT VENTILATOR UR URINAL VCT VINYL COMPOSITION TILE VCGWB VINYL COVERED GYP. WALLBOARD VERT VERTICAL VF VERIFY IN FIELD VIT VITREOUS VOL VOLUME VR VAPOR RETARDER VRB VENTED RESILIENT BASE VS VENT STACK VNT VENT W WEST/WIDEWIDTH W WITH W/O WITHOUT WA WARDROBE ACCESSORIES WB WOOD BASE WC WATER CLOSET/WIND COLUMN WD WOOD WH WATER HEATER WP WORKING POINT WSK WALL SERVICE SINK WWF WELDED WIRE FABRIC YD YARD/YARD DRAIN</p>				<p>STRUCTURAL CONCRETE BATT INSULATION RIGID INSULATION TERRA-COTTA FINISH WOOD FINISH WOOD WOOD BLOCKING PLYWOOD GYPSUM WALLBOARD STEEL (IN SECTION) BRONZE (IN SECTION) ALUMINUM (IN SECTION) OW GRANITE SAND, GROUT, PLASTER, GWS, CONCRETE TERRAZZO MARBLE SLATE PRECAST CONCRETE FACE BRICK FIRE BRICK GLAZED BRICK CONCRETE MASONRY UNIT (PLAN) METAL SHAPES ACOUSTIC TILE CEILING CARPET CONCRETE MASONRY UNIT (CORED, IN SECTION) CONCRETE MASONRY UNIT (SOLID, IN SECTION) SPRAY-ON INSULATION OR FIRE PROTECTION WIRE FENCE CORRUGATED METAL FORMING METAL ROOF DECK</p>				<p>DOOR TAG WINDOW TAG FURNITURE TAG KEY NOTE TAG PARTITION TYPE TAG SMOKE AND CO DETECTOR DETAIL NUMBER SHEET NUMBER REVISION NUMBER DRAWING REVISIONS COLUMN GRID BUBBLE MATCH LINE</p>				<p>ARCHITECT 150 GARY ADVISOR FOGARTY FINGER architecture interiors 69 Walker Street New York, NY 10013 t 212 966 7450 f 212 966 7444 CLIENT ASTORIA COVE PHASE I, LLC 140 BROADWAY, 25TH FLOOR NEW YORK, NY 10005 STRUCTURAL ENGINEER DESIMONE CONSULTING ENGINEERS 140 BROADWAY, 25TH FLOOR NEW YORK, NY 10005 MEP ENGINEER ETTINGER ENGINEERING ASSOCIATES 505 EIGHTH AVE 24TH FLOOR NEW YORK, NY 10018 CIVIL ENGINEER PHILIP HABIB & ASSOCIATES 102 MADISON AVE #11 NEW YORK, NY 10016 GEOTECH GEI CONSULTANTS, INC., P.C 530 7TH AVENUE, SUITE 2007 NEW YORK, NY 10018 CODE CONSULTANT / EXPERTISE JAM CONSULTANTS INC 104 WEST 20TH STREET, 10TH FLOOR NEW YORK, NY 10001 SEAL & SIGNATURE KEY PLAN 01 12 17 2021 DOB FOUNDATION FILING PROJECT BUILDING 3A ASTORIA COVE QUEENS, NY 12127 BLOCK 906, LOT 1 NOTES, ABBREVIATIONS SYMBOLS AND LEGENDS DATE (MM/DD/YY) 2022-01-12 PROJECT NO. CAPE 20001 DRAWING BY: FFA CHK BY: FFA G-003.00 CADD FILE NO. 0# OF 0#</p>			
1. NOTES, ABBREVIATIONS SYMBOLS AND LEGENDS				SCALE: N.T.S.																							



1 2013 PRELIMINARY FIRM MAP SCALE: N.T.S.



2 2007 FIRM MAP SCALE: N.T.S.

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REAL & SIGNATURE

REGISTERED ARCHITECT
STATE OF NEW YORK
068860

KEY PLAN

01 12.17.2021 DOB FOUNDATION FILING

PROJECT

BUILDING 3A
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 1

DOB NOW #Q00646754-I1

DRAWING TITLE

FLOOD MAP

DATE (MM-DD-YY) 2022-01-12
PROJECT NO. CAPS (2000)
DRAWING BY FFA
CHK BY FFA

G-004.00

GRID FILE NO. # OF #

	R73				COMMUNITY FACILITY	COMMERCIAL	TOTAL
	GFA	DEDUCTIONS	OTHER	ZFA			
		QH					
ROOF	731		631	100			100
8TH FLOOR	11023		726	10,297			10,297
7TH FLOOR	12123		4344	7,779			7,779
6TH FLOOR	14,534		783	13,751			13,751
5TH FLOOR	14,534		783	13,751			13,751
4TH FLOOR	15,977		784	15,193			15,193
3RD FLOOR	17,944		699	11,245			11,245
2ND FLOOR	13,356	1,547	6,000	5,809			5,809
GROUND FLOOR	13,611	690	5,564	7,337			11,623
CELLAR	18,512		18,512	0			0
SUM	132,345	10,356	36,727	85,262	0	4,286	89,548

SITE ZONING DATA			
Address	Queens, New York 11102		
Block and Lot	Block 906 Lots 1		
Borough	Queens,		
Community Board	1		
Zoning District	R7-3 with C2-4 Overlay		
Zoning Map	9a (zoning change ULURP C130384MMQ ZMK SEE SHEETS / T-001)		
In Transit District	Yes		
Wide Streets	None		
Narrow Streets	26th Avenue 9th Street		
Block Frontage	26th Avenue	233.89	Lineal Ft
	9TH Street	79.47	Lineal FT
	Total Frontage	313.36	Lineal Ft
Lot Type	Corner Lot		
Zoning Lot Area	R73 with C2-4 Overlay	21,867.00	Square Feet
	TOTAL LOT AREA	21,867.00	Square Feet

CALCULATION FOR 23-24/35-40 NUMBER OF PERMITTED DWELLING UNITS	
Building 3A	
R7A / C2-4 Permitted / Required	
MAX ALLOWED AREA= 4.60X 21,867 = 100,588 SF	
PROPOSED COMMERCIAL=4,286 SF	
PROPOSED COMMUNITY FACILITY=0 SF PERMITTED	
DWELLING UNITS = 100,588/680 = 148	

25-811/36-711 REQUIRED NO OF BICYCLES RESIDENTIAL:

NO OF BICYCLE SPACES PER D.U.	= 1 PER 2 DU
NO OF DWELLING UNITS	= 90 UNITS
REQUIRED NO OF BICYCLE SPACES	= 45 SPACES
PROVIDED NO OF BICYCLE SPACES	= 60 SPACES

28-31 DENSITY PER CORRIDOR

	NO OF DWELLING UNITS PER STORY	FLOOR AREA DECUCTION
LEVEL1.	5	50% DEDUCTION
LEVEL2.	0	50% DEDUCTION
LEVEL3	12	50% DEDUCTION NOT APPLICABLE
LEVEL4	18	50% DEDUCTION NOT APPLICABLE
LEVEL5	17	50% DEDUCTION NOT APPLICABLE
LEVEL6	17	50% DEDUCTION NOT APPLICABLE
LEVEL7	10	50% DEDUCTION
LEVEL8	11	50% DEDUCTION

28-12 REFUSE STORAGE AND DISPOSAL

REFUSE STORAGE(2.9 C.F. PER DWELLING UNIT)

90 D.U. X 2.9 C.F./D.U. = 261 C.F

12 C.Y. x 27C.F./C.Y. = 324 C.F. PROVIDED

28-22 RECREATION ROOM WINDOW ANALYSIS

SEE A-106 A-300 A-610

AMENITY ROOM FLOOR AREA	= 2,814SF
WINDOW GLAZED AREA	= W01A X7 X30.36=212.52 SF
	W01X7 X 24.14 = 168.98 SF
	TOTAL= 381.5

RATIO OF WINDOW TO FLOOR AREA = 381.5/2814= 0.135 or 13.5% > 9.5% COMPLIES

28-14 DAYLIGHT IN CORRIDOR ANALYSIS

WINDOW GLAZED AREA 24.14 SF

FLOOR	0-BR	1-BR	2-BR	3-BR	TOTAL
8	2	6	3	0	11
7	3	5	2	0	10
6	5	10	2	0	17
5	5	10	2	0	17
4	5	11	2	0	18
3	1	10	1	0	12
2	0	0	0	0	0
1	0	0	5	0	5
TOTAL	21	52	17	0	90

ZR	Item / Description	BUILDING 3A		
		R7-3/ C2-4	R73 / C2-4	Compliance Notes
Reference		Permitted / Required	Proposed	
	LOT AREA	21,867.00		SEE Z-101
22-12, 32-10	USES	USE GROUP 1 through 9 & 14	UG 2.66	
22-12	Residential	UG 6A	UG 2A	OK
22-12, 25-11	Parking		UG 2B	
32-15	Retail		UG 6A	OK
23-011	QUALITY HOUSING PROGRAM	REQUIRED / APPLICABLE		PROVIDED
23-011(b)(2)(i)(a)	FAR	PERMITTED	PROPOSED	
23-154(b)	Residential	5.17	3.90	FAR to be 5.17 should project NOT included a FRESH Food Store on Astoria Cove Waterfront
33-121	Commercial	2.00	0.20	
	Community facility	5.00	-	
	Total	5.17	4	
	FLOOR AREA	PERMITTED	PROPOSED	
23-154(b)	Residential	113,052	85,262	OK < 113,213
24-11	Commercial	43,734	4,286	OK
33-121	Community Facility	109,335	-	OK
	Max Total	113,052	89,548	OK<113,213
	LOT COVERAGE	PERMITTED	PROPOSED	
62-322	Max Lot Coverage	70% 21,867 = 15,307 Sq.Ft.	17,950 Sq.Ft.	OK - SEE Z-101
	DENSITY REGULATIONS	PERMITTED	PROPOSED	
23-22	Permitted Dwelling Units	680	680	
23-24 / 35-40	Number of Dwelling Units	148	90	OK SEE CALCS ON Z-100
	YARDS			
23-47	Yards	Rear yard regulations shall be inapplicable on waterfront zoning lots. None Required	None Provided	
23-542 (a)				
62-332				
23-711 / 23-82	Min Distance between buildings	40' Wall to Wall 50' Wall to Window 60' Window to Window	COMPLIES	OK-See Z-103
	HEIGHT AND SETBACK			
23-662 (c)(1)	Min Base Height	40'	62	OK-See Z-103
23-662 (d) (2)	Max Base Height	65'	62	OK-See Z-103
62-341(a)(2)	Setback at Max Base H - Narrow St	10' on a wide street 15' on a narrow street	NON-COMPLIANT 10'on 8th Street , 9th St and 26th Ave	ULLURP C130384MMQ Zoning Action 4 SEE Z-002
62-341(d)(1)	Max Building height (Table 1)	185'	62	COMPLIES
62-341(d)(2) 62-341(d)(2)(i)				
62-431 (c)(3)	Floor Area Distribution	Zoning lots with buildings that exceed the maximum base height listed in Table A shall have a minimum floor area coverage comprising at least 30 percent of the lot area at a height of 20 feet	COMPLIES	OK
62-341b (c) (4)	Maximum Residential Tower Size	Each residential story of a building located entirely above the maximum base height specified in Table A shall not exceed a gross area of 7,000 square feet on zoning lots less than 1.5 acres, and 8,100 square feet on larger zoning lots	14,534 NON-COMPLIANT	ULLURP C130384MMQ Zoning Action 4
23-861	Minimum Distance between legally required Windows and Walls or Lot Lines	Minimum distance between legally required windows and any wall, a rear lot line, or vertical projection thereof, or a side lot line, or vertical projection shall be 30 feet	COMPLIES	SEE Z-103
23-851	Minimum dimension of inner Courts	The area of an inner court shall not be less than 1,200 sqf (30'x40'), & the minimum dimensions on of such inner court shall not be less than 30 ft	COMPLIES - Inner Court Building A = 2,162 SF, Inner Court Building B = 1,397, Inner court A + B = 3,559 SF	See Z-103; ULLURP C130384MMQ Zoning Action 4
	STREET WALL			
35-651(a)(1)	Street Wall Location	70% of street wall width to be located within 8 ft of street line (only one streetw all req to comply if zoning lot is bounded by more than 1 street)	COMPLIES	OK See Z-101
35-651(a)(3)	Street Wall Location	For zoning lots bounded by more than one street line, street wall location provision shall be mandatory only on one street line	COMPLIES - Provided on 9th Street	OK See Z-101
	STREET TREE PLANTING			
26-41	Street Trees	1 per 25' of street frontage	313.36' Frontage / 25'-0" = 12.53 => 13 trees required. Proposed trees to be planted: 8; Trees to be paid into the fund: 5	OK
	QUALITY HOUSING PROGRAM			
28-12	Compactor Room	2.9 CF per 1 DU=2.9 x 90 = 261 CF	12 CY x 27 CF = 324 CF Provided	OK See A-100
28-12	Trash Room - Required	A refuse disposal room of 12 SF Min.	Refuse disposal rooms exceed 12 SF	OK See A-100
28-14	Corridor Daylight	20 SF of glazed area	43 SF is provided	OK See A-610
28-21	Recreation Space - Required Indoor or Outdoor	3.30% of Residential ZFA (85,262 Sq.Ft.) =2,814 Sq.Ft.	(1,388+1,328) = 2,716Sq.Ft. Indoor: 684 Sq.Ft. Outdoor	See Z-100 , A-017, A-107
28-22	Recreation Space (a) accessible to the residents of the building (b)min dim 15 feet... outdoor min 225sf indoor recreation min 300sf (c) open to the sky (d) indoor recreation area shall have windows or skylights		(1,388+1,328) = 2,716Sq.Ft. Indoor: 684 Sq.Ft. Outdoor	See Z-100 , A-017, A-107
28-31	Density per Corridor The number of dwelling units served by a vertical circulation core and corridor less than 11DU, 50 percent of the square feet of the corridor serving such dwelling unit			OK See Z-100
32-40	SUPPLEMENTAL USE REGULATIONS			
32-421	Location of Uses	Commercial only occupy first story.	Commercial use only on first story	OK See A-101
32-434	Ground Floor in Certain C2 Districts	n/a to R73 District		OK
37-30	SPECIAL GROUND FLOOR PROVISIONS			
37-33(a)(1)	Ground Floor lobbies	R73 not included in ZR 32-434		NA OK
	PARKING & LOADING			
25-23, 74-533	Required Parking	MR units = 90 units; 70% of MR units = 63 Income Restricted D.U.; 50% of Income Restricted D.U. = 50% of 63 units = 32 parking spaces	170 TOTAL For Building 3A and 3B (See Appr: Q00646755-I)	OK See A-100, A-101, A-102 & A-103
25-251	Income Restricted Dwelling Units	0 when in transit zone	None Provided	OK See T-001,00
25-31	Community Facility	None Required	None Provided	OK
36-21, 36-232	Commercial: General Retail	1 per 1,000 SF = 4 Spaces Commercial Parking Waived if less than 40 spaces required	None Provided	OK
36-62	Off-Street Loading	Loading Berth Waived if Commercial less than 25,000 SF	Commercial Space is 4,286 SF < 25,000 SF - None Required	OK See A-101
	ENCLOSED BICYCLE PARKING			
25-811	Residential	1 per 2 DU =90/2 =45 spaces	60	See Z-100 A-100
37-11	Commercial: General Retail	4,286 SF @ 1 per 10,000 =0	None provided	
36-711	Total Bicycle Parking	45 Required	60	OK

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102 MADISON AVE #11
NEW YORK, NY 10016

PROTECTOR

GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

CODE CONSULTANT / EXPERTISE

JAM CONSULTANTS INC
104 WEST 20TH STREET, 10TH FLOOR
NEW YORK, NY 10011

SEAL & SIGNATURE

KEY PLAN

01 12.17.2021 DOB FOUNDATION FILING

PROJECT

BUILDING 3A
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 1

DOB NOW #Q00646754-I1

DRAWING TITLE

ZONING ANALYSIS -
BUILDING 3A

DATE (MM-DD-YY)

2022-01-12

PROJECT No.

CAPE_09031

DRAWING BY

FFA

CHECK BY

FFA

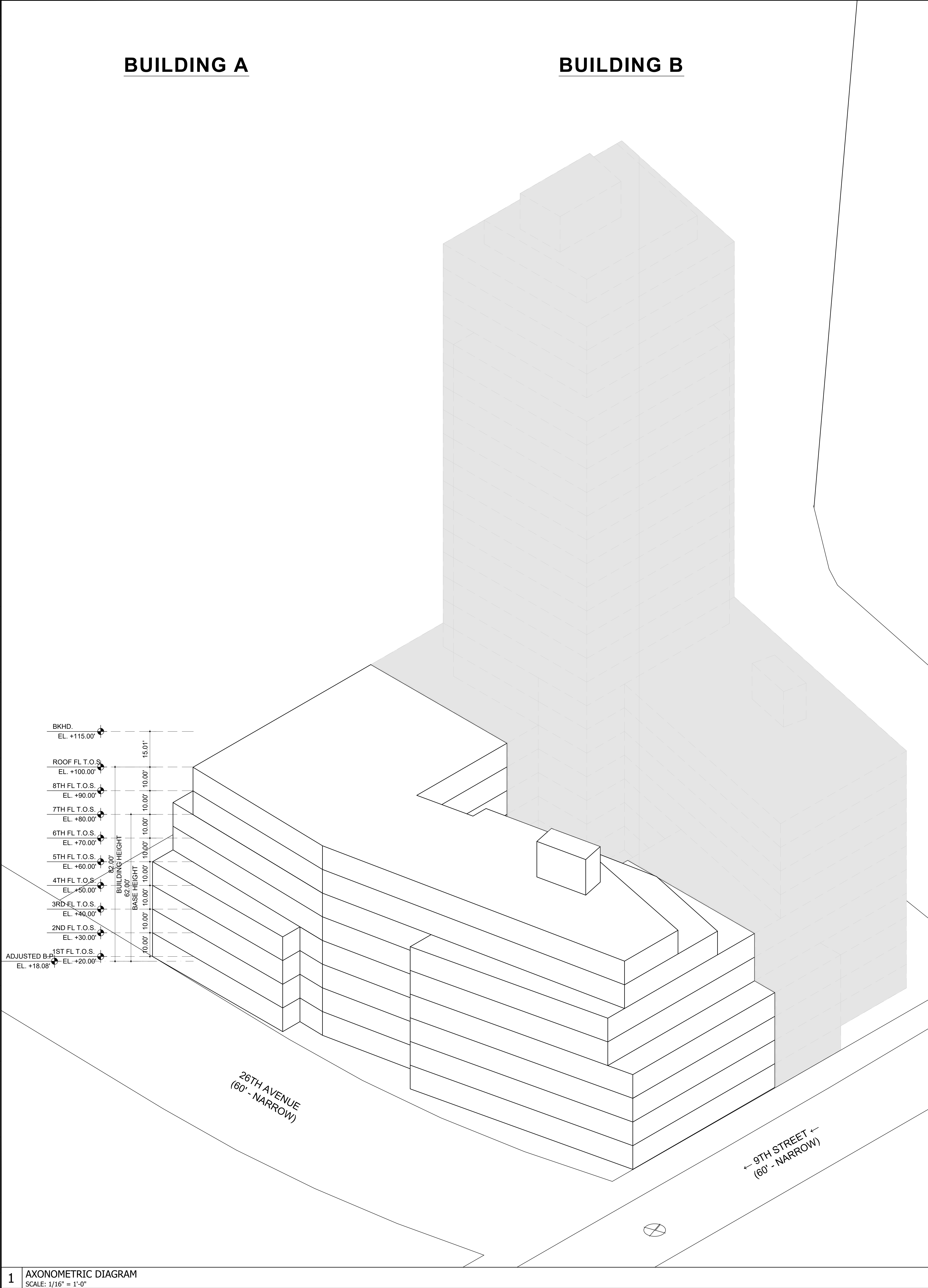
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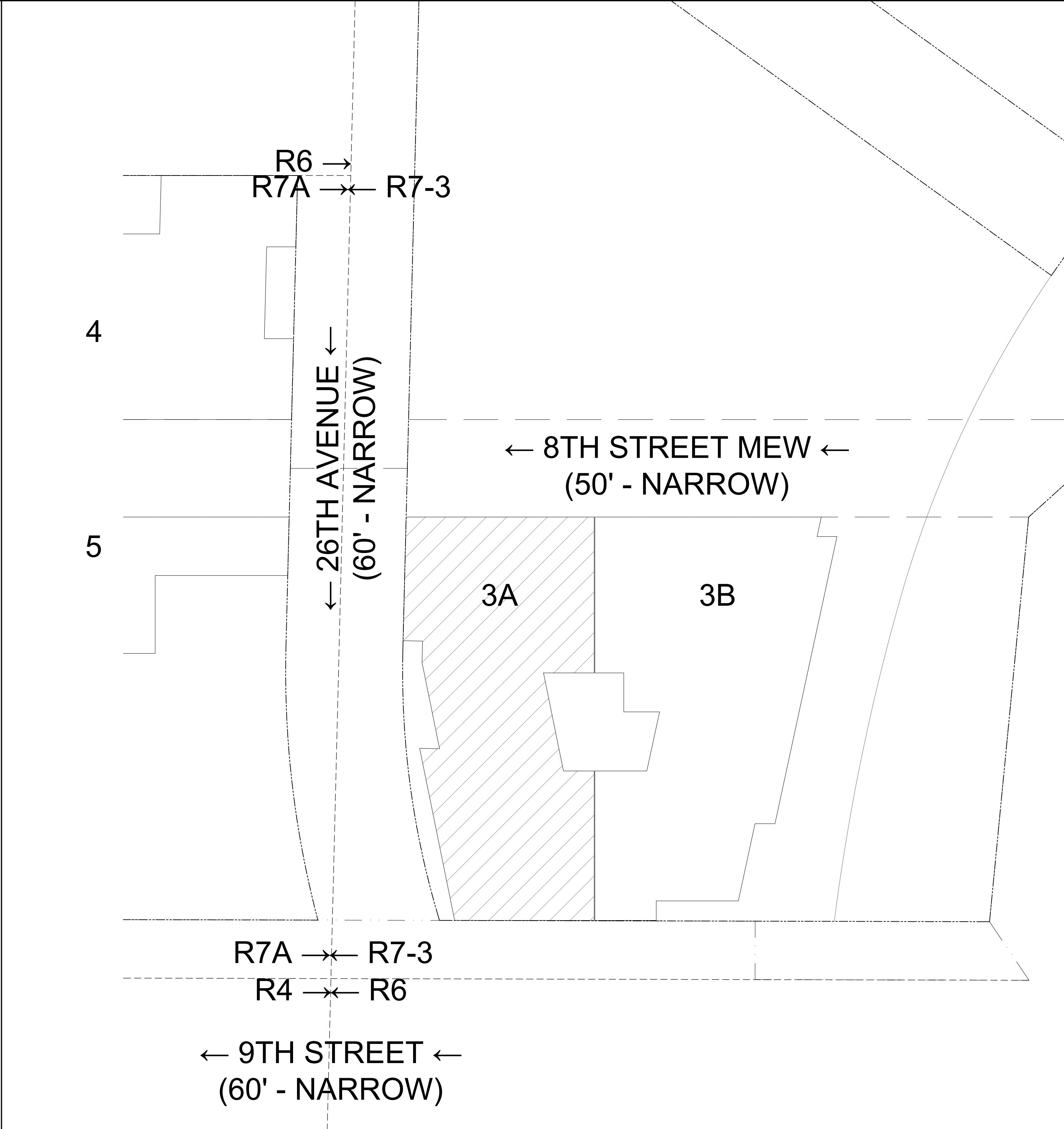
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OF ###

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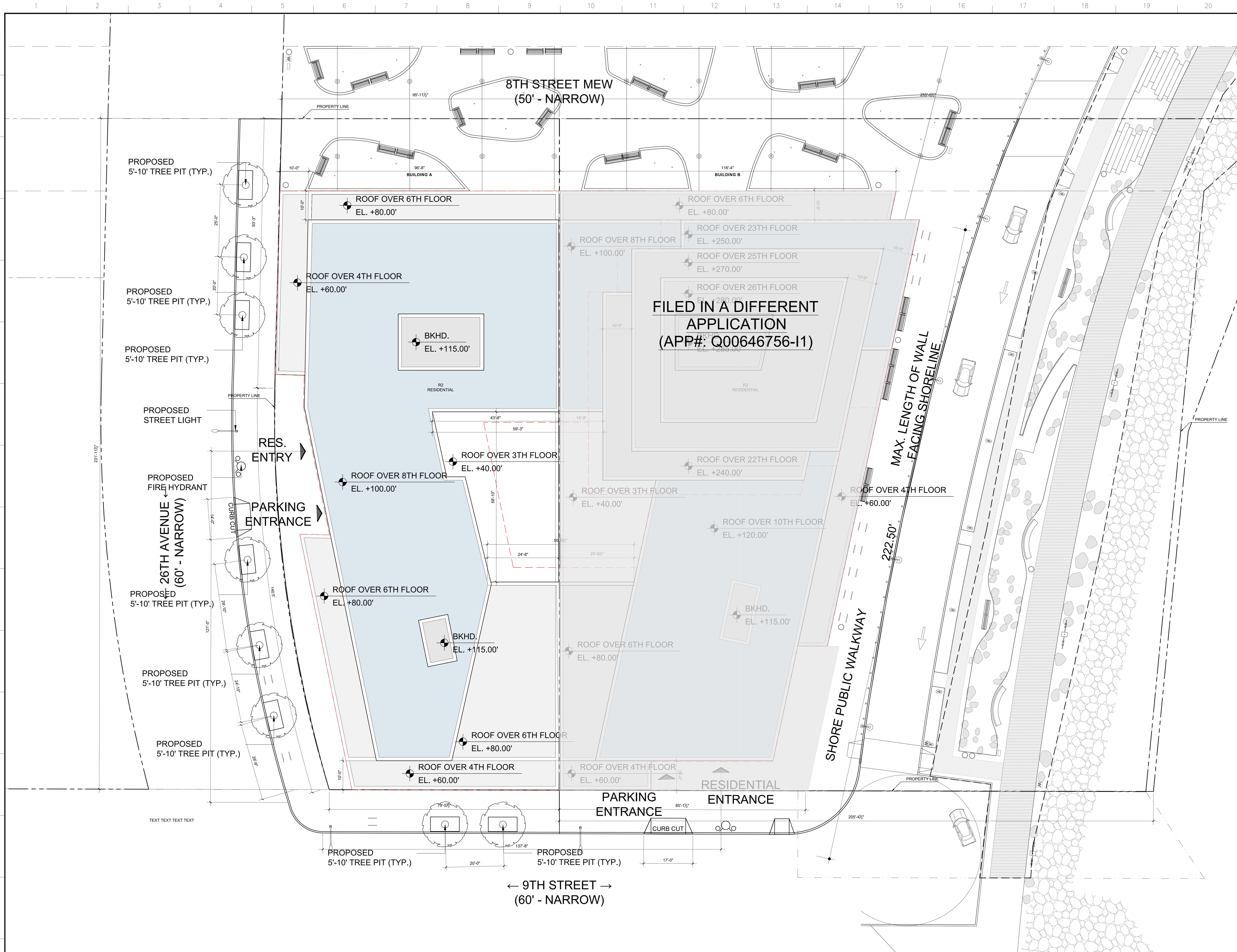
1 AXONOMETRIC DIAGRAM
SCALE: 1/16" = 1'-0"



2 SCALE: 1/16" = 1'-0" KEY PLAN

ARCHITECT	FOGARTY FINGER architecture interiors 69 Walker Street New York, NY 10013 t 212 966 7450 f 212 966 7444								
CLIENT	ASTORIA COVE PHASE I, LLC 230 CAPE ADVISOR 375 GREENWICH ST. 3RD FLOOR NEW YORK, NY 10013								
STRUCTURAL ENGINEER	DESIMONE CONSULTING ENGINEERS 140 BROADWAY, 25TH FLOOR NEW YORK, NY 10005								
M/E/P ENGINEER	ETTINGER ENGINEERING ASSOCIATES 505 EIGHTH AVE 24TH FLOOR NEW YORK, NY 10018								
CIVIL ENGINEER	PHILIP HABIB & ASSOCIATES 102 MADISON AVE #11 NEW YORK, NY 10016								
GEOTECH	GEI CONSULTANTS, INC., P.C 530 7TH AVENUE, SUITE 2007 NEW YORK, NY 10018								
CODE CONSULTANT / EXPERTISE	JAM CONSULTANTS INC 104 WEST 20TH STREET, 8TH FLOOR NEW YORK, NY 10011								
SEAL & SIGNATURE									
KEY PLAN									
<table><tr><td>01</td><td>12.17.2021</td><td>DOB FOUNDATION FILING</td></tr><tr><td>NO.</td><td>DATE</td><td>ISSUE</td></tr></table>		01	12.17.2021	DOB FOUNDATION FILING	NO.	DATE	ISSUE		
01	12.17.2021	DOB FOUNDATION FILING							
NO.	DATE	ISSUE							
PROJECT									
BUILDING 3A ASTORIA COVE QUEENS, NY 11217 BLOCK 906, LOT 1									
DOB NOW #Q00646754-11									
DRAWING TITLE									
ZONING CALCULATION									
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DATE (MM-DD-YY)	2022-01-12								
PROJECT NO.	CAPE_28001								
DRAWING BY	FFA								
CHK BY	FFA								
GADD FILE NO.									
#8 OF #88									

Z-102.00



GENERAL NOTES:

PROPOSED NEW TREES 25' DISTANCE.
313.36' FRONTAGE / 25'-0" = 12.53 => 13 TREES REQUIRED;
PROPOSED TREES TO BE PLANTED: 8; TREES TO BE PAID INTO THE FUND: 5

1 SITE PLAN
SCALE: 3/32" = 1'-0"

FOGARTY FINGER
architecture interiors
69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

ASTORIA COVE PHASE I, LLC
375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016

GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

JAM CONSULTANTS INC
104 WEST 20TH STREET, 8TH FLOOR
NEW YORK, NY 10011

REGISTERED ARCHITECT
STATE OF NEW YORK
668860

KEY PLAN

01 12.17.2021 DOB FOUNDATION FILING
DATE DATE DATE

BUILDING 3A
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 1

DOB NOW #Q00646754-I1

SITE PLAN

DATE (MM-DD-YY):	2022-01-12
PROJECT NO.:	CAPE_28001
DRAWING BY:	FFA
CHK BY:	FFA

A-090.00

GRID FILE NO. # OF SHEETS



ARCHITECT

FOGARTY FINGER
architecture interiors

69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

CLIENT

ASTORIA COVE PHASE I, LLC
230 CAFE ADVISOR
375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

STRUCTURAL ENGINEER

DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

M/E/P ENGINEER

ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

CIVIL ENGINEER

PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016


GEOTECH

GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

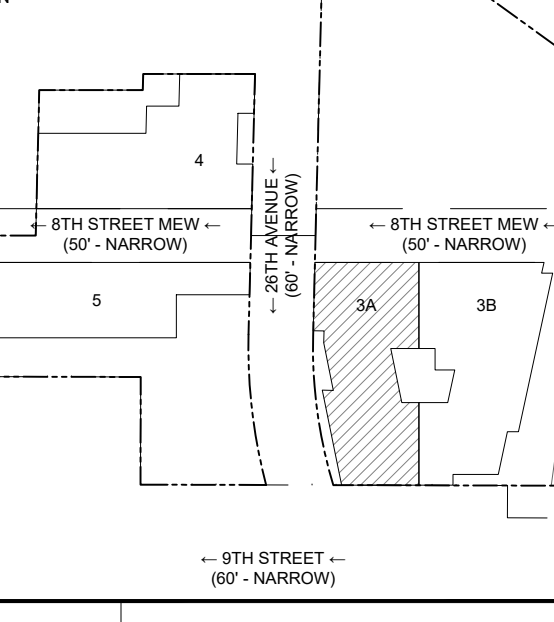
CODE CONSULTANT / EXPERTISE

JAM CONSULTANTS INC
104 WEST 20TH STREET, 8TH FLOOR
NEW YORK, NY 10011

SEAL & SIGNATURE



KEY PLAN



01	12.17.2021	DOB FOUNDATION FILING
NO.	DATE	ISSUE
PROJECT		

BUILDING 3A
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 1

DOBNOW #Q00646754-I1

DRAWING TITLE

CELLAR FLOOR PLAN



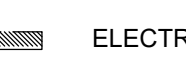

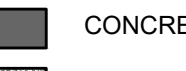
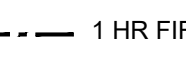
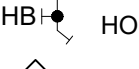
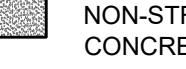
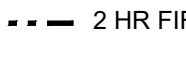
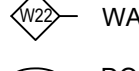
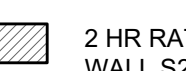
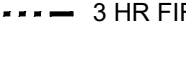
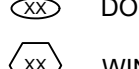
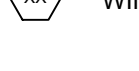
DATE (MM-DD-YY)	2022-01-12
PROJECT NO.	CAPE_28001
DRAWING BY	FFA
CHK BY	FFA

1 CELLAR FLOOR PLAN

SCALE: 1/8" = 1'-0"

18 OF 18

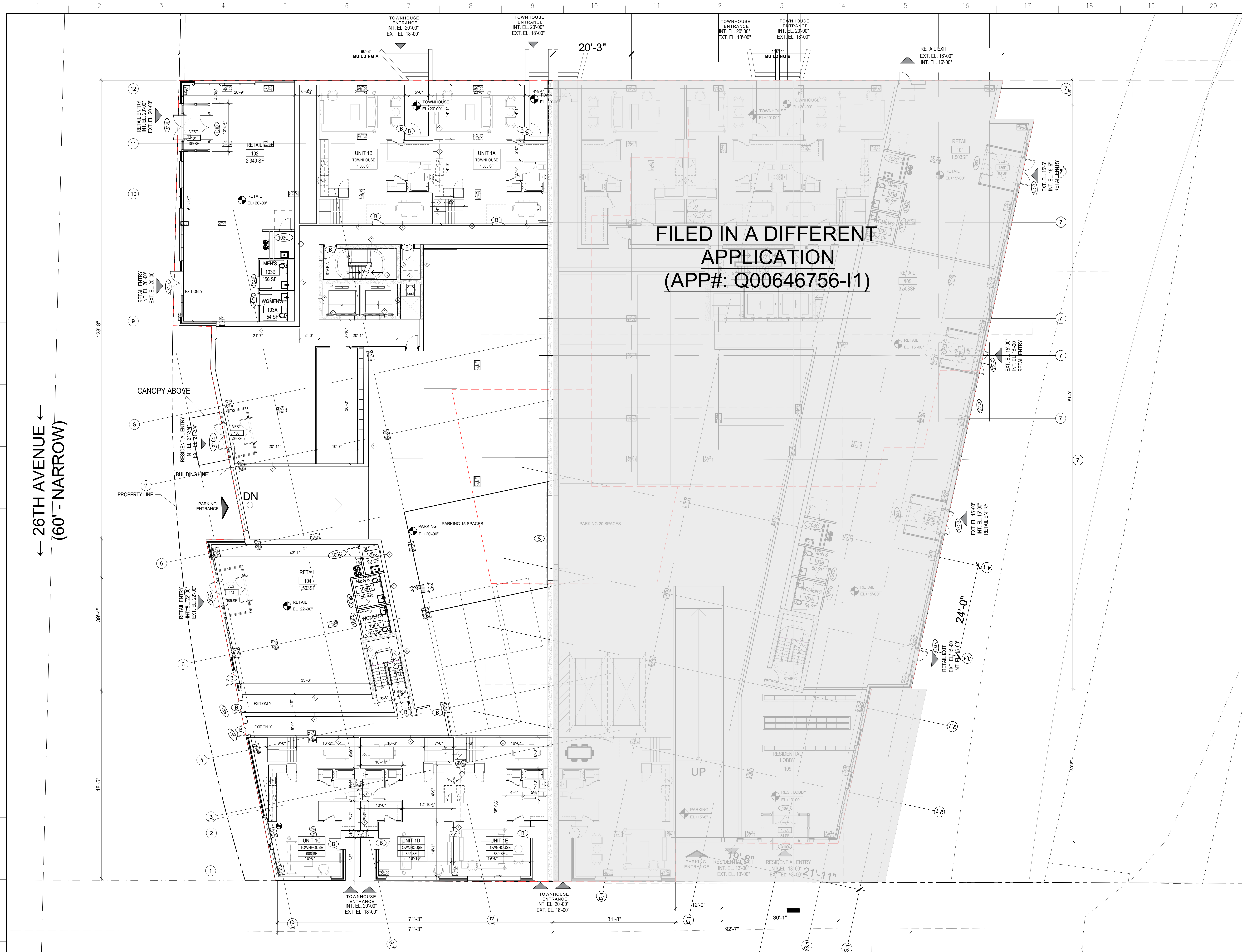
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	FLOOR DRAIN		CMU WALL		ELECTRICAL PANEL
	ROOF DRAIN		CONCRETE WALL		1 HR FIRE RATED WALL
	HOSE BIB		NON-STRUCTURAL CONCRETE		2 HR FIRE RATED WALL
	WALL TAG		2 HR RATED SHAFT WALL S22 PROVIDE S22 ON WET RM SIDE		3 HR FIRE RATED WALL
	DOOR TAG				
	WINDOW TAG				

GENERAL NOTES:

1. PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83
2. ALL PARTITION TYPES TO BE W22 U.O.N
3. ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION

KEY NOTES:



GENERAL NOTES:

- PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83
- ALL PARTITION TYPES TO BE W22 U.O.N
- ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION

KEY NOTES:

DOB NOW #Q00646754-I1

1ST FLOOR PLAN

DATE (MM-DD-YY)	2022-01-12
PROJECT NO.	CAPE_20001
DRAWING BY	FFA
CHK BY	FFA

A-101.00

GRID FILE NO. **# OF SHEET**

FOGARTY FINGER
architecture interiors
69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

CLIENT
ASTORIA COVE PHASE I, LLC
200 CAPE ADVISOR
375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

STRUCTURAL ENGINEER
DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

MFP ENGINEER
ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

CIVIL ENGINEER
PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016

MECHANICAL
GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

CODE CONSULTANT / EXPERTISE
JAM CONSULTANTS INC
104 WEST 20TH STREET, 8TH FLOOR
NEW YORK, NY 10011

SEAL & SIGNATURE

KEY PLAN

01.12.2021 DOB FOUNDATION FILING
DATE DATE DATE
NO. DATE ISSUE

PROJECT
BUILDING 3A
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 1



ARCHITECT

FOGARTY FINGER
architecture interiors

69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

CLIENT

ASTORIA COVE PHASE I, LLC
230 CAPE ADVISOR
375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

STRUCTURAL ENGINEER

DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

M/E/P ENGINEER

ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

CIVIL ENGINEER

PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016

GEOTECH

GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

CODE CONSULTANT / EXPERTISE

JAM CONSULTANTS INC
104 WEST 20TH STREET, 8TH FLOOR
NEW YORK, NY 10011

SEAL & SIGNATURE

KEY PLAN

01	12.17.2021	DOB FOUNDATION FILING
NO.	DATE	ISSUE
PROJECT		

BUILDING 3A
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 1

DOB NOW #Q00646754-I1

DRAWING TITLE

3RD FLOOR PLAN

DATE (MM-DD-YY)	2022-01-12
PROJECT NO.	CAPE_28001
DRAWING BY	FFA
CHK BY	FFA

A-103.00

GRID FILE NO. # OF SHEETS

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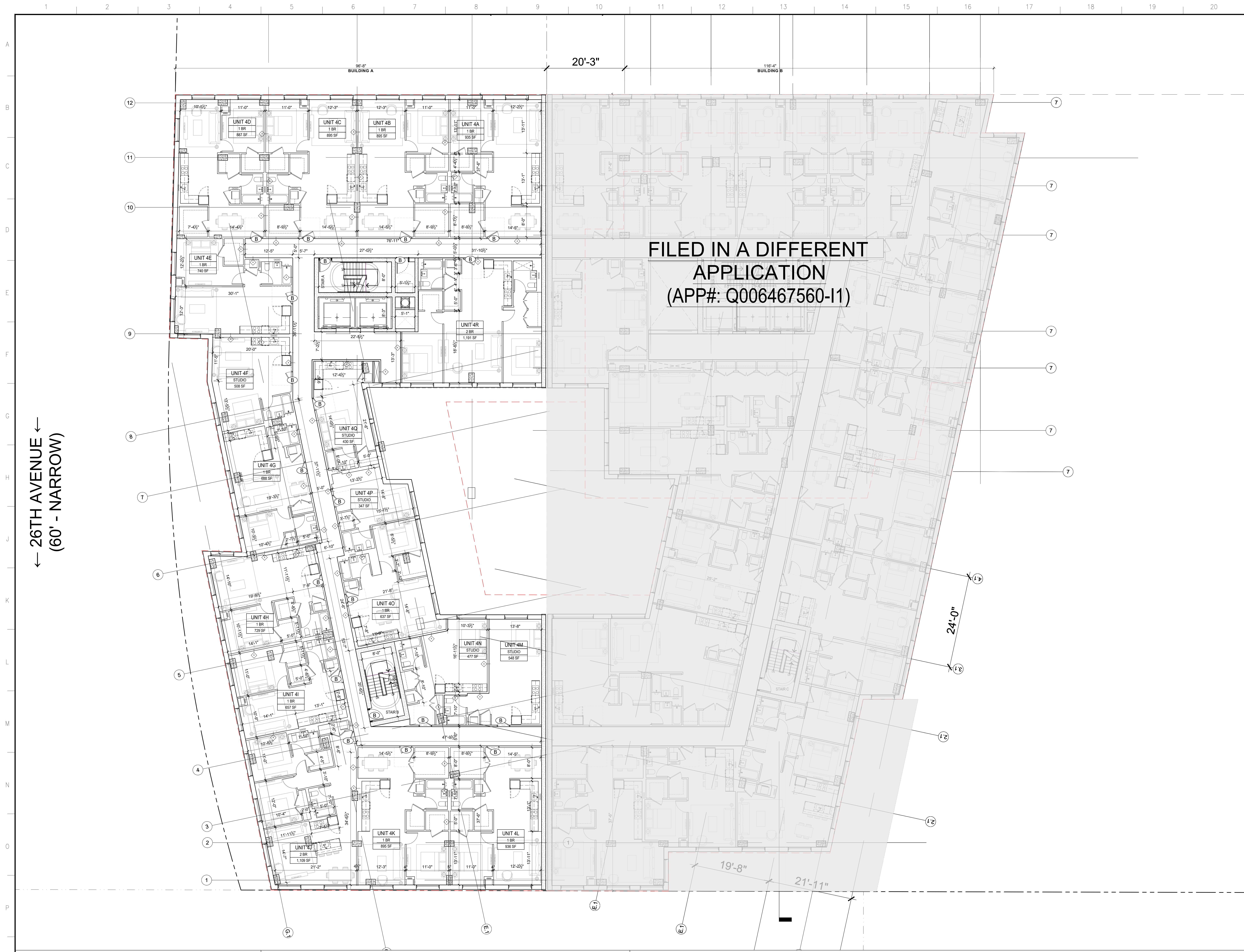
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	ROOF DRAIN		CONCRETE WALL		1 HR FIRE RATED WALL
	HOSE BIB		NON-STRUCTURAL CONCRETE		2 HR FIRE RATED WALL
	WALL TAG		2 HR RATED SHAFT WALL S22 PROVIDE S22 ON WET RM SIDE		3 HR FIRE RATED WALL
	DOOR TAG				
	WINDOW TAG				

GENERAL NOTES:

- PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83
- ALL PARTITION TYPES TO BE W22 U.O.N
- ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION

KEY NOTES:

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



LEGEND:

	FLOOR DRAIN		CMU WALL		ELECTRICAL PANEL
	ROOF DRAIN		CONCRETE WALL		1 HR FIRE RATED WALL
	HOSE BIB		NON-STRUCTURAL CONCRETE		2 HR FIRE RATED WALL
	WALL TAG		2 HR RATED SHAFT WALL S22 PROVIDE S22 ON WET RM SIDE		3 HR FIRE RATED WALL
	DOOR TAG				
	WINDOW TAG				

GENERAL NOTES:

1. PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83
2. ALL PARTITION TYPES TO BE W22 U.O.N
3. ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION

KEY NOTES:

4TH FLOOR PLAN

DATE (MM-DD-YY): 2022-01-12
PROJECT NO.: CAPS_28001
DRAWING BY: FFA
CHK BY: FFA

A-104.00

GRID FILE NO.: #8 OF #88

FOGARTY FINGER
architecture interiors
69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

CLIENT:
ASTORIA COVE PHASE I, LLC
230 CAPE ADVISOR
375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

STRUCTURAL ENGINEER:
DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

M/E/P ENGINEER:
ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

CIVIL ENGINEER:
PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016

PROTECTOR:
GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

CODE CONSULTANT / EXPERTISE:
JAM CONSULTANTS INC
104 WEST 20TH STREET, 8TH FLOOR
NEW YORK, NY 10011

SEAL & SIGNATURE:

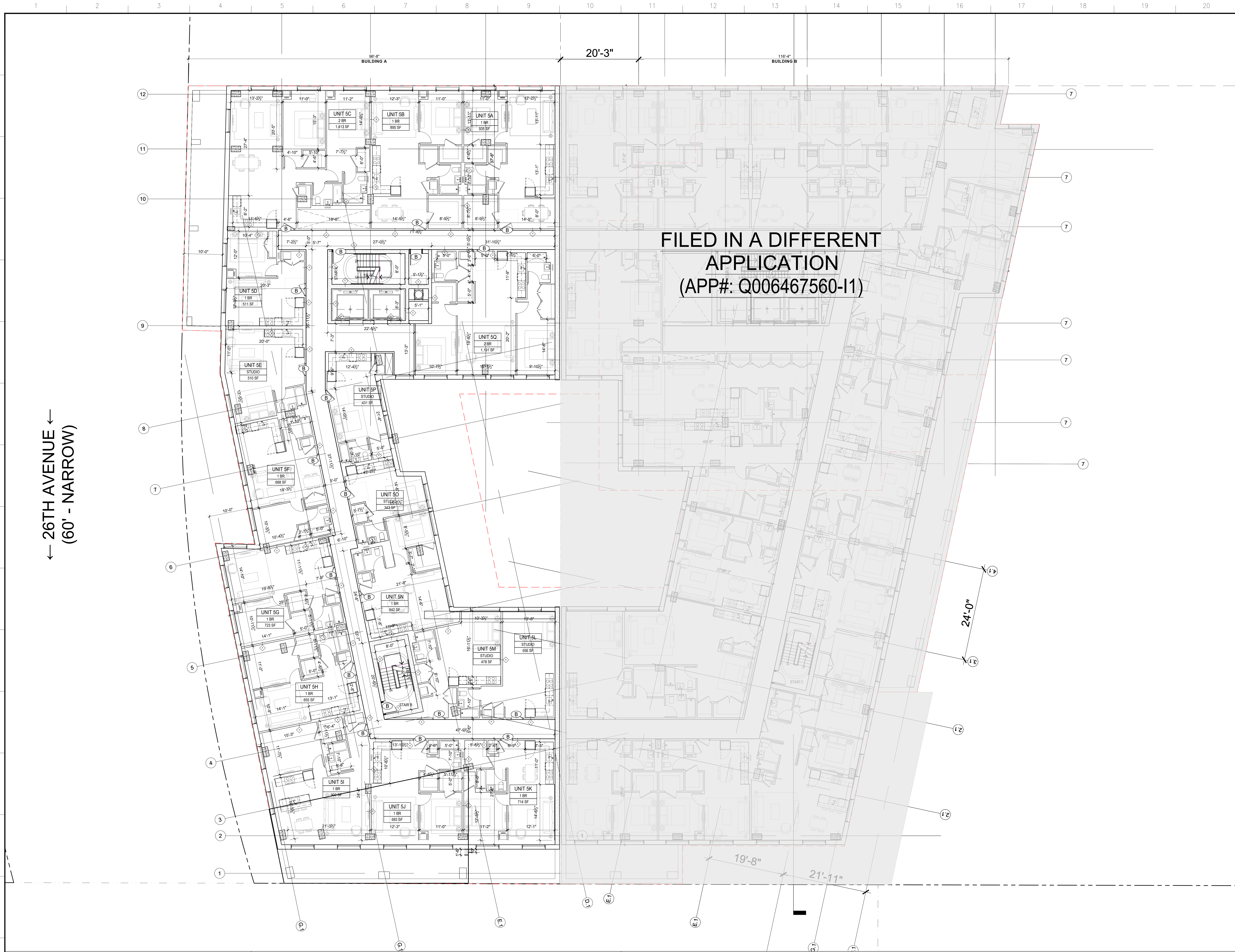
KEY PLAN:

01 12.17.2021 DOB FOUNDATION FILING
DATE DATE DATE
PROJECT PROJECT PROJECT

BUILDING 3A
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 1

DOB NOW #Q00646754-I1

DRAWING TITLE:
4TH FLOOR PLAN



LEGEND:

	FLOOR DRAIN		CMU WALL		ELECTRICAL PANEL
	ROOF DRAIN		CONCRETE WALL		1 HR FIRE RATED WALL
	HOSE BIB		NON-STRUCTURAL CONCRETE		2 HR FIRE RATED WALL
	WALL TAG		2 HR RATED SHAFT WALL S22 PROVIDE S22 ON WET RM SIDE		3 HR FIRE RATED WALL
	DOOR TAG				
	WINDOW TAG				

GENERAL NOTES:

1. PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83
2. ALL PARTITION TYPES TO BE W22 U.O.N
3. ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION

KEY NOTES:

1 5TH - 6TH FLOOR PLAN
SCALE: 1/8" = 1'-0"

ARCHITECT
FOGARTY FINGER
architecture interiors
69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

CLIENT
ASTORIA COVE PHASE I, LLC
230 CAFE ADVISOR
375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

STRUCTURAL ENGINEER
DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

MFP ENGINEER
ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

CIVIL ENGINEER
PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016

PROTECH
GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

CODE CONSULTANT / EXPERTISE
JAM CONSULTANTS INC
104 WEST 20TH STREET, 8TH FLOOR
NEW YORK, NY 10011

REAL & SIGNATURE

KEY PLAN

01 12.17.2021 DOB FOUNDATION FILING
DATE (MM-DD-YY) PROJECT NO. DATE ISSUE

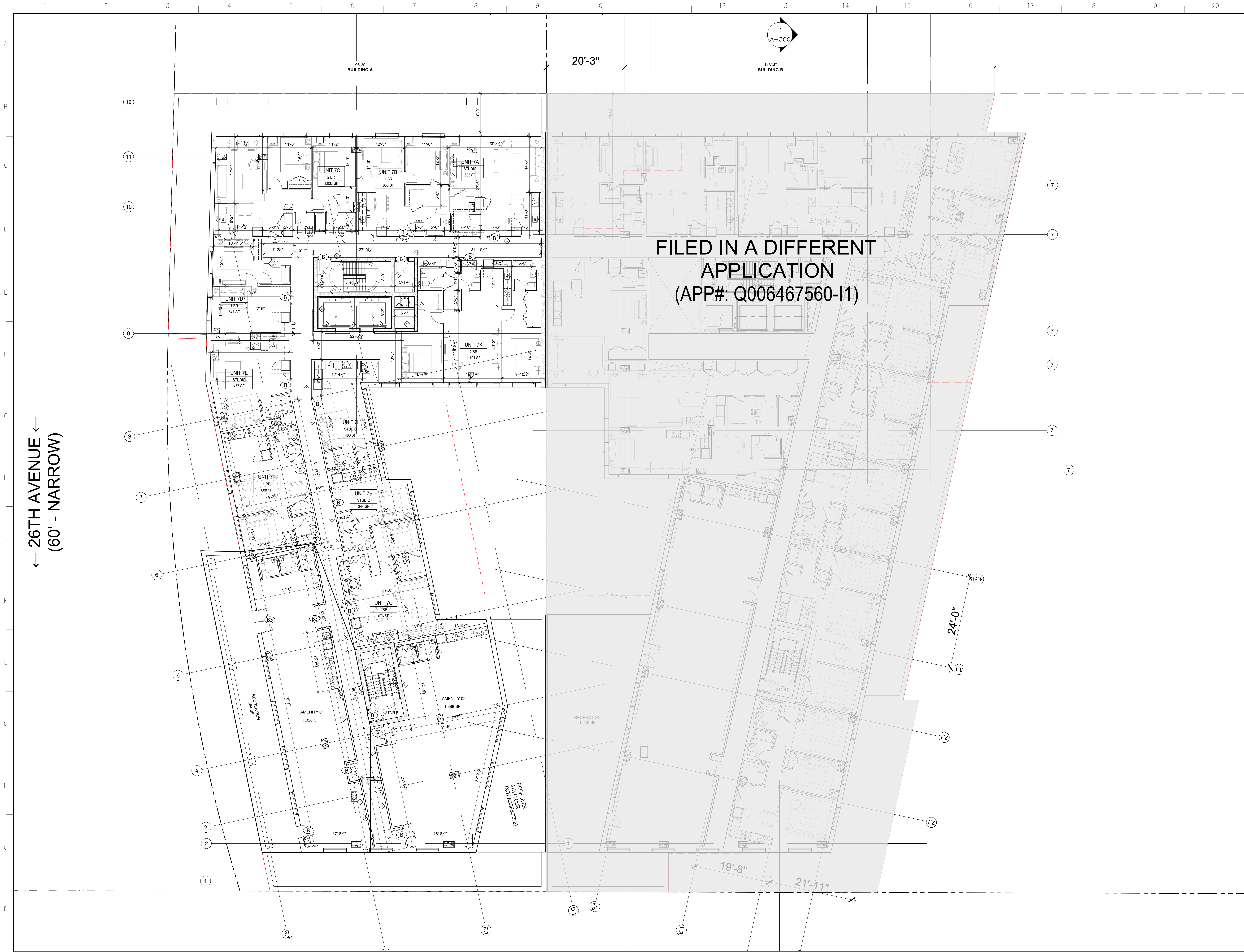
BUILDING 3A
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 1

DOB NOW #Q00646754-I1

DRAWING TITLE
5TH - 6TH FLOOR PLAN

DATE (MM-DD-YY) 2022-01-12
PROJECT NO. CAPL_28001
DRAWING BY FFA
CHK BY FFA

A-105.00
CADD FILE NO. # OF SHEETS



LEGEND:

	FLOOR DRAIN		CMU WALL		ELECTRICAL PANEL
	ROOF DRAIN		CONCRETE WALL		1 HR FIRE RATED WALL
	HOSE BIB		NON-STRUCTURAL CONCRETE		2 HR FIRE RATED WALL
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	DOOR TAG				
	WINDOW TAG				

GENERAL NOTES:

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2. ALL PARTITION TYPES TO BE W22 U.O.N
3. ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION

KEY NOTES:

1. PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83

2. ALL PARTITION TYPES TO BE W22 U.O.N

3. ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION

7TH FLOOR PLAN

DATE (MM-DD-YY): 2022-01-12

PROJECT No.: CAPS_28001

DRAWING BY: FFA

CHK BY: FFA

1 OF 1

FOGARTY FINGER
architecture interiors

69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

ASTORIA COVE PHASE I, LLC
230 CAPE ADVISOR
375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
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ETTINGER ENGINEERING ASSOCIATES
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530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

JAM CONSULTANTS INC
104 WEST 20TH STREET, 8TH FLOOR
NEW YORK, NY 10011

REGISTERED ARCHITECT
STATE OF NEW YORK
608860

BUILDING 3A
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 1

DOB NOW #Q00646754-I1

7TH FLOOR PLAN

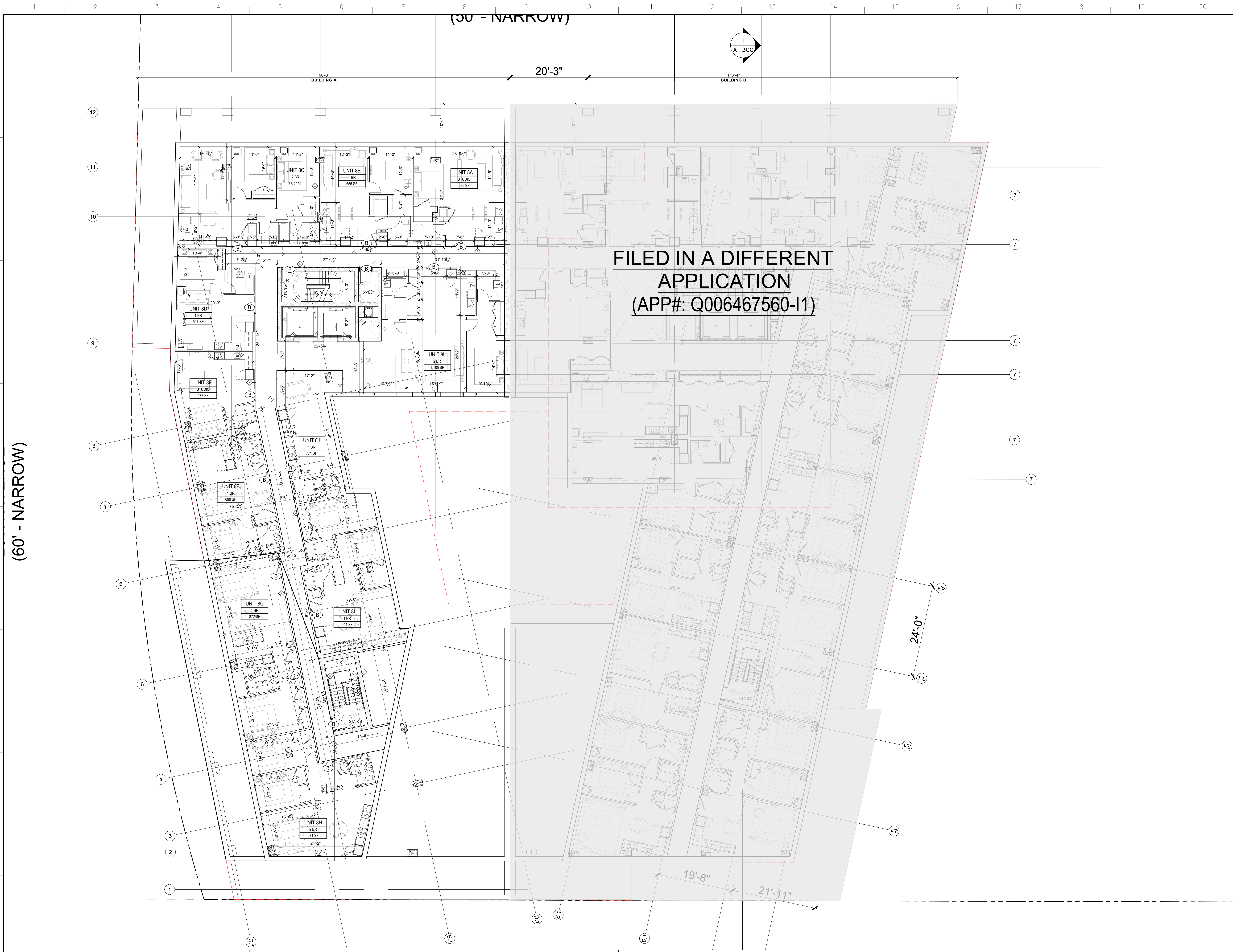
DATE (MM-DD-YY): 2022-01-12

PROJECT No.: CAPS_28001

DRAWING BY: FFA

CHK BY: FFA

1 OF 1



LEGEND:

	FLOOR DRAIN		CMU WALL		ELECTRICAL PANEL
	ROOF DRAIN		CONCRETE WALL		1 HR FIRE RATED WALL
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	DOOR TAG				
	WINDOW TAG				

GENERAL NOTES:

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- ALL PARTITION TYPES TO BE W22 U.O.N
- ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION

KEY NOTES:

8TH FLOOR PLAN

SCALE: 1/8" = 1'-0"

ARCHITECT

FOGARTY FINGER
architecture interiors
69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

CLIENT

ASTORIA COVE PHASE I, LLC
230 CAPE ADVISOR
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STRUCTURAL ENGINEER

DESIMONE CONSULTING ENGINEERS
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NEW YORK, NY 10005

M/E/P ENGINEER

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CIVIL ENGINEER

PHILIP HABIB & ASSOCIATES
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NEW YORK, NY 10016

PHOTOTECH

GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

CODE CONSULTANT / EXPOSITOR

JAM CONSULTANTS INC
104 WEST 20TH STREET, 8TH FLOOR
NEW YORK, NY 10011

SEAL & SIGNATURE

KEY PLAN

DATE (MM-DD-YY) 2022-01-12

PROJECT NO. CAPE_28001

DRAWING BY FFA

CHK BY FFA

DOBNOW #Q00646754-11

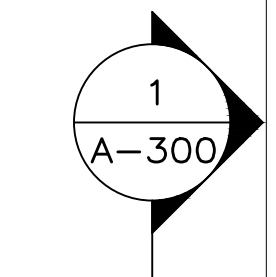
BUILDING 3A
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 1

8TH FLOOR PLAN

A-108.00

GRID FILE NO.

OF SHEETS



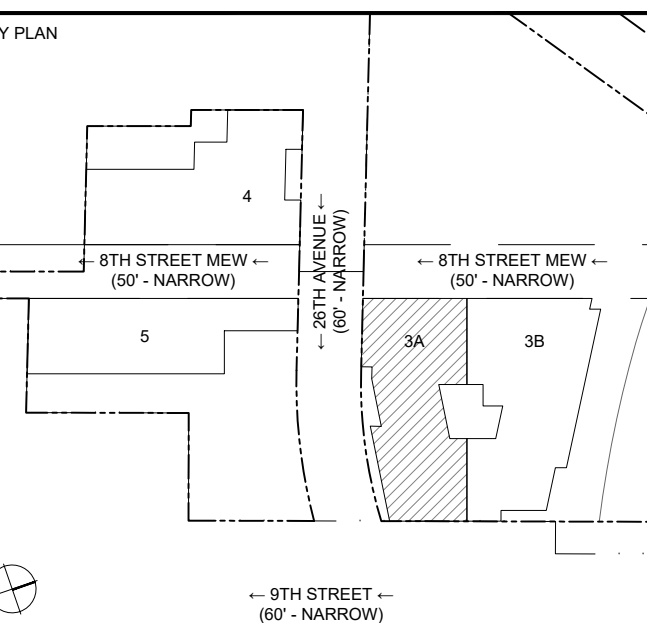
ASTORIA COVE PHASE I, LLC
C/O CAPE ADVISOR
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NEW YORK, NY 10013

ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

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NEW YORK, NY 10018

JAM CONSULTANTS INC
104 WEST 29TH STREET, 9TH FLOOR
NEW YORK, NY 10001

[illegible]

12.17.2021	DOB FOUNDATION FILING
DATE	ISSUE
OBJECT	

DOB NOW #Q00646754-I1

TE (MM-DD-YY):	2022
OBJECT No.:	CAP
DRAWING BY:	
CHECK BY:	

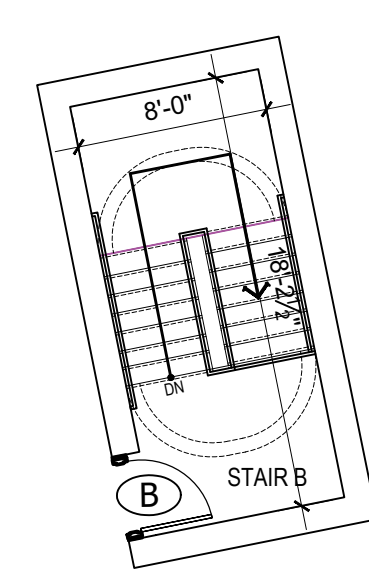
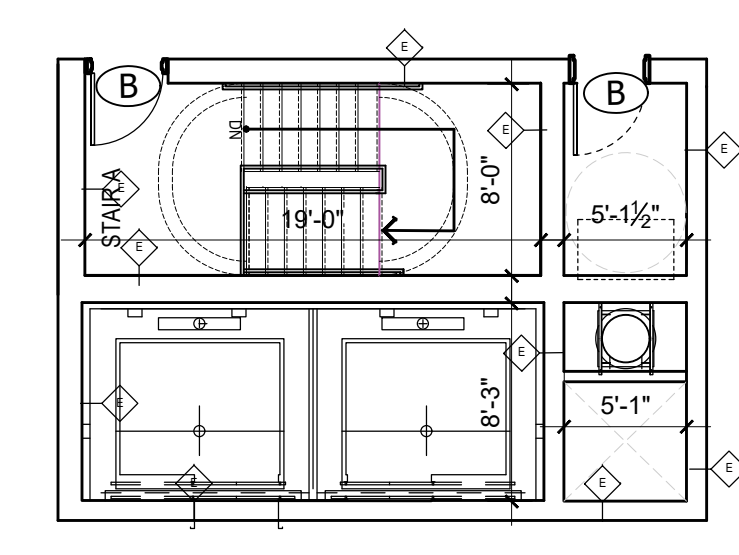
	FFA
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DO FILE No.: #

← 26TH AVENUE ←
(60' - NARROW)

**FILED IN A DIFFERENT
APPLICATION
(APP#: Q006467560-I1)**

ROOF OVER 8TH FLOOR
(NO OCCUPANCY)



LEGEND:				
	FLOOR DRAIN			ELECTRICAL PANEL
	ROOF DRAIN			1 HR FIRE RATED WALL
	HOSE BIB			2 HR FIRE RATED WALL
	WALL TAG			3 HR FIRE RATED WALL
	DOOR TAG	2 HR RATED SHAFT WALL S22 PROVIDE S22 ON WET RM SIDE		
	WINDOW TAG			

GENERAL NOTES:	
1.	PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 88
2.	ALL PARTITION TYPES TO BE W22 U.O.N
3.	ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION.

KEY NOTES:

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

		A-109.00	
CADD FILE NO.:		<small>if you have a .dwg or .dwt file, please email it to: info@autocaddesign.com</small> <small>or fax to: 800-368-5848</small>	## OF##



DOBOWN #Q00646754-1	
DRAWING TITLE	
BUILDING ELEVATIONS - WEST	
DATX (MM/DD/YY)	2022-01-12
PROJECT No.	CAGE 98003
DRAWING BY:	FFA
CHEK BY:	FFA
A-300.00	
CADD FILE No.	# OF SHEET
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BUILDING 3A
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 1

DOBNOW #Q00646754-I1

BUILDING ELEVATIONS - EAST

DATE (MM-DD-YY):	2022-01-12
PROJECT No.:	CAPE_09003
DRAWING BY:	FFA
CHEK BY:	FFA

A-301.00

CADD FILE NO.: _____ OF _____
 I hereby certify that this drawing was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer in the State of Florida. I am not providing engineering services in any other state while contributing to this project.

 Date: _____
 Title: _____
 License No.: _____
 State: _____



FOGARTY | FINGER
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GENERAL NOTES

1. PROJECT CONSTRUCTION DATA AND BASE.
PLANE $+0'-0"$ = EL. $+12'-00"$ (NAVD 88)
2. SEE A-400S FOR TYPICAL WALL TYPES
3. FACADE GLASS, GLASS RAILINGS, AND OTHER EXTERIOR GLASS SHALL COMPLY WITH AMENDMENTS TO THE NEW YORK CITY BUILDING CODE (CODES MANUATED BY LOCAL LAW 15 OF 2020. BIRD-FRIENDLY GLASS SHALL MEET THE DEFINITION OF BIRD-FRIENDLY MATERIAL AS DEFINED BY CODE. EXCEPTIONS TO BIRD-FRIENDLY MATERIALS SHALL BE FOLLOWED PER LOCAL LAW 15/2020.
4. SEE RCP AND ELEC. DWGS FOR EXTERIOR LIGHTING FIXTURE LOCATIONS. SEE LOW VOLTAGE DWGS FOR INTERCOMS AND SECURITY CAMERAS
5. SEE MEP DWGS FOR EXTERIOR WALL PENETRATIONS. LOUVER LOCATIONS TO BE COORDINATED WITH MECH. DWGS

KEY NOTES LEGEND

1 UNDER DIFFERENT APPLICATION

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

JAM CONSULTANTS INC
104 WEST 29TH STREET, 9TH FLOOR
NEW YORK, NY 10001

SEAL & SIGNATURE

REGISTERED ARCHITECT
INSPECTOR GENERAL
STATE OF NEW YORK
1892

[illegible]

MATERIALS LEGEND

	 BR-01	BRICK
	 EF-1	EIFS

01	12.17.2021	DOB FOUNDATION FILING
No.	DATE	ISSUE
PROJECT		

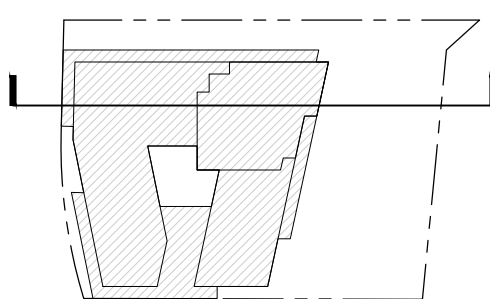
BUILDING 3A
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 1

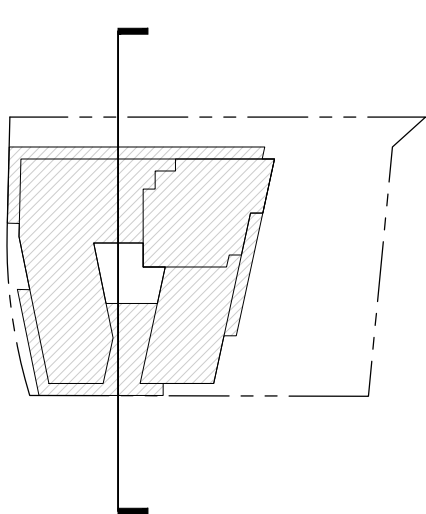
DOBNOW #Q00646754-I1

BUILDING ELEVATION
- SOUTH

DATE (MM-DD-YY):	2022
PROJECT No.:	CAP
DRAWING BY:	
CHK BY:	

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ADD FILE No.: 444 C



A-351.0

BUILDING 3B
ASTORIA COVE
ASTORIA, NY 11217

FILING SET
DECEMBER 17TH, 2021

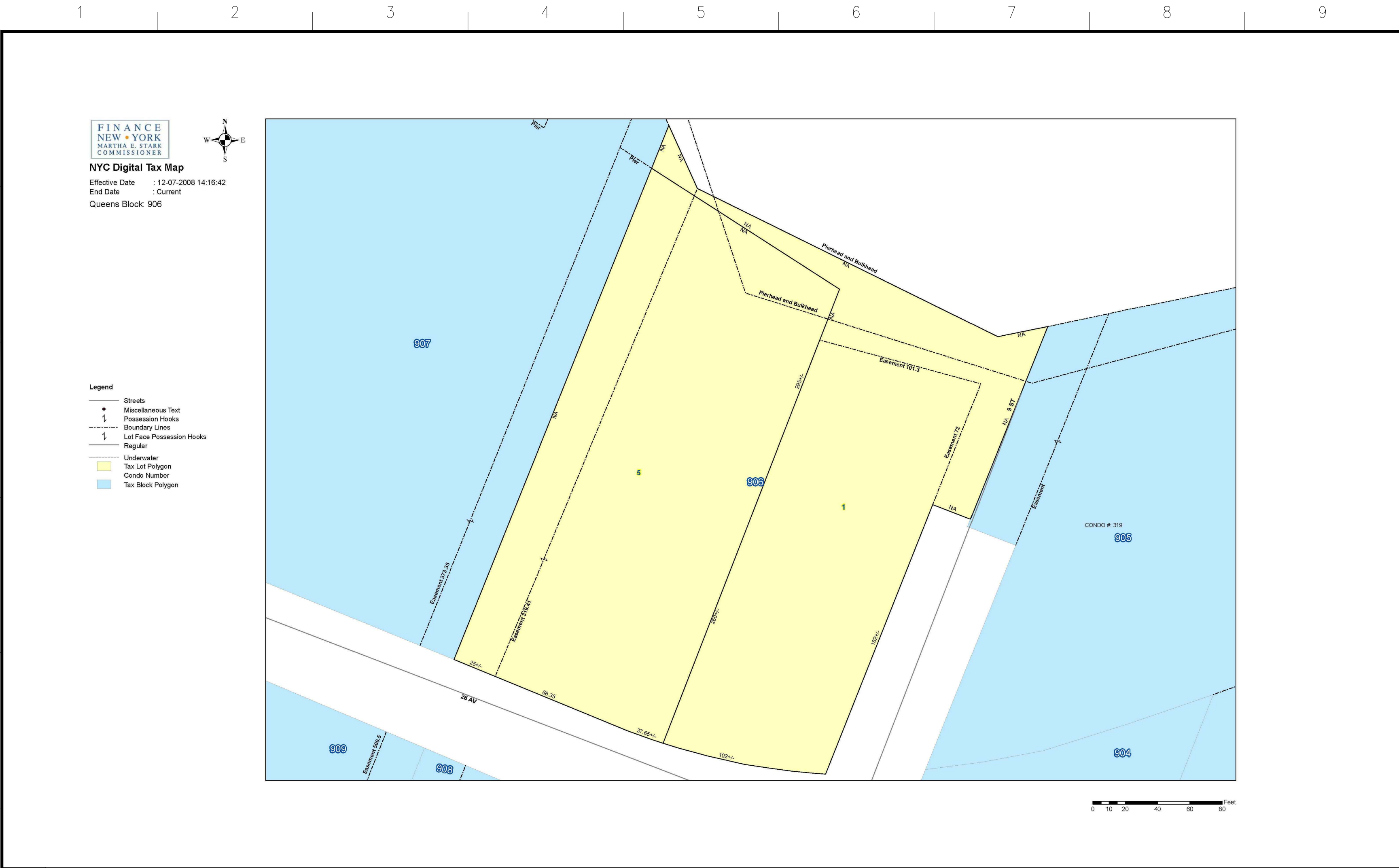
ARCHITECTURE

Building #3A: Block: 906, Lot: 1: Q00646754-I1

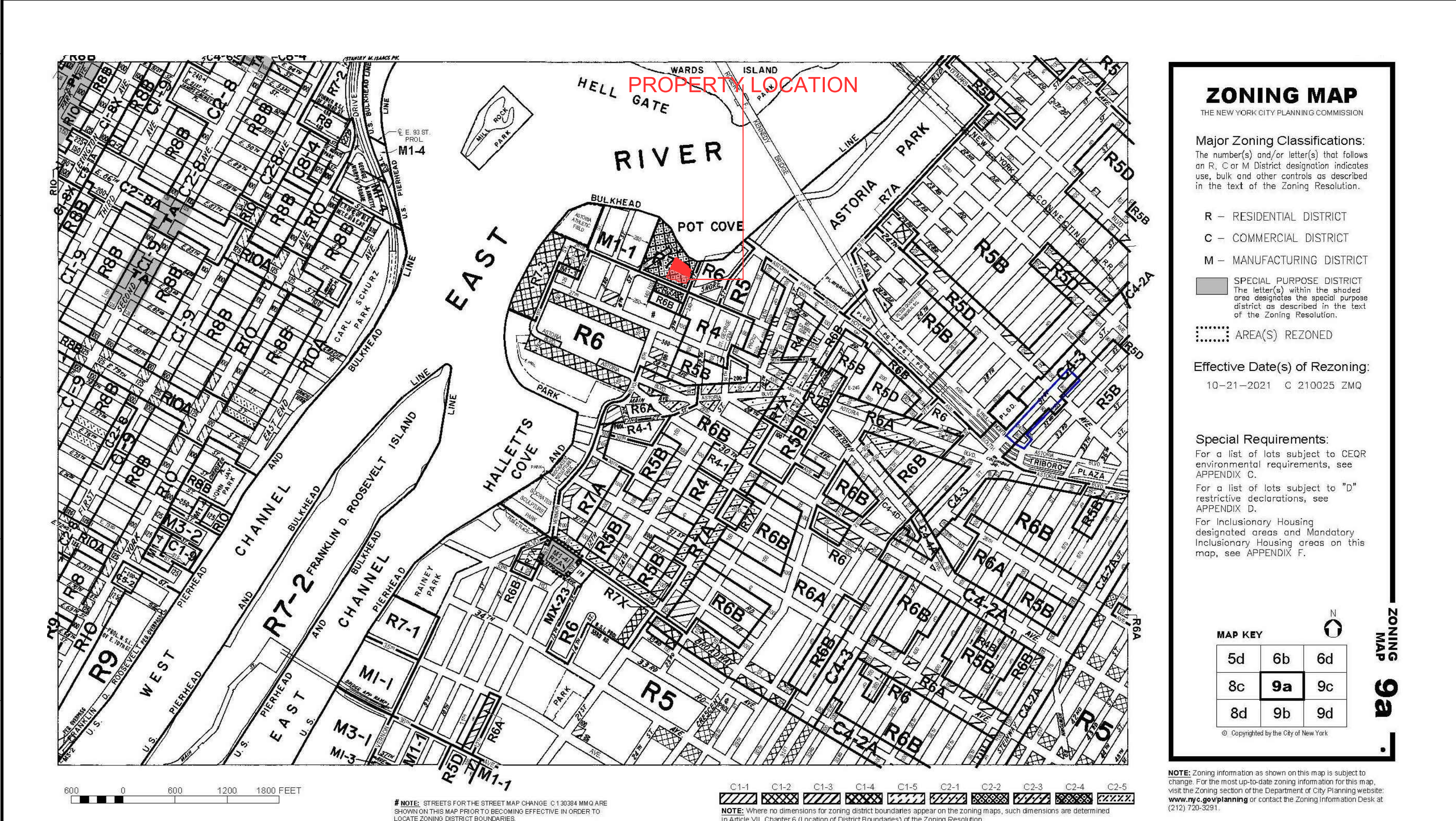
Building #3B: Block: 906, Lot: 5: Q00646756-I1

Building #4: Block: 909, Lot: 35: Q00646746-I1

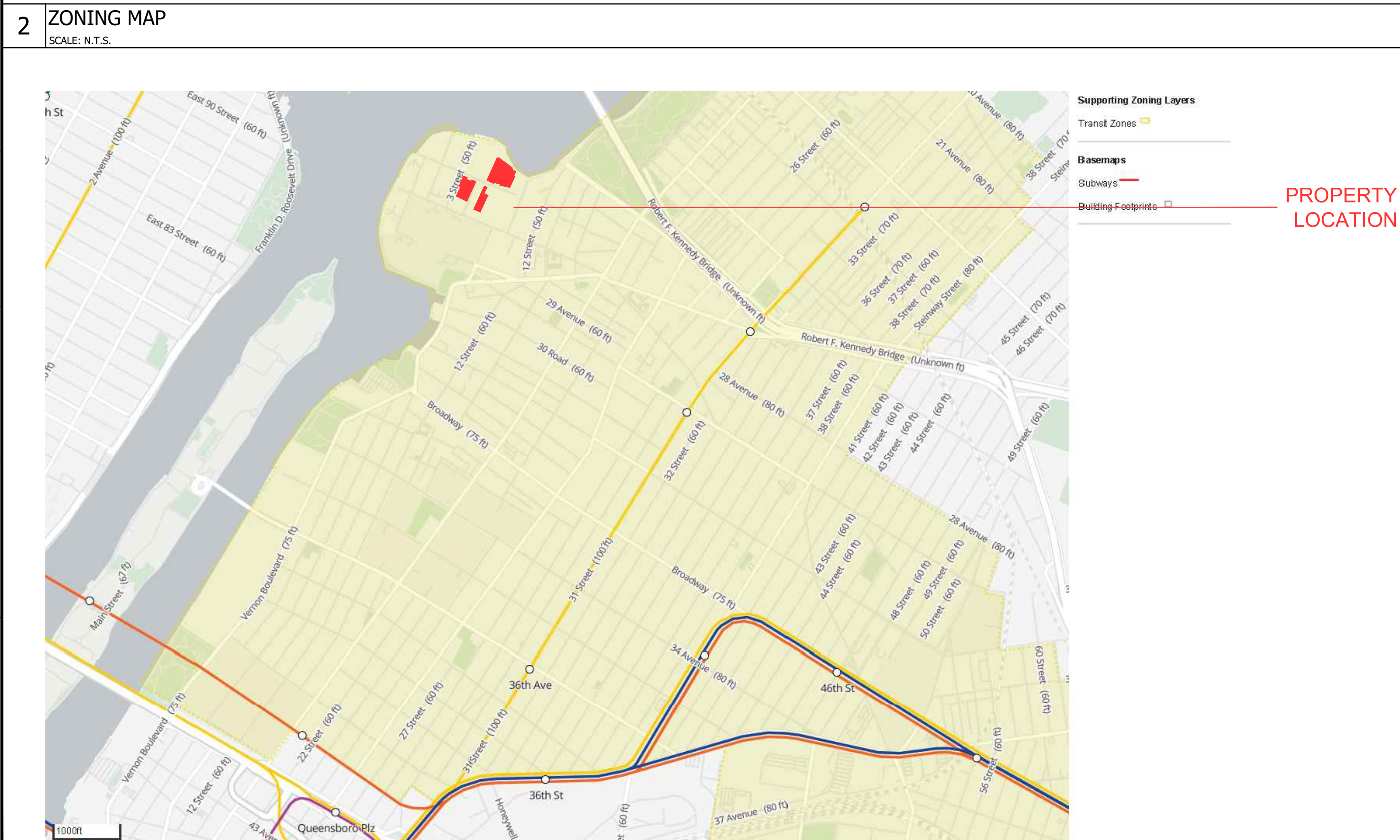
Building #5: Block: 908, Lot: 12: Q00646751-I1



1 TAX MAP
SCALE: N.T.S.



2 ZONING MAP
SCALE: N.T.S.



3 TRANSIT ZONE MAP
SCALE: N.T.S.

GENERAL BUILDING DATA

BUILDING LIMITATIONS		
CATEGORY	CODE SECTION	CRITERIA
1. APPLICABLE BUILDING CODES: HANDICAPPED LAWS AND GUIDELINES		TITLE 28 OF THE ADMINISTRATIVE CODE THE NEW YORK CITY CONSTRUCTION CODES (2008) LL 58.87 HANDICAPPED ACCESSIBILITY: ANSI - 117.1, ALL DWELLING UNITS - TYPE B ALL TOILET AND BATHING FACILITIES TO COMPLY WITH APPENDIX-P
2. BUILDING OCCUPANCY	28.2-310.1.2	GROUP R-2: APARTMENT GROUP M: RETAIL
3. CONSTRUCTION CLASSIFICATION	BC 602 TABLE 601	TYPE 1B
4. HEIGHT LIMITATIONS, GROUP R-2, CONSTRUCTION TYPE 1-B	BC 503 TABLE 503	UNLIMITED STORIES
5. NATURAL LIGHT	BC 1205	LIGHTING
6. NATURAL VENTILATION	BC 1203	VENTILATION
7. FIRE RESISTANCE RATING REQUIREMENT (TABLE 601 & 602)		
CONSTRUCTION ELEMENT		RATING IN HOURS
STRUCTURAL FRAMING (INC. COLUMNS, GIRDERS, TRUSSES)		3
BEARING WALLS _ EXTERIOR		3
BEARING WALLS _ INTERIOR		3
NONBEARING WALLS & PARTITIONS EXTERIOR		SEE TABLE 602
(a) ROOF SUPPORTS: FIRE RESISTANCE RATINGS OF STRUCTURAL FRAME AND BEARING WALLS ARE PERMITTED TO BE REDUCED BY 1 HOUR WHERE SUPPORTING ROOF ONLY.		
NONBEARING WALLS & PARTITIONS INTERIOR		0
FLOOR CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS		2
ROOF CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS		1b
SHAFT ENCLOSURE		2
8. SPRINKLERS	FULLY SPRINKLERED ALL FLOORS	
9. INTERIOR FINISH CLASS	VERTICAL EXITS AND EXIT PASSAGEWAYS EXIT ACCESS CORRIDORS	CLASS B CLASS B CLASS C (R2) CLASS B (M)
BC 803 TABLE 803.5	ROOMS AND ENCLOSED SPACES	
10. EGRESS REQUIREMENTS (FULLY SPRINKLERED)		
OCC. CLASS	TRAVEL DIST.	CAPACITY
R2	200'	NO. OF OCCUPANTS 0.2" PER OCC DOORS
M	200'	0.3" PER OCC STAIRS
		MIN WIDTH 44"
		DEAD END 80'
11. EXIT ACCESS TRAVEL DISTANCE TABLE 1016.1		
12. LOCATION OF EXITS 1015.2.1.3		
13. EXIT DOORS 1008.1.1.1		
14. STAIRS 1009.1		
15. FIRE WALL RESISTANCE RATING PER TABLE 706.4		
16. HORIZONTAL CONTINUITY PER 706.5		
17. VERTICAL CONTINUITY PER 706.6		
18. OPENINGS PROTECTION PER TABLE 715.4		
19. POSTING OF OCCUPANT LOAD PER 1004.3		

NYCECC NOTE

TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE NEW YORK CITY ENERGY CODE. PROPOSED WORK MEETS THE GUIDELINES AND PRESCRIPTIONS OUTLINED IN THE 2020 NYCECC.

CONTROLLED INSPECTIONS

1. CONTROLLED INSPECTIONS AND ALL RELATED ENGINEERING AND TESTING SERVICES SHALL BE OBTAINED BY THE CONTRACTOR FOR THE FOLLOWING AREAS OF WORK: SEE ALSO STRUCTURAL AND MEP DRAWINGS.

THE FOLLOWING MATERIALS, OPERATIONS AND EQUIPMENT RELATED TO THE WORK DESCRIBED IN THESE DOCUMENTS AND SUBJECT TO SPECIAL INSPECTION AS DESCRIBED BY THE NEW YORK CITY BUILDING CODE 2014.

NEW BUILDING APPLICATION - SPECIAL INSPECTION ITEMS		
A. STRUCTURAL STEEL - WELDING	BC1704.3.1	
B. STRUCTURAL STEEL - DETAILS	BC1704.3.2	
C. STRUCTURAL STEEL - HIGH STRENGTH BOLTING	BC1704.3.3	
D. CONCRETE - CAST-IN-PLACE	BC1704.4	
E. MASONRY	BC1704.5	
F. SUB-GRADE INSPECTION	BC1704.7.1	
G. SUBSURFACE INVESTIGATIONS (BORING/TEST PITS)	BC1704.7.4	(TR4)
H. WALL PANELS, CURTAIN WALLS, AND VENEERS	BC1704.10	
I. SITE STORM DRAINAGE DISPOSAL & DETENTION SYSTEM INSTALLATION	BC1704.20	
F. EXCAVATIONS-SHEETING, SHORING, & BRACING	BC1704.20.2	
G. MECHANICAL SYSTEMS	BC1704.16	
H. EXCAVATIONS - SHEETING, SHORING, AND BRACING	BC1704.20.2	
I. PRIVATE ON-SITE STORM WATER DRAINAGE DISPOSAL SYSTEMS, AND DETENTION FACILITIES INSTALLATION	BC1704.21.1.2	
J. SPRINKLER SYSTEMS	BC1704.21	
K. STANDPIPE SYSTEMS	BC1704.23	
L. HEATING SYSTEMS	BC1704.25	
M. FIRE-RESISTANT PENETRATIONS AND JOINTS	BC1905.3	(TR3)
N. CONCRETE DESIGN MIX	BC1913.5	
	BC1905.6	(TR2)
	BC1913.10	
O. CONCRETE SAMPLING AND TESTING	OTCR BB2015-01	(TR1)
P. ALTERNATIVE MATERIALS		

PROGRESS INSPECTION ITEMS		
Q. FOOTING AND FOUNDATION	BC110.3.1	
R. ENERGY CODE COMPLIANCE INSPECTIONS	BC110.3.5	(TR8)
S. FIRE RESISTANCE RATED CONSTRUCTION	BC110.3.5	

ENERGY CODE PROGRESS INSPECTION ITEMS		
A. PROTECTION OF FOUNDATION INSULATION	IA1, IIA1	
B. INSULATION PLACEMENT AND R-VALUES	IA2, IIA2	
C. FENESTRATION THERMAL VALUES AND RATINGS	IA3, IIA3	
D. FENESTRATION RATINGS OF AIR LEAKAGE	IA4, IIA4	
E. FENESTRATION AREAS	IA5, IIA5	
F. AIR SEALING AND INSULATION - VISUAL	IA6, IIA6	
G. VESTIBULES	IA9, IIA9	
H. SHUTOFF DAMPERS	IB3, IIB2	
I. HVAC AND SERVICE WATER HEATING EQUIP.	IB3, IIB3	
J. HVAC AND SERVICE WATER HEATING SYS. CONTROLS	IB4, IIB4	
K. DUCT PLENUM & PIPING INSULATION & SEALS	IB5, IIB5	
L. ELECTRICAL METERING	IC1, IIC1	
M. LIGHTING IN DWELLING UNITS	IC2, IIC2	
N. INTERIOR LIGHTING POWER	IC3	
O. EXTERIOR LIGHTING POWER	IIC4	
P. LIGHTING CONTROLS	IC5	
Q. EXIT SIGNS	IIC6	
R. ELECTRIC MOTORS	IIC7	
S. MAINTENANCE INFORMATION	ID1, IID1	

2. VERIFY IN FIELD ALL EXISTING CONDITIONS AND CONTACT THE ARCHITECT WHEN A CONDITION IN THE FIELD DOES NOT COMPLY WITH THESE DOCUMENTS, INCLUDING ANY AND ALL DEVIATIONS OF DIMENSIONS SHOWN HERE-IN. THESE DEVIATIONS MUST BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO INSTALLATION OF SAME.
3. THE COMMISSIONER MAY ACCEPT SIGNED STATEMENTS BY ARCHITECTS AND ENGINEERS RETAINED BY THE CONTRACTOR AND SUPPORTING INSPECTIONS AND TEST REPORTS SUPPLIED BY THE CONTRACTOR WITHOUT VERIFYING INSPECTION OR TEST BY DEPARTMENT INSPECTORS PER C27-209.
4. EQUIPMENT REQUIRING USE OF PERMITS SHALL BE INSPECTED AND TESTED TO DETERMINE PROPER FUNCTIONING AND COMPLIANCE WITH THE BUILDING CODE AND OTHER APPLICABLE LAWS AND REGULATIONS. ALL INSPECTIONS AND TESTS SHALL BE CONDUCTED IN ACCORDANCE WITH THE REQUIRED INSPECTION AND OF HEATING SYSTEM, A SIGNED STATEMENT BY ARCHITECT OR ENGINEER RETAINED BY THE CONTRACTOR SHALL TEST PROCEDURES AND SIGNED COPIES OF REQUIRED INSPECTIONS AND TEST BE SUBMITTED WITH THE PERMIT APPLICATION, STATING THAT THE SYSTEM HAS REPORTS SHALL BE FILED WITH THE DEPARTMENT OF BUILDINGS AND FORM BEEN OPERATED AND FUNCTIONS SATISFACTORILY, AND THAT TO THE BEST OF PART OF THE PAPERS ACCOMPANYING THE PERMIT APPLICATION. IN THE CASE HIS KNOWLEDGE AND BELIEF, THE SYSTEM WILL MEET THE CODE TEMPERATURE REQUIREMENT.
5. ALL DRAWINGS AND CALCULATIONS PREPARED BY THE OWNER'S CONTROLLED INSPECTING AGENT SHALL BEAR AN ORIGINAL SIGNATURE AND SEAL INDICATING THE INSPECTOR'S NEW YORK STATE REGISTRATION. DUPLICATE COPIES OF ALL DRAWINGS AND CALCULATIONS SHALL BE FORWARDED TO THE OWNER PRIOR TO COMMENCING ANY OF THE TEMPORARY WORK REPRESENTED IN THOSE DOCUMENTS. THE OWNER WILL IN TURN, TRANSMIT THOSE DOCUMENTS TO THE STRUCTURAL ENGINEER OF RECORD FOR HIS REVIEW.
6. THE STRUCTURAL ENGINEER OF RECORD WILL ONLY REVIEW THE DOCUMENTS FOR HOW THE SHORING, BRACING AND OTHER TEMPORARY CONSTRUCTION INTERACTS AND AFFECTS THE EXISTING STRUCTURE. THE STRUCTURAL ENGINEER OF RECORD REVIEW SHALL NOT BE CONSTRUED AS COMPLETE CHECK, NOR RELIEVE THE OWNER'S CONTROLLED INSPECTING AGENT FROM RESPONSIBILITY FOR ERRORS OF ANY SORT NOR FROM THE NECESSITY OF FURNISHING ANY ADDITIONAL DETAILS OR CALCULATIONS WHICH MAY HAVE BEEN OMITTED OR REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION.

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t 212 966 7450 f 212 966 7444

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DESIMONE CONSULTING ENGINEERS
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MEP ENGINEER

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NEW YORK, NY 10011

SEAL & SIGNATURE

REGISTERED ARCHITECT
STATE OF NEW YORK
668860

KEY PLAN

8TH STREET NEW - (8' NARROW)
8TH STREET NEW - (8' NARROW)
8TH STREET NEW - (8' NARROW)
8TH STREET NEW - (8' NARROW)

01 12 17 2021 DOB FOUNDATION FILING
% DATE ISSUE

PROJECT

**BUILDING 3B
ASTORIA COVE**
QUEENS, NY 11217
BLOCK 906, LOT 5

DOB NOW #Q00646756-11

DRAWING TITLE

TITLE SHEET

DATE (MM-DD-YY) 2022-01-12
PROJECT NO. CAPE 20001
DRAWING BY FFA
CHK BY FFA

T-001.00

CADD FILE NO. 02 OF 000

GENERAL NOTES

1. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL WORK PERMITS, SIDEWALK SHED PERMIT, LICENSES, TESTS AND ALL OTHER REQUIRED CERTIFICATES FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK.
2. THE CONTRACTOR SHALL OBTAIN ALL SIGN-OFFS FROM APPLICABLE MUNICIPAL AGENCIES FOR ALL WORK COMPLETED.
3. MAINTAIN A CURRENT AND COMPLETE SET OF CONTRACT DOCUMENTS AT THE JOB SITE.
4. MAINTAIN A TELEPHONE AND FAX MACHINE WITH WORKING PHONE LINES THROUGHOUT THE PROGRESS OF THE WORK.
5. ERECT AND MAINTAIN, AS REQUIRED BY EXISTING FIELD CONDITIONS THROUGHOUT THE ENTIRE PROGRESS OF THE WORK, ALL SAFEGUARDS AND BARRICADES FOR SAFETY INCLUDING POSTING WARNING SIGNS ENFORCING REGULATIONS AND PROTECTION OF PROPERTY.
6. VERIFY EXISTING CONDITIONS. NOTIFY ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES BEFORE COMMENCEMENT OF WORK.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATELY BRACING AND PROTECTING ALL WORK DURING CONSTRUCTION AGAINST DAMAGES, BREAKAGES, COLLAPSE, DISTORTIONS AND OFF-ALIGNMENT ACCORDING TO APPLICABLE CODES, STANDARDS AND GOOD PRACTICE.
8. ALL NOTES HEREIN MENTIONED WITH THOSE ON THE VARIOUS DRAWINGS SHALL APPLY TO ALL DRAWINGS AND FORM PART OF THE CONTRACT.
9. EACH CONTRACTOR WILL BE HELD STRICTLY RESPONSIBLE FOR HIS WORK. ANY DISCREPANCIES ON THE PLANS OR DETAILS SHALL BE CALLED TO THE ATTENTION OF THE ARCHITECT.
10. PRIOR TO CLOSING OF ANY CEILINGS, ALL MECHANICAL SYSTEMS (i.e. HVAC, PLUMBING, SPRINKLER AND ELECTRICAL) ARE TO BE INSPECTED AND WHERE REQUIRED, TESTED BY LOCAL AUTHORITIES AND/OR TESTING AGENCIES HAVING JURISDICTION TO INSURE THEIR PROPER INSTALLATION AND FUNCTION.
11. CEILING HEIGHTS ARE DIMENSIONED IN RELATIONSHIP TO THE FINISHED FLOOR, UNLESS SPECIFICALLY NOTED.
12. LIGHT FIXTURES SHOWN IN ACQUSTICAL TILE CEILING ARE TO BE LOCATED IN THE CENTER OF THE NEAREST LOCATED TILE, UNLESS OTHERWISE NOTED IN PLANS.
13. ALL ELECTRICAL WORK IS TO BE COORDINATED WITH HVAC WORK, PLUMBING, WOODWORK, PARTITIONS, AND ALL OTHER WORK.
14. COORDINATE ALL TELEPHONE WORK WITH OWNERS REPRESENTATIVE AND LOCAL TELEPHONE COMPANY BEFORE STARTING WORK.
15. SHOP DRAWINGS ARE REQUIRED FOR ALL TRADES. SEE SPECIFICATIONS FOR FURTHER INFORMATION.
16. ALL WORK SHOWN ON THESE DRAWINGS IS INCLUDED IN THIS CONTRACT UNLESS SPECIFICALLY NOTED OTHERWISE.
17. ALL GYPSUM BOARD (INCLUDING BUT NOT LIMITED TO CEILINGS, SOFFITS, FASCIA'S, COLUMN ENCLOSURES, ETC.) ARE TO BE TAPED, SANDED, PRIMED AND PAINTED, UNLESS NOTED OTHERWISE.
18. CHECK ALL HEIGHTS AND POSSIBLE CEILING CONDITIONS FOR CLEARANCE OF DUCTWORK AND ALL OTHER CONSTRAINTS TO ASSURE THE LOCATION AND SIZE OF ALL SYSTEMS TO BE INSTALLED. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT IN WRITING IMMEDIATELY BEFORE PROCEEDING WITH THE WORK.
19. CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND ARCHITECTS OFFICE MUST BE NOTIFIED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN BY THESE DRAWINGS.
20. ALL CONSTRUCTION, DIMENSIONS AND DETAILS SHALL CONCUR WITH AND BE DETERMINED FROM THESE DRAWINGS ONLY.
21. DRAWINGS ARE NOT TO BE SCALED FOR INFORMATION.
22. ALL PERMITS ISSUED BY THE DEPARTMENT OF BUILDINGS SHALL BE POSTED IN A CONSPICUOUS PLACE OPEN TO PUBLIC INSPECTION FOR THE ENTIRE TIME OF THE PROSECUTION OF THE WORK OF THE USE AND OPERATION OF THE EQUIPMENT OR UNTIL THE EXPIRATION OF THE PERMIT.
23. ALL ELEVATIONS REFER TO NAVD83 DATUM.
24. 2014 BC 3301 TO BE FOLLOWED DURING DEMOLITION AND CONSTRUCTION.
25. NB APPLICATION - XXXXXXXXXX.
26. RELATED APPLICATIONS FILED WITH DOB NOW:
MS - XXXXXXXXXX
PL - XXXXXXXXXX
SPED - XXXXXXXXXX
ST - XXXXXXXXXX
CC - XXXXXXXXXX
BPP - XXXXXXXXXX

BUILDING DEPARTMENT NOTES

- ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE 2014 BUILDING CODE OF THE CITY OF NEW YORK.
1. SAFETY OF PUBLIC AND PROPERTY DURING CONSTRUCTION OPERATIONS SHALL COMPLY WITH ALL PROVISIONS OF SUBCHAPTER 1 OF CHAPTER 1 OF TITLE 27.
2. CONSTRUCTION SHALL COMPLY WITH ALL FEDERAL, STATE AND LOCAL CODES, ORDINANCES, RULES AND REGULATIONS PERTAINING TO LABOR AND MATERIALS.
3. ALL MATERIALS, ASSEMBLIES FORMS AND METHODS OF CONSTRUCTION SHALL COMPLY WITH ARTICLE SEVEN OF SUBCHAPTER 1 OF CHAPTER 1 OF TITLE 27.
4. AT LEAST 24 HOUR WRITTEN NOTICE SHALL BE GIVEN TO THE COMMISSIONER BEFORE COMMENCEMENT OF WORK (27-195).
5. THE ARCHITECT OF RECORD HAS NOT BEEN RETAINED FOR ANY FIELD SUPERVISION OR INSPECTION; HIS RESPONSIBILITY IS LIMITED TO THE ACCURACY OF THE PLANS, ALL CONTROLLED AND OTHER REQUIRED INSPECTIONS AND TESTING AND SUPERVISION SHALL BE SUPPLIED BY THE CONTRACTOR.
6. ALL MATERIALS, ASSEMBLIES, FORMS AND METHODS OF CONSTRUCTION AND SERVICE EQUIPMENT SHALL MEET THE FOLLOWING REQUIREMENTS:
IT SHALL HAVE BEEN ACCEPTABLE PRIOR TO THE EFFECTIVE DATE OF THE CODE BY THE BOARD OR SHALL HAVE BEEN ACCEPTED FOR USE UNDER THE PRESCRIBED CODE TEST METHODS BY THE COMMISSIONER OR APPROVED BY THE BOARD OF STANDARDS AND APPEALS (C27-131).
7. AS PER 27-328(a), (b), (c), (d), (e) FIRE RETARDANT WOOD MAY BE USED FOR INTERIOR FURRING AND BLOCKING OF EXTERIOR WALLS, AND FURRING AND BLOCKING OF INTERIOR WALLS AND PARTITIONS. FIRE-RETARDANT WOOD SHALL HAVE A FLAME SPREAD RATING NOT GREATER THAN 25 AS PER RS 5-3 AND RS 5-4. SUCH WOODS SHALL BEAR THE IDENTIFICATION OF A TESTING LABORATORY. FIRE RETARDANT WOOD MAY NOT BE USED WHERE EXPOSED TO THE WEATHER.
8. ALL MATERIALS OR ASSEMBLIES REQUIRED TO HAVE A FIRE RESISTANCE RATING SHALL COMPLY WITH ONE OF THE FOLLOWING:
IT SHALL CONFORM WITH NFPA "FIRE RESISTANCE RATING" - "DECEMBER 1964" CRIT SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ASTM E-119-1961, "STANDARD METHODS OF FIRE TESTS OF BUILDING CONSTRUCTION AND MATERIALS" AND ACCEPTED BY THE COMMISSIONER, OR IT SHALL HAVE BEEN ACCEPTABLE PRIOR TO THE EFFECTIVE DATE OF THE CODE.
9. ALL MATERIALS, ASSEMBLIES AND METHODS OF CONSTRUCTION REGULATED BY THE CODE AND NOT LISTED HEREIN SHALL BE SUBJECT TO INSPECTION BY THE CONTRACTOR AND HIS INSPECTING ENGINEER. SIGNED COPIES OF ALL TEST AND INSPECTION REPORTS SHALL BE FILED WITH THE DEPARTMENT OF BUILDINGS AS REQUIRED BY THE CONTRACTOR'S INSPECTING ENGINEER.
10. WHERE PIPES, WIRES, CONDUITS, DUCTS, ETC., PIERCE FIRE PROTECTION OF INDIVIDUALLY ENCASED STRUCTURAL MEMBERS, SUCH PENETRATION SHALL NOT EXCEED 2 PERCENT OF ANY ONE FACE SUCH PROTECTION AND SHALL BE CLOSED OFF WITH CLOSE FITTING METAL ESCUTCHEONS OR PLATES (C27-324A).
11. OPENING PROTECTIVES INCLUDING FRAMES, SELF-CLOSING DEVICES AND HARDWARE SHALL COMPLY WITH ASTM E-152-1961 "STANDARD METHODS OF FIRE TEST OF DOOR ASSEMBLIES" AND ASTM E-153-1965 "STANDARD METHODS OF FIRE TEST OF WINDOW ASSEMBLIES" AND SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH NFPA 80, 81-1967 "INSTALLATION OF FIRE DOORS AND WINDOWS", OPENING PROTECTIVES SHALL BE LABELED, CERTIFYING PERFORMANCE RATING, AND SHALL HAVE BEEN ACCEPTED BY THE COMMISSIONER OR THE BOARD OF STANDARD AND APPEALS (C27-329).
12. INTERIOR FIRE SEPARATIONS AND FIRE DIVISIONS TO BE AS PER TABLE 5-1-5.2.
13. SMOKE DENSITY RATING TO BE AS PER SEC. 27-343.
14. INTERIOR FINISHES TO BE AS PER SEC. 27-348 AND TABLE 5-4.
15. SPACES SHALL COMPLY WITH HANDICAP REQUIREMENTS AS PER SUB-ARTICLE 2 OF SUB-CHAPTER 14 AND AS AMENDED BY LOCAL LAW 58/1987, AND THE ADA OF 1990.
16. ALL REQUIRED FIRESTOPPING SHALL BE IN ACCORDANCE WITH SEC. 27-328. ALL EXIT DOORS SHALL BE FIREPROOF SELF-CLOSING WITH REQUIRED LABEL.
17. STAIR ENCLOSURES SHALL BE VENTED IN ACCORDANCE WITH 27-344.D.
18. ALL EXITS SHALL BE KEPT READILY ACCESSIBLE AND UNOBSTRUCTED AT ALL TIMES.(TABLE 6-1)
19. ALL EXIT DOORS SHALL BE FIREPROOF SELF-CLOSING WITH REQUIRED LABEL, RATINGS IN ACCORDANCE WITH SEC. 27-371.
20. STAIRS SHALL HAVE HANDRAILS ON EACH SIDE (EXCEPT STAIRS LESS THAN 44 INCHES IN WIDTH), HAVING FINGER CLEARANCE 1 1/2 INCHES, PROJECTING NOT MORE THAN 3 1/2 INCHES INTO THE REQUIRED STAIR WIDTH.
21. HEIGHT OF HANDRAIL SHALL BE BETWEEN 30" AND 34" ABOVE THE THREAD NOSING. HANDRAILS SHALL BE RETURNED TO WALLS AND POSTS AT THEIR TERMINATION. MATERIALS OF HANDRAILS SHALL HAVE A FLAME/SPREAD RATING NOT EXCEEDING 150. HANDRAILS SHALL BE DESIGNED TO RESIST A SIMULTANEOUS APPLICATION OF A LATERAL FORCE OF 40 PLF AND A VERTICAL LOAD OF 50 PLF. LANDINGS AND PLATFORMS SHALL BE ENCLOSED ON SIDES BY WALL OR RAILINGS, AT LEAST 3'-0" HIGH. RISERS SHALL BE MAXIMUM 7 1/2" HIGH, EXCEPT 7 3/4" HIGH AT RESIDENTIAL AREAS. TREADS MINIMUM 1'-0" WIDE EXCLUSIVE OF NOSING AND THE SUM OF 2 RISERS PLUS 1 TREAD EXCLUSIVE OF NOSING SHALL NOT BE LESS THAN 24 NOR MORE THAN 25 1/2 INCHES.
22. TREAD STRINGERS AND LANDINGS SHALL BE BUILT OFF OR SURFACED WITH NON-SKID MATERIALS.
23. ALL ASSEMBLY SPACES SHALL BE PROVIDED WITH EMERGENCY LIGHTING TO STREET ILLUMINATION OF AT LEAST 5 FOOTCANDLES MEASURED AT THE FLOOR LEVEL, SHALL BE MAINTAINED CONTINUOUSLY IN EXITS AND THEIR ACCESS FACILITIES (C27-542).
24. EXIT LIGHTING SHALL BE ON CIRCUITS THAT ARE SEPARATE FROM ANY OTHER CIRCUITS, WITH BATTERY OR EMERGENCY BACK UP, AND SHALL CONFORM TO SECTION 27-381.
25. LOCATION OF EVERY EXIT ON EVERY FLOOR SHALL BE CLEARLY INDICATED BY EXIT SIGN PLACED, IF REQUIRED, AT AN ANGLE WITH THE EXIT OPENING. INSTALL DIRECTIONAL SIGNS TO SERVE AS GUIDE FROM ALL PORTIONS OF THE CORRIDOR OR FLOOR. SIGNS SHALL BE ON SEPARATE CIRCUITS, TAKEN OFF AHEAD OF THE MAIN SWITCH (C27-383 - C27-387).

HOUSING MAINTENANCE & MULTIPLE DWELLING LAWS

1. PREMISES TO COMPLY WITH ARTICLE 17 OF HMC FOR HEAT AND HOT WATER. HEAT TO BE SUPPLIED BETWEEN OCTOBER 1 TO MAY 31; BETWEEN THE HOURS OF 6 AM TO 10 PM, 68 DEGREES F. AND BETWEEN 10 PM TO 6 AM 55 DEGREES.
2. PAINTING OF PUBLIC PARTS AND WITHIN THE DWELLING TO COMPLY WITH SECTION D26-12.01 HMC.
3. PREMISES TO BE MAINTAINED AND KEPT FREE OF RODENTS AND INSECT INFESTATION AS PER SECTION D26-13.03 AND D26-13.05 HMC.
4. RECEPTACLES FOR COLLECTION OF WASTE MATTER TO BE PROVIDED AS PER SECTION D26-14.03 HMC.
5. DRAINAGE OF ROOFS, COURTS AND YARD TO COMPLY WITH SECTION D26-16.03 HMC.
6. PROPER ELECTRIC LIGHTING EQUIPMENT WITHIN DWELLING TO BE PROVIDED AND MAINTAINED AS PER SECTION D26-19.01, 19.03, 19.04 HMC.
7. PROPER ELECTRIC LIGHT TO BE PROVIDED AT OR NEAR THE FRONT ENTRANCE DOORS AND IN YARDS AND COURTS AS PER SECTION D26-10.07 HMC AND CONNECTED TO HOUSE LINES SERVING PUBLIC HALLS.
8. BOARD OF STANDARDS AND APPEALS APPROVED TYPE PEEPOLES APPROXIMATELY 5 FEET ABOVE FURNISHED FLOOR TO BE PROVIDED IN ENTRANCE DOORS AND DWELLING UNITS AS PER SECTION D26-01 HMC AND DEPARTMENT OF RULES AND REGULATIONS.
9. KEY LOCK IN THE ENTRANCE DOOR TO EACH DWELLING UNIT WITH AT LEAST ONE KEY TO BE PROVIDED BY OWNER AS PER SECTION D26-20.04 HMC.
10. APPROVED TYPE MAIL RECEPTACLES AND DIRECTORY OF PERSONS LIVING IN DWELLING TO BE PROVIDED AS PER 22-51 HMC AND REGULATIONS OF THE POST OFFICE DEPARTMENT.
11. PROPER FLOOR SIGNS TO BE PROVIDED IN PUBLIC HALL NEAR STAIRS AND WITHIN STAIRS ENCLOSURES AS PER SECTION D26-22.08 HMC AND DEPARTMENT RULES AND REGULATIONS.
12. PROPER STREET NUMBERS TO BE PROVIDED IN FRONT OF THE DWELLING AS PER SECTION D26-21.05 HMC AND RULES AND REGULATIONS OF THE BOROUGH PRESIDENT.
13. REGISTRATION STATEMENT TO BE FILED AS PER SECTION D26-41.01 AND D26 41.03
14. REGISTRATION IDENTIFICATION SIGN CONTAINING DWELLING SERIAL NUMBER TO BE POSTED AS PER SECTION D26-41.15 HMC.
15. INTERCOM AND OR BUZZER SYSTEM TO BE INSTALLED AS PER SECTION C26-604.4 (2) AND SECTION 56 MDL.
16. FACILITIES AND EQUIPMENT SHALL COMPLY WITH D26-32.01 HMC.
17. LIGHTING AND VENTILATION SHALL COMPLY WITH D26-32.03 HMC.
18. ALL COMBUSTIBLE MATERIALS WITHIN ONE FOOT OF COOKING APPARATUS TO BE PROPERLY FIRE RETARDED AND MINIMUM 2 FOOT CLEARANCE MAINTAINED ABOVE EXPOSED COOKING SURFACE. COMBUSTIBLE MATERIAL BETWEEN THE RANGE AND 3 FEET ABOVE EXPOSED COOKING SURFACE TO BE FIRE RETARDED AS PER SECTION D26-32.05 HMC AND DEPARTMENT RULES AND REGULATIONS (IF R. MATERIAL TO BE 3/16" NON-COMBUSTIBLE MATERIAL WITH 26 GA METAL OR MATERIAL OF EQUAL FIRE RATING)
19. NO KITCHEN SHALL BE OCCUPIED FOR SLEEPING PURPOSES. SECTION D26-03.05 HMC.

SMOKE DETECTING NOTES

- SMOKE DETECTING DEVICES
1. SMOKE DETECTING DEVICES SHALL CONFORM TO SUBCHAPTER 17, ARTICLE 6 OF THE BUILDING CODE.
2. DWELLING UNITS SHALL BE EQUIPPED WITH SMOKE DETECTING DEVICES RECEIVING THEIR PRIMARY POWER FROM THE BUILDING WIRING AND THERE SHALL BE NO SWITCHES IN THE CIRCUIT OTHER THAN THE OVER CURRENT DEVICE PROTECTING THE BRANCH CIRCUIT, PROVIDED, HOWEVER, THAT DWELLING UNITS IN EXISTING UNITS IN EXISTING BUILDINGS MAY, IN THE ALTERNATIVE, BE EQUIPPED WITH BATTERY OPERATED SMOKE DETECTING DEVICES EXCEPT WHERE SUCH BUILDINGS ARE SUBSTANTIALLY IMPROVED OR ALTERED ON OR AFTER JANUARY 1, 1982, PER SEC 27-680.
3. ALL SMOKE DETECTING DEVICES SHALL BE ACCEPTED PURSUANT TO RULES AND REGULATIONS PROMULGATED BY THE COMMISSIONER, APPROVED BY THE BOARD OF STANDARDS AND APPEALS OR LISTED BY A NATIONALLY RECOGNIZED INDEPENDENT LABORATORY. NO DEVICE SHALL BE DEEMED TO BE IN COMPLIANCE WITH THIS PROVISION UNLESS IT IS OF EITHER THE IONIZATION OR PHOTO-ELECTRIC TYPE AS PER SEC 27-681.
4. ALL SMOKE DETECTORS MUST BE INSTALLED WITHIN 15'-0" OF THE ENTRANCE TO ANY SLEEPING ROOM, AND MAY BE WALL OR CEILING MOUNTED AS INDICATED ON PLANS AS PER NFPA 874-1980.
5. PROVIDE AND INSTALL AT LEAST ONE APPROVED CARBON MONOXIDE ALARM WITHIN FIFTEEN FEET OF THE PRIMARY ENTRANCE TO EACH SLEEPING ROOM.

INTERIOR DRAFTING SYMBOLS

GENERAL NOTES

1. DIMENSIONS ARE SHOWN FOR GENERAL PLACEMENT. COORDINATE FINAL FLOOR CORE LOCATIONS WITH FURNITURE VENDOR PRIOR TO INSTALLATION.
2. COORDINATE MOUNTING HEIGHTS AND LOCATIONS, EQUIPMENT REQUIREMENTS, AND CLEARANCES WITH AV CONSULTANT DRAWINGS. VERIFY WITH ARCHITECT ANY DISCREPANCIES FOR CLARIFICATION.
3. C.O. TO VERIFY ALL DIMENSIONS WITH FURNITURE PLAN PRIOR TO INSTALLATION. COORDINATE WITH ARCHITECT.

- FLOOR BOX - RECEPTION DESK FEED
6" FIRE-RATED POKE-THRU FLOOR BOX BY FSR, SMARTFIT MODEL. PROVIDE FOR THE FOLLOWING:
(1) 20A DUPLEX RECEPTACLE
(2) 2" DIAMETER EMPTY CONDUIT FITTING FOR AV AND DATA
- FLOOR BOX - MEETING ROOM TABLE FEED
6" FIRE-RATED POKE-THRU FLOOR BOX BY FSR, SMARTFIT MODEL. PROVIDE FOR THE FOLLOWING:
(1) 1 1/2" DIAMETER EMPTY CONDUIT WITH DRAGLINE. STUB UP AT NEAREST WALL OR COLUMN FOR DATA AND AV. FLOOR BOX WITH STUB-PLATE FOR (1) RJ45 AND (1) RJ11
- FLOOR BOX - FITNESS EQUIPMENT FEED
FLOOR BOX FOR POWER AND DATA
(1) COAX, (1) CAT6, (1) NEMA 5-20 OUTLET DEDICATED
(1) 3/4" DIAMETER CONDUIT FOR POWER
(1) 1" DIAMETER CONDUIT FOR DATA
- 15A DUPLEX RECEPTACLE: WALL MOUNTED FLUSH VERTICALLY @ 18" AFF UNLESS NOTED OTHERWISE
- FLUSH GROUND FAULT INTERRUPTER RECEPTACLE: WALL MOUNTED FLUSH VERTICALLY @ 18" AFF UNLESS NOTED OTHERWISE
- QUAD RECEPTACLE: WALL MOUNTED FLUSH @ 18" AFF UNLESS NOTED OTHERWISE
- FLUSH FLOOR MOUNTED QUADRUPEX OUTLET BOX
- DUPLEX FURNITURE MOUNTED POWER OUTLET
- QUAD RECEPTACLE: FURNITURE MOUNTED POWER OUTLET
- CARD READER
- PUSH BUTTON
- MAGNETIC LOCK AND PROXIMITY INFRARED READER
- INTERCOM MASTER STATION

ABBREVIATIONS

@	AT	M	METER/THOUSAND
AC	AIR CONDITIONING	MAS	MASONRY
ACT	ACOUSTICAL CEILING TILE	MAT	MATERIAL
ADJ	ADJUSTABLE	MAX	MAXIMUM
ADF	ABOVE FINISHED FLOOR	MECH	MECHANICAL
AFP	ACCORDION FOLDING PARTITION	MEZZ	MEZZANINE
AGG	AGGREGATE	MFR	MANUFACTURER
ALT	ALTERNATE	MH	MANHOLE
AL	ALUMINUM	MIN	MINIMUM
AP	ACCESS PANEL	MISC	MISCELLANEOUS
APPROX	APPROXIMATE	MM	MILLIMETER
AR	ACID RESISTANT	MO	MASONRY OPENING
ARCH	ARCHITECTURAL	MET	METAL
ASPH	ASPHALT	N	NORTH
AV	AUDIOVISUAL	NIC	NOT IN CONTRACT
AWG	AMERICAN WIRE GAUGE	NO#	NUMBER
AWT	ACOUSTICAL WALL TREATMENT	NOM	NOMINAL
L	ANGLE	NTS	NOT TO SCALE
&	AND	OC	ON CENTER
B/T	BETWEEN	OD	OUTSIDE DIAMETER
BLDG	BUILDING	OPNG	OPENING
BLOCK	BLOCKING	OPP	OPPOSITE
BM	BENCH MARK/BEAM	OPP HD	OPPOSITE HAND
BOS	BOTTOM OF STEEL	O TO O	OUT TO OUT
BOT	BOTTOM	OW	OPERABLE WALL
BRG	BEARING	OWSJ	OPEN WEB STEEL JOIST
BRK	BRICK	Q	QUAKE
BUR	BUILT-UP ROOF	PA	PUBLIC ADDRESS
CAB	CABINET	PERF	PERFORATED
CAR	CARPET	PL	PLATE/PROPERTY LINE
CAT	CATALOG	PLAS	PLASTER
CB	CHALKBOARD/CATCH BASIN	PLM	PLASTIC LAMINATE
CFM	CUBIC FEET PER MINUTE	PLMB	PLUMBING
CH	CABINET HEATER	PLYWD	PLYWOOD
CI	CAST IRON	PREFAB	PREFABRICATED
CL	CONTROL JOINT	PS	PROJECTION SCREEN
CLR	CENTERLINE	PSF	POUNDS PER SQUARE FOOT
CLR	CLEAR	PSI	POUNDS PER SQUARE INCH
CMP	CEILING	PSS	PENCIL SHARPENER SUPPORT
CMP	CORRUGATED METAL PIPE	PVC	POLYVINYL CHLORIDE
CMT	CERAMIC MOSAIC TILE	PVMT	PAVEMENT
CMU	CONCRETE MASONRY UNIT	Q	QUARRY TILE
CO	CLEAN OUT	R	RISER
COL	COLUMN	RA	RETURN AIR
COMP	COMPACTED	RADIR	RADIUS
CONC	CONCRETE	RB	RESILIENT BASE
CONSTR	CONSTRUCTION	RCF	REINFORCED CONCRETE PIPE
CONT	CONTINUOUS	RD	ROOF DRAIN
CONTR	CONTRACTOR	RDS	ROLL DOWN GRILLE
CORR	CORRUGATED	RDS	ROLL DOWN SHUTTER
CPT	CARPET	REF	REFERENCE
CT	CERAMIC TILE	REFR	REFRIGERATOR
C TO C	CENTER TO CENTER	REINF	REINFORCING
CNT	COUNTER SINK	RECD	REQUIRED
CU FT/CF	CUBIC FEET	REV	REVISION(S)
CU IN/CI	CUBIC INCH	RM	ROOM
CU YD/CI	CUBIC YARD	RO	ROUGH OPENING
CUSP	CUSPIDOR	ROW	RIGHT-OF-WAY
CW	COLD WATER	S	SOUTH
CWF	CEMENTITIOUS WOOD FIBER	SA	SUPPLY AIR
d	PENNY (NAILS, ETC.)	SAW	SANITARY
DC	DEGREE	SCHED	SCHEDULE
DO	DISPLAY CASE	SD	STORM DRAIN/SMOKE DETECTOR
DEPT	DEPARTMENT	SECT	SECTION
DET	DETAIL	SEW	SEWER
DFT	DIAMETER	SGFT	STRUCTURAL GLAZED FACING TILE
DIM	DIMENSION	SHT	SHEET
DIV	DIVISION	SH	SIMILAR
DL	DEAD LOAD	SP	SPACE
DWG	DRAWING	SPEC(S)	SPECIFICATIONS(S)
DWS	DOWN SPOUT	SPKR	SPEAKER
DWC	DRAINING WATER COOLER	SO	SQUARE
EA	EACH	SO FT/SF	SQUARE FEET
EJ	EACH FACE	SO IN/SI	SQUARE INCHES
EJ	EXPANSION JOINT	SO YD/SY	SQUARE YARDS
EL	ELEVATION	SST	STAINLESS STEEL
ELEC	ELECTRIC(AL)	ST	STORM/STREET
ELEV	ELEVATOR	STD	STANDARD
ENG	ENGINEER	STL	STEEL
EP	ELECTRICAL PANELBOARD	STRUCT.	STRUCTURAL
EQ	EQUAL	SUSP	SUSPENDED
EQUIP	EQUIPMENT	SW	SHORT WAY/SIDEWALK
EWS	EACH WAY	SYMB	SYMBOL
EWF	EXT. INSULATION & FINISH SYSTEM	SYMM	SYMMETRICAL
EXH	EXHAUST	SYNTH	SYNTHETIC
EXIST	EXISTING	T	TREAD
EXP	EXPANSION	T&B	TOP AND BOTTOM
EXT	EXTERIOR	T&G	TONGUE AND GROOVE
EXTN	EXTENSION	TA	TONGUE ACCESSORIES(T)
FLO	FLOOR DRAIN	TB	TACK BOARD
FHC	FIRE HOSE CABINET	TC	TOP OF CURB
FIN	FINISH	TEL	TELEPHONE
FLR	FLOOR	TER	TERRAZZO
FDN	FOUNDATION	TOC	TOP OF CONCRETE
FSK	FLEXIBLE SHEET ROOFING	TOF	TOP OF FOOTING
FTS	FLOOR SERVICE SINK	TOS	TOP OF STEEL
FE	FEET	TOM	TOP OF MASONRY
FTG	FOOTING	TT	TERRAZZO TILE
FE	FIRE EXTINGUISHER	TV	TELEVISION
FEC	FIRE EXTINGUISHER CABINET	TYP	TYPICAL
GA	GAUGE	TWS	TACKABLE WALL SURFACE
GALV	GALVANIZED	UON	UNLESS OTHERWISE NOTED
GB	GRAB BAR	UR	UNIT VENTILATOR
GL	GLASS	URINAL	URINAL
GWB	GYPSUM WALLBOARD	VCT	VINYL COMPOSITION TILE
H	HEIGHT/RAISE	VCGBW	VINYL COVERED GYP. WALLBOARD
HB	HOSE BIBB	VERT	VERTICAL
HDWE	HARDWARE	VIF	VERIFY IN FIELD
HM	HOLLOW METAL	VIT	VITREOUS
HORIZ	HORIZONTAL	VOL	VOLUME
HPT	HIGH POINT	VRB	VAPOR RETARDER
HS	HIGH STRENGTH	VSB	VENTED RESILIENT BASE
HTG	HEATING	VS	VENT STACK
HVAC	HEATING/VENTILATING/	VT	VINYL TILE
HPDL	AIR CONDITIONING	W	WEST/WIDE/WIDTH
HW	HIGH PRESSURE DECORATIVE LAM.	W	WITH
Hwy	HIGHWAY	W/O	WITHOUT
ID	INSIDE DIAMETER	WA	WARDROBE ACCESSORIES
IN	INCH	WB	WOOD BASE
INCL	INCLUDED	WC	WATER CLOSET/WIND COLUMN
INFO	INFORMATION	WD	WOOD
INSUL	INSULATION/INSULATED	WH	WATER HEATER
INT	INTERIOR	WP	WORKING POINT
INVT	INVERT	WSK	WALL SERVICE SKIN
JS	JOIST SUBSTITUTE	WWF	WELDED WIRE FABRIC
JST	JOIST	YD	YARD/YARD DRAIN
JOINT	JOINT		
KITCHEN	KITCHEN		
L	LENGTH		
LAM	LAMINATED		
LAV	LAVATORY		
LB	LOAD		
LKR	LOCKER		
LLH	LONG LEG HORIZONTAL		
LLV	LONG LEG VERTICAL		
LVR	LOUVER		
LW	LONG WAY		

DRAFTING SYMBOLS

- STRUCTURAL CONCRETE
- BATT INSULATION
- RIGID INSULATION
- TERRA-COTTA
- FINISH WOOD
- FINISH WOOD
- WOOD BLOCKING
- PLYWOOD
- GYPSUM WALLBOARD
- STEEL (IN SECTION)
- BROZE (IN SECTION)
- ALUMINUM (IN SECTION)
- GRANITE
- SAND, GROUT, PLASTER, GWB.
- CONCRETE
- TERRAZZO
- MARBLE
- SLATE
- PRECAST CONCRETE
- FACE BRICK
- FIRE BRICK
- GLAZED BRICK
- CONCRETE MASONRY UNIT (PLAN)
- METAL SHAPES
- ACOUSTIC TILE CEILING
- CARPET
- CONCRETE MASONRY UNIT (CORED, IN SECTION)
- CONCRETE MASONRY UNIT (SOLID, IN SECTION)
- SPRAY-ON INSULATION OR FIRE PROTECTION
- WIRE FENCE
- CORRUGATED METAL FORMING
- METAL ROOF DECK

MATERIAL SYMBOLS

- DOOR TAG
- WINDOW TAG
- FURNITURE TAG
- KEY NOTE TAG
- PARTITION TYPE TAG
- SMOKE AND CO DETECTOR
- ROOM FLOOR AREA
- DETAIL NUMBER
- SHEET NUMBER
- REVISION NUMBER
- DRAWING REVISIONS
- COLUMN GRID BUBBLE
- MATCH LINE

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SEAL & SIGNATURE

REGISTERED ARCHITECT
STATE OF NEW YORK

PER PLAN

5TH STREET NEW - (W) - NARROW

5TH STREET NEW - (W) - NARROW

5TH STREET - (W) - NARROW

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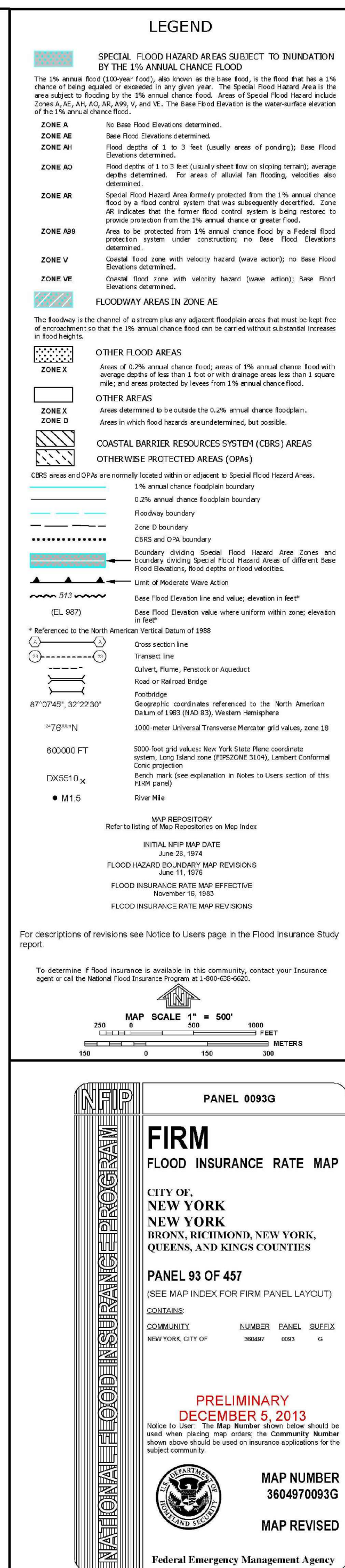
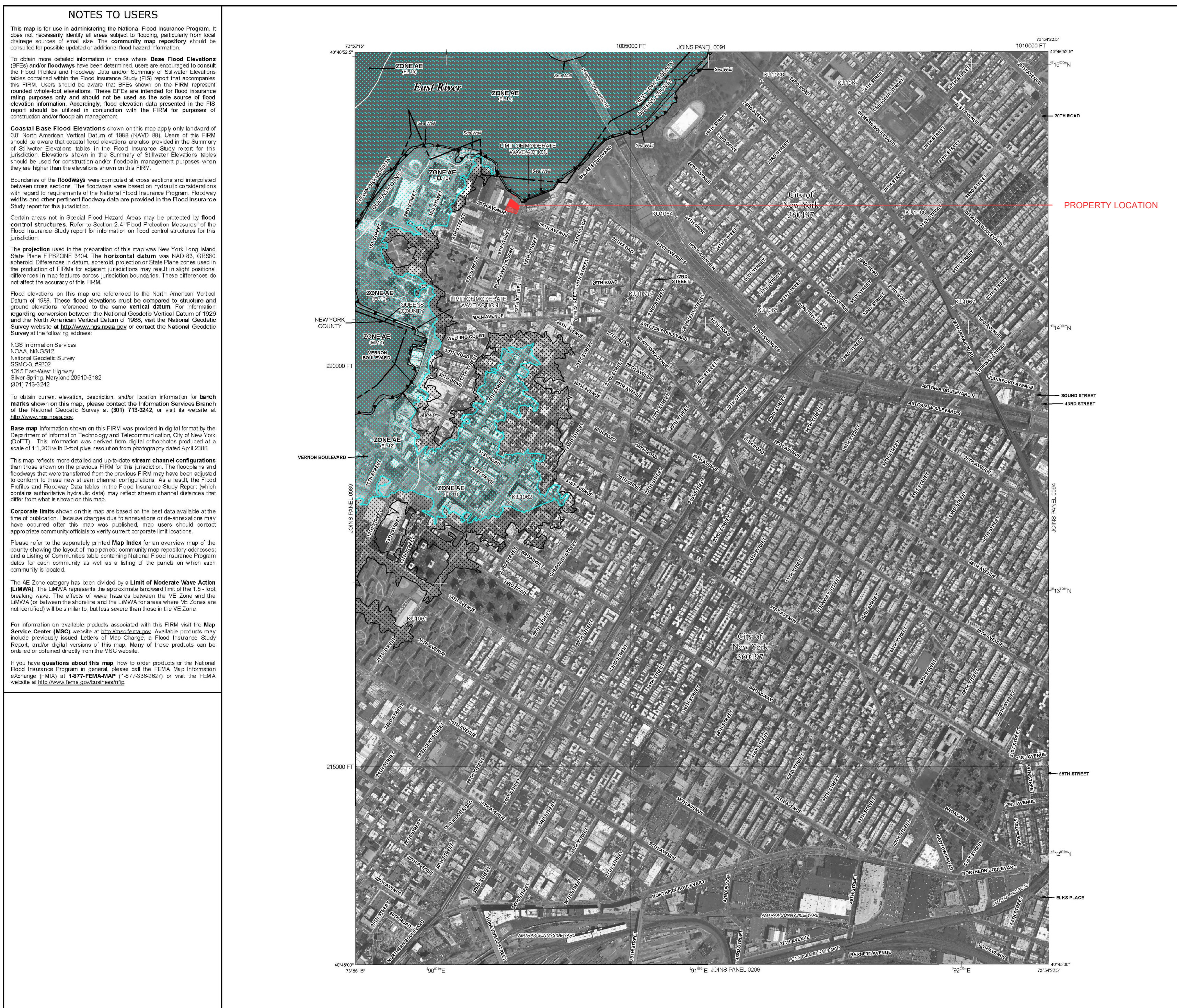
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NOTES, ABBREVIATIONS, SYMBOLS AND LEGENDS

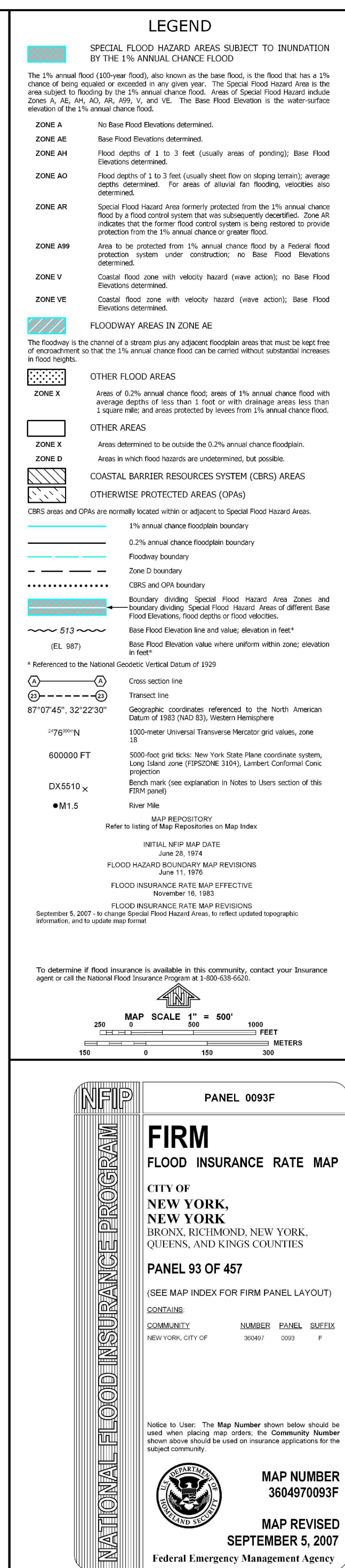
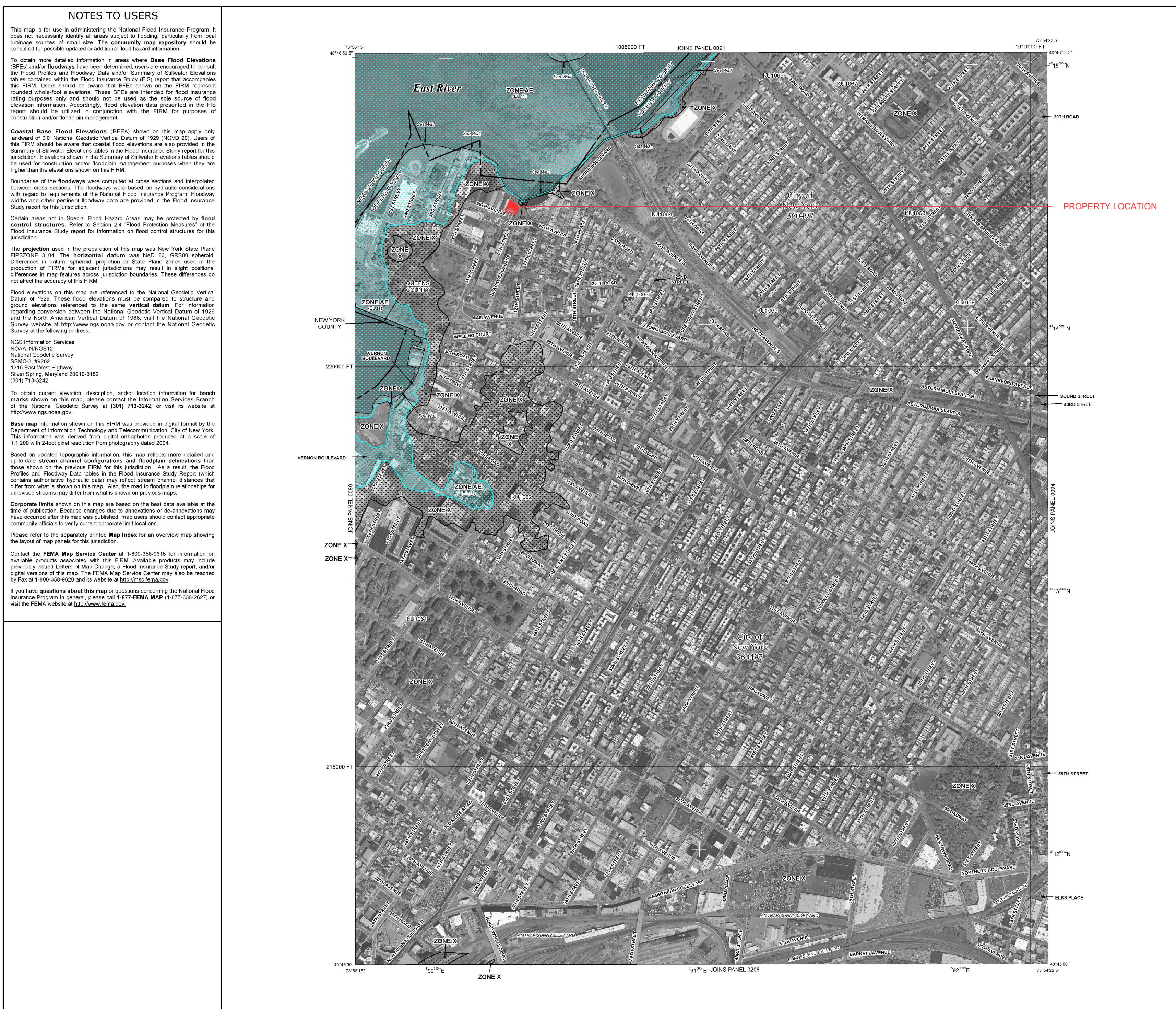
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1	2013 PRELIMINARY FIRM MAP SCALE: N.T.S.
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2	2007 FIRM MAP SCALE: N.T.S.
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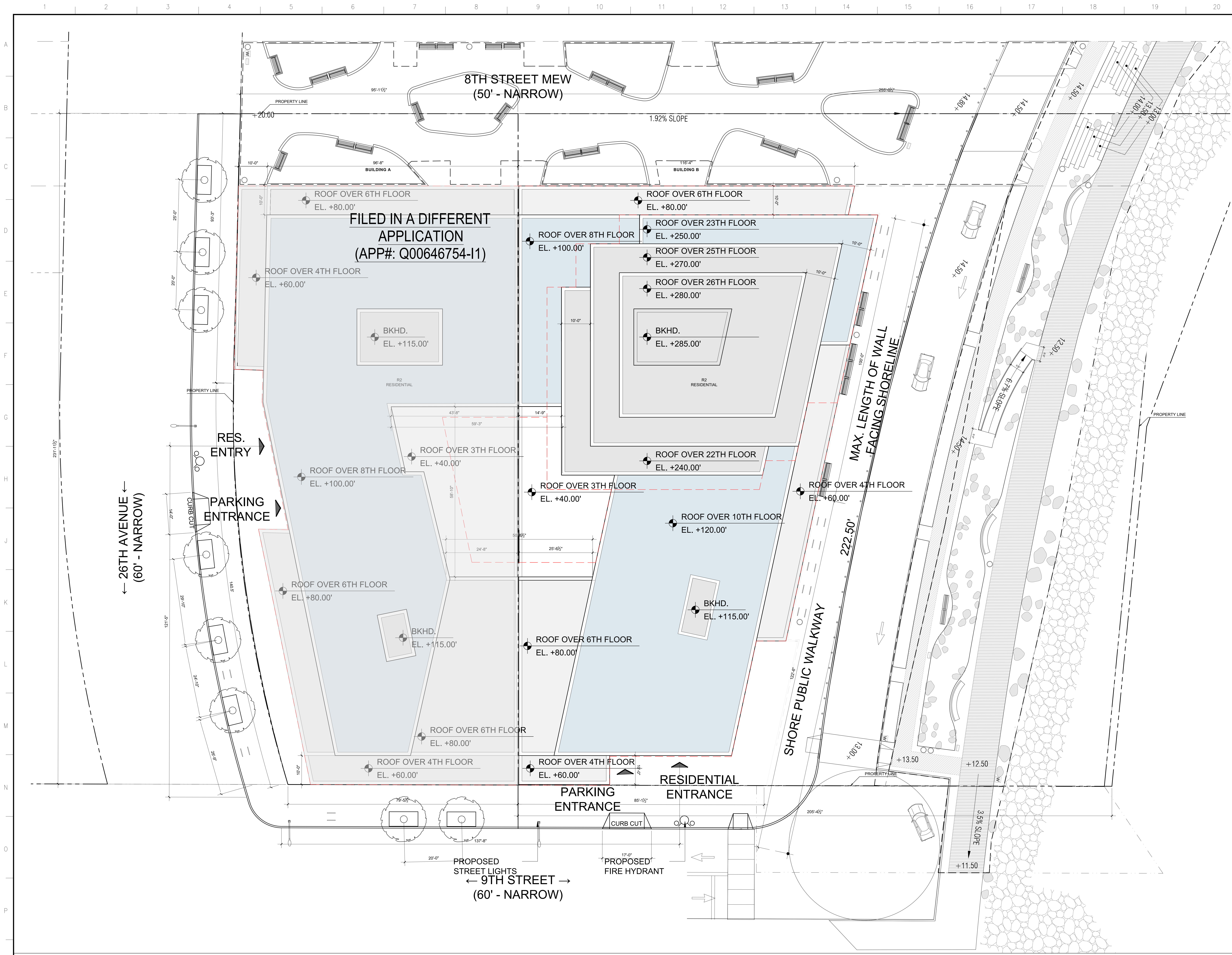
SITE ZONING DATA			
Address	Queens, New York 11102		
Block and Lot	Block 906 Lot 5		
Borough	Queens,		
Community Board	1		
Zoning District	R73 with C2-4 Overlay		
Zoning Map	9a (zoning change ULURP C130384MMQ ZMK SEE SHEETS / T-001)		
In Transit District	Yes		
Wide Streets	None		
Narrow Streets	9th Street		
Block Frontage	9th Street	82.53	Lineal FT
	Total Frontage	82.53	Lineal Ft
Lot Type	Corner Lot		
Zoning Lot Area	R73 with C2-4 Overlay	51,274.00	Square Feet
	TOTAL LOT AREA	51,274.00	Square Feet

NO OF BICYCLE SPACES PER D.U.	= 1 PER 2 DU
NO OF DWELLING UNITS	= 241 UNITS
REQUIRED NO OF BICYCLE SPACES	= 121 SPACES
PROVIDED NO OF BICYCLE SPACES	= 123 SPACES

	NO OF DWELLING UNITS PER STORY	FLOOR AREA DEDUCTION
LEVEL 1	4	50% DEDUCTION
LEVEL 2	0	50% DEDUCTION
LEVEL 3	12	50% DEDUCTION NOT APPLICABLE
LEVEL 4	18	50% DEDUCTION NOT APPLICABLE
LEVEL 5	18	50% DEDUCTION NOT APPLICABLE
LEVEL 6	18	50% DEDUCTION NOT APPLICABLE
LEVEL 7	13	50% DEDUCTION NOT APPLICABLE
LEVEL 8	16	50% DEDUCTION NOT APPLICABLE
LEVEL 9	15	50% DEDUCTION NOT APPLICABLE
LEVEL 10	15	50% DEDUCTION NOT APPLICABLE
LEVEL 11	8	50% DEDUCTION
LEVEL 12	8	50% DEDUCTION
LEVEL 13	8	50% DEDUCTION
LEVEL 14	8	50% DEDUCTION
LEVEL 15	8	50% DEDUCTION
LEVEL 16	8	50% DEDUCTION
LEVEL 17	8	50% DEDUCTION
LEVEL 18	8	50% DEDUCTION
LEVEL 19	8	50% DEDUCTION
LEVEL 20	8	50% DEDUCTION
LEVEL 21	8	50% DEDUCTION
LEVEL 22	8	50% DEDUCTION
LEVEL 23	6	50% DEDUCTION
LEVEL 24	5	50% DEDUCTION
LEVEL 25	5	50% DEDUCTION
LEVEL 26	0	50% DEDUCTION

FLOOR	0-BR	1-BR	2-BR	3-BR	TOTAL
26	0	0	0	0	0
25	1	3	1	0	5
24	1	3	1	0	5
23	1	2	3	0	6
22	1	5	2	0	8
21	1	5	2	0	8
20	1	5	2	0	8
19	1	5	2	0	8
18	1	5	2	0	8
17	1	5	2	0	8
16	1	5	2	0	8
15	1	5	2	0	8
14	1	5	2	0	8
13	1	5	2	0	8
12	1	5	2	0	8
11	1	5	2	0	8
10	3	8	4	0	15
9	3	8	4	0	15
8	2	10	4	0	16
7	3	7	3	0	13
6	4	11	3	0	18
5	4	11	3	0	18
4	4	11	3	0	18
3	0	10	2	0	12
2	0	0	0	0	0
1	0	0	4	0	4
TOTAL	38	144	59	0	241

[illegible]



GENERAL NOTES:
PROPOSED NEW TREES 25' DISTANCE.
82.53' FRONTAGE / 25'-0" = 3.3 => 3 TREES REQUIRED.
PROPOSED TREES TO BE PLANTED: 0; TREES TO BE PAID INTO THE FUND: 3

1 SITE PLAN
SCALE: 3/32" = 1'-0"

FOGARTY FINGER
architecture interiors
69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

CLIENT
ASTORIA COVE PHASE I, LLC
230 CAPE ADVISOR
375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

STRUCTURAL ENGINEER
DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

M/E/P ENGINEER
ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

CIVIL ENGINEER
PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016

GEOTECH
GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

CODE CONSULTANT / EXPERTISE
JAM CONSULTANTS INC
104 WEST 20TH STREET, 8TH FLOOR
NEW YORK, NY 10011

REAL & SIGNATURE

KEY PLAN

01 12.17.2021 DOB FOUNDATION FILING
NO. DATE ISSUE

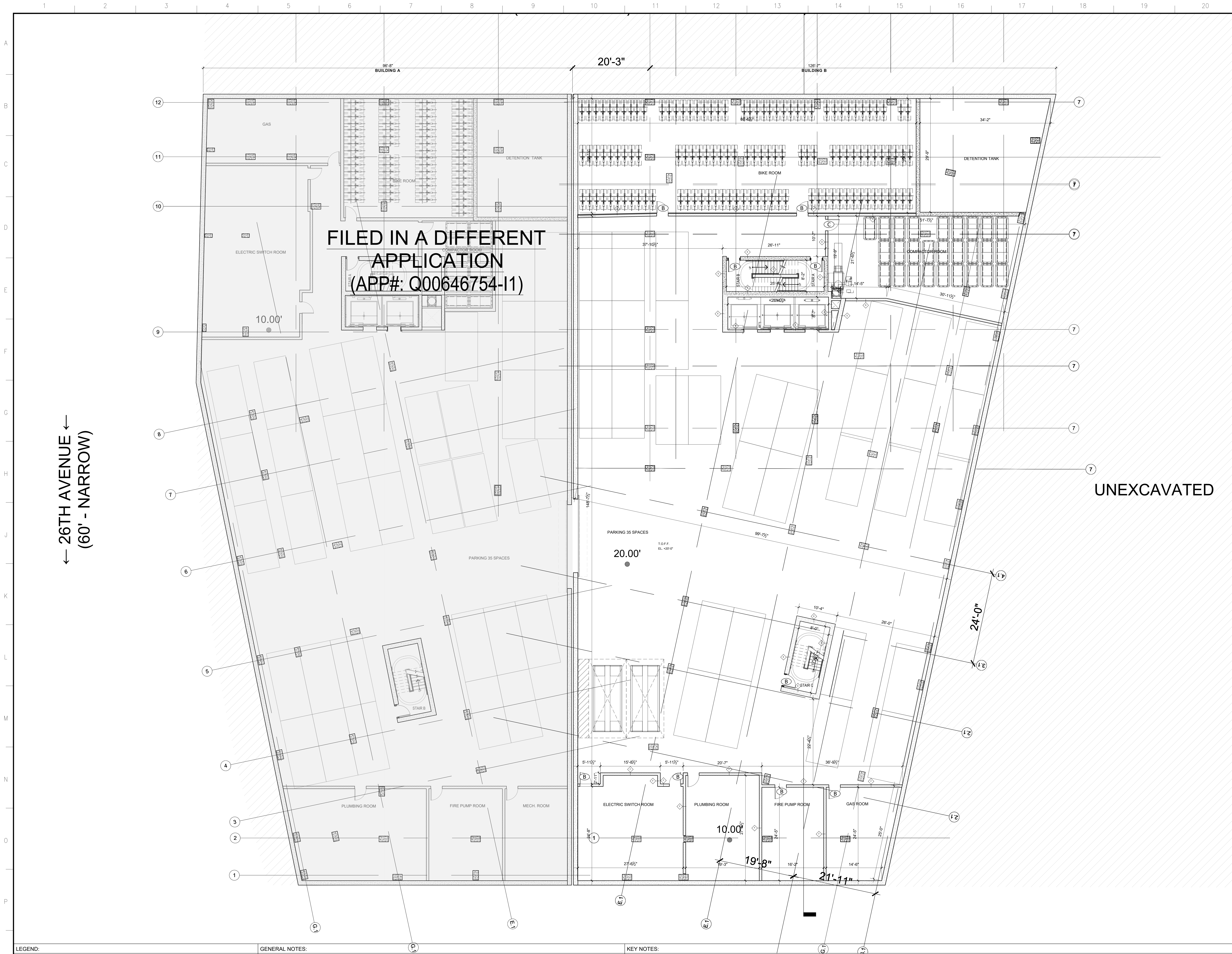
PROJECT
BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 5

DRAWING TITLE
SITE PLAN

DATE (MM-DD-YY) 2022-01-12
PROJECT No. CAPS_28001
DRAWING BY: FFA
CHK BY: FFA

GRID FILE No. #8 OF ##

A-090.00



LEGEND:			
	FLOOR DRAIN		CMU WALL
	ROOF DRAIN		CONCRETE WALL
	HOSE BIB		NON-STRUCTURAL CONCRETE
	WALL TAG		2 HR FIRE RATED WALL
	DOOR TAG		3 HR FIRE RATED WALL
	WINDOW TAG		2 HR RATED SHAFT WALL S22 PROVIDE S22 ON WET RM SIDE

GENERAL NOTES:	
1.	PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83
2.	ALL PARTITION TYPES TO BE 1/2" U.O.N
3.	ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION.

KEY NOTES:	

ARCHITECT

FOGARTY FINGER

architecture interiors

69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

CLIENT

ASTORIA COVE PHASE I, LLC

375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

STRUCTURAL ENGINEER

DESIMONE CONSULTING ENGINEERS

140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

M/E/P ENGINEER

ETTINGER ENGINEERING ASSOCIATES

505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

CIVIL ENGINEER

PHILIP HABIB & ASSOCIATES

102 MADISON AVE #11
NEW YORK, NY 10016

GEOTECH

GEI CONSULTANTS, INC., P.C

530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

CODE CONSULTANT / EXPERTISE

JAM CONSULTANTS INC

104 WEST 20TH STREET, 3TH FLOOR
NEW YORK, NY 10011

SEAL & SIGNATURE

KEY PLAN

01 12 17 2021 DOB FOUNDATION FILING

NO. DATE ISSUE

PROJECT

BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 5

DOB NOW #Q00646756-I1

DRAWING TITLE

CELLAR FLOOR PLAN

DATE (MM-DD-YY)

2022-01-12

PROJECT NO.

CAPE_09001

DRAWING BY

FFA

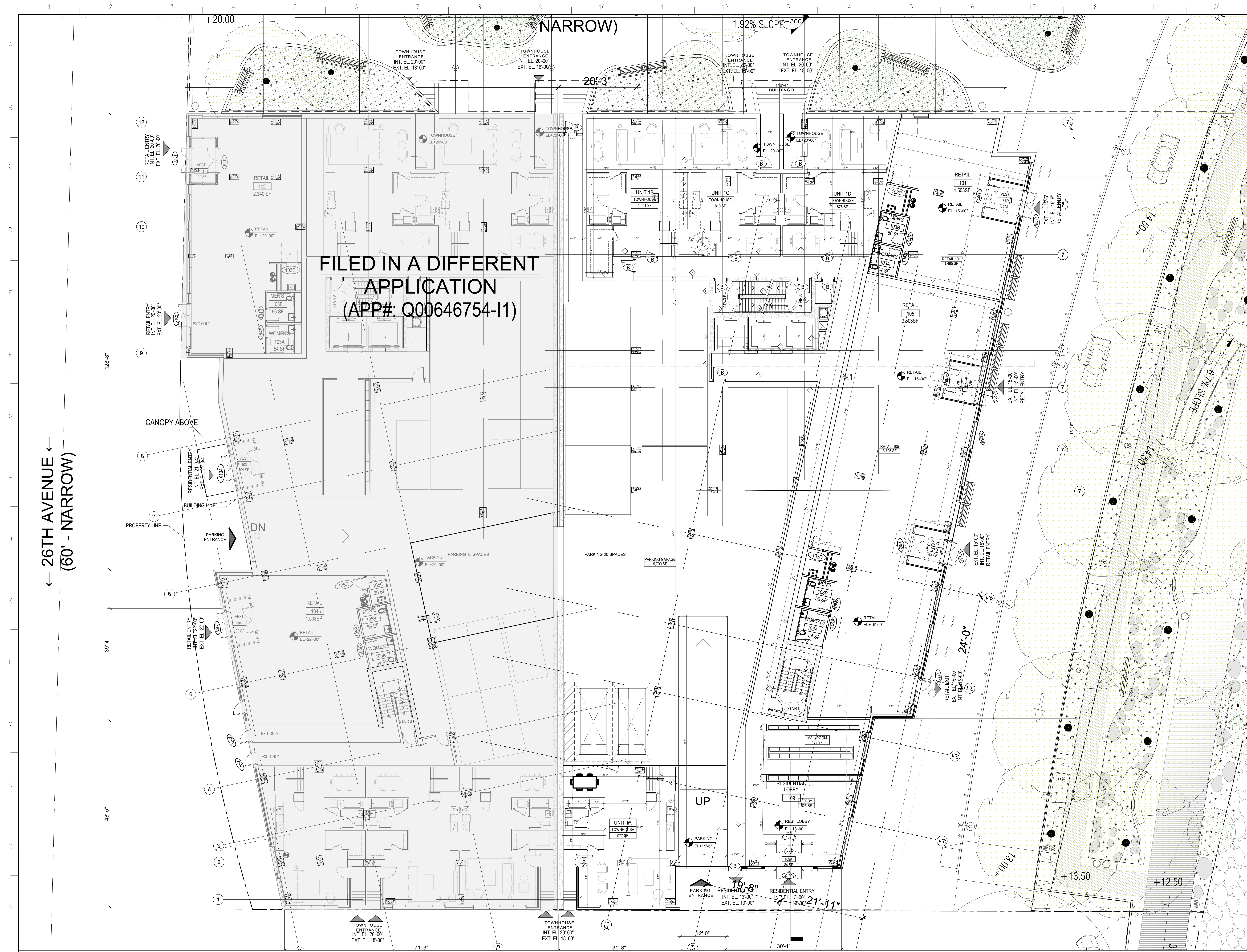
CHECK BY

FFA

CADD FILE NO.

REV OF ###

A-100.00



FILED IN A DIFFERENT
APPLICATION
(APP#: Q00646754-11)

LEGEND:

FLOOR DRAIN	CMU WALL	ELECTRICAL PANEL
ROOF DRAIN	CONCRETE WALL	1 HR FIRE RATED WALL
HOSE BIB	NON-STRUCTURAL CONCRETE	2 HR FIRE RATED WALL
WALL TAG	2 HR RATED SHAFT WALL S22 PROVIDE S22 ON WET RM SIDE	3 HR FIRE RATED WALL
DOOR TAG		
WINDOW TAG		

GENERAL NOTES:

- PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83
- ALL PARTITION TYPES TO BE W22 U.O.N
- ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION.

KEY NOTES:

1. PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83

2. ALL PARTITION TYPES TO BE W22 U.O.N

3. ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION.

FOGARTY FINGER
architecture interiors
69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

ASTORIA COVE PHASE I, LLC
375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016

GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

JAM CONSULTANTS INC
104 WEST 20TH STREET, 3TH FLOOR
NEW YORK, NY 10011

REGISTERED ARCHITECT
STATE OF NEW YORK
668860

BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 5

DOB NOW #Q00646756-11

1ST FLOOR PLAN

DATE (MM-DD-YY): 2022-01-12
PROJECT NO.: CAPE_20001
DRAWING BY: FFA
CHK BY: FFA

A-101.00

CADD FILE NO.:
REV OF #000



ARCHITECT

FOGARTY FINGER
architecture interiors
69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

CLIENT

ASTORIA COVE PHASE I, LLC
375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

STRUCTURAL ENGINEER

DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

M/E/P ENGINEER

ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

CIVIL ENGINEER

PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016

GEOTECH

GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

CODE CONSULTANT / EXPERTISE

JAM CONSULTANTS INC
104 WEST 20TH STREET, 3TH FLOOR
NEW YORK, NY 10011

SEAL & SIGNATURE

KEY PLAN

01 12 17 2021 DOB FOUNDATION FILING

DATE DATE DATE

PROJECT PROJECT PROJECT

BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 5

DOB NOW #Q00646756-11

DRAWING TITLE

2ND FLOOR PLAN

DATE (MM-DD-YY)

2022-01-12

PROJECT NO.

CAPE_29931

DRAWING BY

FFA

CHECK BY

FFA

1 2ND FLOOR PLAN

SCALE: Custom

CADD FILE NO.

REV OF ###

LEGEND:

FLOOR DRAIN

ROOF DRAIN

HOSE BIB

WALL TAG

DOOR TAG

WINDOW TAG

CMU WALL

CONCRETE WALL

NON-STRUCTURAL CONCRETE

2 HR RATED SHAFT WALL S22 PROVIDE S22 ON WET RM SIDE

ELECTRICAL PANEL

1 HR FIRE RATED WALL

2 HR FIRE RATED WALL

3 HR FIRE RATED WALL

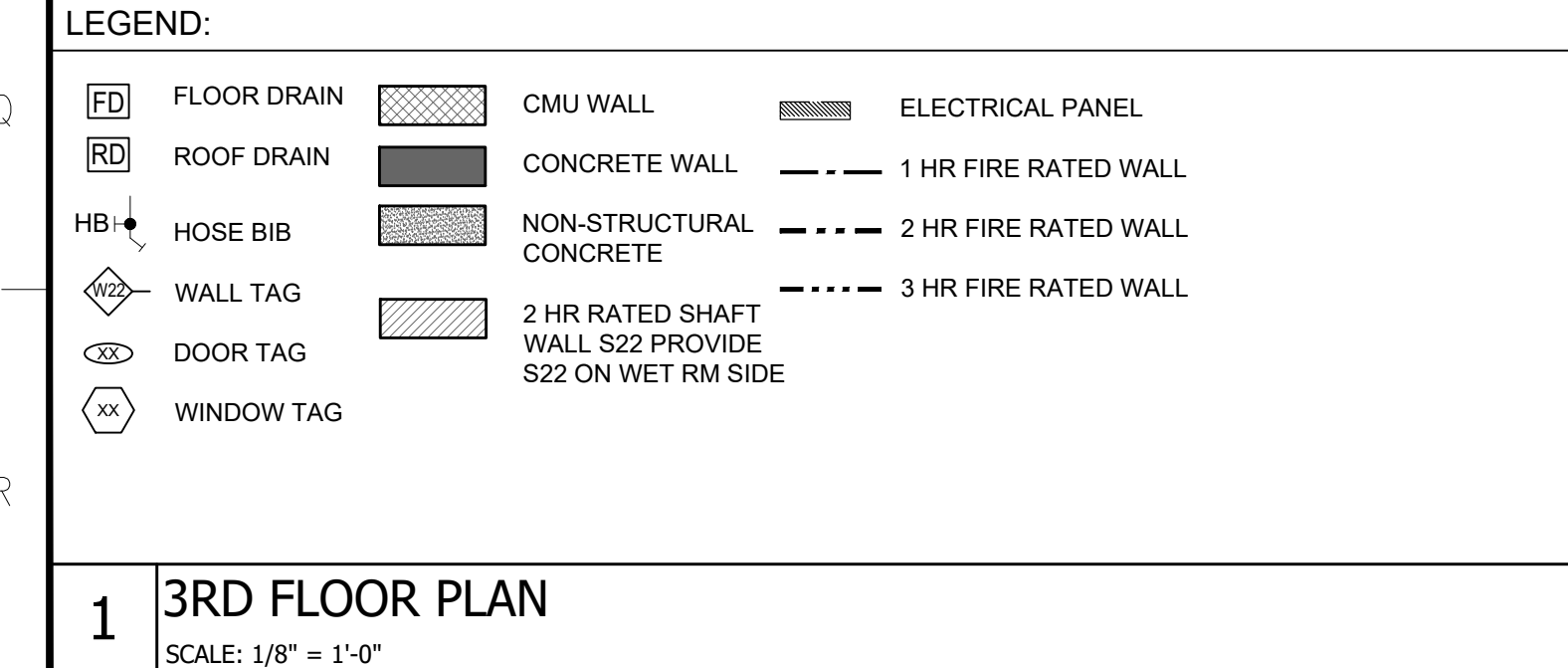
GENERAL NOTES:

1. PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83

2. ALL PARTITION TYPES TO BE 1/2" U.O.N

3. ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION.

KEY NOTES:



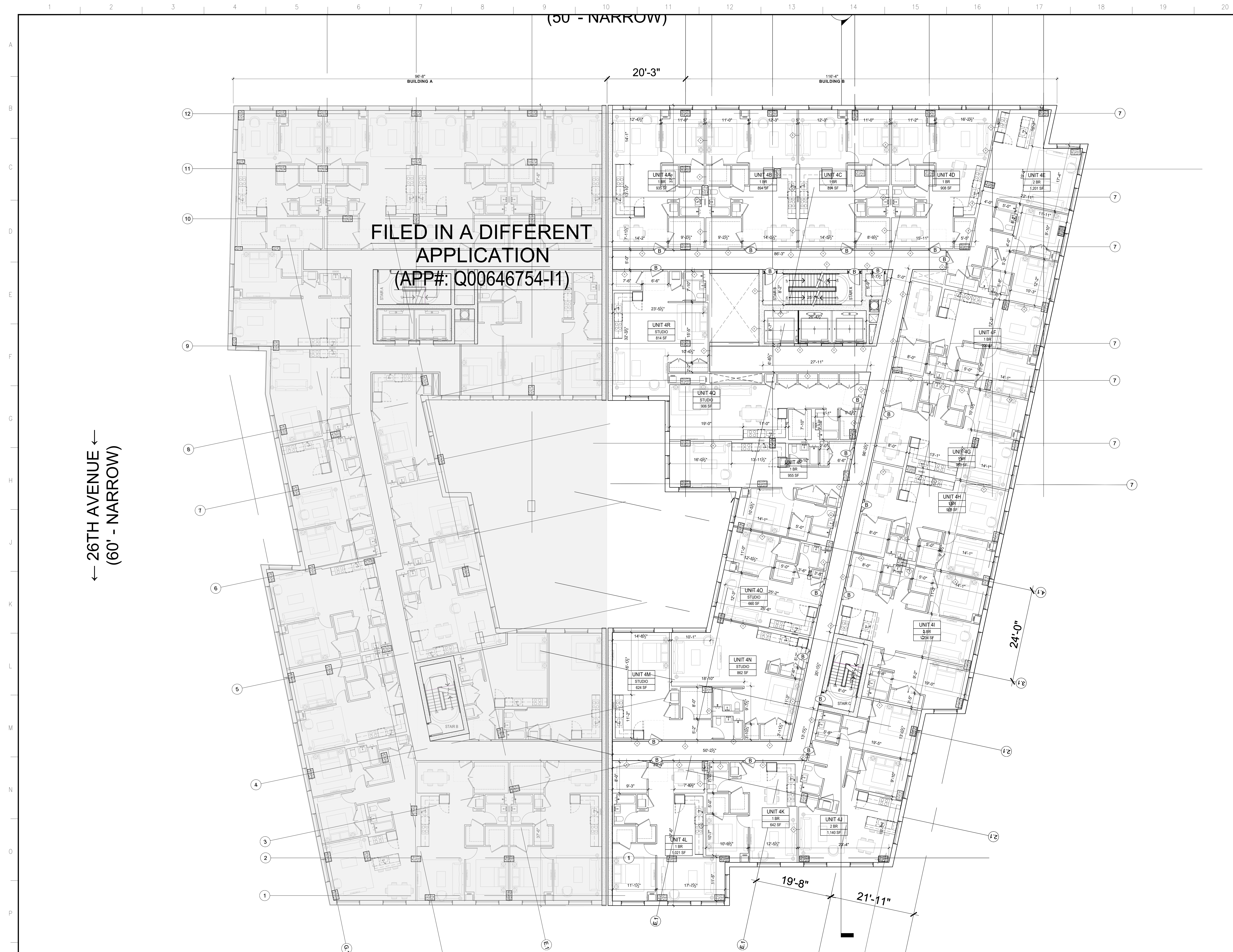
← 26TH AVENUE ←
(60' - NARROW)

PARKING
43 SPACES

PARKING GARAGE
6,221 SF

DATE:	11/11/11
A-103.00	
CADD FILE No.:	

A-103.00



FILED IN A DIFFERENT
APPLICATION
(APP#: Q00646754-I1)

ASTORIA COVE PHASE I, LLC
C/O CAPE ADVISOR
375 GREENWICH ST, 3RD FLOOR
NEW YORK, NY 10013

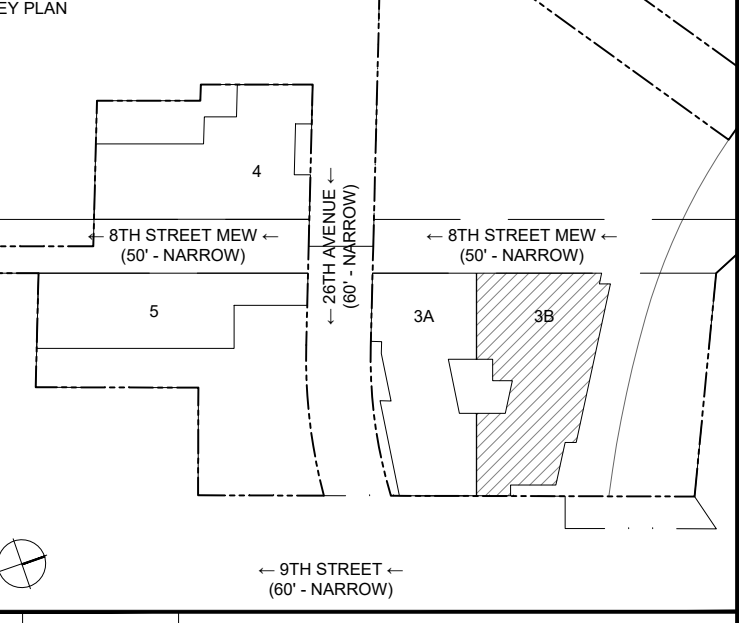
DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016

GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

JAM CONSULTANTS INC
104 WEST 29TH STREET, 9TH FLOOR
NEW YORK, NY 10001



1	12.17.2021	DOB FOUNDATION FILING
2	DATE	ISSUE

PROJECT

BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 5

DOB NOW #Q00646756-I1

4TH FLOOR PLAN

DATE (MM-DD-YY):	2022-01-12
PROJECT No.:	CAPE_09003
DRAWING BY:	FFA
CHECK BY:	FFA

A-104.00

GENERAL NOTES:
1. PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL: +20.00' NAVD 88
2. ALL PARTITION TYPES TO BE W22 U.O.N
3. ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION.

KEY NOTES:

1	4TH FLOOR PLAN SCALE: 1/8" = 1'-0"
---	---------------------------------------

ADD FILE No.: ## OF ###

(50' - NARROW)

20'-3"

FILED IN A DIFFERENT
APPLICATION
(APP#: Q00646754-I1)

← 26TH AVENUE ←
(60' - NARROW)

- LEGEND:
- | | | | | | |
|--|-------------|--|--|--|----------------------|
| | FLOOR DRAIN | | CMU WALL | | ELECTRICAL PANEL |
| | ROOF DRAIN | | CONCRETE WALL | | 1 HR FIRE RATED WALL |
| | HOSE BIB | | NON-STRUCTURAL CONCRETE | | 2 HR FIRE RATED WALL |
| | WALL TAG | | 2 HR RATED SHAFT WALL S22 PROVIDE S22 ON WET RM SIDE | | 3 HR FIRE RATED WALL |
| | DOOR TAG | | | | |
| | WINDOW TAG | | | | |

- GENERAL NOTES:
- PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83
 - ALL PARTITION TYPES TO BE 1/2" U.O.N
 - ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION.

KEY NOTES:

FOGARTY FINGER
architecture interiors
69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

ASTORIA COVE PHASE I, LLC
375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

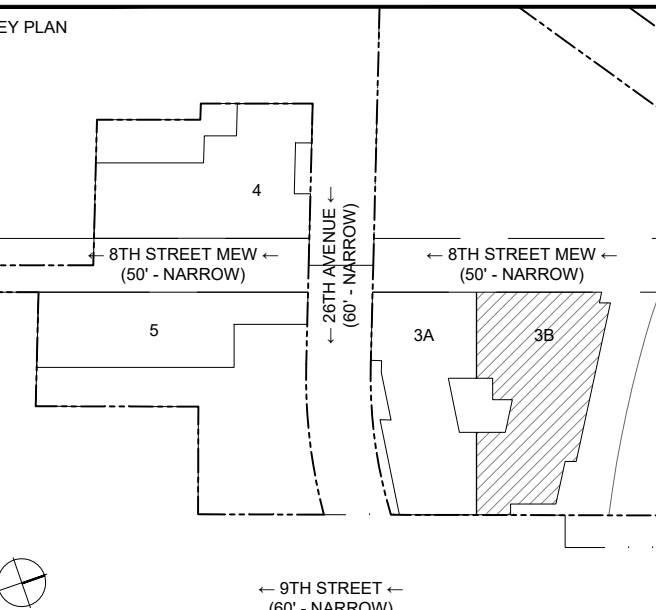
DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016

GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

JAM CONSULTANTS INC
104 WEST 20TH STREET, 3TH FLOOR
NEW YORK, NY 10011



01.12.17.2021 DOB FOUNDATION FILING

BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 5

DOB NOW #Q00646756-I1

5TH-6TH FLOOR PLAN

DATE (MM/DD/YY) 2022-01-12
PROJECT NO. CAPE_20001
DRAWING BY: FFA
CHK BY: FFA

A-105.00

CADD FILE NO. REV OF ##

(50' - NARROW)

20'-3"

BUILDING A

BUILDING B

FILED IN A DIFFERENT
APPLICATION
(APP#: Q00646754-I1)

← 26TH AVENUE ←
(60' - NARROW)

- LEGEND:
- | | | | | | |
|--|-------------|--|--|--|----------------------|
| | FLOOR DRAIN | | CMU WALL | | ELECTRICAL PANEL |
| | ROOF DRAIN | | CONCRETE WALL | | 1 HR FIRE RATED WALL |
| | HOSE BIB | | NON-STRUCTURAL CONCRETE | | 2 HR FIRE RATED WALL |
| | WALL TAG | | 2 HR RATED SHAFT WALL S22 PROVIDE S22 ON WET RM SIDE | | 3 HR FIRE RATED WALL |
| | DOOR TAG | | | | |
| | WINDOW TAG | | | | |

- GENERAL NOTES:
1. PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83
 2. ALL PARTITION TYPES TO BE 1/2" U.O.N
 3. ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION.

KEY NOTES:

1 7TH FLOOR PLAN
SCALE: 1/8" = 1'-0"

FOGARTY FINGER
architecture interiors
69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

CLIENT
ASTORIA COVE PHASE I, LLC
375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

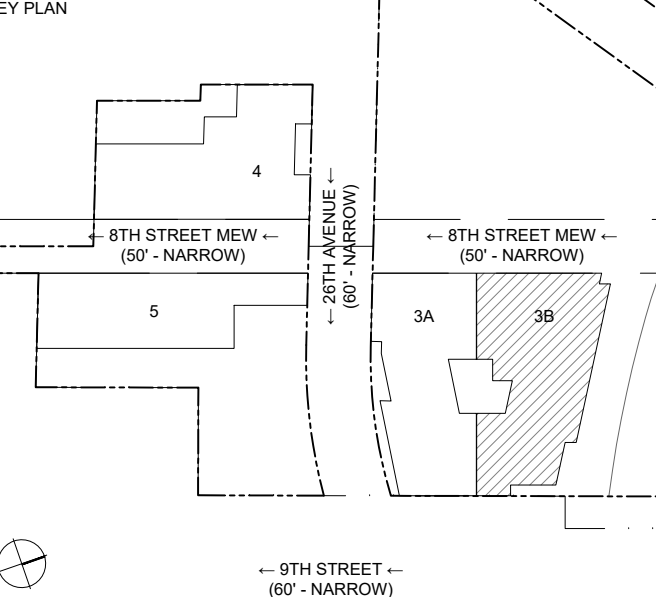
STRUCTURAL ENGINEER
DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

M/E/P ENGINEER
ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

CIVIL ENGINEER
PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016

MECHANICAL
GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

CODE CONSULTANT / EXPEDITOR
JAM CONSULTANTS INC
104 WEST 20TH STREET, 3TH FLOOR
NEW YORK, NY 10011



01 12.17.2021 DOB FOUNDATION FILING
NO. DATE ISSUE

BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 5

DOB NOW #Q00646756-I1

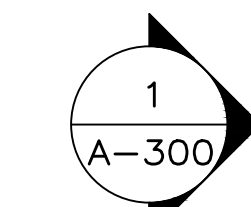
DRAWING TITLE
7TH FLOOR PLAN

DATE (MM-DD-YY)	2022-01-12
PROJECT NO.	CAPE_29931
DRAWING BY	FFA
CHECK BY	FFA

A-107.00

CADD FILE NO. REV OF ###

(50' - NARROW)



FILED IN A DIFFERENT
APPLICATION
(APP#: Q00646754-I1)

← 26TH AVENUE ←
(60' - NARROW)

FOGARTY FINGER
architecture interiors
69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

ASTORIA COVE PHASE I, LLC
375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

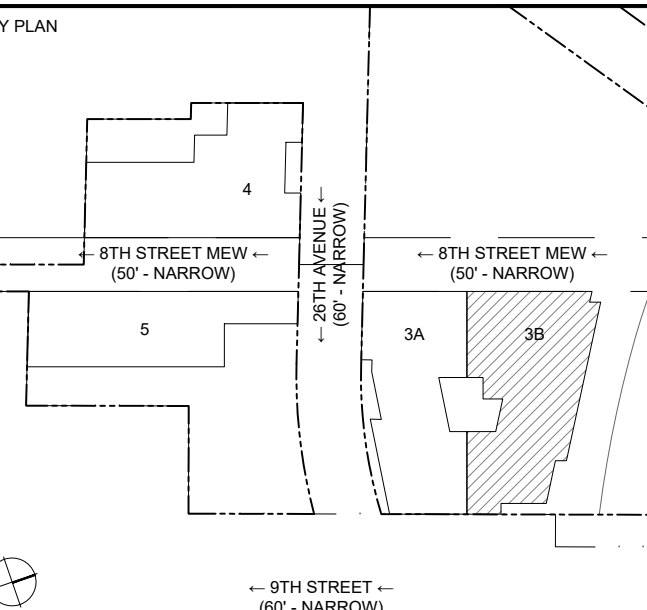
DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016

GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

JAM CONSULTANTS INC
104 WEST 20TH STREET, 8TH FLOOR
NEW YORK, NY 10011



01.12.17.2021 DOB FOUNDATION FILING
DATE DATE DATE
PROJECT PROJECT PROJECT

**BUILDING 3B
ASTORIA COVE**
QUEENS, NY 11217
BLOCK 906, LOT 5

DOB NOW #Q00646756-I1

8TH FLOOR PLAN

DATE (MM-DD-YY) 2022-01-12
PROJECT NO. CAPS_28001
DRAWING BY: FFA
CHK BY: FFA

A-108.00

CADD FILE NO. # OF SHEETS

- LEGEND:
- FLOOR DRAIN
 - ROOF DRAIN
 - HOSE BIB
 - WALL TAG
 - DOOR TAG
 - WINDOW TAG
 - CMU WALL
 - CONCRETE WALL
 - NON-STRUCTURAL CONCRETE
 - 2 HR RATED SHAFT WALL S22 PROVIDE S22 ON WET RM SIDE
 - ELECTRICAL PANEL
 - 1 HR FIRE RATED WALL
 - 2 HR FIRE RATED WALL
 - 3 HR FIRE RATED WALL

- GENERAL NOTES:
- PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83
 - ALL PARTITION TYPES TO BE 1/2" U.O.N
 - ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION

KEY NOTES:

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

ASTORIA COVE PHASE I, LLC
C/O CAPE ADVISOR
375 GREENWICH ST, 3RD FLOOR
NEW YORK, NY 10013

ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016

GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

JAM CONSULTANTS INC
104 WEST 29TH STREET, 9TH FLOOR
NEW YORK, NY 10001

The seal is circular with the text "REGISTERED ARCHITECT" at the top and "STATE OF NEW YORK" at the bottom. In the center is a crest featuring a sun rising over mountains and water, with the date "1784" below it. The number "068880" is printed at the bottom of the seal. A handwritten signature is written across the seal, and a horizontal line is drawn through the bottom portion of the seal.

1	12.17.2021	DOB FOUNDATION FILING
2.	DATE	ISSUE

PROJECT

**BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217**

BLOCK 906, LOT 5















DOB NOW #Q00646756-I1

9TH-10TH FLOOR PLAN

DATE (MM-DD-YY)	2022-01-12
PROJECT No.:	CAPE_09003
DRAWING BY:	FFA
CHECK BY:	FFA

A-109.00	
ADD FILE No.:	## 05###

←← 26TH AVENUE ←←
(60' - NARROW)

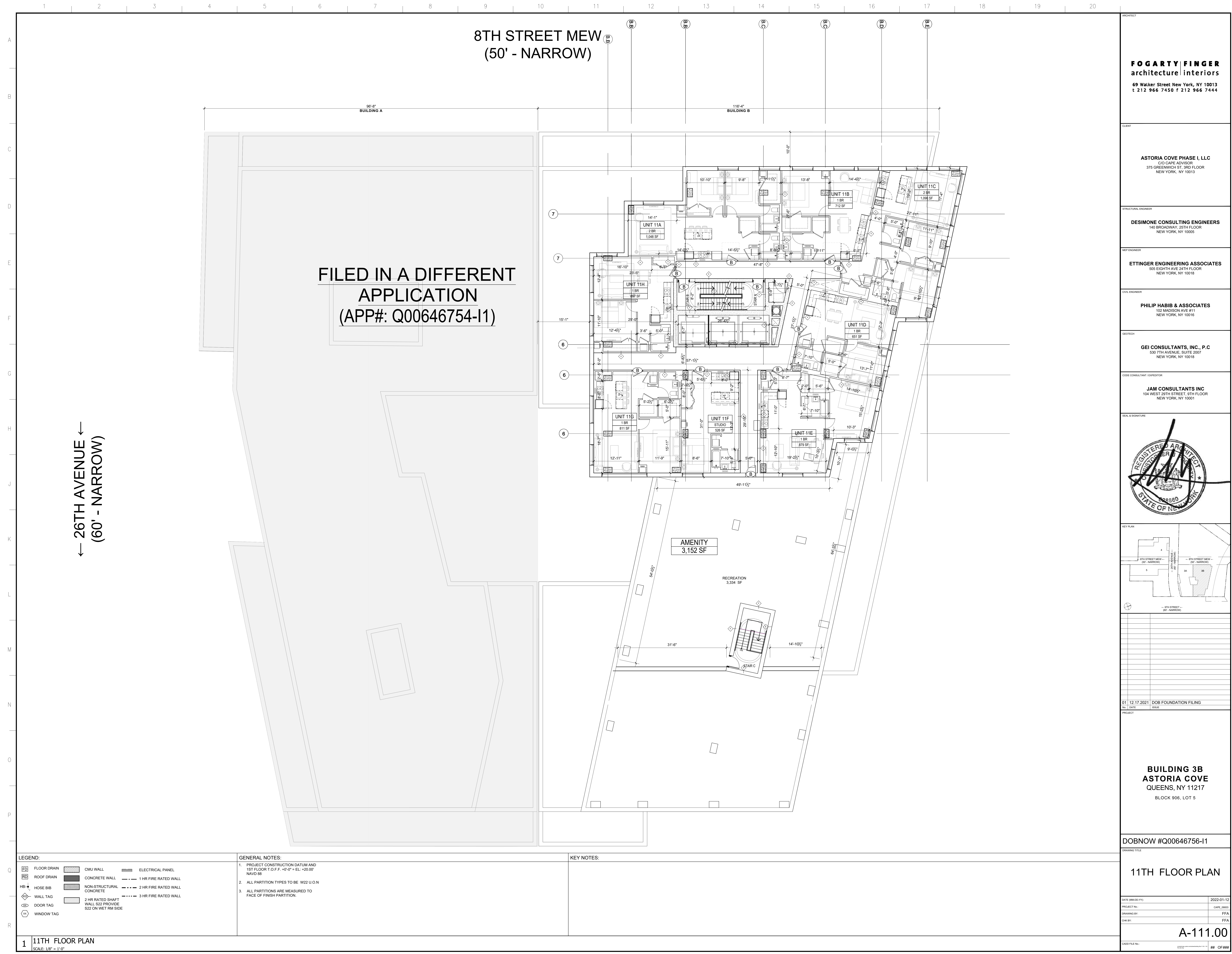
LEGEND:					
	FLOOR DRAIN		CMU WALL		ELECTRICAL PANEL
	ROOF DRAIN		CONCRETE WALL		1 HR FIRE RATED WALL
	HOSE BIB		NON-STRUCTURAL CONCRETE		2 HR FIRE RATED WALL
	WALL TAG		2 HR RATED SHAFT WALL		3 HR FIRE RATED WALL
	DOOR TAG		WALL S22 PROVIDE S22 ON WEST SIDE		
	WINDOW TAG				

GENERAL NOTES:	
1.	PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL: +20.00' NAVD 88
2.	ALL PARTITION TYPES TO BE W22 U.O.N
3.	ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION.

KEY NOTES:

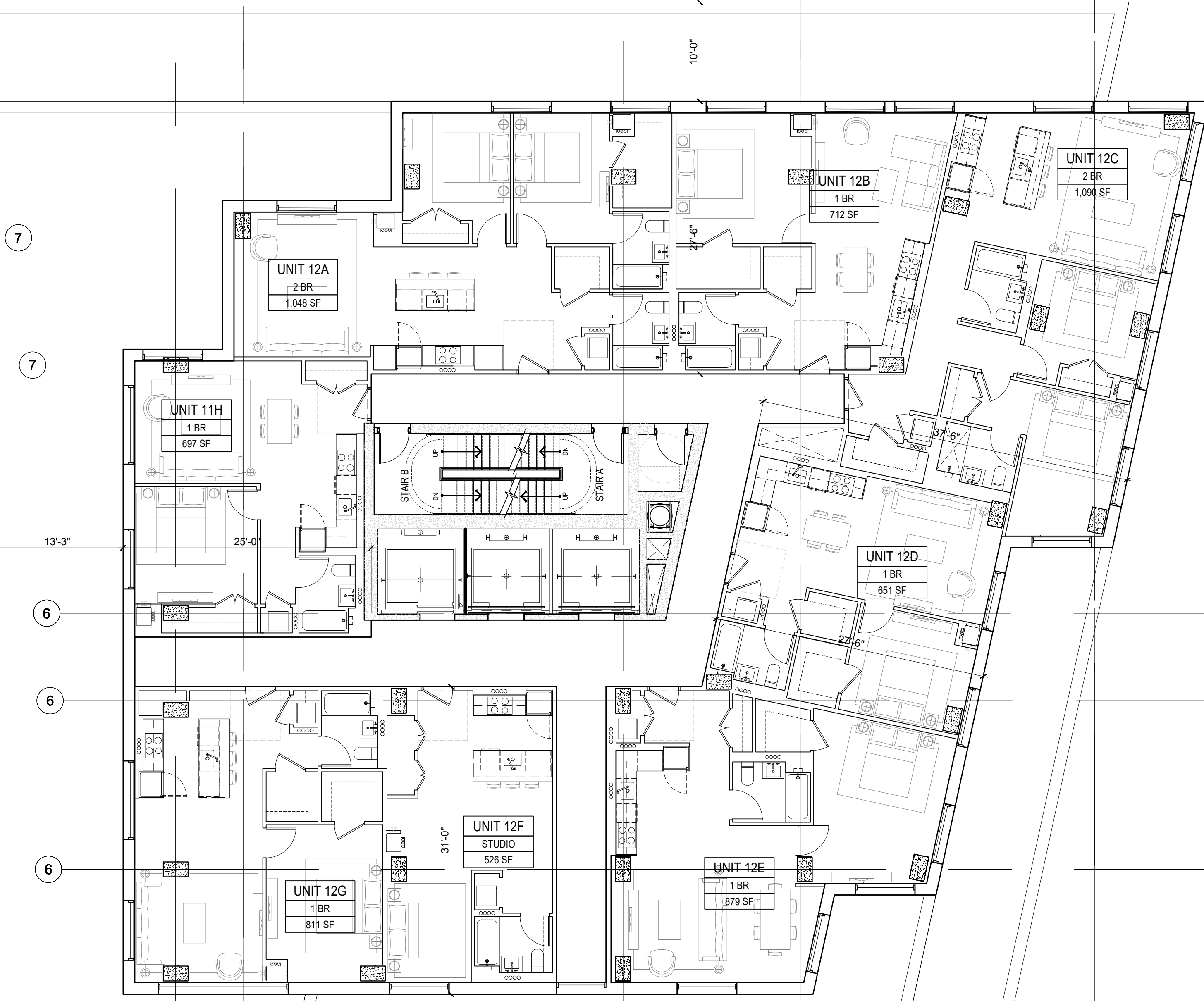
1	9TH-10TH FLOOR PLAN SCALE: 1/8" = 1'-0"
---	--

A-109.00	
ADD FILE No.:	## 05###



(50' - NARROW)

FILED IN A DIFFERENT
APPLICATION
(APP#: Q00646754-I1)



- LEGEND:**
- | | | | | | |
|--|-------------|--|--|--|----------------------|
| | FLOOR DRAIN | | CMU WALL | | ELECTRICAL PANEL |
| | ROOF DRAIN | | CONCRETE WALL | | 1 HR FIRE RATED WALL |
| | HOSE BIB | | NON-STRUCTURAL CONCRETE | | 2 HR FIRE RATED WALL |
| | WALL TAG | | 2 HR RATED SHAFT WALL S22 PROVIDE S22 ON WET RM SIDE | | 3 HR FIRE RATED WALL |
| | DOOR TAG | | | | |
| | WINDOW TAG | | | | |

- GENERAL NOTES:**
- PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83
 - ALL PARTITION TYPES TO BE 1/2" U.O.N
 - ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION.

KEY NOTES:

1 12TH-22ND FLOOR PLAN
SCALE: 1/8" = 1'-0"

FOGARTY FINGER
architecture interiors
69 Walker Street New York, NY 10013
t 212 966 7450 f 212 966 7444

CLIENT
ASTORIA COVE PHASE I, LLC
375 GREENWICH ST. 3RD FLOOR
NEW YORK, NY 10013

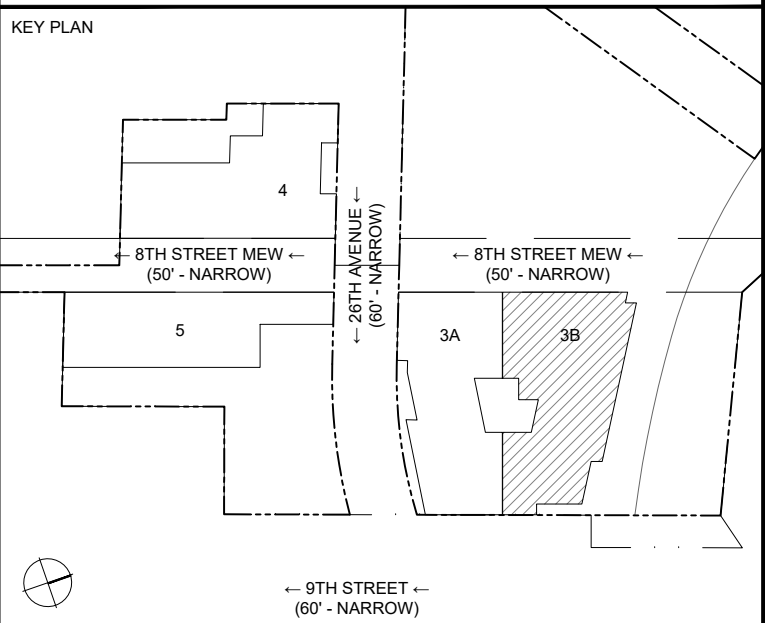
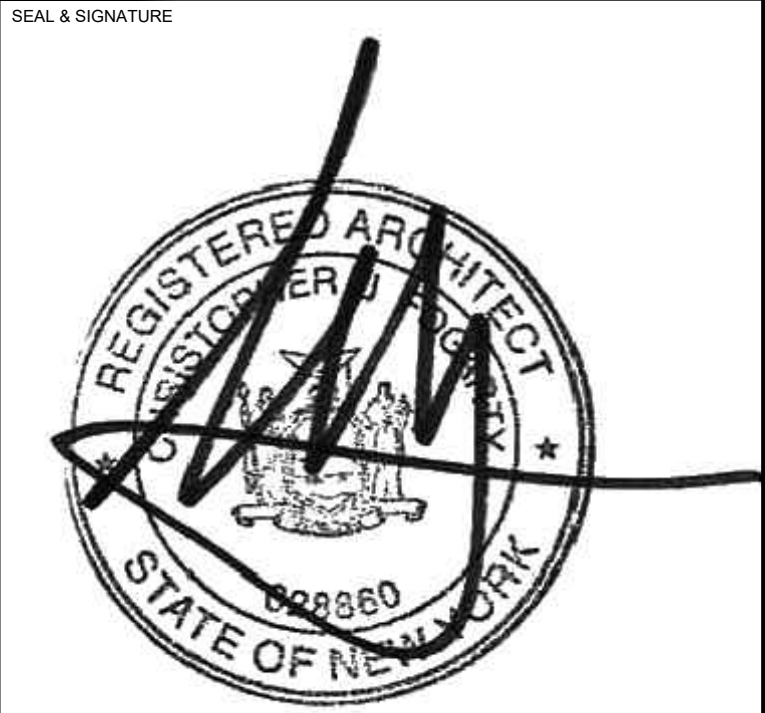
STRUCTURAL ENGINEER
DESIMONE CONSULTING ENGINEERS
140 BROADWAY, 25TH FLOOR
NEW YORK, NY 10005

MEP ENGINEER
ETTINGER ENGINEERING ASSOCIATES
505 EIGHTH AVE 24TH FLOOR
NEW YORK, NY 10018

CIVIL ENGINEER
PHILIP HABIB & ASSOCIATES
102 MADISON AVE #11
NEW YORK, NY 10016

GEOTECH
GEI CONSULTANTS, INC., P.C
530 7TH AVENUE, SUITE 2007
NEW YORK, NY 10018

CODE CONSULTANT / EXPEDITOR
JAM CONSULTANTS INC
104 WEST 20TH STREET, 3TH FLOOR
NEW YORK, NY 10011



01 12.17.2021 DOB FOUNDATION FILING
No. DATE ISSUE

BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 5

DOB NOW #Q00646756-I1

12TH-22ND FLOOR PLAN

DATE (MM/DD/YY) 2022-01-12
PROJECT No. CAPE_09001
DRAWING BY FFA
CHK BY FFA

A-112.00

CADD FILE No. REV OF ###

10^{-4}

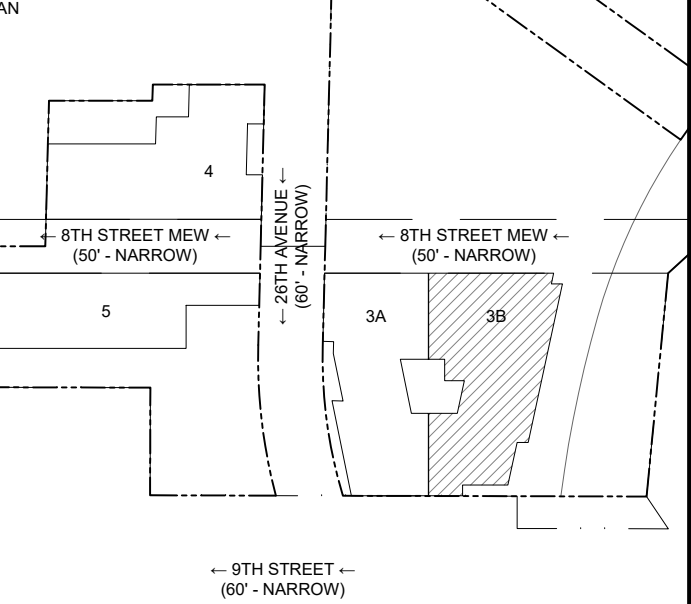
ASTORIA COVE PHASE I, LLC
C/O CAPE ADVISOR
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SIGNATURE



2/17/2021	DOB FOUNDATION FILING
DATE	ISSUE

DBNOW #Q00646756-I1

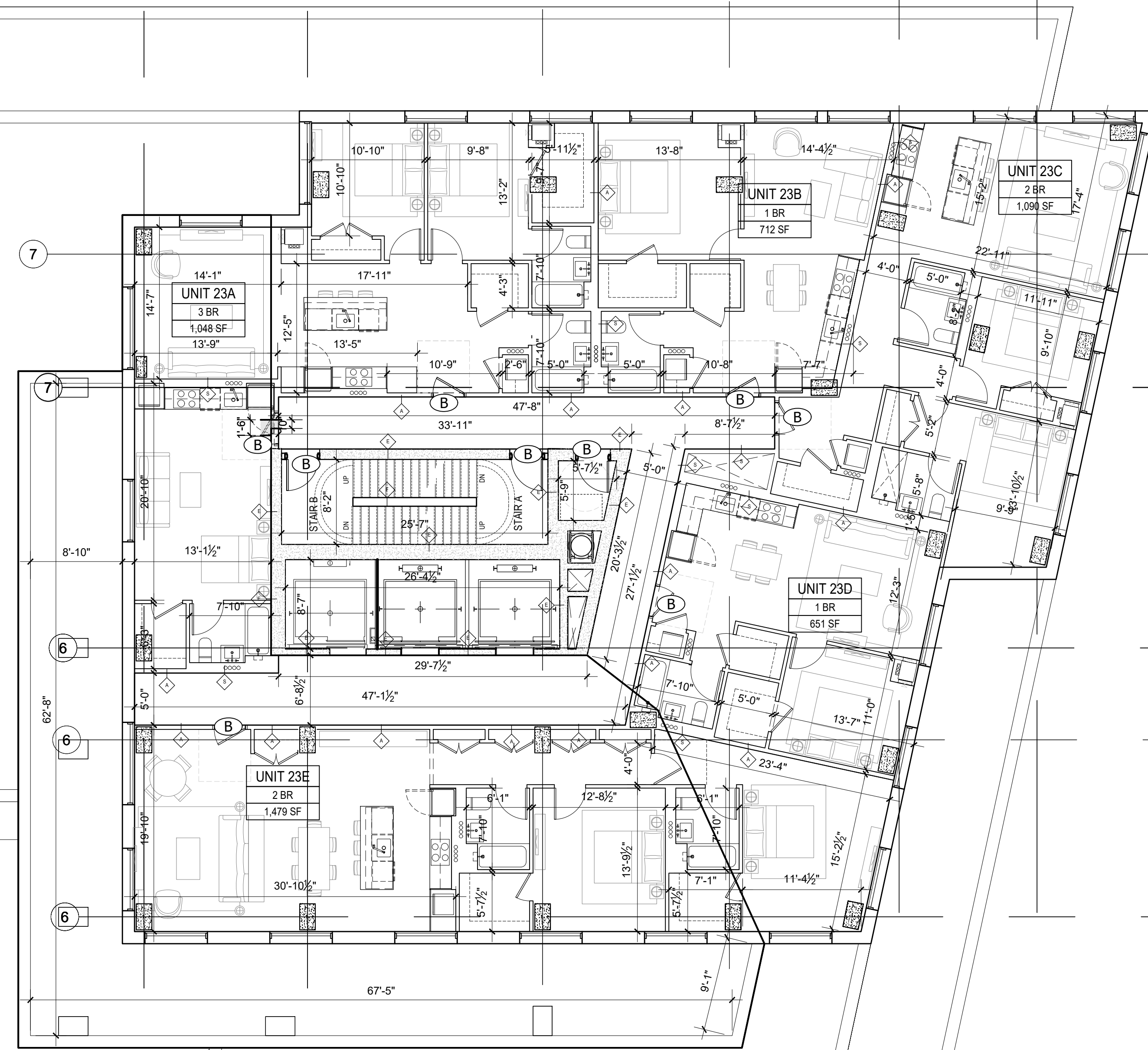
23RD FLOOR PLAN

IM CD-YY:	2022-01-12
IT No.:	CAPE_00003
IG BY:	FFA
	FFA

A-123.00

FILE No.:	<small>(If applicable, also include including the CER - the for each file)</small>	## OF ##
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←← 26TH AVENUE ←←
(60' - NARROW)



GENERAL NOTES:	
1.	PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL: +20.00' NAVD 88
2.	ALL PARTITION TYPES TO BE W22 U.O.N
3.	ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION.

KEY NOTES:

1	23RD FLOOR PLAN SCALE: 1/8" = 1'-0"
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OF

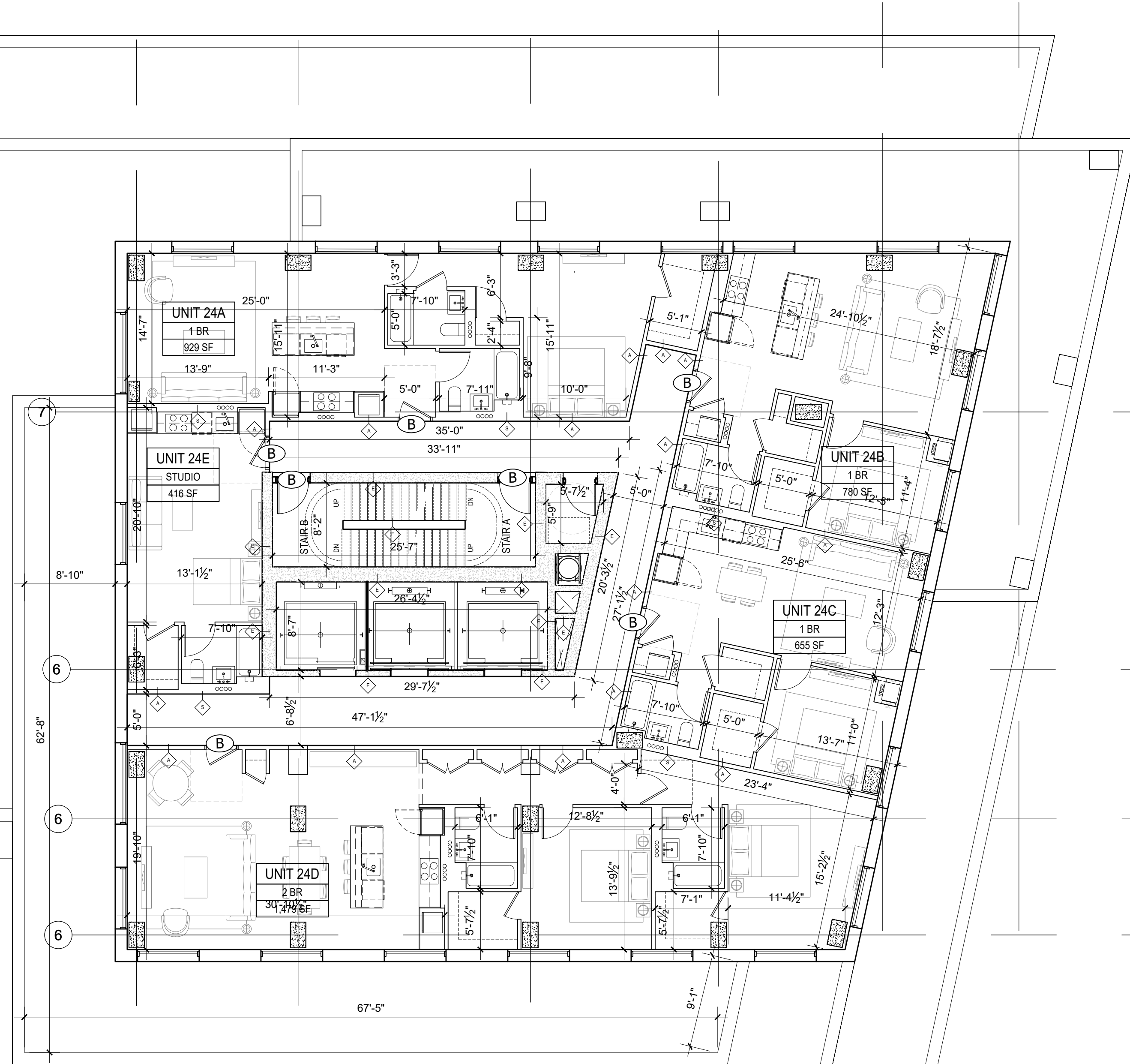
8TH STREET MEW
(50' - NARROW)

22'-7"

18'-4"

FILED IN A DIFFERENT
APPLICATION
(APP#: Q00646754-I1)

← 26TH AVENUE ←
(60' - NARROW)



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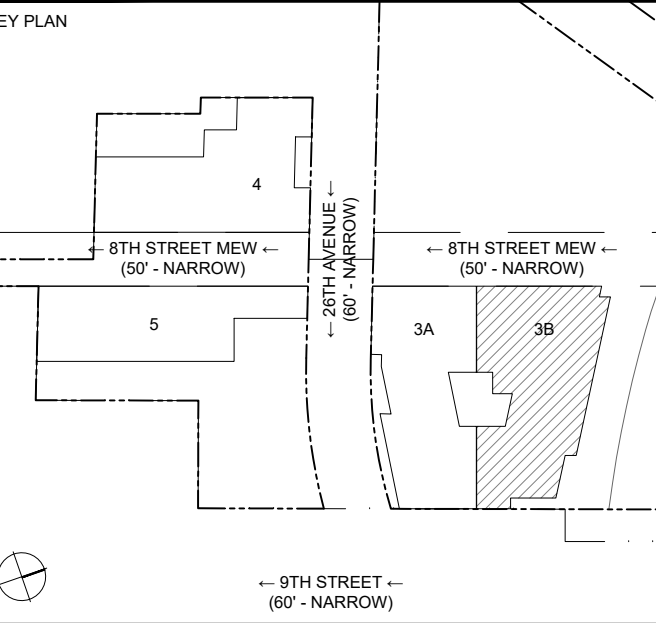
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01 12.17.2021 DOB FOUNDATION FILING
No. DATE ISSUE

BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 5

DOBNOW #Q00646756-I1

**24TH-25TH FLOOR
PLAN**

DATE (MM-DD-YY) 2022-01-12
PROJECT No. CAPE_20001
DRAWING BY FFA
CHK BY FFA

A-124.00

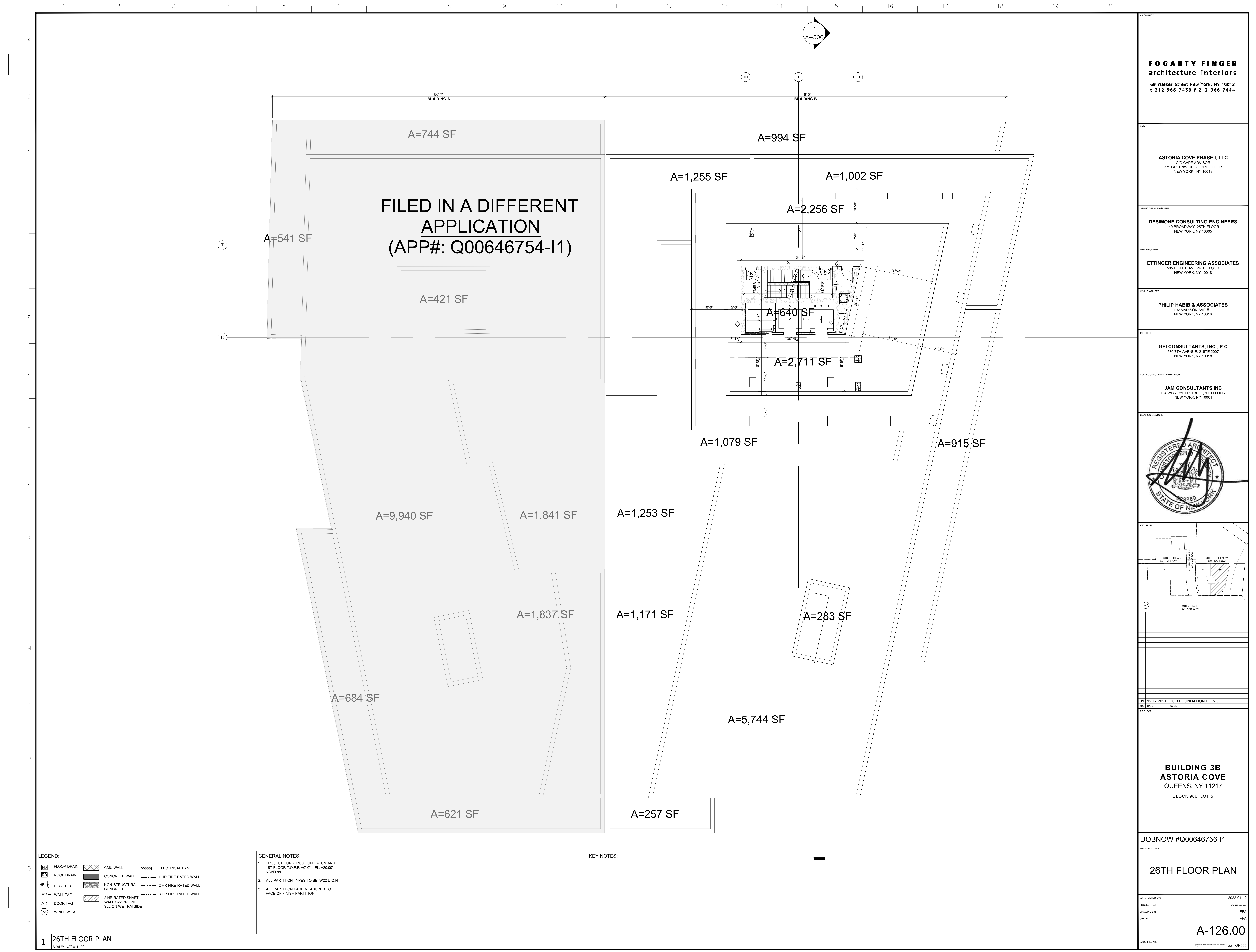
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- LEGEND:**
- | | | | | | |
|--|-------------|--|--|--|----------------------|
| | FLOOR DRAIN | | CMU WALL | | ELECTRICAL PANEL |
| | ROOF DRAIN | | CONCRETE WALL | | 1 HR FIRE RATED WALL |
| | HOSE BIB | | NON-STRUCTURAL CONCRETE | | 2 HR FIRE RATED WALL |
| | WALL TAG | | 2 HR RATED SHAFT WALL S22 PROVIDE S22 ON WET RM SIDE | | 3 HR FIRE RATED WALL |
| | DOOR TAG | | | | |
| | WINDOW TAG | | | | |

- GENERAL NOTES:**
- PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83
 - ALL PARTITION TYPES TO BE W22 U.O.N
 - ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION.

KEY NOTES:

1 24TH-25TH FLOOR PLAN
SCALE: 1/8" = 1'-0"



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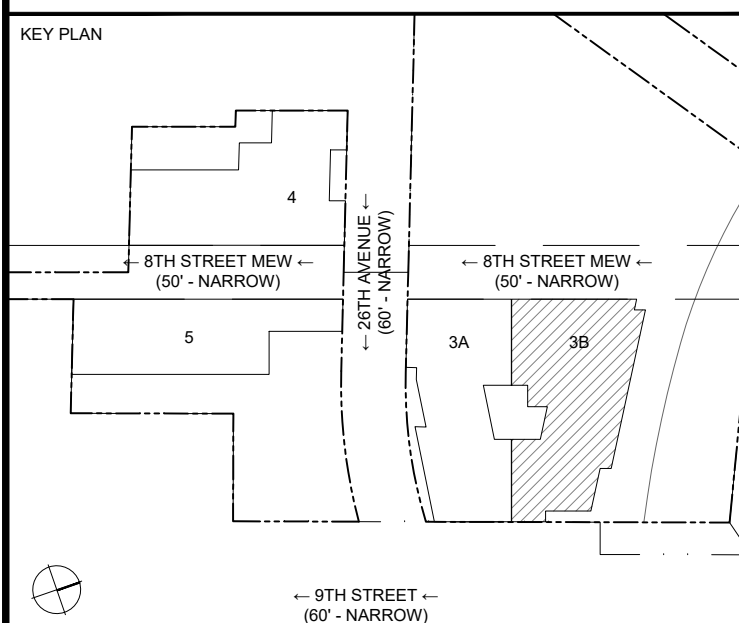
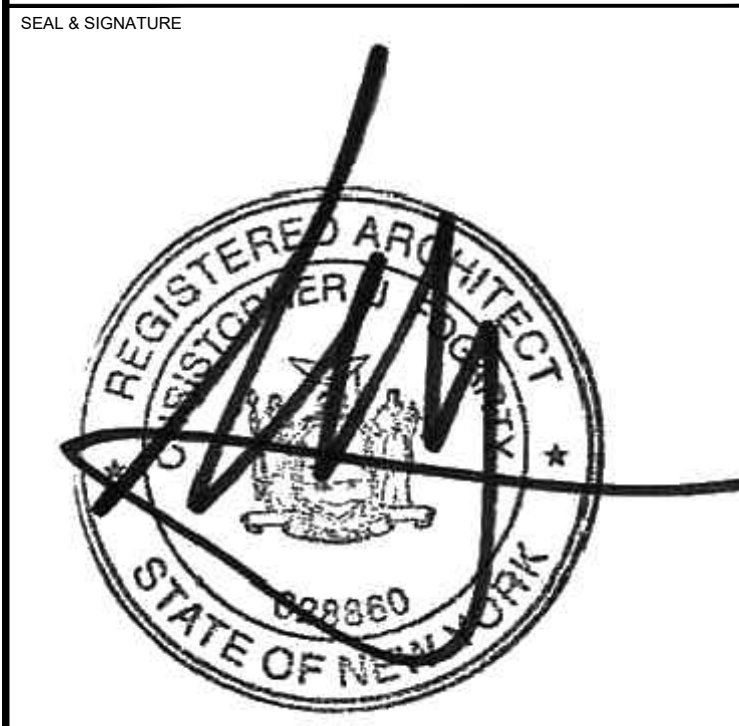
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BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 5

DOBNOW #Q00646756-I1

26TH FLOOR PLAN

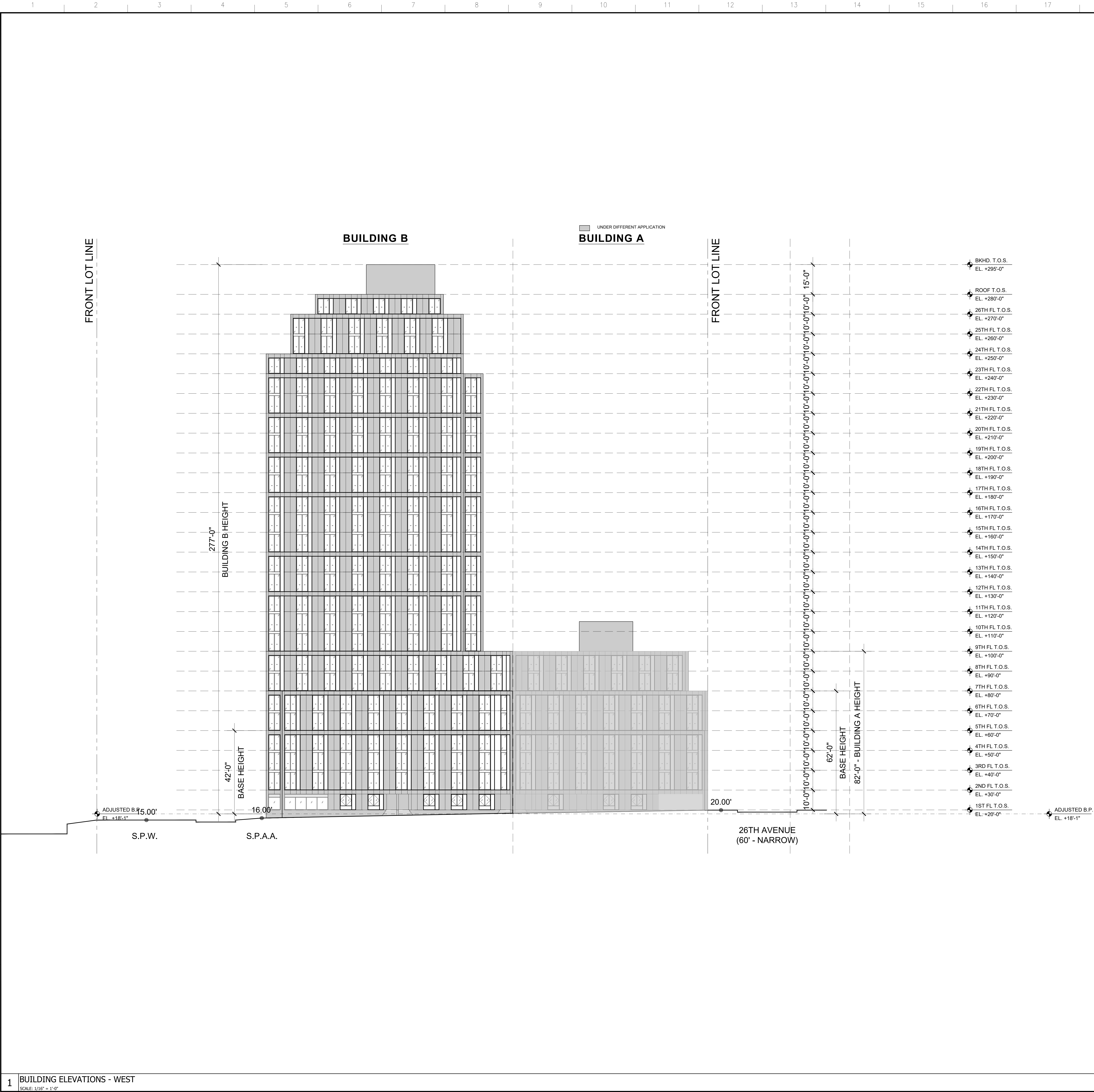
DATE (MM/DD/YYYY)	2022-01-12
PROJECT NO.	CAPE_20001
DRAWING BY	FFA
CHECK BY	FFA

A-126.00
CADD FILE NO. **26TH FLOOR PLAN**

LEGEND:			
	FLOOR DRAIN		CMU WALL
	ROOF DRAIN		CONCRETE WALL
	HOSE BIB		NON-STRUCTURAL CONCRETE
	WALL TAG		2 HR RATED SHAFT WALL S22 PROVIDE S22 ON WET RM SIDE
	DOOR TAG		
	WINDOW TAG		

- GENERAL NOTES:
- PROJECT CONSTRUCTION DATUM AND 1ST FLOOR T.O.F.F. +0'-0" = EL. +20.00' NAVD 83
 - ALL PARTITION TYPES TO BE 1/2" U.O.N
 - ALL PARTITIONS ARE MEASURED TO FACE OF FINISH PARTITION.

KEY NOTES:



LEGEND

XXB

0

WB

0

MATERIALS TAG

KEYED NOTES

WINDOW TAG

DOOR TAG

GENERAL NOTES

1. PROJECT CONSTRUCTION DATUM AND BASE PLANE +0'-0" = EL. +12.00' (NAVD 88)

2. SEE A-400S FOR TYPICAL WALL TYPES

3. FACADE GLASS, GLASS RAILINGS, AND OTHER EXTERIOR GLASS SHALL COMPLY WITH AMENDMENTS TO THE NEW YORK CITY BUILDING CODE (CODE) MANDATED BY LOCAL LAW 15 OF 2020. BIRD FRIENDLY GLASS SHALL MEET THE DEFINITION OF BIRD FRIENDLY MATERIAL AS DEFINED BY CODE. EXCEPTIONS TO BIRD FRIENDLY MATERIALS CAN BE FOLLOWED PER LOCAL LAW 15/2020.

4. SEE RCP AND ELEC. DWGS FOR EXTERIOR LIGHTING FIXTURE LOCATIONS; SEE LOW VOLTAGE DWGS FOR INTERCOMS AND SECURITY CAMERAS

5. SEE MEP DWGS FOR EXTERIOR WALL PENETRATIONS; LOUVER LOCATIONS TO BE COORDINATED WITH MECH. DWGS

KEY NOTES LEGEND

1

UNDER DIFFERENT APPLICATION

MATERIALS LEGEND

BR-01

EIFS

BRICK

EIFS

ARCHITECT

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SEAL & SIGNATURE

KEY PLAN

01.12.17.2021

DOB FOUNDATION FILING

NO. DATE ISSUE

PROJECT

**BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 5**

DOBNOW #Q00646756-11

DRAWING TITLE

**BUILDING ELEVATIONS
- WEST**

DATE (MM-DD-YY)

2022-01-12

PROJECT NO.

CAPE_28001

DRAWING BY

FFA

CHK BY

FFA

A-300.00

GRID FILE NO.

OF



**BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217**
BLOCK 906, LOT 5

DOBNOW #Q00646756-I1

BUILDING ELEVATIONS - EAST

DATE (MM-DD-YY):	2022-01-12
PROJECT No.:	CAPE_09003
DRAWING BY:	FFA
CHK BY:	FFA

A-301.00

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GENERAL NOTES

1. PROJECT CONSTRUCTION (NAVD 83) AND BASE PLANE $+0.0' = \text{E.L.} +12.00'$ (DUMP 88)
2. SEE A-400S FOR TYPICAL WALL TYPES
3. FACADE GLASS, GLASS RAILINGS, AND OTHER EXTERIOR GLASS SHALL COMPLY WITH AMENDMENTS TO THE NEW YORK CITY BUILDING CODE (CODE) MANDATED BY LOCAL LAW 15 OF 2020. BIRD FRIENDLY GLASS SHALL MEET THE DEFINITION OF BIRD FRIENDLY MATERIALS AS DEFINED BY CODE. EXCEPTIONS TO BIRD FRIENDLY MATERIALS SHALL BE FOLLOWED PER LOCAL LAW 15/2020.
4. SEE RCP AND ELEC. DWGS FOR EXTERIOR LIGHTING FIXTURE LOCATIONS; SEE LOW VOLTAGE DWGS FOR INTERCOMS AND SECURITY CAMERAS
5. SEE MEP DWGS FOR EXTERIOR WALL PENETRATIONS AND OVERHEAD LOCATIONS TO BE COORDINATED WITH MECH. DWGS

<p>KEY NOTES LEGEND</p> <hr/> <p>① UNDER DIFFERENT APPLICATION </p>	<p>ETTINGER ENGINEERING ASSOCIATES 505 EIGHTH AVE 24TH FLOOR NEW YORK, NY 10018</p>
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Seal of the State of New York, Registered Architect, with a signature over it.

KEY PLAN

8TH STREET NW - (57' WARRIOR)

8TH STREET SE - (57' WARRIOR)

8TH STREET - (57' WARRIOR)

3A

3B

NORTH

[illegible]

01	12.17.2021	DOB FOUNDATION FILING
No.	DATE	ISSUE

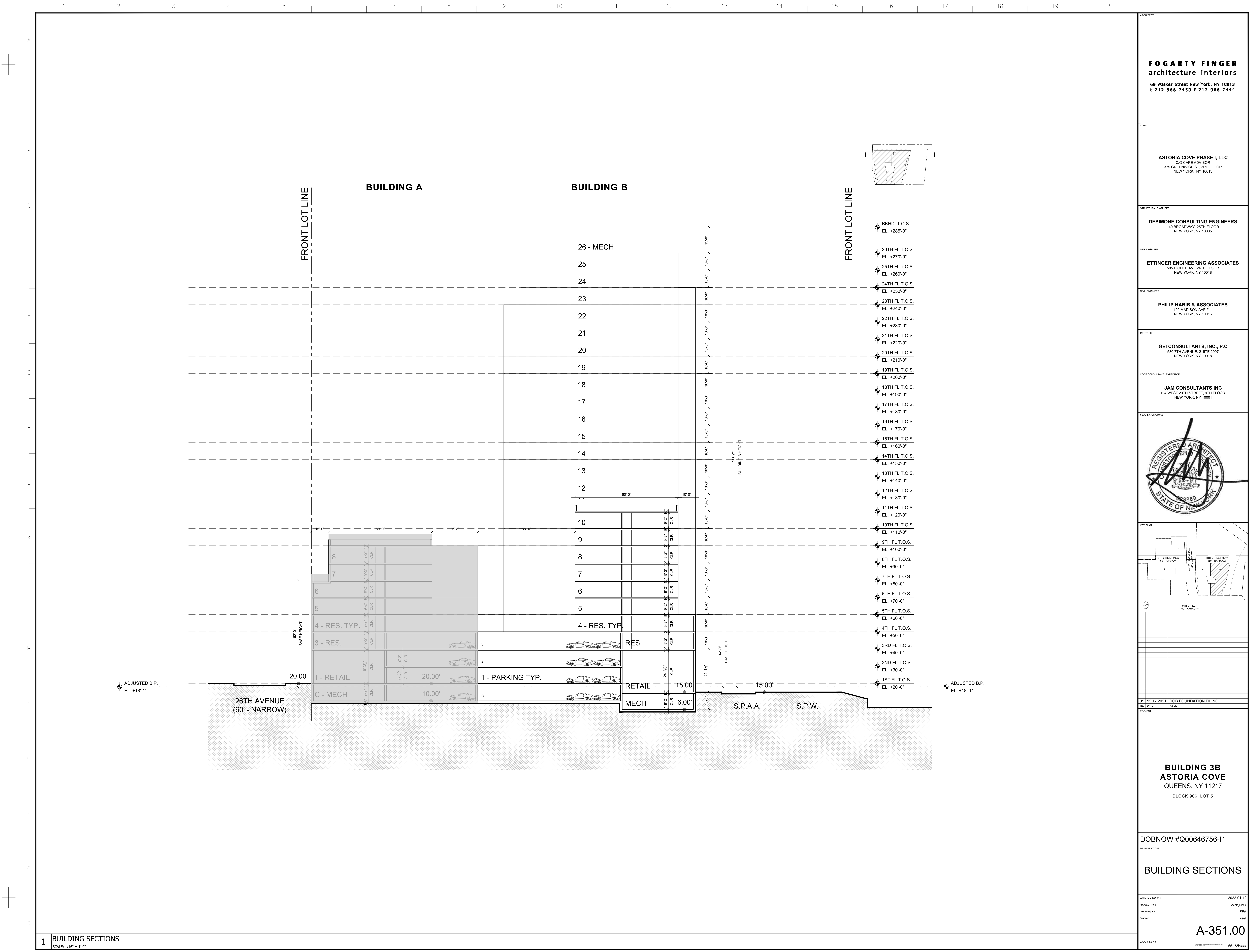
BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 5

DOB NOW #Q00646756-I1

BUILDING ELEVATION
- NORTH

DATE (MM/DD-YY)	2022-0
PROJECT No.:	CAPE
DRAWING BY:	
CHK BY:	

A-302.0



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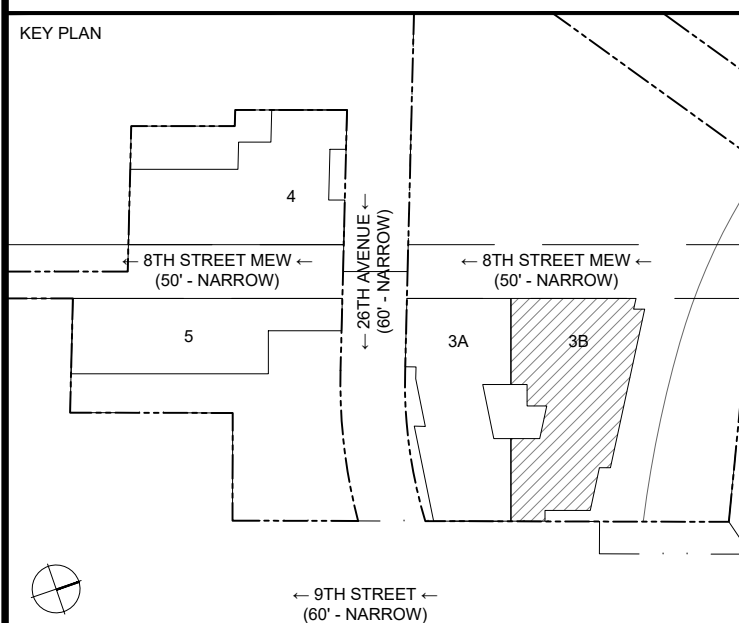
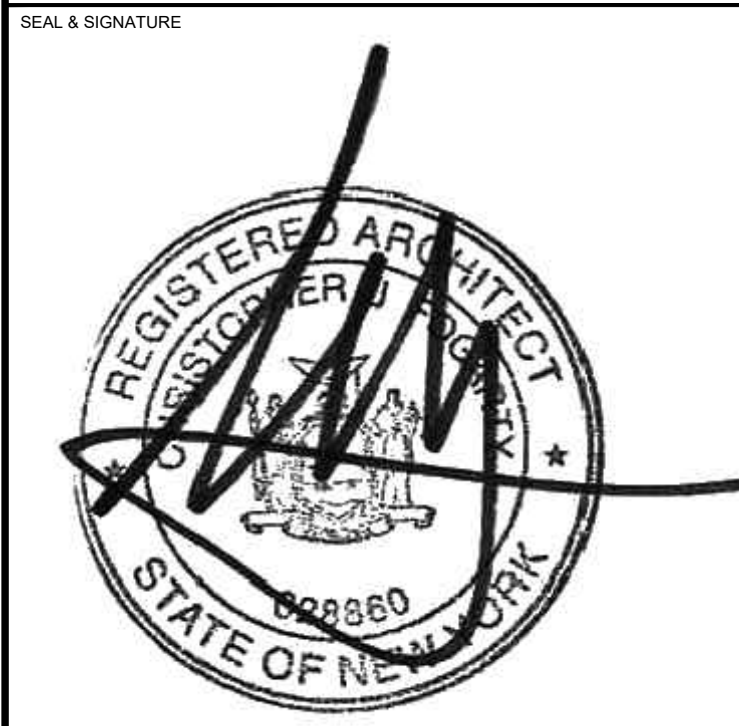
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NEW YORK, NY 10011



01.12.2021 DOB FOUNDATION FILING
DATE DATE
PROJECT PROJECT

BUILDING 3B
ASTORIA COVE
QUEENS, NY 11217
BLOCK 906, LOT 5

DOB NOW #Q00646756-11

BUILDING SECTIONS

DATE (MM-DD-YY) 2022-01-12
PROJECT No. CAPS_28001
DRAWING BY: FFA
CHK BY: FFA

A-351.00
CADD FILE No. OF ###

APPENDIX 2

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 (QEP) 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 OER.

1.2 Stockpile Methods

Excavated soil from suspected areas of contamination (e.g., hot spots, 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 OER. 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 RAP.
- 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 considers 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 RCR 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 OER 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 Soil Cleanup Objectives (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 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. Soil reuse is not planned on this project.

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 RCR.

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 Unrestricted Use remedial action projects will not exceed Unrestricted Use SCOs.

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.
 - 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.

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.

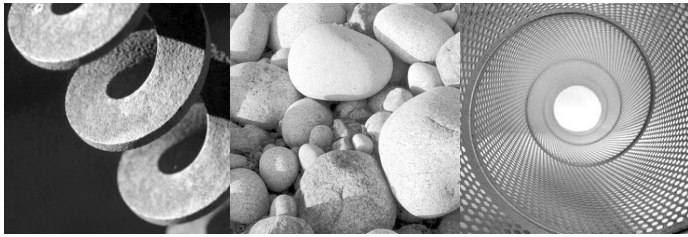
Other Nuisances

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 3

CONSTRUCTION HEALTH AND SAFETY PLAN



Consulting
Engineers and
Scientists

Construction Health and Safety Plan

Astoria Cove – NYCOER RAWP
26th Avenue Between 4th Street and 9th Street
Astoria, Queens, New York

Prepared For:

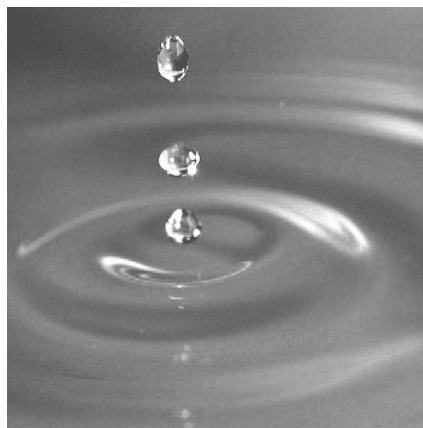
Astoria Cove Phase 1, LLC
c/o Cape Advisors, Inc.
375 Greenwich St, 3rd Floor
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Submitted by:

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March 2022

Project No. 2104337



George Holmes, P.G.
Project Manager

Jeena Sheppard
Regional Safety Manager

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- B. Safety Data Sheets
- C. Heat and Cold Stress Guidelines
- D. Forms
- E. GEI Health and Safety SOPs

1. Emergency Contact Information

Table 1. Emergency Contact Information

Important Phone Numbers	
Local Police:	911
Fire Department:	911
Ambulance:	911
Hospital and Occupational Clinic Information (See Attached Map and Directions in Appendix A)	
Mount Sinai Queens: 25-10 30 th Avenue Queens, NY 11102	(718) 932-1000
CityMD Astoria Urgent Care - Queens: 31-11 Steinway Street Queens, NY 11103	(718) 475-2345
Contacts	
Project Manager: George Holmes	(631) 759-2972 office (631) 512-1077 cell
Safety Director: Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell
Regional Safety Manager : Jeena Sheppard	(856) 298-7138 cell
GEI People Team:	(781) 721-4117 Boston (916) 631-4596 Sacramento
Medcor Triage	1-800-775-5866
Client Contact: Matthew Hurson	mhurson@capeadvisors.com
Other Information	
Contractor Requesting Utility Clearance: Utility Clearance Ticket Number:	TBD
Nearest Telephone Location (or alternate means of communication)	On-site Cellular

2. Background

Project Name: Astoria Cove – NYCOER RAWP
Project Location: 26th Avenue Between 4th and 9th Street, Astoria, NY 11102
GEI Project No: 2104337

This Construction Health and Safety Plan (CHASP) establishes policies and procedures to protect GEI Consultants, Inc. (GEI) personnel from the potential hazards posed by the activities at the Astoria Cove site in Astoria, New York. Reading of the CHASP is required of on-site GEI personnel and will be reviewed by GEI subcontractors. Subcontractors will prepare their own site-specific CHASP and may use this as a guide. The plan identifies measures to minimize accidents and injuries, which may result from project activities or during adverse weather conditions. A copy of this CHASP will be maintained on site for the duration of the work.

Included in Section 1 and Appendix A is a route to the nearest medical facility from the site with directions and contact information. Safety data sheets (SDS), specific to chemicals that may be encountered while working at the site, are in Appendix B. Appendix C details the signs, symptoms, care and procedures to both heat and cold stress. Appendix D includes the Tailgate Safety Briefing form, the Project Safety Briefing form, the Accident/Incident Report Form, and the Near Miss Reporting Form. Appendix E contains the GEI Health and Safety (H&S) Standard Operating Procedures (SOPs) that apply to this project. Also included in Appendix E is the COVID-19 Field Work Guidance.

2.1 Site Description

Currently there are several one to two-story buildings that were used for commercial and industrial use. The site is relatively flat except in the southeast corner where there is a 20-foot slope. Prior sampling conducted at the site has identified potential petroleum contamination as well as volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs) above applicable standards.

2.2 Scope of Field Work

The Site will be remediated in accordance with a New York City Office of Environmental Remediation (NYCOER) Remedial Action Work Plan (RAWP). The remedial action will include soil excavation and off-Site disposal, import of soil to use as backfill, and installation of a composite cover system and a vapor barrier.

3. GEI Health and Safety Policy

GEI is committed to providing a safe and healthy work environment for its employees. To maintain a safe work environment, GEI has established an organizational structure and a Corporate Health and Safety Program to promote the following objectives:

- Reduce the risk of injury, illness, and loss of life to GEI employees.
- Maintain compliance with federal, state, and other applicable safety regulations; and minimize GEI employees' work exposure to potential physical, chemical, biological, and radiological hazards.

Safety policy and procedure on any one project cannot be administered, implemented, monitored, and enforced by any one individual. The total objective of a safe, accident-free work environment can only be accomplished by a dedicated, concerted effort by every individual involved with the project from management down to all employees.

Each GEI employee must understand their value to the company; the costs of accidents, both monetary, physical, and emotional; the objective of the safety policy and procedures; the safety rules that apply to the safety policy and procedures; and what their individual role is in administering, implementing, monitoring, and compliance of their safety policy and procedures. This allows for a more personal approach to compliance through planning, training, understanding, and cooperative effort, rather than by strict enforcement. If for any reason an unsafe act persists, strict enforcement will be implemented.

4. Potential Hazards

The potential hazards associated with site conditions and activity hazards related to GEI on-site activities have been identified in this section.

4.1 Special Site Conditions or Concerns

- Traffic – The majority of traffic on the project site will be construction traffic. Some areas are used for commercial vehicle parking. Field staff should pay extra attention to their surroundings in these areas. Traffic controls will be utilized from the driller or contractor if necessary.
- Equipment – Contractors will use various heavy equipment. Specific attention given to rotating equipment, pinch points, and overhead equipment.
- Biohazards (insect bites, poison ivy, etc.) – The site abuts the East River along the northern boundary of the site. Mosquitos may be present, increasing risk for mosquito-borne diseases. Field staff should wear insect repellant to minimize bug bites.
- Hazardous winter conditions – Cold stress, slippery surfaces, and icy conditions are possible dangers.

Safety equipment will include: First aid kit, fire extinguisher, eye wash bottles, adequate supply of drinking water and electrolyte fluids, hand cleaner, insect repellent, sunscreen, and cell phone.

4.2 Activity Hazard Analysis

The potential hazards for this project associated with site conditions and activity hazards associated with GEI on-site activities have been identified in Table 2. General hazards and control measures that are applicable to all site activities are identified in the General Hazards section. The site-specific tasks, potential hazards, and control measures established to reduce the risk of injury or illness are identified in the Activity Hazard section of Table 2. Health and Safety SOPs for routine hazards and common site conditions are referenced in the table below and included in Appendix E.

Table 2. Activity Hazard Analysis

General Hazards These Hazards Apply to All Site Activities	Control Measure
Abandoned Building Entry	<ul style="list-style-type: none"> • Wear steel-toed boots, safety glasses, gloves, and dust mask as needed. • Use the buddy system. • Bring additional lighting – e.g. flashlights or headlamps • Be aware of potential for animals including birds. Avoid disturbing their habitats and droppings. • Confirm walking/working surfaces are sound. • Determine the safest entry and exit points – walk the perimeter first. • Avoid exposed wiring. • Look for signs of vandalism or vagrants and avoid interaction.
Chemical / Contaminant Exposure – Skin and eye injury/irritation	<ul style="list-style-type: none"> • Wear protective coveralls (e.g. Tyvek) with shoe covers, safety glasses, face shield, Nitrile gloves, if needed. • Dispose of gloves after use and wash hands. • Avoid contact with pooled liquids and limit contact with contaminated soils/groundwater. • See SOP HS-009

General Hazards These Hazards Apply to All Site Activities	Control Measure
<p>Cold Stress – Hypothermia, Frostbite</p>	<ul style="list-style-type: none"> • Take breaks in heated shelters when working in extremely cold temperatures. • Drink warm liquids to reduce the susceptibility to cold stress. • Wear protective clothing (recommended three layers: an outside layer to break the wind, a middle layer to provide insulation, and an inner layer of cotton or synthetic weave to allow ventilation). • Wear a hat and insulated boots. • Keep a change of dry clothing available in case clothes become wet. • Do heavy work during the warmer parts of the day and take breaks from the cold. • If possible shield work areas from drafts of wind and use insulating material on equipment handles when temperatures are below 30°F • Watch for symptoms of cold stress. (see Appendix C in CHASP)

General Hazards These Hazards Apply to All Site Activities	Control Measure
<p>Coronavirus-COVID-19</p>	<ul style="list-style-type: none"> • Maintain a distance of 6 feet from others. • If tasks needed to be performed close to others, wear appropriate PPE including a face mask (surgical or cloth), gloves, and eye protection. • When travelling to project site, travel in separate vehicles. • Frequent washing of hands with soap and warm water for 20 seconds. If soap is not available, use hand sanitizer with 60% alcohol. • Wipe down surfaces such as equipment surfaces, vehicle steering wheel, gear shifter, controls and door handles with disinfectant routinely before and after use. • Wear Nitrile gloves as frequently as possible. • Wash hands after gloves removal. • Do not shake hands, hug, or engage in other personal contact.
<p>Cuts and Lacerations</p>	<ul style="list-style-type: none"> • Keep free hand out of the way. • Secure work if cutting through thick material. • Use only sharp blades; dull blades require more force that results in less knife control. • Pull the knife through the object and away from your body; pulling motions are easier to manage. • Do not put the knife in your pocket. • Wear leather or Kevlar® gloves when using knives or blades, or when removing sharp objects caught or dangling in sampling gear.

General Hazards These Hazards Apply to All Site Activities	Control Measure
Driving	<ul style="list-style-type: none"> • Employees must wear their safety belt while in a moving vehicle. • Vehicle accidents will be reported in accordance with GEI's accident reporting procedures. • Vehicles will be properly maintained and safely operated (refer to GEI's Fleet Maintenance Program). • Employees will follow safe driving behaviors, which include limiting distractions such as manipulating radios or other equipment that may cause a distraction. Employees will not exceed the posted speed limit and will maintain a safe distance between other vehicles. • Use defensive driving techniques. • Driving distance and time after a 12-hour shift will not exceed 30 miles or 30 minutes (whichever is greater). • See SOP HS-004
Dusty Conditions – Eye and respiratory irritation	<ul style="list-style-type: none"> • Avoid travel at extreme times • Wear protective gear – dust masks, safety glasses
Heat stress – Fainting, Fatigue, Heat Stroke	<ul style="list-style-type: none"> • Increase water intake while working. • Increase number of rest breaks and/or rotate workers in shorter work shifts. Rest in cool, dry areas. • Watch for signs and symptoms of heat exhaustion and fatigue. • Plan work for early morning or evening during hot months. • Use ice vests when necessary. • In the event of heat stroke, bring the victim to a cool environment and initiate first aid procedures. • See Appendix C of the CHASP

General Hazards These Hazards Apply to All Site Activities	Control Measure
Inclement Weather	<ul style="list-style-type: none"> • Listen to local forecasts for warnings about specific weather hazards such as tornados, thunder storms, and flash floods. • If the storms produce thunder and/or lightning, leave the work area immediately and move to a safe area. • Discuss an action plan prior to the severe weather. • Wear appropriate PPE for the type of weather that could be encountered. • Stop work until conditions are suitable. Take cover in vehicles or shelter as appropriate. • See SOP HS-010
Insects – Bites, Stings, Allergic Reactions	<ul style="list-style-type: none"> • Apply insect repellent prior to performing field work and as often as needed throughout the work shift • Wear proper protective clothing (work boots, socks and light colored clothing) • Wear shoes, long pants with bottoms tucked into boots or socks, and a long-sleeved shirt when outdoors for long periods of time, or when many insects are most active (between dawn and dusk). • When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible • Field personnel who may have insect allergies will have bee sting allergy medication on site and will provide this information to the SSM and the Safety Director prior to commencing work. • Field personnel will perform a self-check at the end of the day for ticks. • See SOP HS-001

General Hazards These Hazards Apply to All Site Activities	Control Measure
<p>Noise - Hearing loss</p>	<ul style="list-style-type: none"> • Wear appropriate hearing protection based on the noise. • Remove the hazard by taking away the source of the noise. • Remove the employee from the source of the noise. • Provide the employee with appropriate personal protective equipment (PPE). • Other employees who do not need to be in proximity of the noise should distance themselves from the equipment generating the noise. • See SOP HS-012
<p>Physical Injury – Slips, Trips and Falls</p>	<ul style="list-style-type: none"> • Wear PPE that properly fits, is in good condition and appropriate for the activities and hazards. • Maintain good visibility of the work area. • Avoid walking on uneven, steeply sloped or debris ridden ground surfaces. • Plan tasks prior to performing them including an activity hazard analysis. • Keep trafficked areas free from slip/trip/fall hazards. • Maintain weed growth in sampling areas, especially on slopes. • Wear shoes with traction. • Avoid traversing steep areas in slippery conditions. • Do not carry heavy objects to sampling areas, on steeply sloped areas, or where steep areas must be traversed to arrive at sample points.

General Hazards These Hazards Apply to All Site Activities	Control Measure
<p>Portable Fuel Containers</p>	<ul style="list-style-type: none"> • When dispensing gasoline into a container, use only an approved portable container and place it on the ground to avoid a possible static electricity ignition of fuel vapors. Containers should never be filled while inside a vehicle or its trunk, the bed of a pickup truck or the floor of a trailer. • When filling a portable container, manually control the nozzle valve throughout the filling process. Fill a portable container slowly to decrease the chance of static electricity buildup and minimize spilling or splattering. Keep the nozzle in contact with the rim of the container opening while refueling. • Fill container no more than 95 percent full to allow for expansion. • Place cap tightly on the container after filling - do not use containers that do not seal properly. • Only store gasoline in approved containers as required by federal or state authorities. Never store gasoline in glass or any other unapproved container. • If gasoline spills on the container, make sure that it has evaporated before you place the container in your vehicle. • Report spills to the attendant. • When transporting gasoline in a portable container make sure it is secured against tipping and sliding, and never leave it in direct sunlight or in the trunk of a car.
<p>Repetitive Motion Injury - Standing, Squatting, and Bending Over</p>	<ul style="list-style-type: none"> • Take regular breaks and do not work in unusual positions for long periods of time. • Walk and stretch between tasks. • See SOP HS-025

General Hazards These Hazards Apply to All Site Activities	Control Measure
<p>Sun Exposure</p>	<ul style="list-style-type: none"> • Liberally apply sunscreen, with a minimum broad-spectrum sun protection factor (SPF) of 30 • Wear safety glasses that offer protection from ultraviolet A and B (UVA/UVB) rays. • Bring shade to the site to reduce exposure. • When possible, wear long-sleeved shirts and long pants. • Clothes made from tightly woven fabric and darker colors offer the best protection. Some clothing is certified as offering UV protection. • Wear a hat that has a brim all the way around that shades your face, ears, and the back of your neck. A tightly woven fabric, such as canvas, works best to protect your skin from UV rays. • Sunscreen wears off. Put it on again if you stay out in the sun for more than 2 hours. • Check the sunscreen's expiration date. Sunscreen without an expiration date has a shelf life of no more than 3 years.
<p>Unsecured or High Crime Areas</p>	<ul style="list-style-type: none"> • Be aware of your surroundings. • Use the buddy system. Do not remain on site alone. Accompany or be accompanied by others to vehicles. • Request police detail when appropriate. • Let the SSM know when you begin work in these areas and when you leave. • Call in regularly. • If you arrive in an area and it does not look safe to get out of your vehicle, lock the doors and drive off quickly but safely.

General Hazards These Hazards Apply to All Site Activities	Control Measure
<p>Utilities – Shock, Electrocution, Fire, Explosion</p>	<ul style="list-style-type: none"> • An underground utility survey must be conducted prior to intrusive activities. Coordination with utility locating services, property owner(s) or utility companies must be conducted. • Utilities are to be considered live or active until documented otherwise. • For overhead utilities within 50 feet, determine with the utility company the appropriate distance. Minimum distance for clearance is based on voltage of the line. • If exposing a utility, proper support and protection must be provided so that the utility will not be damaged. • If a gas line is contacted, the contractor must notify police, fire, and emergency personnel, and evacuate employees according to the site evacuation procedures. No attempt will be made to tamper with or correct the damaged utility. • See SOP HS-014
<p>Vehicular Traffic – Struck by injury, crushing</p>	<ul style="list-style-type: none"> • Increase visibility of the work area to others by using cones, flags, barricades, proper lighting and caution tape to define work area. • Use a "spotter" to locate oncoming vehicles. • Use vehicle to block work area. • Engage police detail for all work conducted in appropriate areas. • Wear high-visibility, reflective vest at all times. • Maintain minimum DOT defined distances to other traffic lanes. • See SOP HS-016.

Activity	Potential Hazard	Control Measures
Carrying Equipment	Heavy lifting, strains/sprains, slips/trips/falls, pinch points	<ul style="list-style-type: none"> • Use proper lifting techniques as defined in the heavy lifting activity analysis below • Wear the proper type of glove to protect hands against sharp edges and skin/soft tissue injuries • Wear appropriate footwear • Be aware of hard to grip and hold items that may force your hand or wrist into awkward, stressful positions and cause disorders like tendinitis or carpal tunnel syndrome • Take breaks when carrying items frequently and/or for long distances • Do not overreach when picking up or placing items. • Use the buddy system when necessary • When climbing ladders, maintain three points of contact at all times. DO NOT carry equipment up or down ladders unless it is in a secure backpack or similar hands-free shoulder-strap bag or case. Lower or raise larger equipment by crane or rope
Construction Site Entry	Struck-by, caught-in-between equipment, crushing, pinch points	<ul style="list-style-type: none"> • Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or (electrical hazard) EH-rated safety boots with composite toe and shank; safety glasses; nitrile/neoprene gloves; and earplugs. • Identify yourself and your work location to heavy equipment operators, so they may incorporate you into their operations. • Coordinate hand signals with operators. • Stay Alert! Pay attention to equipment backup alarms and swing radii. • Wear a high-visibility, reflective vest when working near equipment or motor vehicle traffic. • Position yourself in a safe location when filling out logs talking with the contractor. • Notify the contractor immediately if any problems arise. • Do not stand or sit under suspended loads or near any pressurized equipment lines. • Do not operate cellular telephones in the vicinity of heavy equipment operation. • See HS-018

Activity	Potential Hazard	Control Measures
Cutting Cores	Cuts/lacerations	<ul style="list-style-type: none"> • Use care when cutting cores. Use mechanical shears, electric knife or self-retracting safety blade when handling cores. • Eliminate hazard by having the drillers open the cores for you. • When using cutting tools, follow the safety precautions listed below: • Keep free hand out of the way. • Secure work if cutting through thick material. • Use only sharp blades; dull blades require more force that results in less knife control. • Pull the knife through the object and away from your body; pulling motions are easier to manage. • Do not put the knife in your pocket. • Wear leather or Kevlar® gloves when using knives or blades, or when removing sharp objects caught or dangling in sampling gear.
Demolition Oversight	Respiratory irritation, eye irritation	<ul style="list-style-type: none"> • Do not enter demolition area while active demolition is occurring. • Wear appropriate PPE as needed including, steel-toe/shank boots, gloves, reflective vest, and hearing protection. • Confirm utility locate has been completed and/or utilities have been disconnected. • Confirm adequate clearance from overhead utilities. • Keep trafficked areas free from slip/trip/fall hazards. • Identify yourself and your work location to heavy equipment operators, so they may incorporate you into their operations. • Confirm contractor is thoroughly wetting active demolition areas.

Activity	Potential Hazard	Control Measures
Drilling Oversight/ Sampling	Contaminant Exposure, Noise, Contact with Utilities, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls	<ul style="list-style-type: none"> • Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs. • Confirm utility locate has been completed. • Confirm adequate clearance from overhead utilities. • Dispose of gloves after use and wash hands. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards. • If cutting through concrete, follow the work practices and respiratory protection recommended in Table 1 of the GEI Silica Program based on the type of equipment being used to cut through the concrete.
Drum Handling	Contaminant Contact, Cuts or Abrasions Heavy Lifting , Slips/Trips/Falls	<ul style="list-style-type: none"> • Wear proper PPE during sampling including nitrile gloves and safety glasses and face shield as appropriate. • Use proper dollies or drum moving tools. • Use applicable tools to open/close drum lids. • Do not handle drums with bulging sides. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Use proper lifting techniques. • Ask fellow worker for help. • Keep trafficked areas free from slip/trip/fall hazards. • See SOP HS-003

Activity	Potential Hazard	Control Measures
Electrical Safety	Electrocution, burns, shock	<ul style="list-style-type: none"> • Conductive items such as jewelry or clothing containing metals will not be worn • Visually inspect equipment or systems for indications of possible damage. Equipment found damaged or defective will not be used and will be properly tagged as “Out of Service”. • Shut down the machine/equipment by the normal stopping procedure (stop button, open switch, close valve, etc.). • Disconnect the machine/equipment from the energy source. • Be aware of stored or residual energy and dissipate or restrain. • When the system/equipment is ready to be returned to service, make sure all tools are removed and the system is operationally intact. • Verify that all employees are in a safe position and have been removed from the area and notify when system/equipment is ready for use. • See SOP HS-005 a/b
Excavation and Trenching Oversight	Crushing, entrapment, falls, fire/explosion	<ul style="list-style-type: none"> • Prior to excavating, determine utility locations and have locations marked by utility companies and the property owner. • Utilities shall be properly supported, and barriers will be erected around excavations in remote areas. • Backfill temporary excavations when work is completed. • Personnel must remain 2 feet from the face of the excavation. • Sides, slopes, and faces shall meet OSHA requirements. • Excavation entry will be allowed only with proper sloping or shoring. • See SOP HS-006

<p>Generator Operation</p>	<p>Fire, Explosion, CO poisoning, Noise, Heavy Lifting</p>	<ul style="list-style-type: none"> • Read the user's manual and familiarize yourself with all equipment before using. • Visually inspect equipment or systems for indications of possible damage. Equipment found damaged or defective will not be used and will be properly tagged as "Out of Service". • Shut down the machine/equipment by the normal stopping procedure (stop button, open switch, close valve, etc.). • Only run a generator OUTSIDE, far away from windows, doors, and vents. • Never operate a generator inside a house, garage, basement, crawl space, or any enclosed or partially enclosed space. • Never operate a generator near open doors or windows. • Keep the generator dry. Using a generator in wet conditions such as in rain or snow, near a pool or sprinkler, or with wet hands could result in electrocution. • Connections to a building must isolate generator power from utility lines and comply with all local laws and electrical codes. • Parts of a generator become very hot during operation and remain hot for a while after stopping the engine. Be careful not to touch the muffler while it is hot. Let the engine cool before storing the generator indoors. • Use a heavy duty, outdoor-rated extension cord that is rated (in watts or amps) at least equal to the sum of the connected appliance loads. • Keep flammable materials away from the generator when it is running. • Keep the generator at least three feet (one meter) away from buildings when the engine is running. The generator needs at least three feet of clearance on the top and all four sides for cooling. • Gasoline is extremely flammable and gasoline vapors can explode. Do not refuel while the engine is hot or running, and do not overfill the fuel tank. Refuel only outdoors in a well-ventilated area. Never smoke near gasoline and keep flames and sparks away. Store fuel in an approved container. • Review Portable Fuel Container Safety in General Hazard Table.
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Activity	Potential Hazard	Control Measures
		<ul style="list-style-type: none"> • Use proper lifting techniques, if needed ask fellow worker for help. • If you must lift, plan the lift before doing it including checking your route for clearance.
Groundwater Sampling	Contaminant Exposure, Heavy Lifting, Repetition, Slips/Trips/Falls	<ul style="list-style-type: none"> • Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses and Nitrile/neoprene gloves. • Dispose of gloves after use and wash hands. • User proper lifting techniques. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Hand Augering	Repetition, pinch point, back/wrist/knee injury, cuts and scrapes	<ul style="list-style-type: none"> • Wear appropriate PPE including safety glasses and gloves that provide protection and grip. • Remove excavated soil only after stopping the hand auger. • Keep trafficked areas free from slip/trip/fall hazards. • An underground utility survey must be conducted prior to intrusive activities. Coordination with utility locating services, property owner(s) or utility companies must be conducted. • Inspect hand auger prior to use to determine if it is functioning properly and free of metal burs. • Use the appropriate size hand auger for the job. • Use hand movements that exert minimum pressure on wrist bones. • Take regular breaks and do not work in unusual positions for long periods of time.
Heavy Lifting	Back injury, knee injury	<ul style="list-style-type: none"> • Use proper lifting techniques. • Ask fellow worker for help. • Use a mechanical lifting device or a lifting aid where appropriate. • If you must lift, plan the lift before doing it. • Check your route for clearance. • Bend at the knees and use leg muscles when lifting. • Use the buddy system when lifting heavy or awkward objects. • Do not twist your body while lifting. • See SOP HS-025

Activity	Potential Hazard	Control Measures
Heavy Equipment – Working Near	Struck-by, caught-in-between equipment, crushing, pinch points	<ul style="list-style-type: none"> • Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or (electrical hazard) EH-rated safety boots with composite toe and shank; safety glasses; nitrile/neoprene gloves; and earplugs. • Identify yourself and your work location to heavy equipment operators, so they may incorporate you into their operations. • Coordinate hand signals with operators. • Stay Alert! Pay attention to equipment backup alarms and swing radii. • Wear a high-visibility, reflective vest when working near equipment or motor vehicle traffic. • Position yourself in a safe location when filling out logs or talking with the contractor. • Notify the contractor immediately if any problems arise. • Do not stand or sit under suspended loads or near any pressurized equipment lines. • Do not operate cellular telephones in the vicinity of heavy equipment operation. • See SOP HS-018
Ladder Use	Falls	<ul style="list-style-type: none"> • Use the appropriate ladder for the job. • Inspect the ladder prior to use. • Make sure ladder rungs are sturdy and free of cracks. • Use ladders with secure safety feet. • Pitch ladders at a 4:1 ratio. • Secure ladders at the top when possible. • Do not use ladders for access to air stripper towers. • Use nonconductive ladders near electrical wires. • See SOP HS-011
Manhole removal and Inspection	Struck-by, caught-in-between, crushing	<ul style="list-style-type: none"> • While working near manholes stay within the limits of safety cones. • Be aware of local traffic. • Do not enter the manhole in any circumstance unless confined space training has been performed. • Buddy system shall be in use. • Perform proper lifting techniques when pulling the lid off of manhole. • Review heavy lifting procedures in SOP HS-025

Activity	Potential Hazard	Control Measures
Power Tool Use	Cuts/Scrapes, Noise, Slips/Trips/Falls, Heavy Lifting, Repetition, Struck-by, caught-in-between equipment, pinch points, hot surfaces (burns), electrical shock	<ul style="list-style-type: none"> • Wear appropriate PPE including: hard hat, gloves, steel toed/shank safety boots, safety glasses, high visibility reflective clothing, and ear plugs. • Keep hands and loose clothing away from moving parts • Use proper lifting techniques. • Do not remove equipment guards on equipment. • Take regular breaks and do not work in unusual positions for long periods of time. • Avoid standing in water when working with electrically powered equipment or tools. • Inspect electrically powered equipment or tools prior to use. Tag and remove from service any tool with frayed cords, broken plugs, or otherwise damaged. • Electrical equipment of tools must be connected to ground fault circuit interrupters.
Site Surveying	Repetition, slip/trip/fall, back injury	<ul style="list-style-type: none"> • Wear steel-toed boots and high visibility reflective vest when traversing work areas. • Avoid walking on uneven, steeply sloped or debris ridden ground surfaces. • Inspect equipment prior to use to determine if it is functioning properly and free of hazards. • Take regular breaks and do not work in unusual positions for long periods of time. This will also help mitigate complacency. • Use proper lifting techniques. • While carrying device, check your travel route for hazards.
Soil Sampling/Soil Vapor Sampling	Contaminant Exposure, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls	<ul style="list-style-type: none"> • Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs as necessary. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Excavation entry will be allowed only with proper sloping or shoring. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.

Activity	Potential Hazard	Control Measures
Waste Characterization	Contaminant Contact, Cuts or Abrasions, Slips/Trips/Falls	<ul style="list-style-type: none"> • Wear proper PPE during sampling including nitrile gloves and safety glasses. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Keep trafficked areas free from slip/trip/fall hazards.

If site conditions suggest the existence of a situation more hazardous than anticipated, the site personnel will evacuate the immediate area. The hazard, the level of precautions, and the PPE will then be reevaluated with the assistance and approval of the Safety Director and the Project Manager (PM).

4.3 Personal Safety

Field activities have the potential to take employees into areas which may pose a risk to personal safety. The following websites (sources) have been researched to identify potential crime activity in the area of the project:

- <https://communitycrimemap.com/>
- www.cityrating.com/crimestatistics.asp
- www.crimemapping.com

Crime data available shows felony assault and grand larceny as the top two crimes in the area. GEI employees should make sure that their cars are securely locked with personal possessions out of plain view.

To protect yourself, take the following precautions:

- If deemed necessary by the PM, use the buddy system (teams of a minimum of two persons present).
- Let the Site Safety Manager (SSM) know when you begin work in these areas and when you leave.
- Call in regularly.
- Pay attention to what is going on around you; and
- If you arrive in an area and it does not look safe to get out of your vehicle, lock the doors and drive off quickly but safely.

Employees must not knowingly enter into a situation where there is the potential for physical and violent behaviors to occur. If employees encounter hostile individuals or a confrontation develops in the work area, suspend work activities, immediately leave the area of concern,

and contact local 911 for assistance. Notify the SSM and Safety Team (Safety Director and Regional Safety Managers – SafetyTeam@geiconsultants.com) of any incidents once you are out of potential danger.

In the event of an emergency, prompt communications with local emergency responders are essential. At least one charged and otherwise functioning cell phone to facilitate emergency communications will be on-site. Confirmation of cellular phone operation will be confirmed at the start of each working day.

4.3.1 Coronavirus (COVID-19)

GEI field employees will follow the COVID-19 Field Guidance in Appendix E.

Distancing

COVID-19 spreads from person-to-person primarily through droplets that are emitted from the initial person to a distance of 6 feet.

- Maintain a distance of at least 6 feet (2 meters) from others. This includes during site meetings and breaks and while performing work tasks. Meetings should be held outside or by phone/video.
- Minimize the number of employees in one location to the extent possible. Follow local restrictions for maximum number of people congregated in one location at a time.
- If tasks need to be performed close to others (within 6 feet) and that cannot be avoided, wear appropriate PPE including a face mask (surgical or cloth), gloves, and eye protection.

NOTE: Face masks are not a substitute for distancing. Masks are meant to protect others in case you are infected. Contact the Safety Team (safetyteam@geiconsultants.com) to discuss any special circumstances and the PPE warranted.

- Wear nitrile gloves as much as practicable and change them frequently. As practicable, wash your hands or use sanitizer between glove changes. Wash your hands after wearing gloves.
- Minimize and stagger time in office spaces to performing essential duties such as picking up and dropping off equipment and samples. If you need to spend more time in a project office (e.g., a construction trailer), it is important that the workspace allows for proper social distancing.
- When traveling to project sites, travel in separate vehicles. Do not travel in the same vehicle.

Hygiene Practices

The hygiene practices we have been instructed to perform more routinely apply to performing field work as well, such as:

- Frequent hand washing with soap and warm water for 20 seconds. If soap and water are not readily available, use hand sanitizer (containing 60% alcohol) until soap and water can be used. If sanitizer is not available, bringing gallon containers of water and soap may be a good substitute.
- If you are filling water bottles (for drinking or hand washing) keep the bottle away from the spigot to avoid transfer of germs or contaminants.
- Wipe down surfaces with disinfectant on a routine basis (at least once per day). This includes field equipment and other items that may have previously been used by others. This is especially important while working in construction trailers. When using company and personal vehicles, wipe surfaces including the steering wheel, gear shifter, controls, and door handles before and after use.
- Wear nitrile gloves as frequently as possible. Hand washing is necessary after removing gloves.
- When greeting others do not shake hands, hug, or engage in other personal contact. A greeting from a distance such as a wave is suggested.
- Avoid sharing field equipment and other materials with others. Before using field equipment or putting it away, wipe it down with disinfectant or wash it with soap and water. Note, use extra caution using disinfectants while collecting environmental samples to ensure that the samples are not compromised.

4.3.2 *Electrical Hazards*

Utilities

The site may have shallow, buried utilities and also overhead utilities in certain areas. It will be necessary for parties disturbing the existing ground surface and conducting operations with heavy equipment having high clearances to exercise caution in performing project-related work with respect to the presence of utilities. Utility companies with active, buried lines in the site area will be asked by the Contractor performing intrusive activities to mark their facilities. Employees will use these data to choose work locations.

Underground Utilities

No excavating, drilling, boring, or other intrusive activities will be performed until an underground utility survey, conducted by knowledgeable persons or agencies, has been made. This survey will identify underground and in-workplace utilities such as the following:

- Electrical lines and appliances
- Telephone lines
- Cable television lines
- Gas line
- Pipelines
- Steam lines
- Water line
- Sewer lines
- Pressurized air lines

The location of utilities will be discussed with GEI employees and subcontractors during a site safety briefing. Identified utilities should be marked or access otherwise restricted to avoid chance of accidental contact.

Even when a utility search has been completed, drilling, boring, and excavation should commence with caution until advanced beyond the depth at which such utilities are usually located. Utilities will be considered “live” or active until reliable sources demonstrate otherwise.

Overhead Utilities

Overhead transmission and distribution lines will be carried on towers and poles which provide adequate safety clearance over roadways and structures. Clearances will be adequate for the safe movement of vehicles and for the operation of construction equipment.

Overhead or above-ground electric lines should be considered active until a reliable source has documented them to be otherwise. Elevated work platforms, ladders, scaffolding, man-lifts, and drill or vehicle superstructures will be erected a minimum of 20 feet (the actual distance is dependent upon the voltage of the line) from overhead electrical lines until the line is de-energized, grounded, or shielded so arcing cannot occur between the work location or superstructure.

4.3.3 Excavations and Trenches

The safety requirements for excavations and trenches must be determined by a competent person who is capable of identifying existing and predictable hazards and work conditions that are unsanitary, hazardous, or dangerous to GEI employees. The competent person must also have the authorization to take prompt corrective measures to eliminate unsatisfactory conditions. GEI employees will not enter trenches.

The following are general requirements for work activities in and around excavations:

- Prior to initiation of excavation activity (or ground intrusive activity, such as drilling), the location of underground installations will be determined. The <One-Call/Dig-Safe> center will be contacted by the Contractor/Subcontractor a minimum of 72 hours prior to excavation activities. It may also be necessary to temporarily support underground utilities during excavation. When excavations approach the estimated location of underground installations, the exact location of the underground installations will be determined by means that are safe for GEI employees, i.e., hand dig, test pits, etc.
- Excavations should be inspected daily by the excavating company's competent person prior to commencement of work activities. Evidence of cave-ins, slides, sloughing, or surface cracks or excavations will be cause for work to cease until necessary precautions are taken to safeguard employees.
- Excavated and other materials or equipment that could fall or roll into the excavation, and vehicular traffic and heavy equipment will be placed at least 5 feet from the edge of the excavation.
- Excavation operations will cease immediately during hazardous weather conditions such as high winds, heavy rain, lightning, and heavy snow.

Employees will refer to GEI's Excavation Safety SOP for further information.

4.3.4 Fire and Explosion

When conducting excavating activities, the opportunity for encountering fire and explosion hazards exists from contamination in soil and the possibility of free product in underground structures and pipelines. Additionally, the use of diesel-powered excavating equipment could present the possibility of encountering fire and explosion hazards.

4.3.5 Heat Stress

Employees may be exposed to the hazards associated with heat stress when ambient temperatures exceed 70°F. Employees should increase water intake while working in conditions of high heat. Enough water should be available so that each employee can consume 1 quart of water per hour. In addition, they should increase number of rest breaks and/or rotate employees in shorter work shifts. Employees should rest in cool, dry, shaded areas for at least 5 minutes. Employees should not wait until they feel sick to cool down. Watch for signs and symptoms of heat exhaustion and fatigue. In the event of heat stroke, bring the victim to a cool environment, call for help, and initiate first aid procedures. The procedures to be followed regarding avoiding heat stress are provided in Appendix C – Heat Stress Guidelines and in GEI's Heat Stress program.

4.3.6 Cold Stress

Employees may be exposed to the hazards associated with cold stress when working in cold, wet, and/or windy conditions. Potential hazards in cold environments include frostbite, trench foot or immersion foot, hypothermia, as well as slippery surfaces, brittle equipment, and poor judgment. The procedures to be followed regarding avoiding cold stress are provided in Appendix C – Cold Stress Guidelines and in GEI’s Cold Stress program.

4.3.7 Noise

Noise is a potential hazard associated with the operation of heavy equipment, power tools, pumps, and generators. Employees who will perform suspected or established high noise tasks and operations will wear hearing protection. If deemed necessary by the SSM, the Safety Director will be consulted on the need for additional hearing protection and the need to monitor sound levels for site activities. Other employees who do not need to be in proximity of the noise should distance themselves from the equipment generating the noise.

4.3.8 Slips, Trips, and Falls

Working in and around the site may pose slip, trip, and fall hazards due to slippery and uneven surfaces. Excavation at the site may cause uneven footing in trenches and around the soil piles. Steep slope and uneven terrain conditions at the site are also a primary concern. GEI employees will wear proper foot gear and will employ good work practice and housekeeping procedures to minimize the potential for slips, trips, and falls.

4.3.9 Manual Lifting

Manual lifting of objects and equipment may be required. Failure to follow proper lifting technique can result in back injuries and strains. Employees should use a buddy system and/or power equipment to lift heavy loads whenever possible and should evaluate loads before trying to lift them (i.e., they should be able to easily tip the load and then return it to its original position). Carrying heavy loads with a buddy and proper lifting techniques include: 1) make sure footing is solid; 2) make back straight with no curving or slouching; 3) center body over feet; 4) grasp the object firmly and as close to your body as possible; 5) lift with legs; and 6) turn with your feet, do not twist.

4.3.10 Projectile Objects and Overhead Dangers

Overhead dangers, including but not limited to falling debris and equipment, can occur while operating drill rigs. GEI employees will maintain a minimum distance from large overhead operations and to maintain proper communication with heavy equipment operators and their handlers, should work necessitate their presence beyond the minimum safety distance.

Proper PPE will be worn during these types of activities including steel-toed/shank boots, safety vests, and hard hats.

4.3.11 Cuts and Lacerations

The core sampling program may require employees to use powered cutting tools (circular saw or shears) or a hooked knife to cut open the sample liner. Safety box cutters will be utilized for routine operations such as opening boxes of supplies or cutting rope or string. When using cutting tools, follow the safety precautions listed below:

- Keep free hand out of the way.
- Secure work if cutting through thick material.
- Use only sharp blades; dull blades require more force that results in less knife control.
- Pull the knife through the object and away from your body; pulling motions are easier to manage.
- Do not put the knife in your pocket.
- Wear leather or Kevlar® gloves when using knives or blades, or when removing sharp objects caught or dangling in sampling gear.

4.4 Chemical Hazards

The characteristics of compounds at the site are discussed below for information purposes. Adherence to the safety and health guidelines in this CHASP should reduce the potential for exposure to the compounds discussed below.

4.4.1 Chlorinated Hydrocarbons

Chlorinated hydrocarbons (organochlorides) are a very large and diverse group of hydrocarbon molecules that also have at least one covalently bound chlorine atom chemically bonded to them. Chlorinated hydrocarbons are used predominantly as solvents and have historically been used as industrial degreasers, dry cleaning solvents, anesthetic agents and as refrigerants. They are colorless, volatile liquids with a moderately sweet aroma and partially soluble in but denser than water. They are the most common DNAPL.

The more common forms of chlorinated solvent contamination of soils and ground waters include:

- Tetrachloroethene (PCE, Tetrachloroethylene)
- Carbon tetrachloride (Tetrachloromethane or carbon tet)

- Trichloroethylene (TCE, Trichloroethene)
- 1,1,1-TrichloroMethane (Chloroform)
- 1,1,1 - Trichloroethane (TCA, methyl chloroform, chloroethene, Solvent 111)
- Dichloromethane (DCM or methylene chloride)

As a class, the chlorinated hydrocarbons are potent central nervous system depressants or stimulants. They also cause greater liver and kidney damage compared to other organic solvents. Many have been shown to cause cancer in laboratory animals; due to widespread industrial use, the issue of carcinogenic risk to humans is one of the most controversial issues in regulatory toxicology.

Exposure to chlorinated hydrocarbon compounds in the occupational setting is primarily through inhalation. Skin absorption is variable and usually insignificant, although dermal absorption following prolonged or extensive skin contact can cause systemic toxicity.

4.4.2 Heavy Metals

Exposure to high concentrations of arsenic can cause dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, and hyper pigmentation of skin. Chronic exposure to arsenic has resulted in lung cancer in humans.

Exposure to chromium can cause acute symptoms such as irritation of the eyes, nose and throat as well as wheezing and coughing. Chronic effects include nosebleeds, nasal congestion, dermatitis, and loss of sight.

Exposure to lead may cause acute symptoms such as eye irritation, weakness, weight loss, abdominal pain, and anemia. Chronic exposure to lead may result in kidney disease, effects to the reproductive system, blood forming organs, and CNS.

Lead and arsenic are regulated by specific OSHA standards. They are 29 CFR 1910.1025/1926.52 and 29 CFR 1910.1018/1926.1118, respectively. These standards include specific requirements for air monitoring, signs and labels, training and medical surveillance.

Exposure to high concentrations of nickel may cause sensitization dermatitis, allergic asthma, and pneumonitis. Exposure to mercury can cause dizziness, salivation nausea, vomiting, diarrhea, constipation, emotional disturbance, and kidney injury. Chronic exposure to mercury can cause CNS damage.

Exposure to high concentrations of zinc through ingestion can cause abdominal pain, nausea, vomiting, and diarrhea. Chronic exposure can lead to low blood pressure, jaundice, and seizures.

4.4.3 Pesticides

Pesticide exposures, in general, affect the CNS, liver, kidneys, and skin. At high concentrations, pesticides can cause headache, dizziness, nausea, vomiting, malaise (vague feeling of discomfort), sweating, limb jerks, convulsions, and coma. The pesticides detected at the site are at environmental concentrations and are not expected to be at concentrations that exposure symptoms would occur.

4.4.4 Polycyclic Aromatic Hydrocarbons

Polycyclic aromatic hydrocarbons (PAHs), are a group of chemicals consisting of numerous carbon atoms joined together to form multiple rings. Most are formed from the incomplete combustion of plant or animal matter, or carbon fuels, such as coal or petroleum. These compounds are at environmental concentrations and are not expected to be at concentrations that exposure symptoms would occur. PAHs may cause contact dermatitis. Direct contact can be irritating to the skin and produce itching, burning, swelling, and redness. Direct contact or exposure to the vapors may be irritating to the eyes. Conjunctivitis may result from prolonged exposure. High levels of exposure to PAHs, though not anticipated during work activities conducted during this project, may increase the risk of cancer including lung, kidney, and skin cancer. Naphthalene is also an eye and skin irritant and can cause nausea, headache, fever, anemia, liver damage, vomiting, convulsions, and coma. Poisoning may occur by ingestion of large doses, inhalation, or skin absorption.

The major route of entry for the work activities to be conducted at this Site is through direct contact. Exposure is most likely when handling soil and water samples. Inhalation may occur when the soil is disturbed causing respirable and nuisance dust particles to become airborne.

4.4.5 Polychlorinated Biphenyls

PCBs have historically been used from a number of sources including, but not limited to; electrical systems, hydraulic oils, lubricants, cutting oils, printer's ink, and asphalt. Exposure to PCBs can occur through unbroken skin without immediate pain or irritation. PCBs detected at the site are at environmental concentrations and are not expected to be at concentrations that exposure symptoms would occur. Acute effects of exposure to high concentrations of PCB can include eye, skin, nose, and throat irritation. Chronic effects of PCB exposure can include skin swelling and redness, gastro-intestinal disturbances, and neurological effects such as headache, dizziness, nervousness, and numbness of extremities.

PCBs are suspected human carcinogens that can cause liver cancer. PCBs can accumulate in fatty tissues and result in health effects after the initial exposure has occurred. The primary route of exposure for PCBs is inhalation, dermal contact, and ingestion.

4.4.6 *Evaluation of Skin Contact and Absorption*

Skin contact by contaminants may be controlled by use of proper hygiene practices, PPE, and good housekeeping procedures. The proper PPE (e.g., Tyvek, gloves, safety glasses) as described in Section 5 will be worn for activities where contact with potential contaminated media or materials are expected.

SDSs for decontamination chemicals and laboratory reagents that may be used on site are included in Appendix B. Specific chemical hazards information from the occupational health sources are summarized in Table 3.

Table 3. Chemical Data

Compound	CAS #	ACGIH TLV	OSHA PEL	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
Arsenic	7440-38-2	0.01 mg/m ³	0.01 mg/m ³ A.L. .005mg/m ³	Inhalation Skin Absorption Ingestion Skin Contact	Ulceration of nasal septum, dermatitis, GI disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin, potential carcinogen	Liver, kidneys, skin, lungs, lymphatic system	Metal: Silver-gray or tin-white, brittle, odorless solid FP: NA IP: NA LEL: NA UEL: NA VP: 0 mm
Chromium (Chromic Acid and Chromates)	1333-82-0	0.05 mg/m ³	0.1 mg/m ³	Inhalation Ingestion Skin Contact	Irritates respiratory system, nasal, septum perforation, liver and kidney damage, leucocytosis (increased blood leucocytes), leukopenis (reduced blood leucocytes), moncytosis (increased monocytes), Eosinophilia, eye injury, conjunctivitis, skin ulcer, sensitivity dermatitis, potential carcinongen	Blood, respiratory system, liver, kidney, eyes, skin, lung cancer	FP:NA IP:NA VP: Very Low LEL: NA UEL: NA
Lead	7439-92-1	0.050 mg/m ³	0.05 mg/m ³ A.L. 0.03 mg/m ³	Inhalation Ingestion Skin Contact	Weakness, insomnia; facial pallor; pal eye, anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis of wrist and ankles; irritates eyes, hypo tension	Eyes, GI tract, CNS, kidneys, blood, gingival tissue	A heavy, ductile, soft, gray solid. FP: NA IP: NA LEL: NA UEL: NA VP: 0 mm
Naphthalene	91-20-3	10 ppm (52 mg/m ³) TWA, 15 ppm (79 mg/m ³) STEL	10 ppm (50 mg/m ³) TWA	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage	Eyes, skin, blood, liver, kidneys, central nervous system	FP: 174 F IP: 8.12 eV, LEL: 0.8% UEL:6.7%, VP: 0.08 mm

Table 3. Chemical Data

Compound	CAS #	ACGIH TLV	OSHA PEL	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
Nickel	7440-02-0 (Metal)	NIOSH REL*: Ca TWA 0.015 mg/m ³ [*Note: The REL does not apply to Nickel carbonyl.]	TWA 1 mg/m ³ [*Note: The PEL does not apply to Nickel carbonyl.]	Inhalation, ingestion, skin and/or eye contact	Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]	Nasal cavities, lungs, skin Cancer Site: [lung and nasal cancer]	Metal: Lustrous, silvery, odorless solid FP: none LEL: N/A UEL: N/A VP: 0 mm
PCBs	11097-69-1	0.5 mg/m ³ (Skin)	0.5 mg/m ³ (Skin)	Inhalation Skin Absorption Ingestion Skin Contact	Irritate eyes; chloracne; liver damage;	Skin, eyes, liver, reproductive system	Colorless liquid or solid with a mild, hydro-carbon odor VP = 0.00006 mm
PCE	127-18-4	25 ppm	100 ppm TWA 200 ppm C 300 ppm (5 minutes in any 3 hours)	Inhalation, Ingestion, Skin Contact	Irritation, nausea, vomiting, chest pain, difficulty breathing, headache, drowsiness, dizziness, disorientation, loss of coordination, blurred vision, loss of appetite, stomach pain, pain in extremities	Eyes, skin, respiratory system, liver, CNS	A colorless, sweet smelling volatile liquid. FP: NA IP: 9.32 eV LEL: NA UEL: NA VP: 14 mmHg
TCE	79-01-6	200 ppm	100 ppm TWA 200 ppm C 300 ppm (5 minutes in any 3 hours)	Inhalation, Ingestion, Skin Contact	Irritation to eyes, skin, dizziness, fatigue, blurred vision, tremors, nausea, vomiting, drowsiness, headache	Kidneys, CNS, liver, heart, upper respiratory	Colorless liquid with chloroform odor FP: NA IP: 9.45 eV LEL: 8% UEL: 10.5% VP: 58 mmHg
VOCs1	NA	0.5 ppm (Skin)	0.5 ppm TWA 2.5 ppm STEL	Inhalation, Skin Absorption, Ingestion, Skin Contact	Irritate eyes and skin; headaches; dizziness; nausea; kidney; liver damage; depress CNS	Skin, eyes, liver, kidney, CNS	Colorless volatile liquid, sometimes with a sweet or solvent odor

Table 3. Chemical Data

Compound	CAS #	ACGIH TLV	OSHA PEL	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
Zinc	1314-13-2	5 mg/m ³ (TWA), 10 mg/m ³ (STEL) for zinc oxide fume	10 mg/m ³ (TWA), for zinc oxide fume	Inhalation	Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function	Respiratory system	Colorless liquid FP: NA? IP: 11 eV LEL: 7.5% UEL: 12.5% VP: 100 mmHg
4,4 - DDD	72-54-8	NE	NE	Inhalation, skin and/or eye contact	Irritation of skin, eyes, GI tract and respiratory system	Skin, eyes, GI tract, Respiratory system	FP: none LEL:N/A UEL: N/A VP: NA
Dieldrin	60-57-1	REL: Ca TWA 0.25 mg/m ³ [skin]	OSHA PEL: TWA 0.25 mg/m ³ [skin]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Headache, dizziness; nausea, vomiting, malaise (vague feeling of discomfort), sweating; myoclonic limb jerks; clonic, tonic convulsions; coma; [potential occupational carcinogen]; in animals: liver, kidney damage	Central nervous system, liver, kidneys, skin	Colorless to light-tan crystals with a mild, chemical odor. [insecticide] FP: none LEL:N/A UEL: N/A VP: 8 x 10 ⁻⁷ mm

Abbreviations:

°F = degrees Fahrenheit

ACGIH = American Conference of Industrial Hygienists

A.L. = Action Level

atm = atmosphere

C = ceiling limit, not to be exceeded

CAS # = chemical abstract services number

CNS = Central Nervous System

CTPV = Coal Tar Pitch Volatiles

CVS = Cardiovascular System

eV = electron volt

f/cc = fibers per cubic centimeter

FP = Flash point

IP = Ionization Potential

LEL = Lower explosive limit

mg/m³ = micrograms per cubic meter

min = minute

mm = millimeter

mmHg = millimeters of mercury

N/A = not applicable

OSHA = Occupational Safety and Health Administration

PAH = Polycyclic Aromatic Hydrocarbons

PCB = Polychlorinated Biphenyls

PEL = Permissible exposure limit

ppm = parts per million

Table 3. Chemical Data

Compound	CAS #	ACGIH TLV	OSHA PEL	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
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GI = Gastro-intestinal

H₂S = Hydrogen Sulfide

HCN = Hydrogen Cyanide

hr. = hour

Skin = significant route of exposure

STEL = Short-term exposure limit (15 minutes)

TWA = Time-weighted average (8 hours)

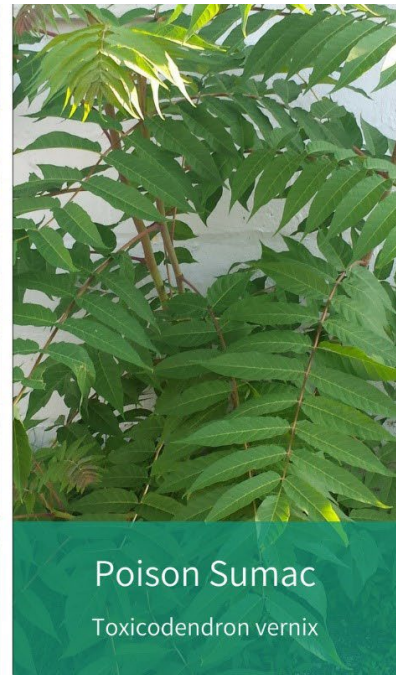
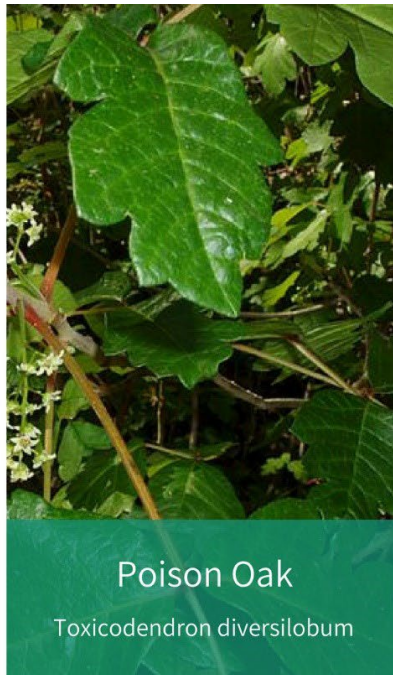
VP = vapor pressure approximately 68°F in mm Hg

4.5 Biological Hazards

Areas of the site may be wooded, surrounded with brush, or landscaped. Therefore, employees working on this project should be aware of the potential biological hazards at this site. Each is discussed in detail below:

4.5.1 *Poisonous Plants*

Persons working on the site should be aware of the possible presence of poisonous plants and insects. Poison ivy is a climbing plant with leaves that consist of three glossy, greenish leaflets. Poison ivy has conspicuous red foliage in the fall. Small yellowish-white flowers appear in May through July at the lower leaf axils of the plant. White berries appear from August through November. Poison ivy is typically found east of the Rockies. Poison oak is similar to poison ivy, but its leaves are oak-like in form. Poison oak occurs mainly in the south and southwest. Poison sumac typically occurs as a small tree or shrub and may be 6 to 20 feet in height. The bark is smooth, dark, and speckled with darker spots. Poison sumac is typically found in swampy areas and east of the Mississippi. The leaves have 7 to 13 smooth-edged leaflets and drooping clusters of ivory-white berries that appear in August and last through spring.



The leaves, roots, stems, and fruit of these poisonous plants contain urushiol. Contact with the irritating oil causes an intensely itching skin rash and characteristic, blister-like lesions.

The oil can be transmitted on soot particles when burned and may be carried on the fur of animals, equipment, and apparel.

Proper identification of these plants is the key to preventing contact and subsequent dermatitis. Wear long sleeves and pants when working in wooded areas. In areas of known infestation, wear Tyvek coveralls and gloves. Oils are easily transferred from one surface to another. If you come in contact with these poisonous plants, wash exposed areas immediately with cool water to remove the oils. Some commercial products such as Tecnu's Poison Oak-n-Ivy Cleanser claim to further help with the removal of oils.

4.5.2 Ticks

Lyme Disease

Ticks are bloodsuckers, attaching themselves to warm-blooded vertebrates to feed. Deer ticks are associated with the transmission the bacteria that causes Lyme disease. Female deer ticks are about ¼-inch in length and are black and brick red in color. Males are smaller and all black. If a tick is not removed, or if the tick is allowed to remain for days feeding on human blood, a condition known as tick paralysis can develop. This is due to a neurotoxin, which the tick apparently injects while engorging. This neurotoxin acts upon the spinal cord causing incoordination, weakness, and paralysis.

The early stages of Lyme disease, which can develop within a week to a few weeks of the tick bite, are usually marked by one or more of these signs and symptoms:

- Tiredness
- Chills and fever
- Headache
- Muscle and/or joint pain
- Swollen lymph glands
- Characteristic skin rash (i.e., bullseye rash)

Rocky Mountain Spotted Fever

Rocky Mountain spotted fever is spread by the American dog tick, the lone-star tick, and the wood tick, all of which like to live in wooded areas and tall, grassy fields. The disease is most common in the spring and summer when these ticks are active, but it can occur anytime during the year when the weather is warm.

Initial signs and symptoms of the disease include sudden onset of fever, headache, and muscle pain, followed by development of a rash. Initial symptoms may include fever, nausea, vomiting, severe headache, muscle pain, and/or lack of appetite.

The rash first appears 2 to 5 days after the onset of fever and is often not present or may be very subtle. Most often it begins as small, flat, pink, non-itchy spots on the wrists, forearms, and ankles. These spots turn pale when pressure is applied and eventually become raised on the skin. Later signs and symptoms include rash, abdominal pain, joint pain, and/or diarrhea.

The characteristic red, spotted rash of Rocky Mountain spotted fever is usually not seen until the 6th day or later after onset of symptoms, and this type of rash occurs in only 35% to 60% of patients with Rocky Mountain spotted fever. The rash involves the palms or soles in as many as 50% to 80% of patients; however, this distribution may not occur until later in the course of the disease.

Prevention

Tick season lasts from April through October; peak season is May through July. You can reduce your risk by taking these precautions:

- During outside activities, wear long sleeves and long pants tucked into socks. Wear a hat, and tie hair back.
- Use insecticides to repel or kill ticks. Repellents containing the compound n,n-diethyl-meta-toluamide (DEET) can be used on exposed skin except for the face, but they do not kill ticks and are not 100% effective in discouraging ticks from biting. Products containing permethrin kill ticks, but they cannot be used on the skin -- only on clothing. When using any of these chemicals, follow label directions carefully.
- After outdoor activities, perform a tick check. Check body areas where ticks are commonly found behind the knees, between the fingers and toes, under the arms, in and behind the ears, and on the neck, hairline, and top of the head. Check places where clothing presses on the skin.
- Remove attached ticks promptly. Removing a tick before it has been attached for more than 24 hours greatly reduces the risk of infection. Use tweezers and grab as closely to the skin as possible. Do not try to remove ticks by squeezing them, coating them with petroleum jelly, or burning them with a match. Keep ticks in a zip-lock baggie in case testing needs to be performed.
- Report any of the above symptoms and all tick bites to the PM and Safety Team for evaluation.

4.5.3 Mosquito- Borne Disease – West Nile Virus

West Nile encephalitis is an infection of the brain caused by the West Nile virus, which is transmitted by infected mosquitoes. Following transmission from an infected mosquito, West Nile virus multiplies in the person's blood system and crosses the blood-brain barrier to reach the brain. The virus interferes with normal CNS functioning and causes inflammation of the brain tissue. However, most infections are mild, and symptoms include fever,

headache, and body aches. More severe infections may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and rarely, death. Persons over the age of 50 have the highest risk of severe disease.

Prevention centers on public health action to control mosquitoes and on individual action to avoid mosquito bites. To avoid being bitten by the mosquitoes that cause the disease, use the following control measures:

If possible, stay inside between dusk and dark. This is when mosquitoes are most active. When outside (between dusk and dark), wear long pants and long-sleeved shirts. Spray exposed skin with an insect repellent, preferably containing DEET.

4.5.4 Wasps and Bees

Wasps (hornets and yellow jackets) and bees (honeybees and bumblebees) are common insects that may pose a potential hazard to the field team if work is performed during spring, summer, or fall. Bees normally build their nests in the soil. However, they use other natural holes such as abandoned rodent nests or tree hollows. Wasps make a football-shaped, paper-like nest either below or above the ground. Yellow jackets tend to build their nests in the ground, but hornets tend to build their nests in trees and shrubbery. Bees are generally more mild-mannered than wasps and are less likely to sting. Bees can only sting once while wasps sting multiple times because their stinger is barbed. Wasps sting when they feel threatened. By remaining calm and not annoying wasps by swatting, you lessen the chance of being stung.

Wasps and bees inject a venomous fluid under the skin when they sting. The venom causes a painful swelling that may last for several days. If the stinger is still present, carefully remove it with tweezers. Some people may develop an allergic reaction (i.e., anaphylactic shock) to a wasp or bee sting. If such a reaction develops, seek medical attention at once. If a GEI employee is allergic to bees or wasps notify the SSM and if, needed, the location of the epi pen.

4.5.5 Sun Exposure

Employees are encouraged to liberally apply sunscreen, with a minimum broad-spectrum sun protection factor (SPF) of 30, when working outdoors to avoid sunburn and potential skin cancer, which is associated with excessive sun exposure to unprotected skin. Additionally, employees should wear safety glasses that offer protection from ultraviolet A and B (UVA/UVB) rays.

5. Personal Protective Equipment

The PPE specified in Table 4 represents PPE selection required by 29 CFR 1910.132, and is based on the Activity Hazard Analysis of Section 4 (Table 2). Specific information on the selection rationale activity can be found in the GEI Health and Safety Manual.

The PPE program addresses elements, such as PPE selection based on site hazards, use and limitations, donning and doffing procedures, maintenance and storage, decontamination and disposal, training and proper fitting, inspection procedures prior to / during / and after use, evaluation of the effectiveness of the PPE program, and limitations during temperature extremes, heat stress, and other appropriate medical considerations. A summary of PPE for each level of protection is in Table 4.

Table 4. Site-Specific PPE

Task	PPE Level	Site-Specific Requirements	Respirator
Mobilization/Demobilization			
Reconnaissance	D	Hard hat, safety glasses, steel toe/shank safety boot, reflective vest, leather work gloves, hearing protection as needed	D - None
Mobilization/Demobilization of Equipment and Supplies	D	Hard hat, safety glasses, steel toe/shank safety boot, reflective vest, leather work gloves, hearing protection as needed	D – None
Establishment of Site Security, Work Zones, and Staging Area	D	Hard hat, safety glasses, steel toe/shank safety boot, reflective vest, leather work gloves, hearing protection as needed	D - None
Construction			
Drilling, Groundwater Well Installation, Excavation, Digging Test Pits, Backfilling, Grading Observation, Sampling	D	Hard hat, safety glasses, steel toe/shank safety boot with overboot as needed, reflective vest, leather work gloves as needed, nitrile gloves, hearing protection as needed, Tyvek as needed	Level D initially, Level C-If action levels exceeded (see Section 9 of CHASP)
Hazardous Materials Assessment			
Sampling: Caulking, Paint, Concrete, Brick, and Soil	D	Hard hat, safety glasses, steel toe/shank safety boot with overboot as needed, reflective vest, leather work gloves as needed, nitrile gloves, hearing protection as needed, Tyvek as needed	D - None
Demolition/Remediation Observation			
Observe Contractor Activities	D	Hard hat, safety glasses, steel toe/shank safety boot with overboot as needed, reflective vest, leather work gloves as needed, nitrile gloves, hearing protection as needed, Tyvek as needed	D - None

Use of Level A or Level B PPE is not anticipated. If conditions indicating the need for Level A or Level B PPE are encountered, personnel will leave the site and this CHASP will be revised with oversight of the Safety Director or GEI personnel will not re-enter the site until conditions allow.

For most work conducted at the site, Level D PPE will include long pants, hard hats, safety glasses with side shields, and steel toe/shank or EH-rated safety boots. When work is conducted in areas where non-aqueous phase liquid (NAPL) is anticipated, employees will wear, at a minimum, modified Level D PPE, which can include Tyvek coveralls and safety boots with overboots.

5.1 OSHA Requirements for PPE

Personal protective equipment used during the course of this field investigation must meet the following OSHA standards:

Table 5. OSHA Standards for PPE

Type of Protection	Regulation	Source
Eye and Face	29 CFR 1910.133	ANSI Z87.1 1968
Respiratory	29 CFR 1910.134	ANSI Z88.1 1980
Head	29 CFR 1910.135	ANSI Z89.1 1969
Foot	29 CFR 1910.136	ANSI Z41.1 1999 or ASTM F-2412-2005, and ASTM F-2413-2005

CRF = Code of Federal Regulations

ANSI = American National Standards Institute

ASTM = American Society for Testing and Materials

On-site GEI personnel who have the potential to don a respirator must have a valid fit test certification and documentation of medical clearance. The Safety Director will maintain such information on file for on-site personnel. The PM will obtain such information from the subcontractor's site supervisor prior to the initiation of such work. Both the respirator and cartridges specified for use in Level C protection must be fit-tested prior to use in accordance with OSHA regulations (29 CFR 1910.134). Air purifying respirators cannot be worn under the following conditions:

- Oxygen deficiency (less than 20.7%).
- Imminent Danger to Life and Health (IDLH) concentrations.
- If contaminant levels exceed designated use concentrations.

6. Key Project Personnel/Responsibilities and Lines of Authority

6.1 GEI Personnel

- George Holmes Project Manager
- Gary Rozmus In-House Consultant
- TBD Site Safety Manager
- Steve Hawkins Safety Director
- Jeena Sheppard Regional Safety Manager

The implementation of health and safety at this project location will be the shared responsibility of the PM, the Safety Director, Regional Safety Manager, the Site Safety Manager (SSM), other GEI personnel implementing the proposed scope of work.

6.1.1 *GEI Project Manager*

The PM is responsible for confirming that the requirements of this CHASP are implemented. Some of the PM's specific responsibilities include:

- Conducting and documenting the Project Safety Briefing for GEI project employees and forwarding the signed form (Appendix D) to the Safety Team.
- Verifying that the GEI staff selected to work on this program are sufficiently trained for site activities.
- Assuring that personnel to whom this CHASP applies, including subcontractor personnel, have received a copy of it.
- Providing the Safety Director with updated information regarding conditions at the site and the scope of site work.
- Providing adequate authority and resources to the on-site SSM to allow for the successful implementation of necessary safety procedures.
- Supporting the decisions made by the SSM and Safety Director.
- Maintaining regular communications with the SSM and, if necessary, the Safety Director.
- Verifying that the subcontractors selected by GEI to work on this program have completed GEI environmental, health and safety requirements and has been deemed acceptable for the proposed scope of work.

- Coordinating the activities of GEI subcontractors and confirming that they are aware of the pertinent health and safety requirements for this project.

6.1.2 GEI Safety Director

The Safety Director is the individual responsible for the review, interpretation, and modification of this CHASP. Modifications to this CHASP which may result in less stringent precautions cannot be undertaken by the PM or the SSM without the approval of the Safety Director. Specific duties of the Safety Director include:

- Writing, approving, and amending the CHASP for this project.
- Advising the PM and SSM on matters relating to health and safety on this site.
- Recommending appropriate PPE and safety equipment to protect personnel from potential site hazards.
- Conducting accident investigations.
- Maintaining regular contact with the PM and SSM to evaluate site conditions and new information which might require modifications to the CHASP.

6.1.3 GEI Site Safety Manager

GEI field staff are responsible for implementing the safety requirements specified in this CHASP. However, one person will serve as the SSM. The SSM will be on-site during all activities covered by this CHASP. The SSM is responsible for enforcing the requirements of this CHASP once work begins. The SSM has the authority to immediately correct situations where noncompliance with this CHASP is noted and to immediately stop work in cases where an immediate danger is perceived. Some of the SSM's specific responsibilities include:

- Conducting/attending the Project Safety Briefing prior to beginning work, and subsequent safety meetings, as necessary.
- Conduct daily Safety Tailgate meetings for site-related work.
- Verifying that personnel to whom this CHASP applies have attended and participated in the Project Safety Briefing and subsequent safety meetings that are conducted during the implementation of the program.
- Maintaining a high level of health and safety consciousness among employees implementing the proposed activities.
- Procuring the air monitoring instrumentation required and performing air monitoring for investigative activities.
- Procuring and distributing the PPE and safety equipment needed for this project for GEI employees.

- Verifying that PPE and health and safety equipment used by GEI is in good working order.
- Verifying that the selected contractors are prepared with the correct PPE and safety equipment and supplies.
- Notifying the PM of noncompliance situations and stopping work in the event that an immediate danger situation is perceived.
- Monitoring and controlling the safety performance of personnel within the established restricted areas to confirm that required safety and health procedures are being followed.
- Stopping work in the event that an immediate danger situation is perceived.
- Reporting accident/incident and preparing accident/incident reports, if necessary.

6.1.4 GEI Field Personnel

GEI field personnel covered by this CHASP are responsible for following the health and safety procedures specified in this CHASP and for performing their work in a safe and responsible manner. Some of the specific responsibilities of the field personnel are as follows:

- Reading and signing the CHASP in its entirety prior to the start of on-site work.
- Attending and actively participating in the required Project Safety Briefing prior to beginning on-site work and any subsequent safety meetings that are conducted during the implementation of the program.
- Stopping work in the event that an immediate danger situation is perceived.
- Bringing forth any questions or concerns regarding the content of the CHASP to the PM or the SSM, prior to the start of work.
- Reporting accidents, injuries, and illnesses, regardless of their severity by following GEI's incident reporting procedures.
- Complying with the requirements of this CHASP and the requests of the SSM.

6.1.5 Lines of Authority

GEI will have responsibility for safety of its employees during the work performed at the site. GEI's field representative will have a cell phone available to contact the appropriate local authorities, in the event of an emergency. GEI's field representative will be available for communication with the GEI PM and with the Client's representative.

GEI employees have the authority to stop work activities if an unanticipated hazard is encountered or a potential unsafe condition is observed. The GEI employee should contact the Safety Director and the Project Manager to discuss the stop work conditions and potential control methods that can be implemented.

6.2 Subcontractors

GEI has subcontracted the following firms to assist in performing work on this project:

Subcontractor Name	Contact Name
TBD	TBD
	Office: TBD

GEI requires its subcontractors to work in a responsible and safe manner. Subcontractors hired by GEI are required to submit documentation of their safety practices as part of GEI's Subcontractor Management Program for evaluation and approval before the start of work. Subcontractors for this project will be required to develop their own CHASP for protection of their employees, but, at a minimum, must adhere to applicable requirements set forth in this CHASP.

7. Training Requirements

7.1 HAZWOPER Training

In accordance with OSHA Standard 29 CFR 1910.120 “Hazardous Waste Operations and Emergency Response” (HAZWOPER) responders will, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations. At a minimum, the training will have consisted of instruction in the topics outlined in the standard. Personnel who have not met the requirements for initial training will not be allowed to work in any site activities in which they may be exposed to hazards (chemical or physical). Prior to commencement of field activities, the PM will verify that GEI field personnel assigned to the project have completed the required training.

7.2 Annual 8-Hour Refresher Training

Annual 8-hour refresher training will be required of hazardous waste site field personnel in order to maintain their qualifications for fieldwork. The training will cover a review of 29 CFR 1910.120 requirements and related company programs and procedures. Prior to commencement of field activities the PM will verify that GEI field personnel assigned to the project have completed the required training and have an current training certificate.

7.3 Supervisor Training

Personnel acting in a supervisory capacity will have received 8 hours of instruction in addition to the initial 40-hour training. In addition, supervisors will have 1 year of field experience and training specific to work activities (i.e., sampling, construction observation, etc.)

7.4 Site-Specific Training

Prior to commencement of field activities, the PM or the SSM will verify GEI field personnel assigned to the project will have completed training that will specifically address the activities, procedures, monitoring, and equipment used in the site operations. It will include site and facility layout, hazards, and emergency services at the site, and will highlight the provisions contained within this CHASP and applicable GEI H&S SOPs (Appendix E). This training will be documented on the Project Safety Briefing Form Appendix D). The signed form will be forwarded to the Safety Team at SafetyTeam@geiconsultants.com. In addition, GEI personnel will sign the plan to document that they understand the hazards and control measures presented and agree to comply with the procedures established in the CHASP. Personnel that have not received project-specific training will not be allowed on-site.

7.5 On-Site Safety Briefings

Other GEI personnel will be given health and safety briefings daily by the SSM or field representative to assist GEI personnel in safely conducting work activities. The briefing will include GEI subcontractors. The briefings can include information on new operations to be conducted, changes in work practices, or changes in the site's environmental conditions, as well as periodic reinforcement of previously discussed topics. The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety inspections. Documentation of these briefings will be recorded in the GEI field book, if the project duration is less than 5 days. If the project is longer than 5 days, the Tailgate Safety Briefing Form (Appendix D) will be used to document briefings. The meetings will also be an opportunity to periodically update the employees on monitoring results.

7.6 First Aid and CPR

The PM will verify that GEI field staff has current certifications in first aid and Cardiopulmonary Resuscitation (CPR), so that emergency medical treatment is available during field activities. The training will be consistent with the requirements of the American Red Cross Association. GEI employees also attend annual Bloodborne Pathogens training in compliance with OSHA regulations.

7.7 OSHA 10-hour Construction Safety Training

GEI employees will have received 10-hour construction safety training through the OSHA Outreach Training Program when required for a specific site, client, or based on the type of work activities that are being performed. This training provides employees with an awareness level training in recognizing and preventing the hazards associated with the construction industry. Employees receive training in hazard identification, avoidance, control, and prevention, not OSHA standards. The training implies an increased level of safety training has become a widely known standard for OSHA orientation training in the construction industry. The PM will verify that GEI staff requiring this training has an OSHA issued completion card.

8. Medical Surveillance Program

GEI maintains a continuous, corporate, medical surveillance program that includes a plan designed specifically for field personnel engaged in work at sites where hazardous or toxic materials may be present. GEI's Safety Director and is responsible for the administration and coordination of medical evaluations conducted for GEI's employees at branch office locations. Comprehensive examinations are given to GEI field personnel on an annual basis who participate in hazardous waste operations. The medical results of the examinations aid in determining the overall fitness of employees participating in field activities.

Under the Safety Director's supervision, field personnel undergo a complete initial physical examination, including a detailed medical and occupational history before they participate in hazardous waste site investigations. Upon completion of these tests, personnel are certified by an occupational health physician as to whether they are fit for field work in general and fit to use respiratory protection.

If a GEI employee or other project worker shows symptoms of exposure to a hazardous substance and wishes to be rechecked, he/she will be directed to the nearest area hospital or medical facility.

GEI subcontractor personnel that will enter any active waste handling or other active non-"clean" area must certify that they are participating in a medical surveillance program that complies with OSHA regulations for hazardous waste operations (i.e., 29 CFR 1910.120 and 29 CFR 1926.65). Proof of medical clearance will be submitted to the GEI PM or SSM prior to the start of field activities.

9. Atmospheric Monitoring

Air monitoring will be performed to identify and quantify airborne levels of hazardous substances and safety and health hazards in order to determine the appropriate level of worker protection needed on-site in the event that intrusive work is conducted. Work requiring air monitoring includes the installation and/or abandonment of monitoring wells, DNAPL recovery wells, oxygen injection wells, and soil vapor points. Additionally, PID screening of the well head space will be conducted during groundwater sampling activities.

GEI will conduct work zone monitoring for on-site GEI employees during intrusive activities only. GEI will monitor and document daily site conditions and operations and inform field representatives of results. ***If Action Levels are exceeded, the SSM will immediately implement site action(s) according to Table 6 below and notify the PM and Safety Team.***

The following air monitoring equipment will be on site:

- PID with 10.6 eV lamp or equivalent
- Particulate Meter (PM-10 capable)

9.1 Equipment Use

9.1.1 Calibration

Air monitoring equipment will be calibrated and maintained in accordance with manufacturer's requirements. Calibrations will be recorded in the project notes daily or on a daily calibration form.

9.1.2 Photoionization Detector

Organic vapor concentrations will be measured using a PID during intrusive activities. During intrusive operations, organic vapor concentrations will be measured continuously. Organic vapor concentrations will be measured upwind of the work site(s) to determine background concentrations at least twice a day, (once in the morning and once in the afternoon). The SSM will interpret monitoring results using professional judgment and according to the alert and Action Limits set forth in the associated Site Work Plan.

9.2 Particulate Meter

A particulate meter will be used to measure airborne particulate matter during intrusive activities. Monitoring will be continuous, and readings will be averaged over a 15-minute period for comparison with the Action Levels. Monitoring personnel will make a best effort

to collect dust monitoring data from downwind of the intrusive activity. If off-site sources are considered to be the source of the measured dust, upwind readings will also be collected.

9.3 Action Levels

Table 6 provides a summary of real time air monitoring Action Levels and contingency plans for work zone activities. The below Action Levels are determined by halving the Permissible Exposure Limits (PELs) or Threshold Limit Values (TLVs) as set forth by OSHA and the American Conference of Government Industrial Hygienists (ACGIH). O₂ values are based on the maximum use limits of a full-face respirator if oxygen were being displaced by a chemical.

Table 6. Real-Time Work Zone Air Monitoring Action Levels

Air Monitoring Instrument	Action Level (above background)	Site Action
Action Levels for the following parameters are 15-minute time weighted averages (TWA), not a single exceedance.		
PID (Monitoring for VOCs)	0.0 – 50 ppm	No respiratory protection is required if VOCs are not present.
	50 – 100 ppm	Stop work, withdrawal from work area, institute engineering controls, if levels persist, upgrade to Level C.
	> 100 ppm	Stop work, withdraw from work area, notify PM and Safety Team.
Particulate Meter	150 µg/m ³	Implement work practices to reduce/minimize airborne dust generation, e.g., spray/misting of soil with water.

10. Site Control

10.1 Buddy System

GEI personnel should be in line-of-site or communication contact with another on-site person. The other on-site person should be aware of his or her role as a “buddy” and be able to help in the event of an emergency. A copy of this plan will be given to any person acting as a GEI “buddy” for informational purposes.

10.2 Sanitation for Temporary Work Sites

Sanitation requirements identified in the OSHA Standard 29 CFR 1926.51 “Sanitation” specifies that employees working at temporary project sites have at least one sanitary facility available to them. Sanitary facilities will be available on-Site.

10.3 Illumination

Illumination requirements identified by OSHA are directed to work efforts inside buildings and/or during non-daylight hours. Activities planned for the site are anticipated to occur outside during daylight hours. However, if work areas do not meet illumination requirements, they will be equipped with appropriate illumination that meets or exceeds requirements specified in OSHA Standard 29 CFR 1926.56 “Illumination.” Employees will not work on sites that are not properly lighted.

10.4 Smoking

Smoking is prohibited at or in the vicinity of hazardous operations or materials. Where smoking is permitted, safe receptacles will be provided for smoking materials.

10.5 Alcohol and Drug Abuse Prevention

Alcohol and drugs will not be allowed on the site. Project personnel under the influence of alcohol or drugs will not be allowed to enter the site.

11. Incident Reporting

GEI will report incidents involving GEI personnel or subcontractor personnel, such as: lost time injuries, injuries requiring medical attention, near miss incidents, fires, fatalities, accidents involving the public, chemical spills, vehicle accidents, and property damage. The following steps must be followed when an incident occurs:

1. For incidents involving life-threatening situations or serious injury that require emergency response personnel (Police, Fire, EMS), call 9-1-1 from a safe area.
2. **Stop work** activity to address any injury, illness, property damage, spill or other emergency.
3. Call Medcor Triage at 1-800-775-5866 to speak with a medical professional following any injury or illness.
4. Notify your Supervisor/Project Manager of the incident or injury.
5. Complete an incident report using the GEI Incident Report Form located on the GEI Safety Smartphone App, GEI Connections intranet page, or in the project CHASP.
6. Resume work activity if all steps above have been completed and it is safe to do so.

For vehicle accidents involving another vehicle or damage to property, the employee will take pictures of each vehicle or property involved in the incident and obtain a police report. In some municipalities police will not be dispatched to a non-injury accident, but every effort needs to be made to try and obtain the report.

The Incident Report Form and the Near Miss Reporting Form can be found in Appendix D, on the GEI Health and Safety smartphone app, or on the Safety page of the GEI Intranet. To report subcontractor injuries or incidents, follow the same verbal reporting procedures and submit an email describing the event to the PM and the Safety Team.

11.1 Injury Triage Service

If a GEI employee experiences a work-related injury that is not life-threatening, the employee will initiate a call to Medcor Triage at 1-800-775-5866. The injured employee will detail any medical symptoms or complaints which will be evaluated by a Registered Nurse (RN) specially trained to perform telephonic triage. The RN will recommend first aid self-treatment or refer the injured employee for an off-site medical evaluation by a health professional at a clinic within GEI's workers compensation provider network. GEI employees are still required to follow our Accident Reporting procedures as listed above.

12. Supplemental Contingency Plan Procedures

12.1 Hazard Communication Plan

GEI personnel have received hazard communication training as part of their annual health and safety training and new employee health and safety orientation training. Hazardous materials used on the site will be properly labeled, stored, and handled. SDS will be available to potentially exposed employees.

12.2 Fire

In the event of a fire personnel will evacuate the area. GEI's field representative will contact the local fire department with jurisdiction and report the fire. Notification of evacuation will be made to the PM and the Safety Team. The field representative will account for GEI personnel and subcontractor personnel and report their status to the PM.

12.3 Medical Support

In case of minor injuries, on-site care will be administered with the site first aid kit. For serious injuries, call 911 and request emergency medical assistance. Seriously injured persons should not be moved, unless they are in immediate danger. Notify the PM and the Safety Team of the emergency.

Section 1 and Table 1 of this CHASP contain detailed emergency information, including directions to the nearest hospital, and a list of emergency services and their telephone numbers. In addition, Appendix A includes maps to the hospital and/or occupational health clinic. GEI field personnel will carry a cellular telephone.

12.4 Severe Weather

The contingency plan for severe weather includes reviewing the expected weather to determine if severe weather is in the forecast. Severe weather includes high winds over 40 miles per hour (mph), heavy rains or snow squalls, thunderstorms, tornados, and lightning storms. If severe weather is approaching, the decision to evacuate GEI personnel and subcontractor personnel from the site will be the responsibility of GEI's field representative. Notification of evacuation will be made to the PM and the Safety Team. The field representative will account for GEI personnel and subcontractor personnel and report their status to the PM. If safe, work can resume 30 minutes after the last clap of thunder or flash of lightning.

12.5 Spills or Material Release

If a hazardous waste spill or material release occurs, if safe, the SSM or their representative will immediately assess the magnitude and potential seriousness of the spill or release based on the following:

- SDS for the material spilled or released;
- Source of the release or spillage of hazardous material;
- An estimate of the quantity released and the rate at which it is being released;
- The direction in which the spill or air release is moving;
- Personnel who may be or may have been in contact with the material, or air release, and possible injury or sickness as a result;
- Potential for fire and/or explosion resulting from the situation; and
- Estimates of area under influence of release.

If the spill or release is determined to be within the on-site emergency response capabilities, the SSM will verify implementation of the necessary remedial action. If the release is beyond the capabilities of the site personnel, personnel will be evacuated from the immediate area and the local fire department will be contacted. The SSM will notify the PM and the Safety Team.

13. Health and Safety Plan Sign-Off

GEI personnel conducting site activities will be familiar with the information in this CHASP. After reviewing this plan, please sign the copy in the project files, and bring a copy of the plan with you to the site. By signing this site-specific CHASP, you are agreeing that you have read, understand, and will adhere to the provisions described in this plan while working on the Project site below.

Site Name: Astoria Cove

Investigation: NYCOER RAWP

GEI Project No: 2104337

Print Name	Signature
Project Manager: George Holmes	

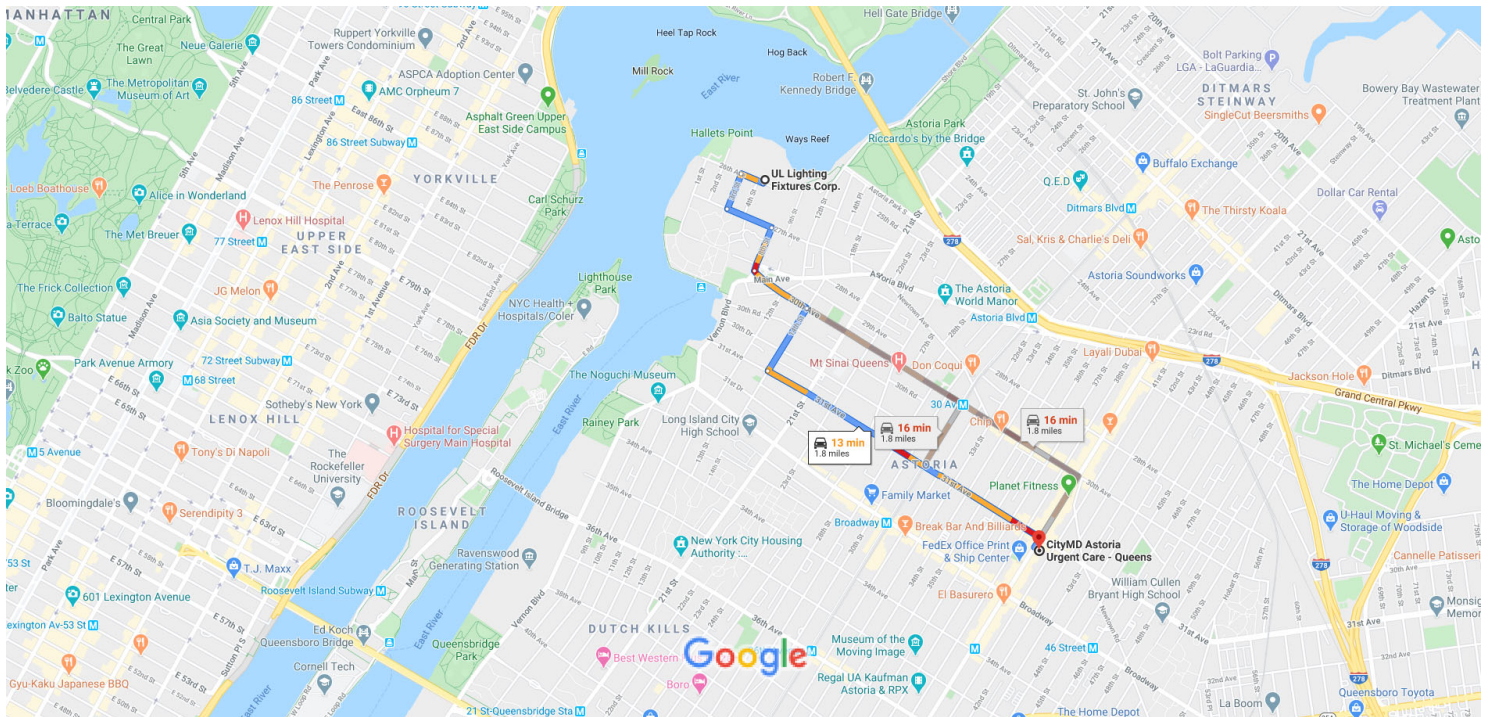
Appendix A

Map to Hospital



U.L. Lighting Fixtures Corp. to CityMD Astoria Urgent Care - Queens

Drive 1.8 miles, 13 min



Map data ©2020 Google

1000 ft

U.L. Lighting Fixtures Corp.

4-05 26th Ave, Astoria, NY 11102

Take 27th Ave and 8th St to 30th Ave

1. Head northwest on 26th Ave toward 4th St
3 min (0.4 mi)
2. Turn left onto 3rd St
361 ft
3. Turn left onto 27th Ave
0.1 mi
4. Turn right onto 8th St
0.1 mi
5. Turn left onto 30th Ave
1 min (0.2 mi)
6. Turn right onto 14th St
57 s (0.2 mi)

Follow 31st Ave to Steinway St

7. Turn left onto 31st Ave
7 min (1.0 mi)
- 0.9 mi



8. Turn right onto Steinway St



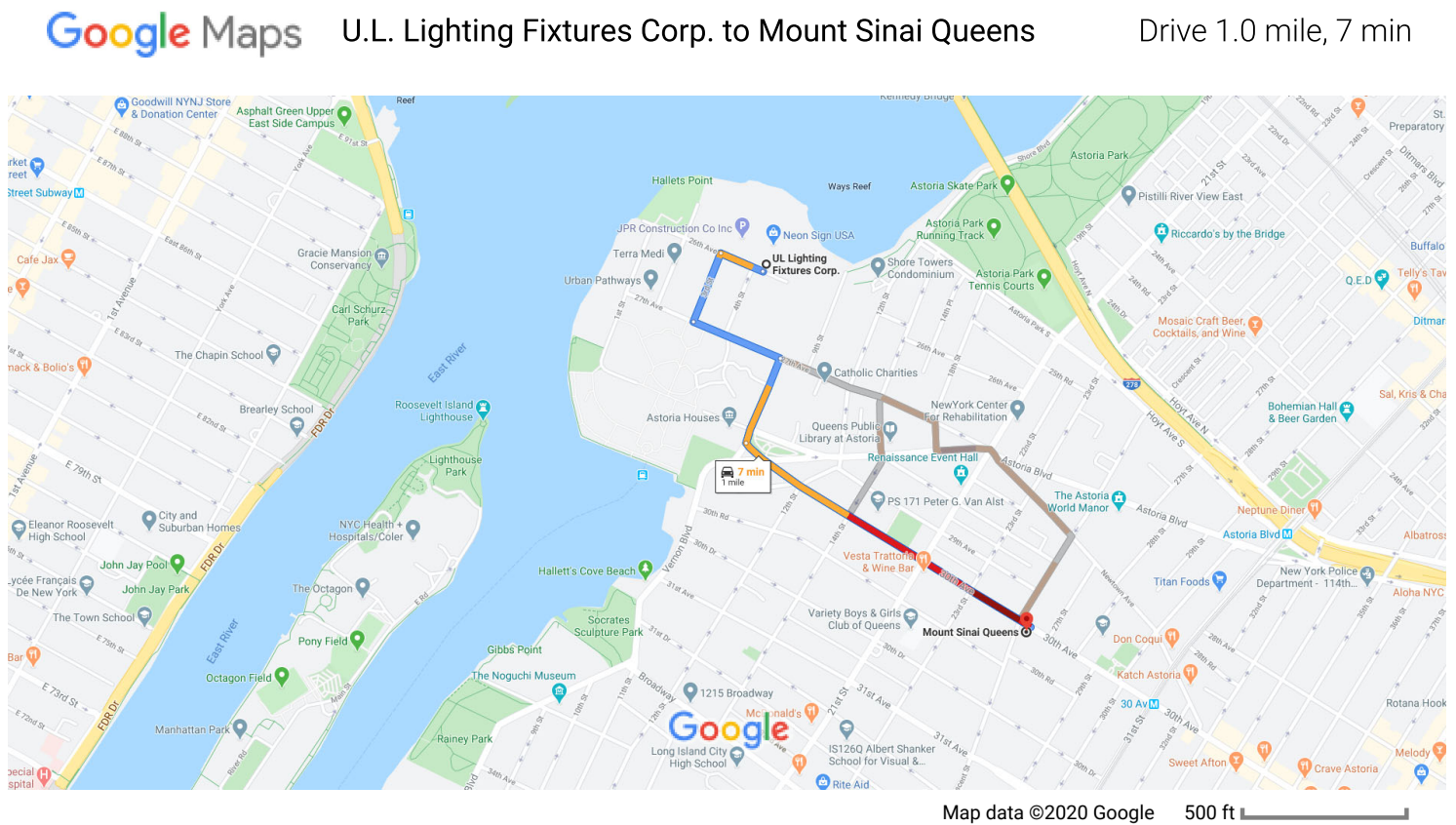
Destination will be on the left

167 ft

CityMD Astoria Urgent Care - Queens

31-11 Steinway St, Astoria, NY 11103

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.



U.L. Lighting Fixtures Corp.

4-05 26th Ave, Astoria, NY 11102

- ↑

1. Head northwest on 26th Ave toward 4th St

361 ft
- ↶

2. Turn left onto 3rd St

0.1 mi
- ↶

3. Turn left onto 27th Ave

0.1 mi
- ↷

4. Turn right onto 8th St

0.1 mi
- ↶

5. Turn left onto 30th Ave

i

Destination will be on the right

0.5 mi

Mount Sinai Queens

25-10 30th Ave, Queens, NY 11102

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.

Appendix B

Safety Data Sheets

VOLATILE ORGANIC COMPOUNDS (VOCs)

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.



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 known 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

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Semi-Volatile Organic Compounds

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Brownfields Home
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Regulations
Contacts

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-Methylnaphthalene
- 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
- Dibenzo(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 ≤ 30 (see method for any allowable variations), and a minimum Response Factor of ≥ 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 ≤ 25 (see method for any allowable variations), and a minimum Response Factor of ≥ 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-volatile.htm>

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'i-sī/kŭk ār'e-măt'ik hī'dre-kar/benz)

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?

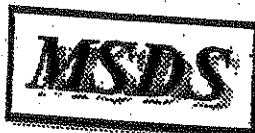
- ☐ PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- ☐ PAHs can occur in air attached to dust particles.
- ☐ Some PAH particles can readily evaporate into the air from soil or surface waters.
- ☐ PAHs can break down by reacting with sunlight 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 Number: A7020 * * * * * Effective Date: 05/08/03 * * * * * Supercedes: 08/02/00



Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08855



24 Hour Emergency Telephone: 800-833-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 813-856-8886

Outside U.S. And Canada
Chemtrec: 703-527-3887

NEVER RE-ENTER A CONTAINER OF A HAZARDOUS
SUBSTANCE WITHOUT FIRST CONSULTING THE
SAFETY DATA SHEET FOR THE PRODUCT.
NEVER MIX OR COMBINE MATERIALS UNLESS
SPECIFICALLY INSTRUCTED TO DO SO.
NEVER POUR OR FLUSH MATERIALS DOWN THE
DRAIN OR INTO THE GROUND.

All non-emergency questions should be directed to Customer Service (1-800-552-2537) for assistance.

ANTHRACENE

1. Product Identification

Synonyms: Paranaphthalene; Green Oil; Anthracene 90-95%
CAS No.: 120-12-7
Molecular Weight: 178.23
Chemical Formula: $(C_6H_4CH)_2$
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/m ³ TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m ³ TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m ³ IDLH (listed under Coal tar pitches).	0.2 mg/m ³ 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 threshold)

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

© IPCS, CEC, 1993

BENZ(a)ANTHRACENE

**IMPORTANT
LEGAL
NOTICE:**

Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.

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 cerevisiae* (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) *Neaethes 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.

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 μ g/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	ETNECS/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: 1.60×10^{-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 depleters.

This material does not contain any Class 2 Ozone depleters.

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.

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---
Known Anticipated

IARC Categ

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 into water, this material is expected to quickly evaporate. When released into the

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

Naphthalene (91-20-3)

	Korea	---Canada--- DSL	NDSL	Phil.
	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----

Ingredient

Naphthalene (91-20-3)

	-SARA 302- RQ	TPQ	-SARA 313- List	Chemical C
	No	No	Yes	No

-----\Federal, State & International Regulations - Part 2\-----

Ingredient

Naphthalene (91-20-3)

	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
	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](#).]

This information was last updated on September 17, 2003. 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.)

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.]

This information was last updated on November 16, 2004. Although we have tried to make it as accurate and useful as possible, we can take no responsibility for its use or misuse.

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.

PESTICIDES AND PCBs



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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,

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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:

Simply put,

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.

Types of Toxicity Tests EPA Requires for Human Health Risk Assessments

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

<http://www.epa.gov/pesticides/factsheets/riskassess.htm>

1/30/2006

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](#) [\[External Link\]](#).

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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 considered 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.

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

POLYCHLORINATED BIPHENYLS

ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>

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 breastfeeding 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

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Introduction

The **term heavy metal** refers to any metallic chemical element that is toxic or poisonous at low concentrations. Examples of heavy metals are mercury (Hg), cadmium (Cd), arsenic (As), chromium (Cr), thallium (Tl), and lead (Pb).

Heavy metals are natural components of the Earth's crust. They cannot be degraded or destroyed. They enter our bodies via food, drinking water and air. As trace elements, some heavy metals (e.g. copper) are essential to maintain the metabolism of the human body. However, at higher concentrations they can cause metal poisoning could result, for instance, from drinking-water contamination (e.g. lead pipes), high concentrations near emission sources, or intake via the food chain.

Heavy metals are dangerous because they tend to **bioaccumulate**. Bioaccumulation means an increase of a chemical in a biological organism over time, compared to the chemical's concentration in the environment. They accumulate in living things any time they are taken up and stored faster than they are broken down and excreted.

Heavy metals can enter a water supply by industrial and consumer waste, or even from acidic rain that releases 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 prominent are 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 found in pigments and ceramics and glass. Exposure to high levels of antimony for short periods of time causes nausea and vomiting. There is little information on the effects of long-term antimony exposure, but it is a suspected human carcinogen. 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 micronutrient for humans. Cadmium is biopersistent and, once absorbed by an organism, remains resident for many years (for humans) although it is eventually excreted.

In humans, long-term exposure is associated with renal dysfunction. High exposure can lead to obstructive pulmonary disease, which has been linked to lung cancer, although data concerning the latter are difficult to interpret due to confounding factors. Cadmium may also produce bone defects (osteomalacia, osteoporosis) in humans and animals. In animals, it is linked to increased blood pressure and effects on the myocardium in animals, although most human findings are from animal studies.

The average daily intake for humans is estimated as $0.15\mu\text{g}$ from air and $1\mu\text{g}$ from water. Smoking can lead to the inhalation of around $2\text{--}4\mu\text{g}$ 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. Cadmium 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 addit 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 kidn and intestinal irritation. People with Wilson's disease are at greater risk for health effects from over 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 $20\mu\text{g}/\text{dl}$ in young children.

Average daily lead intake for adults in the UK is estimated at $1.6\mu\text{g}$ from air, $20\mu\text{g}$ 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 through food, air, soil and dust from old paint containing lead. In the general non-smoking, adult population the major pathway is from food and water. Food, air, water and dust/soil are the major potential exposure pathways for young children. For infants up to 4 or 5 months of age, air, milk formulae and water are the significant sources.

Lead is among the most recycled non-ferrous metals and its secondary production has therefore grown despite declining lead prices. Its physical and chemical properties are applied in the manufacturing, construction and other 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 and ammunition.

Effects of Mercury on the environment

Mercury is a toxic substance which has no known function in human biochemistry or physiology and is found in living organisms. Inorganic mercury poisoning is associated with tremors, gingivitis and/or minor neurological effects together with spontaneous abortion and congenital malformation.

Monomethylmercury causes damage to the brain and the central nervous system, while foetal and perinatal exposure 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 source is the degassing of the Earth's crust, emissions from volcanoes and evaporation from natural bodies of water.

World-wide mining of the metal leads to indirect discharges into the atmosphere. The usage of mercury in industrial processes and in various products (e.g. batteries, lamps and thermometers). It is also used in amalgam for fillings and by the pharmaceutical industry. Concern over mercury in the environment has led to the identification of toxic forms in which mercury can occur.

Mercury is mostly present in the atmosphere in a relatively unreactive form as a gaseous element. The long lifetime (of the order of 1 year) of its gaseous form means the emission, transport and deposition of mercury over large distances.

Natural biological processes can cause methylated forms of mercury to form which bioaccumulate and concentrate in living organisms, especially fish. These forms of mercury: monomethylmercury and dimethylmercury are toxic, causing neurotoxicological disorders. The main pathway for mercury to humans is through the diet.

The main sources of mercury emissions in the UK are from the manufacture of chlorine in mercury cells, production, coal combustion and crematoria. UK emissions of mercury are uncertain and it is estimated to be between 13 to 36 tonnes per year (DERA). Emissions are estimated to have declined by around ¾'s between 1990 and 1995 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 outside the EU are expected to increase - increasing the level of ambient concentrations in the continent.

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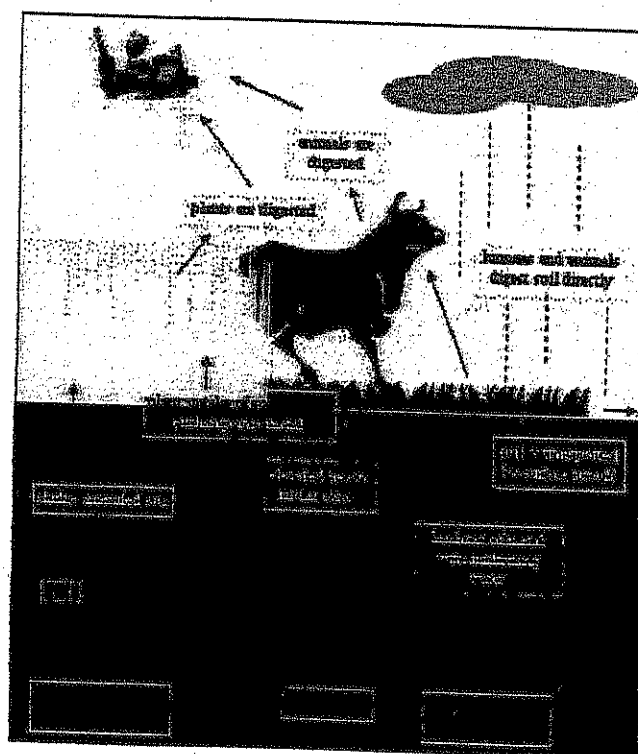
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effects of Nickel on the environment

Small amounts of Nickel are needed by the human body to produce red blood cells, however, in excess 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 along

Effects of Selenium on the environment

Selenium is needed by humans and other animals in small amounts, but in larger amounts can cause system, fatigue, and irritability. Selenium accumulates in living tissue, causing high selenium content organisms, and causing greater health problems in human over a lifetime of overexposure. These include and fingernail loss, damage to kidney and liver tissue, damage to circulatory tissue, and more severe system.

Heavy Metals adsorption process:

In the picture we can observe the way that follows the heavy metals from the first step of the pollution human body by means the food.

The most important disasters with heavy metals:

1932

http://www.lennotech.com/heavy-metals.htm?gclid=CPfez7WT84ICFRspGgodjAI_tQ

1/30/2006

Minamata

Sewage containing mercury is released by Chisso's chemicals works into Minamata 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 Minamata 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 m³ 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**Heavy Metal Analysis Test**

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MSDS Number: A7441 * * * * * Effective Date: 11/12/03 * * * * * Supercedes: 02/23/01



Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08855



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-8886

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 is 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---		IARC Category
	Known	Anticipated	
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-		-SARA 313-	
	RQ	TPQ	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-	-TSCA-
		261.33	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:

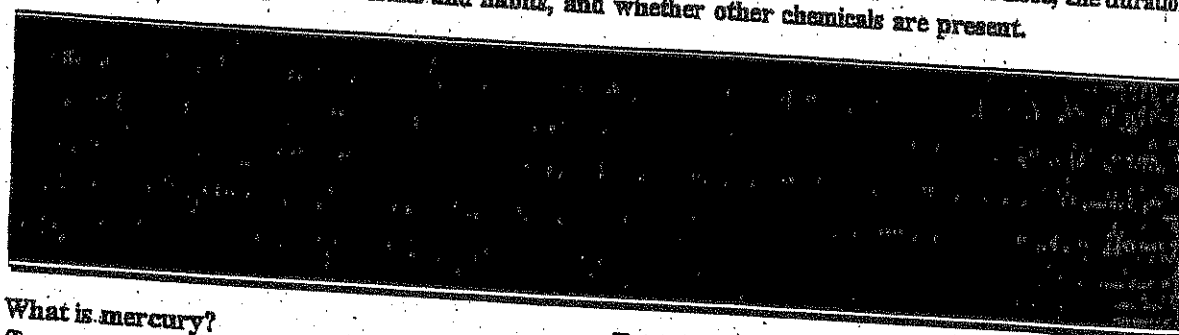
No Changes.

Disclaimer:

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

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 mĕr'kyə-rĕs)

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?

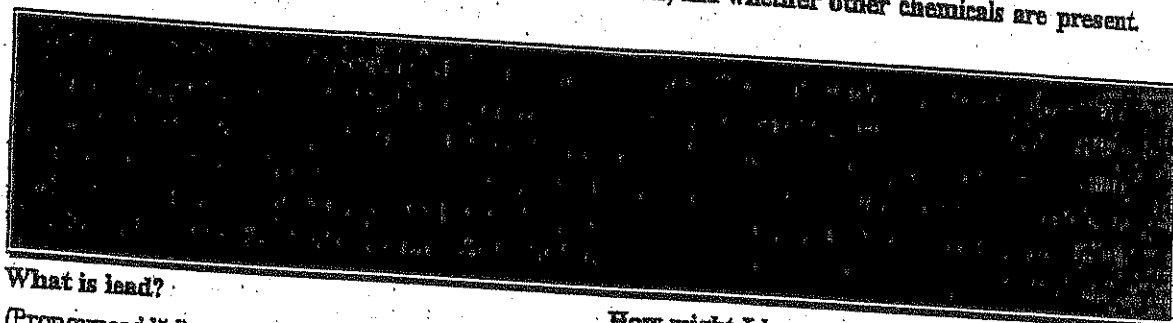
- ☐ Eating fish or shellfish contaminated with methylmercury.
- ☐ Breathing vapors in air from spills, incinerators, and industries that burn mercury-containing fuels.
- ☐ Release of mercury from dental work and medical treatments.
- ☐ Breathing contaminated workplace air or skin contact during use in 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,

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 lēd)

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?

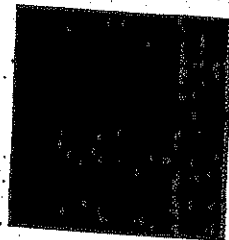
Lead can affect almost every organ and system in your body. The most sensitive is the central nervous system, particularly in children. Lead also damages kidneys and the reproductive system. The effects are the same whether it is breathed or swallowed.

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---		IARC Categ
	Known	Anticipated	
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-	-TSCA-	
Anthracene (120-12-7)	5000	261.33	8(d)	
		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	Drosophila pseudo-obscura
emb	embryo
esc	Escherichia coli
eug	Euglena gracilis

itt	intratesticular
iu	international unit
iut	intrauterine
ivg	intravaginal
ivn	intravenous
kdy	kidney
kg	kilogram
kfp	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	miconucleus 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
smm	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
tn	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.](#)]

This information was last updated on October 28, 2003. 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.

- 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.

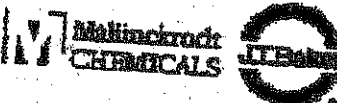
Return to the Safety Glossary.

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.
228 First School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 800-420-0104
DOWNTOWN: 1-800-420-0900

National Response in Canada
DOWNTOWN: 800-420-0900

Outside U.S. and Canada
Telephone: 709-420-5007

NOTE: CHEMICAL, CARTRIDGE and National
Response Center emergency numbers to be
used only in the event of chemical emergency:
including spill, leak, fire, exposure or accident
involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-520-0537) 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.

Page 3 of 7

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 121°C), chlorine trifluoride, and hydrazinium nitrate (above 70°C). 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---		IARC Category
	Known	Anticipated	
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 **NEIN:** 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 - Composition/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

8/9/2002 9:23:55 AM

Disposal:	safety. Store in a well ventilated area. Keep container tightly closed. Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazards not otherwise classified (HNOC):	None known
Supplemental Information:	Respirable Crystalline Silica (RCS) may cause cancer. Repeated inhalation of respirable crystalline silica (quartz) may cause lung cancer according to IARC and NTP; ACGIH states that it is a suspected cause of cancer. Other forms of RCS (e.g., tridymite and cristobalite) may also be present or formed under certain industrial processes.

Section 3. Composition/information on ingredients

Substance/mixture:	Mixture
Chemical Name:	Calcium compounds, calcium silicate compounds, and other calcium compounds containing iron and aluminum make up the majority of this product.

CAS number/other identifiers

Ingredient name	%	CAS number
Portland Cement	100%	65997-15-1
The structure of Portland cement may contain the following in some concentration ranges:		
Calcium oxide	A-B	1305-78-8
Quartz	C-D	14808-60-7
Hexavalent chromium*	E-F	18450-29-9
Portland cement also contains gypsum, limestone and magnesium oxide in various concentrations. However, because these components are not classifiable as a hazard under Title 29 Code of Federal Regulations 1910.1200, they are not required to be listed in this section.		
Gypsum	G-H	13397-24-5
Limestone	I-J	1317-65-3
Magnesium oxide	K-L	1309-48-4

Any concentration shown as a range is to protect confidentiality or is due to process variation.

*Hexavalent chromium is included due to dermal sensitivity associated with the component.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye Contact:	Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Chemical burns must be treated promptly by a physician.
Inhalation:	Seek medical help if coughing or other symptoms persist. Inhalation of large amounts of portland cement requires immediate medical attention. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If the individual is not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in a recovery position and get medical attention immediately. Maintain an open airway.
Skin Contact:	Get medical attention immediately. Heavy exposure to portland cement dust, wet concrete or associated water requires prompt attention. Quickly remove contaminated clothing, shoes, and leather goods such as watchbands and belts. Quickly and gently blot or brush away excess portland cement. Immediately wash thoroughly with lukewarm, gently flowing water and non-abrasive pH natural soap. Seek medical attention for rashes, burns, irritation, dermatitis and prolonged unprotected exposure to wet cement, cement mixtures or liquids from wet cement. Burns should be treated as caustic burns. Portland cement causes skin burns with little warning. Discomfort or pain cannot be relied upon to alert a person to

a serious injury. You may not feel pain or the severity of the burn until hours after the exposure. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure.

Ingestion: Get medical attention immediately. Call a poison center or physician. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING unless directed to do so by medical personnel. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Have victim drink 60 to 240 mL (2 to 8 oz.) of water. Stop giving water if the exposed person feels sick as vomiting may be dangerous. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed potential acute health effects

Eye contact:	Causes serious eye damage.
Inhalation:	May cause respiratory irritation.
Skin contact:	Causes severe burns. May cause an allergic skin reaction.
Ingestion:	May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact:	Adverse symptoms may include the following: pain, watering and redness.
Inhalation:	Adverse symptoms may include the following: respiratory tract irritation and coughing.
Skin contact:	Adverse symptoms may include the following: pain or irritation, redness and blistering may occur, skin burns, ulceration and necrosis may occur.
Ingestion:	Adverse symptoms may include the following: stomach pains.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician:	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments:	Not applicable.
Protection of first-aiders:	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media:	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media:	Do not use water jet or water-based fire extinguishers.
Specific hazards arising from the chemical:	No specific fire or explosion hazard.
Hazardous thermal decomposition Products:	Decomposition products may include the following materials: carbon dioxide, carbon monoxide, sulfur oxides and metal oxide/oxides.
Special protective actions for fire-fighters:	Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
Special protective equipment for fire-fighters:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel:	No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not
-------------------------------------	--

**For emergency responders:
Environmental precautions:**

breathe dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For personal protective clothing requirements, please see Section 8.
Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has entered the environment, including waterways, soil or air. Materials can enter waterways through drainage systems.

Methods and materials for containment and cleaning up

Small spill:

Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Place spilled material in a designated, labeled waste container. Dispose of waste material by using a licensed waste disposal contractor.

Large spill:

Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place dust in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Large spills to waterways may be hazardous due to alkalinity of the product. Dispose of waste material using a licensed waste disposal contractor. Note: see section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures:

Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure by obtaining and following special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe dust. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material and keep the container tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene:

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities:

A key to using the product safely requires the user to recognize that portland cement reacts chemically with water to produce calcium hydroxide which can cause severe chemical burns. Every attempt should be made to avoid skin and eye contact with cement. Do not get portland cement inside boots, shoes or gloves. Do not allow wet, saturated clothing to remain against the skin. Promptly remove clothing and shoes that are dusty or wet with cement mixtures. Launder/clean clothing and shoes before reuse. Do not enter a confined space that stores or contains portland cement unless appropriate procedures and protection are available. Portland cement can build up or adhere to the walls of a confined space and then release or fall suddenly (engulfment).

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
-----------------	-----------------

Cement, portland, chemicals	<p>ACGIH TLV (United States, 3/2012) TWA: 1 mg/m³ 8 hours. Form: Respirable fraction</p> <p>NIOSH REL (United States, 6/2009) TWA: 5 mg/m³ 10 hours. Form: Respirable fraction TWA: 10 mg/m³ 10 hours. Form: Total</p> <p>OSHA PEL (United States, 6/2010) TWA: 5mg/m³. 8 hours. Form: Respirable fraction TWA: 15 mg/m³. 8 hours. Form: Total dust</p>
Calcium oxide	<p>ACGIH TLV (United States, 3/2012) TWA: 2 mg/m³ 8 hours</p> <p>NIOSH REL (United States, 6/2009) TWA: 2mg/m³ 10 hours.</p> <p>OSHA PEL (United States, 6/2010) TWA: 5 mg/m³ 8 hours.</p>
Limestone	<p>NIOSH REL (United States, 6/2009) TWA: 5 mg/m³ 10 hours. Form: Respirable fraction TWA: 10 mg/m³ 10 hours. Form: Total</p> <p>OSHA PEL (United States, 6/2010) TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust</p>
Magnesium oxide	<p>ACGIH TLV (United States, 3/2012) TWA: 10 mg/m³ 8 hours. Form: Inhalable fraction</p> <p>OSHA PEL (United States, 6/2010) TWA: 15 mg/m³ 8 hours. Form: Total particulates</p>
Quartz	<p>ACGIH TLV (United States, 3/2012) TWA: 0.025 mg/m³ 8 hours. Form: Respirable fraction</p> <p>NIOSH REL (United States, 6/2009) TWA: 0.05 mg/m³ 10 hours. Form: Respirable dust</p> <p>OSHA PEL Z-3 (United States, 9/2005) TWA: 10 mg/m³ divided by % SiO₂ + 2: Respirable TWA: 30 mg/m³ divided by % SiO₂ + 2: Total</p>
Calcium sulfate (gypsum)	<p>ACGIH TLV (United States, 3/2012) TWA: 10 mg/m³ 8 hours. Form: Respirable fraction</p> <p>NIOSH REL (United States, 6/2009) TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 10 mg/m³ 8 hours. Form: Total dust</p> <p>OSHA PEL Z-1 (United States, 2/2006) TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust</p>

Appropriate engineering controls:

Use only with adequate ventilation. If user operations generate dust, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls:

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures:	Clean water should always be readily available for skin and (emergency) eye washing. Periodically wash areas contacted by portland cement with a pH neutral soap and clean, uncontaminated water. If clothing becomes saturated with portland cement, garments should be removed and replaced with clean, dry clothing.
Eye/face protection:	To prevent eye contact, wear safety glasses with side shields, safety goggles or face shields when handling dust or wet cement. Wearing contact lenses when working with cement is not recommended.

Skin protection

Hand protection:	Use impervious, waterproof, abrasion and alkali-resistant gloves. Do not rely on barrier creams in place of impervious gloves. Do not get portland cement inside gloves.
Body protection:	Use impervious, waterproof, abrasion and alkali-resistant boots and protective long-sleeved and long-legged clothing to protect the skin from contact with wet portland cement. To reduce foot and ankle exposure, wear impervious boots that are high enough to prevent portland cement from getting inside them. Do not get portland cement inside boots, shoes, or gloves. Remove clothing and protective equipment that becomes saturated with cement and immediately wash exposed areas of the body.
Other skin protection:	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved.
Respiratory protection:	Use properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product, and assigned protection factor of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical State:	Solid. [Powder]	Lower and Upper explosive flammable limits	Not applicable
Color:	Gray or white	Vapor pressure:	Not applicable
Odor:	Odorless	Vapor density:	Not applicable
Odor threshold:	Not available	Relative density:	2.3 to 3.1
pH:	>11.5 [Conc. (% w/w): 1%]	Solubility:	Slightly soluble in water
Melting point:	Not available	Solubility in water:	0.1 to 1%
Boiling point:	>1000°C (>1832°F)	Partition coefficient: n-octanol/water:	Not applicable
Flash point:	Not flammable. Not combustible	Auto-ignition temperature:	Not applicable
Burning time:	Not available	Decomposition temperature:	Not available
Burning rate:	Not available	SADT:	Not available
Evaporation Rate:	Not applicable	Viscosity:	Not applicable
Flammability (solid, gas):	Not applicable		

Section 10. Stability and reactivity

Reactivity:	Reacts slowly with water forming hydrated compounds, releasing heat and producing a strong alkaline solution until reaction is substantially complete.
Chemical Stability:	The product is stable.
Possibility of hazardous reactions:	Under normal circumstances of storage and use, hazardous reactions will not occur.
Conditions to avoid:	No specific data.
Incompatible materials:	Reactive or incompatible with the following materials: oxidizing materials, acids, aluminum and ammonium salt. Portland cement is highly alkaline and will react with acids to produce a violent, heat-generating reaction. Toxic gases or vapors may be given off depending on the acid involved. Reacts with acids, aluminum metals and ammonium salts. Aluminum powder and other alkali and alkaline earth elements will react in wet mortar or concrete, liberating hydrogen gas. Limestone ignites on contact with fluorine and is incompatible with acids, alum, ammonium salts, and magnesium. Silica reacts violently with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride yielding possible fire and/or explosions. Silicates dissolve readily in hydrofluoric acid producing a corrosive gas-silicon tetrafluoride.
Hazardous decomposition products:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity: Portland Cement LD50/LC50 = Not available
Irritation/Corrosion: **Skin:** May cause skin irritation. May cause serious burns in the presence of moisture.
Eyes: Causes serious eye damage. May cause burns in the presence of moisture.
Respiratory: May cause respiratory tract irritation.
Sensitization: May cause sensitization due to the potential presence of trace amounts of hexavalent chromium.
Mutagenicity: There are no data available.

Carcinogenicity:
 Classification below:

Product/ingredient name	OSHA	IARC	ACGIH	NTP
Cement, portland, chemicals	-	-	A4	-
Quartz	-	1	A2	Known to be a human carcinogen.

Reproductive toxicity: There are no data available.
Teratogenicity: There are no data available.

Specific target organ toxicity (single exposure)

Name	Category	Route of Exposure	Target Organs
Calcium oxide	Category 3	Inhalation and skin contact	Respiratory tract irritation, skin irritation
Cement, portland, chemicals	Category 3	Inhalation and skin contact	Respiratory tract irritation, skin irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of Exposure	Target Organs
Quartz	Category 1	Inhalation	Respiratory tract and kidneys

Aspiration hazard: There are no data available.

Information on the likely routes of exposure

Potential acute health effects: **Eye contact:** Causes serious eye damage.
Inhalation: May cause respiratory irritation.
Skin contact: Causes severe burns. May cause an allergic skin reaction.
Ingestion: May cause burns to mouth, throat and stomach.
Symptoms related to the physical, chemical and toxicological characteristics: **Eye contact:** Adverse symptoms may include the following: pain, watering, redness.
Inhalation: Adverse symptoms may include the following: respiratory tract irritation, coughing
Skin contact: Adverse symptoms may include the following: pain or irritation, redness, blistering may occur, skin burns, ulcerations and necrosis may occur
Ingestion: Adverse symptoms may include the following: stomach pains
Delayed and immediate effects and also chronic effects from short and long term exposure: **Short term exposure**
 Potential immediate effects: No known significant effects or critical hazards.
 Potential delayed effects: No known significant effects or critical hazards.
Long term exposure
 Potential immediate effects: No known significant effects or critical hazards.

Potential chronic health effects:

Potential delayed effects: No known significant effects or critical hazards.

General: Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation. If sensitized to hexavalent chromium, a severe allergic dermal reaction may occur when subsequently exposed to very low levels.

Carcinogenicity: Portland cement is not classifiable as a human carcinogen. Crystalline silica is considered a hazard by inhalation. IARC has classified crystalline silica as a Group 1 substance, carcinogenic to humans. This classification is based on the findings of laboratory animal studies (inhalation and implantation) and epidemiology studies that were considered sufficient for carcinogenicity. Excessive exposure to crystalline silica can cause silicosis, a non-cancerous lung disease.

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.

Developmental effects: No known significant effects or critical hazards.

Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity:

Acute toxicity estimates: There are no data available.

Section 12. Ecological Information

Toxicity

Product/ingredient name	Result	Species	Exposure
Calcium oxide	Chronic NOEC 100 mg/L Fresh water	Fish-Oreochromis niloticus-Juvenile (Fledgling, Hatchling, Weanling)	46 days

Persistence and degradability:

There are not data available.

Bioaccumulative potential:

There are not data available.

Mobility in soil:

Soil/water partition coefficient (Koc): Not available.

Other adverse effects:

No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods:

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Untreated waste should not be released to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe manner. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff, and contact with soil, waterways, drains and sewers.

Section 14. Transportation information

	DOT Classification	IMDG	IATA
UN number	Not regulated	Not regulated	Not regulated
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	None	None	None
Additional information	-	-	-

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.
Not available.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:

Section 15. Regulatory Information

TSCA 6 final risk management: Chromium, ion (Cr6+)

United States inventory (TSCA 8b): Cements are considered to be statutory mixtures under TSCA. CAS 65997-15-1 is included on the TSCA inventory.

CERCLA: This product is not listed as a CERCLA substance

Clean Air Act Section 112 (b): Hazardous Air Pollutants (HAPs) – Not listed

Clean Air Act Section 602: Class I Substances – Not listed

Clean Air Act Section 602: Class II Substances – Not listed

DEA List I Chemicals: (Precursor Chemicals) – Not listed

DEA List II Chemicals: (Essential Chemicals) – Not listed

SARA 311/312

Classification: Immediate (acute) health hazard
Delayed (chronic) health hazard

Composition/information on ingredients

Name	%	Fire Hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Calcium oxide	A-B	No	No	No	Yes	No
Quartz	>0.1	No	No	No	No	Yes
Chromium, ion (Cr6+)	<0.1	No	No	No	Yes	Yes

SARA 313

	Product name	CAS number	%
Form R-Report requirements	Chromium, ion (Cr6+)	8540-29-9	<0.1

State regulations

Massachusetts:

The following components are listed: cement, portland, chemicals, limestone

New York:

None of the components are listed.

New Jersey:

The following components are listed: cement, portland, chemicals, gypsum, limestone

Pennsylvania:

The following components are listed: cement, portland, chemicals, gypsum, limestone

California Prop. 65

WARNING: This product contains crystalline silica and chemicals (trace metals) known to the State of California to cause cancer, birth defects or other reproductive harm. California law requires the above warning in the absence of definitive testing to prove the defined risks do not exist.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Quartz	Yes	No	No	No
Chromium, ion (Cr6+)	Yes	Yes	0.001µg/day (inhalation)	8.2 micrograms/day (ingestion)

International regulations

International lists: **Canadian Domestic Substances List (DSL):** Portland cement is included on the DSL.
Mexico Inventory (INSQ): All components are listed or exempted.

Section 16. Other Information

Date of issue: 06/01/2015
Version: 06/01/2015
Revised Section(s): N/Ap

Notice to reader

While the information provided in this safety data sheet is believed to provide a useful summary of the hazards of portland cement as it is commonly used, the sheet cannot anticipate and provide all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product. In particular, the data furnished in this sheet do not address hazards that may be posed by other materials mixed with portland cement to produce portland cement products. Users should review other relevant material safety data sheets before working with this portland cement or working on portland cement products, for example, portland cement concrete.

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Abbreviations

ACGIH — American Conference of Governmental Industrial Hygienists
CAS — Chemical Abstract Service
CERCLA — Comprehensive Emergency Response and Comprehensive Liability Act
CFR — Code of Federal Regulations
DOT — Department of Transportation
GHS — Globally Harmonized System
HEPA — High Efficiency Particulate Air
IATA — International Air Transport Association
IARC — International Agency for Research on Cancer
IMDG — International Maritime Dangerous Goods
NIOSH — National Institute of Occupational Safety and Health
NOEC — No Observed Effect Concentration
NTP — National Toxicology Program
OSHA — Occupational Safety and Health Administration
PEL — Permissible Exposure Limit
REL — Recommended Exposure Limit
RQ — Reportable Quantity
SARA — Superfund Amendments and Reauthorization Act
SDS — Safety Data Sheet
TLV — Threshold Limit Value
TPQ — Threshold Planning Quantity
TSCA — Toxic Substances Control Act
TWA — Time-Weighted Average
UN — United Nations

Appendix C

Heat Stress and Cold Stress Guidelines

Heat Stress Guidelines

Form	Signs & Symptoms	Care	Prevention ³
Heat Rash	Tiny red vesicles in affected skin area. If the area is extensive, sweating can be impaired.	Apply mild lotions and cleanse the affected area.	Cool resting and sleeping areas to permit skin to dry between heat exposures.
Heat Cramps	Spasm, muscular pain (cramps) in stomach area and extremities (arms and legs).	Provide replacement fluids with minerals (salt) such as Gatorade.	Adequate salt intake with meals ¹ . ACCLIMATIZATION ²
Heat Exhaustion	Profuse sweating, cool (clammy) moist skin, dizziness, confusion, pale skin color, faint, rapid shallow breathing, headache, weakness, and/or muscle cramps.	Remove from heat, sit or lie down, rest, replace lost water with electrolyte replacement fluids (water, Gatorade) take frequent sips of liquids in amounts greater than required to satisfy thirst.	ACCLIMATIZATION ² Adequate salt intake with meals ¹ , only during early part of heat season. Ample water intake, frequently during the day.
Heat Stroke	HOT <u>Dry</u> Skin. Sweating has stopped. Mental confusion, dizziness, nausea, chills, severe headache, collapse, delirium, and/or coma.	HEAT STROKE IS A MEDICAL EMERGENCY <ul style="list-style-type: none"> • Remove from heat. • COOL THE BODY AS RAPIDLY AS POSSIBLE by immersing in cold (or cool) water, or splash with water and fan. • Call for Emergency Assistance. • Observe for signs of shock. 	ACCLIMATIZATION ² Initially moderate workload in heat (8 to 14 days). Monitor worker's activities.

Footnotes:

- 1.) American diets are normally high in salt, sufficient to aid acclimatization. However, during the early part of the heat season, (May, June), one extra shake of salt during one to two meals per day may help, so long as this is permitted by your physician. Check with your personal physician.
- 2.) ACCLIMATIZATION - The process of adapting to heat is indicated by worker's ability to perform hot jobs less fluid loss, lower concentrations of salt loss in sweat, and a reduced core (body) temperature and heart rate.
- 3.) Method to Achieve Acclimatization - Moderate work or exercise in hot temperatures during early part of heat season. Adequate salt (mineral) and water intake. Gradually increasing work time in hot temperatures. Avoid alcohol. Normally takes 8 to 14 days to achieve acclimatization. Lost rapidly, if removed from strenuous work (or exercise) in hot temperature for more than approximately 5 days.

Cold Stress Guidelines

Stress	Symptoms	What to do
Mild Hypothermia	<ul style="list-style-type: none"> • Body Temp 98 to 90°F • Shivering • Lack of coordination, stumbling, fumbling hands • Slurred speech • Memory loss • Pale, cold skin 	<ul style="list-style-type: none"> • Move to warm area • Stay active • Remove wet clothes and replace with dry clothes or blankets • Cover the head • Drink warm (not hot) sugary drink
Moderate Hypothermia	<ul style="list-style-type: none"> • Body temp 90 to 86°F • Shivering stops • Unable to walk or stand • Confused and/or irrational 	<ul style="list-style-type: none"> • All of the above, plus: <ul style="list-style-type: none"> ○ Call 911 ○ Cover all extremities completely ○ Place very warm objects, such as hot packs on the victim's head, neck, chest, and groin
Severe Hypothermia	<ul style="list-style-type: none"> • Body temp 86 to 78°F • Severe muscle stiffness • Very sleepy or unconscious • Ice cold skin • Death 	<ul style="list-style-type: none"> • Call 911 • Treat victim very gently • Do not attempt to re-warm
Frostbite	<ul style="list-style-type: none"> • Cold, tingling, stinging, or aching feeling in the frostbitten area, followed by numbness • Skin color turns red, then purple, then white or very pale skin • Cold to the touch • Blisters in severe cases 	<ul style="list-style-type: none"> • Call 911 • Do not rub the area • Wrap in soft cloth • If help is delayed, immerse in warm (not hot) water
Trench Foot	<ul style="list-style-type: none"> • Tingling, itching, or burning sensation • Blisters 	<ul style="list-style-type: none"> • Soak feet in warm water, then wrap with dry cloth bandages • Drink a warm (not hot) sugary drink

Appendix D

Forms

Accident/Incident Report Form

Follow the GEI incident reporting procedures and send the completed form to: SafetyTeam@GEIConsultants.com.

SECTION A ACCIDENT/INCIDENT DETAILS

EMPLOYEE INFORMATION:	OTHER INJURED (IF APPLICABLE):
Name: _____	Name: _____
Home Address: _____ Street Address City State Zip Code	Home Address: _____ Street Address City State Zip Code
Contact Information: () () Primary Secondary	Contact Information: () () Primary Secondary
Date of Birth: _____	Date of Birth: _____
Date of Hire: _____	Date of Hire: _____
Branch: _____	Branch: _____
Supervisor: _____	Supervisor: _____

Date and Time Accident/Incident	Date and Time Reported	LOCATION OF INCIDENT/ACCIDENT
____ / ____ / ____ Month Day Year ____ A.M. ____ P.M.	____ / ____ / ____ Month Day Year ____ A.M. ____ P.M.	Project Name: _____ Client and Location: _____ or _____ Office Location: _____

INCIDENT TYPE: (Check All That Applies)	WITNESS INFORMATION
<input type="checkbox"/> Personal Injury/Illness <input type="checkbox"/> Vehicle Accident <input type="checkbox"/> Property Damage <input type="checkbox"/> Environmental Spill <input type="checkbox"/> Other	Name: _____ Contact Number: _____ Company: _____

WHAT HAPPENED TO THE INJURED PARTY: ☐ First Aid Administered ☐ Refused Treatment/Transport ☐ Transported to Hospital
☐ Returned to Work ☐ Went Home ☐ Went to Physician ☐ Unknown

Clinic/Hospital or Treating Physician: _____ Phone: _____
 Name Street Address City State Zip Code

SECTION B PERSONAL INJURY

Cause of Injury: _____

Part of Body Injured: _____ Multiple Injuries: ☐ Y ☐ N

Was PPE worn when injured? : ☐ Y ☐ N What PPE was worn? _____

WAS INJURY A RESULT OF THE USE A MOTOR VEHICLE: ☐ YES ☐ NO (If yes, complete Section C)

Accident/Incident Report Form

Follow the GEI incident reporting procedures and send the completed form to: SafetyTeam@GEIConsultants.com.

SECTION C

AUTO ACCIDENT ONLY

DRIVER/VEHICLE INFORMATION

Name of Insured: _____	Name of Other Driver: _____
Department: _____	Driver's License Number: _____
Driver's License Number: _____	State: _____
DOB: ____/____/____ State: _____	Description of Vehicle: License Plate Number: _____
Description of Vehicle: License Plate Number: _____	Make: _____ Model: _____ Year: _____ Color: _____
Make: _____ Model: _____ Year: _____ Color: _____	Insurance Carrier: _____
Owner: _____	Policy Number: _____ Ph. Number: _____

SECTION D

PROPERTY DAMAGE OR CHEMICAL RELEASE ONLY

Type of Damage(s): _____

Cause of Damage(s): _____

Type of Chemical Released (if known): _____

Quantity of Chemical Released: _____

Spill Measures Employed: _____

SECTION E

NATURE OF ACCIDENT/INCIDENT AND EXTENT OF INJURIES/DAMAGES

(Please give a detailed description of what happened. Attach a sketch or picture if applicable)

I hereby certify that the above information is true and correct to my understanding of this accident/incident.

Employee/Preparer's Name

Date and Time

Near Miss Report Form

Follow the GEI incident reporting procedures and send the completed form to: SafetyTeam@GEIConsultants.com.

NEAR MISS DETAILS

Employee Name: _____

Phone Number: _____

Branch: _____

Supervisor: _____

Date and Time Accident/Incident	Date and Time Reported	LOCATION OF NEAR MISS
____/____/____ Month Day Year ____ A.M. ____ P.M.	____/____/____ Month Day Year ____ A.M. ____ P.M.	Project Name: _____ Client and Location: _____ or _____ Office Location: _____

WHAT HAPPENED?

(Please give a detailed description of what happened. Attach photos or a sketch, if applicable.)

☐ Photos were Taken

WHAT WAS DONE?

(Please give a detailed description of what was done to prevent and incident from occurring.)

☐ I have verbally contacted a member of the Safety Team and my Supervisor.

Employee/Preparer's Name _____

Date and Time _____

Project Safety Briefing Form

[illegible]



This sign-in log documents the tailgate briefing conducted in accordance with the site specific HASP. Personnel who perform work operations on site are required to attend each briefing and to acknowledge receipt of each briefing, daily.

<input type="checkbox"/> Accident Reporting Procedures	<input type="checkbox"/> General PPE Usage	<input type="checkbox"/> Site Control	<input type="checkbox"/> Other:
<input type="checkbox"/> Cellular Phone Charged w/Service	<input type="checkbox"/> Heat Stress	<input type="checkbox"/> Site Emergency Procedures	<input type="checkbox"/> Other:
<input type="checkbox"/> Changes to the HASP	<input type="checkbox"/> Hearing Conservation	<input type="checkbox"/> Slips, Trips, Falls	<input type="checkbox"/> Other:
<input type="checkbox"/> Cold Stress	<input type="checkbox"/> Lockout/Tagout	<input type="checkbox"/> Traffic Safety	<input type="checkbox"/> Other:
<input type="checkbox"/> Confined Space	<input type="checkbox"/> Personal Hygiene	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:
<input type="checkbox"/> Decon Procedures	<input type="checkbox"/> Respiratory Protection	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:
<input type="checkbox"/> Exposure Guidelines	<input type="checkbox"/> Review of Hazards	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:

Daily Safety Topic Description:	
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[illegible]

Revised January 2015

Appendix E

GEI's Health and Safety SOPs

Applicable GEI H&S SOPs <i>(check all that apply)</i>		
<input checked="" type="checkbox"/> Biological Hazards – 001	<input checked="" type="checkbox"/> Ladders -011	<input type="checkbox"/> Mobile Equipment – 021
<input checked="" type="checkbox"/> Bloodborne Pathogens – 002	<input checked="" type="checkbox"/> Noise Exposure -012	<input type="checkbox"/> Aquatic Ecological Survey & Electrofishing -022
<input type="checkbox"/> Container Management – 003	<input type="checkbox"/> Nuclear Density Gauge Operation -013	<input type="checkbox"/> Scaffolding - 023
<input checked="" type="checkbox"/> Driver Safety -004	<input checked="" type="checkbox"/> Utility Markout-014	<input type="checkbox"/> Wilderness Safety - 024
<input type="checkbox"/> Electrical Safety Lock Out Tag Out -005	<input checked="" type="checkbox"/> Respirator Fit Test Procedure-015	<input checked="" type="checkbox"/> Manual Lifting – 025
<input checked="" type="checkbox"/> Excavation Trenching - 006	<input checked="" type="checkbox"/> Traffic Hazards -016	<input checked="" type="checkbox"/> Hazard Identification - 026
<input checked="" type="checkbox"/> Non-Powered Hand Tools -008a	<input type="checkbox"/> Water Safety – 017	<input type="checkbox"/> Confined Space Entry for Sanitary Sewers – 027
<input checked="" type="checkbox"/> Powered Hand Tools – 008b	<input checked="" type="checkbox"/> Working Around Heavy Equipment – 018	<input type="checkbox"/> Safe Trailer Use – 028
<input checked="" type="checkbox"/> Hazardous Substances Management -009	<input type="checkbox"/> Rail Safety -019	<input checked="" type="checkbox"/> COVID-19 Field Work Guidance
<input checked="" type="checkbox"/> Inclement Weather – 010	<input type="checkbox"/> Aerial Lift – 020	

STANDARD OPERATING PROCEDURES

SOP No. HS-001 Biological Hazards

1.1 Objective

The objective of this Standard Operating Procedure (SOP) is to prevent or limit the potential for GEI personnel to encounter biological hazards during field activities.

1.2 General

This SOP is intended for use by employees engaged in work with the potential for contact with biological hazards such as animals, insects, plants, and sewage. The site-specific health and safety plan (HASP) should include a hazard assessment for the project that identifies the potential for encounters with biological hazards and the control methods to be implemented by GEI employees. These hazards must be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.3 Mammals

During some site operations, animals such as stray or domesticated dogs or cats, raccoons, snakes, bears, rats, bats, etc. may be encountered. Employees should use discretion and attempt to avoid contact with animals. If these animals present a problem, efforts will be made to remove these animals from the site by contacting a licensed animal control technician.

1.3.1 Rabies

The rabies virus is transmitted through the bite of an infected animal or contact with saliva or brain/nervous system tissue of an infected animal. The rabies virus infects the central nervous system, causing disease in the brain. The early symptoms of rabies in people are fever, headache, and general weakness or discomfort. As the disease progresses, more specific symptoms appear and may include insomnia, anxiety, confusion, slight or partial paralysis, excitation, hallucinations, agitation, hypersalivation (increase in saliva), difficulty swallowing, and hydrophobia (fear of water). Death usually occurs within days of the onset of these symptoms.

If you are bitten or think you may be exposed, wash any wounds immediately and thoroughly with soap and water. Then go to the hospital emergency room and notify the Project Manager and the People Safety Team. The doctor, possibly in consultation with the state or local health department, will decide if you need a rabies vaccination.

Decisions to start series of vaccinations will be based on your type of exposure and the animal you were exposed to, as well as laboratory and surveillance information for the geographic area where the exposure occurred. If possible have someone document what type of animal it was, how it was behaving prior to the bite, what caused it to bite the

employee, and if it's not a domestic animal that would be easy to find again in the future, try to get animal control on site to capture it. An Incident Report Form must be completed and submitted, per GEI's Incident reporting procedures. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

1.4 Insects and Arachnids

Insects, including bees, wasps, hornets, mosquitoes, ticks, spiders, etc., may be present at a job site making the chance of a bite/sting possible. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life-threatening condition. Some insect bites can transmit diseases such as Lyme disease or a virus such as West Nile. The following is a list of preventive measures:

- Apply insect repellent prior to performing field work and as often as needed throughout the work shift.
- Wear proper personal protective equipment (PPE), including protective clothing (work boots, socks, and light colored clothing).
- Wear shoes, long pants with bottoms tucked into boots or socks, and a long-sleeved shirt when outdoors for long periods of time, or when many insects are most active (between dawn and dusk).
- When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible.
- Field personnel who have or may have insect allergies must have insect allergy medication onsite and must inform the Site Safety Officer (SSO) and the People and Safety Team of their particular allergy prior to commencing work.
- Field personnel should perform a self-check at the end of the day for ticks.

1.4.1 Tick-borne Diseases

Lyme Disease

Lyme disease is caused by infection from a deer tick that carries a spirochete (a bacterium). During the painless tick bite, the spirochete may be transmitted into the bloodstream, often after feeding on the host for 12 to 24 hours. The ticks that cause the disease are often no bigger than a poppy seed or a comma in newsprint. The peak months for human infection are from May to September.

Symptoms appear in three stages. First symptoms usually appear from 2 days to a few weeks after a person is bitten by an infected tick. Symptoms usually consist of a ring-like red rash on the skin where the tick was attached. The rash is often bulls-eye like with red around the edges and clear in the center. The rash may be warm, itchy, tender, and/or "doughy." This rash appears in only 60 to 80 percent of infected persons. An infected

person also has flu-like symptoms of a stiff neck, chills, fever, sore throat, headache, fatigue, and joint pain. These symptoms often disappear after a few weeks.

The second stage symptoms, which occur weeks to months later include meningitis, severe headache, drooping of the muscles on the face, called Bell's Palsy, encephalitis, numbness, withdrawal, and lethargy. These symptoms may last for several weeks to several months. Third stage symptoms, which occur months or years later include arthritis, heart problems, and loss of memory. The third stage symptoms may mimic multiple sclerosis and Alzheimer's disease.

When in areas that could harbor deer ticks, employees should wear light color clothing, and visually check themselves and check and be checked by another employee when coming from wooded or vegetated areas. If a GEI employee has a tick bite, the People and Safety Team and Project Manager must be contacted immediately. The employee will be offered the option for medical treatment by a physician, which typically involves antibiotics. An Incident Report form must be completed in compliance with the Incident Reporting procedures. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

If personnel feel sick or have signs similar to those mentioned above, the SSO and the People and Safety Team must be notified immediately.



Figure 1: From left to right, the deer tick adult female, adult male, nymph, and larva on a centimeter scale.

How to Remove a Tick

A tick can be removed from the skin by pulling gently at the head with tweezers. If tweezers are not available, use tissue paper or cloth to grasp the tick. It is important to grasp the tick as close to the site of attachment and use a firm steady pull to remove it. Wash hands immediately after with soap and water. The affected area should also be washed with soap and water, then disinfected with an antiseptic wipe, if available. All mouth parts must be removed from the skin. If the tick was removed by breaking off the

mouth parts, an irritation or infection may occur because the organism that is causing the disease can still enter the body through the skin.

Treatment for Lyme Disease

Treatment with antibiotics is effective and recovery is usually complete. For first stage symptoms, antibiotics are usually given orally. However, treatment for second and third stage symptoms is prolonged and recovery may take longer. Antibiotic treatment is usually provided intravenously for second and third stage Lyme disease.

Babesiosis

The deer tick can also cause Babesiosis, an infection of the parasite *Babesia Microti*. Symptoms of Babesiosis may not be evident, but may also include fever, fatigue and hemolytic anemia lasting from several days to several months. Babesiosis is most commonly diagnosed in the elderly or in individuals whose immune systems are compromised. If there are no signs or symptoms of Babesiosis, usually no treatment is needed. If an employee believes they might have Babesiosis they'll see a physician to be tested. Treatment usually consists of taking prescription medications for 7 to 10 days.

Ehrlichiosis

Ehrlichiosis is a tick-borne disease which can be caused by either of two different organisms. Human monocytic ehrlichiosis (HME) is caused by *Ehrlichia chaffeensis*, which is transmitted by the lone star tick (*Amblyomma americanum*). Human granulocytic anaplasmosis (HGA), previously known as human granulocytic ehrlichiosis (HGE), is caused by *Anaplasma phagocytophilia*, which is transmitted by the deer tick (*Ixodes scapularis*).

Ehrlichiosis is transmitted by the bite of infected ticks, including the deer tick and the lone star tick. The symptoms of HME and HGE are the same and usually include fever, muscle aches, weakness and headache. Patients may also experience confusion, nausea, vomiting and joint pain. Unlike Lyme disease or Rocky Mountain spotted fever, a rash is not common. Infection usually produces mild to moderately severe illness, with high fever and headache, but may occasionally be life-threatening or even fatal. Symptoms appear 1 to 3 weeks after the bite of an infected tick. However, not every exposure results in infection. For those that become infected a drug called Doxycycline will be prescribed.

Rocky Mountain Spotted Fever

Rocky Mountain spotted fever is a tick-borne disease caused by a rickettsia (a microbe that differs somewhat from bacteria and virus). In the eastern United States, children are infected most frequently, while in the western United States, disease incidence is highest among adult males. Disease incidence is directly related to exposure to tick-infested habitats or to infested pets. Rocky Mountain spotted fever is characterized by a sudden onset of moderate to high fever (which can last for 2-3 weeks), severe headache, fatigue, deep muscle pain, chills and rash. The rash begins on the legs or arms, may include the

soles of the feet or palms of the hands and may spread rapidly to the trunk or rest of the body. Symptoms usually appear within 2 weeks of the bite of an infected tick. Like Ehrlichiosis the prescription drug Doxycycline is the first line treatment option.

1.4.2 Mosquito-Borne Disease

West Nile Virus

West Nile Virus is a mosquito-borne infection transmitted through the bite of an infected mosquito. The symptoms of West Nile Virus can be asymptomatic (no symptoms) or in more serious cases can lead to West Nile Fever. West Nile Fever can include fever, headache, tiredness, body ache, an occasional rash on the trunk of the body, and swollen lymph glands. In severe cases, people have developed West Nile Encephalitis or Meningitis which symptoms include fever, headache, neck stiffness, tremors, coma, and in some cases death. The incubation period for the disease is usually 2 to 15 days. The symptoms can range from a few days to several weeks. Most mosquitoes are not infected and the chance of infection from a mosquito bite of an on-site employee is very small.

1.5 Repellants

The following precautions will be used to help reduce the risk of mosquito bites:

Reduce mosquito-breeding areas by making sure wheelbarrows, buckets, and other containers are turned upside down when not used so that they do not collect standing water. According to the Environmental Protection Agency (EPA), many mosquitoes can breed in pooled water that's minimal enough to fill a bottle cap.

Wear shoes, long pants with bottoms tucked into boots or socks, and a long-sleeved shirt when outdoors for long periods of time, or when many mosquitoes are most active (between dawn and dusk).

Use mosquito repellent according to the manufacturer's directions when outdoors for long periods of time and when mosquitoes are most active.

Centers for Disease Control and Prevention (CDC) evaluation of information contained in peer-reviewed scientific literature and data available from the EPA has identified several EPA-registered products that provide repellent activity sufficient to help people avoid the bites of disease carrying mosquitoes. Products containing these active ingredients typically provide reasonably long-lasting protection:

- **DEET** (Chemical Name: N,N-diethyl-m-toluamide or N,N-diethyl-3-methylbenzamide)
- **Picaridin** (KBR 3023, Chemical Name: 2-(2-hydroxyethyl)-1-piperidinecarboxylic acid 1-methylpropyl ester)

- **Oil of Lemon Eucalyptus** or **PMD** (Chemical Name: para-Menthane-3,8-diol) the synthesized version of oil of lemon eucalyptus
- **IR3535** (Chemical Name: 3-[N-Butyl-N-acetyl]-aminopropionic acid, ethyl ester)
- **Permethrin** (3-Phenoxybenzyl (1RS)-cis,trans-3-(2,2-dichlorovinyl) -2,2-dimethylcyclopropanecarboxylate) – Permethrin kills ticks and can be used on clothing (but not skin)

The EPA characterizes the active ingredients DEET and Picaridin as “conventional repellents” and Oil of Lemon Eucalyptus, PMD, and IR3535 as “biopesticide repellents”, which are derived from natural materials.

In general, higher concentrations of active ingredient provide longer duration of protection, regardless of the active ingredient, although concentrations above approximately 50 percent do not offer a marked increase in protection time. Products with less than 10 percent active ingredient may offer only limited protection, often from 1 to 2 hours. Products that offer sustained release or controlled release (micro-encapsulated) formulations, even with lower active ingredient concentrations, may provide longer protection times. Regardless of what product you use, if you start to get mosquito bites reapply the repellent according to the label instructions or remove yourself from the area with biting insects if possible.

Clothing and other products can be purchased pre-treated, or products can be treated using EPA-registered products. Permethrin is the only pesticide approved by the EPA for these uses. Permethrin binds tightly to the fabrics, resulting in little loss during washing and minimal transfer to the skin. Permethrin is poorly absorbed through the skin, although sunscreens and other products may increase the rate of skin absorption.

If you decide to use permethrin-treated clothing, consider these tips:

- Read the application instructions carefully and apply the product according to the label directions. Do not over-treat products.
- Permethrin treatments are only intended for use on fabrics; do not apply them directly to the skin or other items.
- Do not apply permethrin to clothing while it is being worn.
- Apply the product to clothing outdoors in well ventilated areas that are protected from wind.
- Hang treated fabrics outdoors and allow them to dry completely before wearing them.
- Wash permethrin treated clothing separately from other clothing items.

1.6 Poisonous Plants

The potential for contact with poisonous plants, such as poison ivy, oak, and sumac exists when performing fieldwork in wooded or boggy areas. Urushiol, an oily organic allergen found in plants, can cause an allergic reaction when in contact with the leaves or vines.

Poison ivy can be found as vines on tree trunks or as upright bushes. Poison ivy consists of three leaflets with notched edges. Two leaflets form a pair on opposite sides of the stalk, and the third leaflet stands by itself at the tip. Poison ivy is red in the early spring and turns shiny green later in the spring. Poison ivy grows throughout much of North America, including all states east of the Rocky Mountains. It is normally found in wooded areas, especially along edge areas where the tree line breaks and allows sunshine to filter through. It also grows in exposed rocky areas, open fields, and disturbed areas.

Poison oak can be present as a sparsely-branched shrub. Poison oak can grow anywhere in the United States with the exception of Hawaii, Alaska, and some southwest areas that have desert climates. Poison oak is similar to poison ivy in that it has the same leaflet configuration; however, the leaves have slightly deeper notches.

Poison sumac can be present in the form of a flat-topped shrub or tree. It has fern-like leaves, which are velvety dark green on top and pale underneath. The branches of immature trees have a velvety “down.” Poison sumac has white, “hairy” berry clusters. Poison sumac grows exclusively in very wet or flooded soils, usually in swamps and peat bogs, in the eastern United States.



Poison Ivy



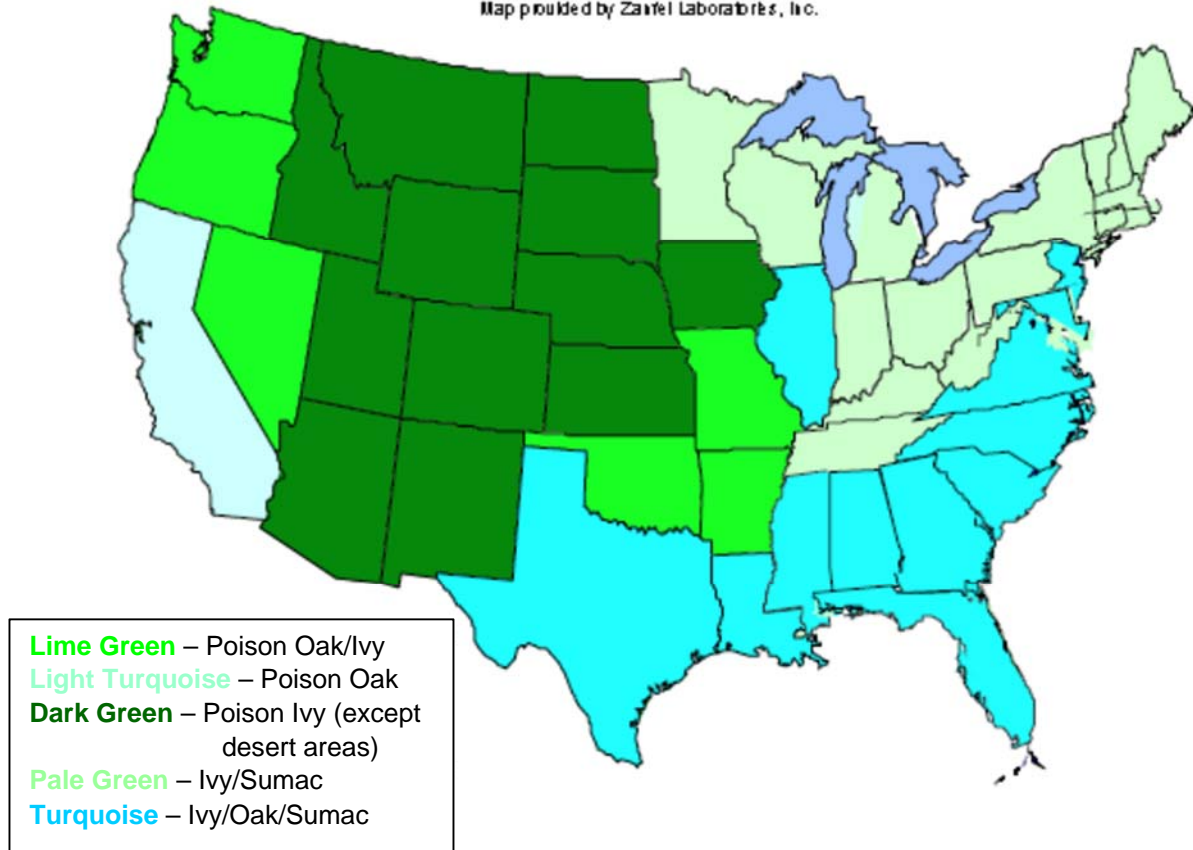
Poison Oak



Poison Sumac

U.S. Prevalence of Poison Ivy, Oak & Sumac

Map provided by Zantel Laboratories, Inc.



Source: United States Department of Agriculture Plant Database, <http://plants.usda.gov/>

To prevent exposure to these poisonous plants:

- Wear proper PPE, including long sleeves, long pants, boots, and gloves.
- Barrier skin creams, such as lotion containing bentoquatam (Tecnu®), may offer some protection prevent the occurrence of exposure symptoms.
- Contact with poison ivy, sumac, or oak may lead to a skin rash, characterized by reddened, itchy, blistering skin which needs first aid treatment. Employees with known allergies should identify themselves to the SSO or Project Manager prior to starting field work as a precautionary measure. If you believe you have contacted one of these plants:
 - Immediately wash skin thoroughly with soap and water, taking care not to touch your face or other body parts.
 - Contact the People and Safety Team and Project Manager immediately after caring for affected skin.

- Wash exposed clothing separately in hot water with detergent.
- After use, clean tools, and soles of boots with rubbing alcohol or soap and lots of water. Urushiol can remain active on the surface of objects for up to 5 years.
- If a rash occurs, contact the People and Safety Team and complete and submit an Incident Report Form. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

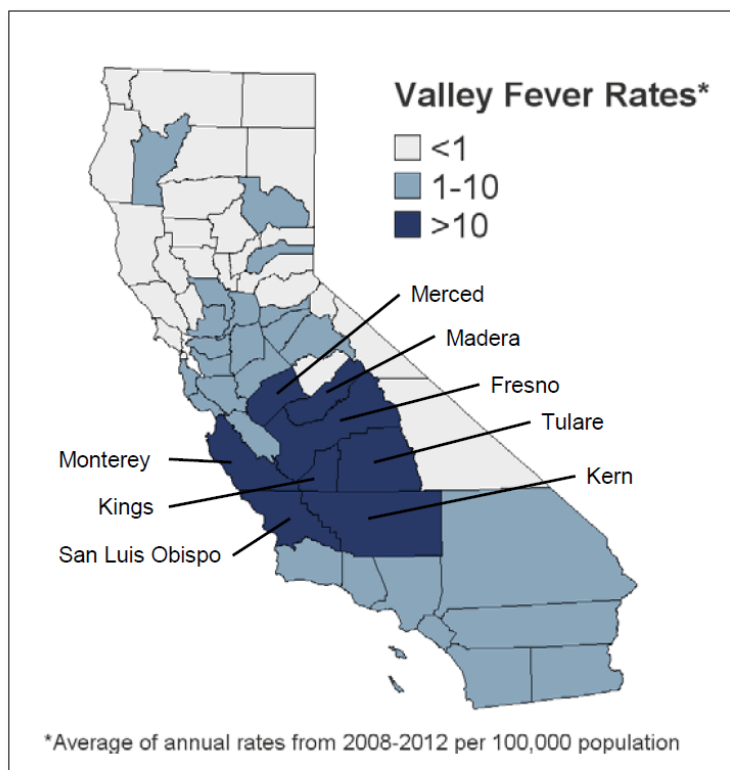
1.7 Sewage and Bacterial Impacted Sediments

Some project work may be conducted at sites that serve or have served as a combined sewer overflow and consequently may have received untreated sanitary sewage from numerous sources. Decomposed sewage can potentially be encountered within sites and their sediments. Sediments could contain soil and marine microorganisms, and bacterium associated with sewage. Many of these bacterium can cause illness through ingestion, direct contact, or the inhalation of a bio-aerosol possibly in the form of dust. Potential respiratory exposure to biological agents can also occur through the inhalation of aerosols produced during sediment handling activities. PPE as identified in the site-specific HASP will be worn to minimize potential exposures. Employees will follow the decontamination or disposal procedures identified in the HASP.

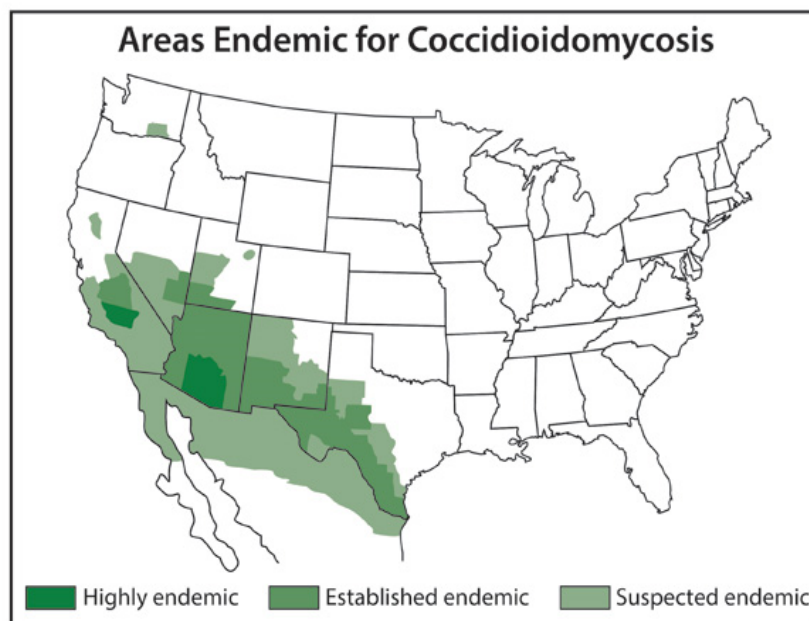
1.7.1 Fungal Spores in Soil – Valley Fever

Valley Fever is an illness that usually affects the lungs. It is caused by the fungus *Coccidioides immitis* that lives in the top 2 to 12 inches of soil in many parts of California. When fungal spores are present, any work activity that disturbs the soil, such as digging, grading, or other earth moving operations, or vehicle operation on dirt roads, can cause the spores to become airborne, therefore increasing the risk of Valley Fever. All employees on sites where the fungus is present, and who are exposed to dusty conditions and wind-blown dusts are at increased risk of becoming infected.

Valley Fever fungal spores are too small to be seen, and there is no reliable way to test the soil for spores before working in a particular place. Valley Fever can be found throughout the southwestern United States, parts of Mexico, and South America. Some California counties consistently have Valley Fever fungus present in the soil. In these regions Valley Fever is considered endemic. Health departments track the number of cases of Valley Fever illness that occur. This information is used to map illness rates as seen on the figures below from the Center of Disease Control Valley Fever Awareness website.



Rates of reported Valley Fever cases in California counties from 2008–2012. Darkest colored counties had the highest rates of Valley Fever.



When present, symptoms usually occur between 7 to 21 days after breathing in spores, and can include:

- Cough
- Fever
- Chest pain
- Headache
- Muscle aches
- Rash on upper trunk or extremities
- Joint pain in the knees or ankles
- Fatigue

Symptoms of Valley Fever can be mistaken for other diseases such as the flu (influenza) and TB (tuberculosis), so it is important for employees to obtain medical care for an accurate diagnosis and possible treatment.

While there is no vaccine to prevent Valley Fever, the following important steps must be taken in order to limit risk:

- Determine if the worksite is in an endemic area. Contact the local health department for more information about the risk in the county GEI is performing work that may disturb soils.
- Prepare work plans and work practices that reduce employee's exposure, which may include:
 - Provide air conditioned cabs with properly maintained dust filters for vehicles that generate heavy dust and make sure employees keep windows and vents closed.
 - Suspend work during heavy winds.
- When exposure to dust is unavoidable, National Institute for Occupational Safety and Health (NIOSH)-approved respiratory protection with particulate filters rated as N95, N99, N100, P100, or High Efficiency Particulate Air (HEPA) must be provided. The Project Manager must work with the Safety Team to develop and implement a respiratory protection program in accordance with California's Occupational Safety and Health Administration (Cal/OSHA's) Respiratory Protection standard (8 CCR 5144) for the project.
- Take measures to reduce transporting spores offsite, such as:
 - Clean tools, equipment, PPE, and vehicles before transporting offsite.
 - If employee's clothing is likely to be heavily contaminated with dust, provide coveralls and change rooms, and showers where possible.

1.8 Injury Reporting

If a GEI employee suffers an injury, bite, or sting on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.9 Limitations

Follow safety procedures as defined in the site-specific HASP. Appropriate PPE must be worn correctly to provide the intended level of protection.

1.10 References

<http://www.cdc.gov/ncidod/dvbid/westnile/index.htm>

http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm

<http://www.epa.gov/pesticides/health/mosquitoes/insectrp.htm>

<http://www.cdc.gov/niosh/topics/lyme/>

Protecting Yourself from Ticks and Mosquitoes, NIOSH Fast Facts, Publication No. 2010-119

<http://npic.orst.edu/pest/mosquito/ptc.html>

<http://www.cdc.gov/features/valley-fever-10-things/>

<https://www.cdph.ca.gov/HealthInfo/discond/Documents/VFGeneral.pdf>

<https://blog.epa.gov/blog/tag/mosquitoes/>

1.11 Attachments

None

1.12 Contact

Health&SafetyTeam@geiconsultants.com

1.13 Review History

- June 2016
- June 2014
- November 2013
- October 2010

STANDARD OPERATING PROCEDURES

SOP No. HS-002 Infectious Materials and Bloodborne Pathogens Exposure Control Plan

1.1 Objective

GEI personnel may come in contact with potentially infectious agents (materials) when performing first aid or cardiopulmonary resuscitation (CPR). Employees may also come into contact with these agents when working at certain contaminated sites (i.e., urban sites, discarded contaminated needles, or sewer outfall exposures). This standard operating procedure (SOP) has been developed to minimize the potential for exposure to employees who may contact, directly or indirectly, infectious agents.

1.2 General

This SOP is intended for use by employees engaged in work with the potential for contact with infectious materials and bloodborne pathogens. The site-specific health and safety plan (HASP) should include a hazard assessment for the project that identifies the potential for encounters with infectious materials or bloodborne pathogens and the control methods to be implemented by GEI employees. These hazards should be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

Universal Precautions (i.e., treat all potentially infectious materials as if it were infected) will be used by GEI employees.

1.3 Exposure Control Plan

1.3.1 Standard Procedures

Sampling of potentially infectious materials will be performed in a manner that minimizes the potential for creating splashes, droplets, or aerosols. Mechanical pipetting devices will be used for manipulating sanitary sewer effluent. Mouth pipetting is prohibited.

The use of glassware or equipment with sharp or pointed edges will be kept at a minimum to reduce the potential of injury that would create a direct route of entry into the body for infectious materials.

Minor cuts, scratches, or other breaks in the skin barrier will be covered prior to the handling of infectious materials. Employees experiencing exudative lesions or weeping dermatitis will refrain from direct contact with infectious materials.

Eating, drinking, smoking, or application of cosmetics is not permitted in areas where potentially infectious materials are handled or sampled.

Employees will wash and disinfect their hands, face, or other potentially contaminated skin surfaces upon completing the handling of infectious or potentially infectious agents or after rendering first aid.

1.3.2 Personal Protective Equipment

Personal Protective Equipment (PPE) will be worn to reduce the potential of exposures to splashes or aerosols. At a minimum, PPE will include safety glasses and appropriate gloves, but may also require the use of face, respiratory, foot, and full-body protection. Refer to the site-specific HASP for specific PPE requirements.

Disposable PPE used in the handling or sampling of infectious materials will be appropriately disposed of and not reused.

1.3.3 Medical Monitoring

Medical monitoring is required for an employee when a potential workplace exposure has occurred. The employee must follow the GEI Incident Reporting procedures regarding the potential exposure as soon as possible. For infectious agents in which a medically accepted vaccination has been developed (e.g., hepatitis B virus) (HBV) potentially exposed employees will be given the option to receive an inoculation at no cost. Employees who have been exposed will be given the option to receive a confidential medical evaluation also at no cost. Required records for exposed employees will be kept confidential.

1.3.4 Training

Employees with a reasonable risk for exposure must complete Bloodborne Pathogen training covering the following topics:

- An explanation of the Occupational Health and Safety Administration (OSHA) bloodborne pathogen standard.
- A general explanation of bloodborne diseases.
- An explanation of the modes of transmission of bloodborne diseases.
- An explanation of the GEI's Bloodborne Pathogen SOP and exposure control plan.
- Appropriate methods for recognizing tasks that involve potential exposure.
- An explanation of the use and limitations of methods to prevent exposure.
- Proper types, use, handling, decontamination, and disposal of PPE.
- The availability of HBV vaccines and the procedures for obtaining a vaccination.
- Appropriate actions to take during an emergency involving bloodborne pathogens.
- Post-exposure procedures.
- An explanation of required signs and labels.

1.4 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Health & Safety Officer (RHSO).

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the RHSO will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health & Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.5 Limitations

Follow safety procedures as defined in the site-specific HASP. Appropriate PPE must be worn correctly to provide the intended level of protection.

1.6 Attachment

None

1.7 Reference

OSHA 29 CFR 1910.1030 – Bloodborne Pathogens

1.8 Contact

Health&SafetyTeam@geiconsultants.com

1.9 Review History

- June 2016
- June 2014
- November 2013
- January 2011
- November 2010

STANDARD OPERATING PROCEDURE

HS-004 Driver Safety

1.1 Objective

GEI has implemented a Safe Driving Program to encourage safe driving habits and promote the ongoing safety of our staff and the communities where we work. For more information, refer to the Operation of Vehicles section of GEI's Employee Handbook.

This Standard Operating Procedure (SOP) provides requirements and recommendations to minimize the potential risks while operating or riding in a motor vehicle.

1.2 General

GEI employees will adhere to the following requirements when operating a vehicle while conducting business on behalf of GEI. These requirements apply to GEI-owned, rental, and personal vehicles used to conduct GEI business:

- Employees must maintain a valid and current driver's license.
- Employees using a personal vehicle for work-related travel must have proper insurance coverage that meets the requirements in the state in which they reside.
- Employees must wear their safety belt while in a moving vehicle.
- Vehicle incidents will be reported in accordance with GEI's Incident Reporting procedures (*refer to* GEI's Safety App for smart phones or the Safety page on the GEI intranet.).
- Vehicles will be properly maintained and safely operated (*refer to* GEI's Fleet Maintenance Program).
- Employees will follow safe driving behaviors, which include limiting distractions such as manipulating radios or other equipment that may cause a distraction. Employees should not exceed the posted speed limit and should maintain a safe distance between other vehicles.
- When parking a vehicle at a job site, the employee should position the vehicle in a manner which reduces or eliminates the need to operate the vehicle in reverse. It is recommended, a safety cone should be placed at the rear of the vehicle after parking the vehicle and be removed prior to moving the vehicle. This precautionary measure makes the employee aware of other vehicles, equipment, and structures within the backup radius of the vehicle.

When driving an unfamiliar vehicle (rental or GEI-owned), it is the driver's responsibility to orient themselves to the vehicle by:

- Walking around the vehicle to observe the condition of the vehicle and hazards that could be within the travel path.
- Becoming familiar with the size of the vehicle.
- Note if the vehicle has anti-lock braking system (ABS¹).
- Adjusting mirrors (rear and side).
- Adjust seats to be situated as far back as safely practical, away from the air bag, located in the steering wheel.
- Becoming familiar with dashboard, center console, and steering controls.
- Locating the turn signals, windshield wipers, lights, emergency flashers, and the heating, air conditioning, and defrost controls.

1.3 Driving Defensively

Driving defensively means not only taking responsibility for oneself and actions but also keeping an eye on “the other guy.” Good defensive drivers may be able to anticipate what the other driver will do next. GEI recommends the following guidelines to help reduce risks while driving:

- Do not start the vehicle until each passenger and any belongings are secured in the vehicle.
- Remember that driving above or below the speed limit can increase the likelihood of a collision.
- Be aware of impaired drivers; if a car is straddling the center line, weaving, making wide turns, stopping abruptly, or responding slowly to traffic signals, the driver may be impaired or using a cellular telephone. Avoid an impaired driver by turning right at the nearest corner or exiting at the nearest exit.
 - If it appears that an oncoming car is crossing into your lane, pull over to the roadside, sound the horn, and flash the headlights.
 - If an unsafe or suspicious driver is observed, notify the police.
- Follow the rules of the road. Do not contest the “right of way” or try to race another car during a merge. Always be respectful of other motorists.

¹ ABS is a mechanism that allows the wheels on a vehicle to maintain contact with the surface of the road, based on inputs from the driver (braking), to prevent the wheels from locking up (ceasing rotation) and to avoid an uncontrolled skid.

- Allow large vehicles, including tractor trailers, extra breaking distance, turning radius, and avoid traveling in the other driver's blind spots.
- Do not follow too closely. GEI employees should use a minimum of "3-second following distance."
- While driving, be cautious, aware, and responsible.
- Use extra caution, observe road signs, and reduce speed in construction areas and school zones.
- Always be aware of pedestrians, bicyclists, and motorcyclists.

1.4 Cellular Phone Use and Other Distractions

Refer to the *Portable Communication Device Use While Driving* section of the GEI Employee Handbook for GEI's policy on the use of cellular telephones while operating a vehicle.

1.5 Drugs and Alcohol

The use of illegal drugs or alcohol is prohibited when driving a vehicle on GEI business. Be aware of the side effects of prescription and over-the-counter medications which can impair an employee's ability to drive.

1.6 Adverse Driving Conditions

When operating a vehicle, its possible adverse driving conditions may be encountered. Below is a list of possible conditions and how they can be mitigated.

1.6.1 Driving at Night

Vision maybe limited at night due to impairment of the driver's depth perception, color recognition, and peripheral vision. Another factor adding danger to night or early morning driving is fatigue. Drowsiness makes driving more difficult by dulling concentration and slowing reaction time. Effective measures to minimize these hazards by preparing the car and following guidelines:

- Check the headlights to ensure they are properly aimed. If you notice the headlights are not properly aimed, report it to the Branch Manager, or if applicable the rental car agent. Misaimed headlights blind other drivers and reduce the driver's ability to see the road.
- In addition to the known hazards of consuming alcohol prior to driving, night driving can potentially be affected because the recovery rate of glare from headlights is prolonged. Thus reducing your ability to see.

- Smoking in GEI vehicles and rentals is not permitted. When driving a personal vehicle for business, avoid smoking while driving. Nicotine and carbon monoxide may hamper night vision.
- Observe driving safety as soon as the sun goes down. Twilight is one of the most difficult times to drive, because the eyes' pupils are constantly changing to adapt to the growing darkness. Always use headlights at dusk and at dawn; lights will not help the driver see better in early twilight, but they will make it easier for other drivers to see your car. Drive at a speed that allows you to see the road that is within the headlights span. Driving in a manner that prevents you from seeing hazards as they are illuminated is known as overdriving the headlights; it may be necessary for the driver to reduce speed to be prepared to brake within the illuminated area of the headlights.
- If an oncoming vehicle does not lower beams from high to low, avoid glare by watching the right edge of the road and using it as a steering guide.
- The driver should make frequent stops for light snacks and exercise. If the driver is too tired to drive, stop in a safe area and get some rest.

1.6.2 Snow/Freezing Conditions

When snow and ice are present, be prepared by following these winter driving safety tips.

1.6.2.1 Prepare the Vehicle Before a Snowstorm

- Check under the hood and take a look at the vehicles cooling system. Make sure the vehicle contains adequate antifreeze and the hoses are in good condition.
- Test heaters and defrosters ahead of time to make sure they are in good working condition.
- Test the windshield wipers and check the condition of the wiper blades. If wipers leave streaks on the windshields, replace the blades at the next possible opportunity. Keep the receipt to expense the cost with GEI or with the car rental company.
- It is recommended that a windshield washer/antifreeze solution is used during winter conditions.
- Check the lights on the vehicle and periodically clear them of snow and dirt.
- Vehicle batteries need extra power in cold conditions. Make sure the battery's terminals are clean and cables are secure.
- Determine if the vehicle has a anti-lock brake (ABS) system.
- Keep the gas tank at least half-full in the winter to help avoid gas line freeze up.

1.6.2.2 Driving During and After a Snowstorm

- Wear sunglasses to aid in limiting reflection from snow.
- Be aware of blind spots created by snow banks.
- Be extra cautious of pedestrians and other vehicles in intersections.
- Allow extra time for braking and increase the distance between your car and the car immediately in front of the car.
- Reduce speed and do not exceed the posted limit.
- If the tires start to lose traction, remove the foot off the gas and gradually reduce speed. Accelerate slowly once traction is regained.
- If the vehicle starts to skid, and does not have anti-lock brakes, steer into the skid. This will bring the back end of the car in line with the front. Avoid using the brakes. If the vehicle does have anti-lock brakes, firmly brake as you steer into the skid.

1.6.3 Driving In the Rain

To prevent losing control of the car on wet pavement, take these preventive measures.

- Prevent skids by driving slowly and carefully, especially on curves.
- Steer and brake with a light touch.
- When necessary to stop or slow, do not brake hard or lock the wheels.
- Maintain mild pressure on the brake pedal.

Skidding

If the car begins to skid, ease the foot off the gas, and carefully steer the car in the direction you want the front of the car to go. For cars without anti-lock brakes, avoid using the brakes. This procedure, known as “steering into the skid,” will bring the back end of the car in line with the front. If the car has anti-lock brake systems (ABS), brake firmly as you steer into the skid.

Hydroplaning

Hydroplaning happens when the water in front of the tires builds up faster than the car’s weight can push it out of the way. The water pressure causes the car to lose contact with the road surface and slide on a thin layer of water between the tires and the road. At this point, the car can be completely out of contact with the road, making it possible for the driver to skid or drift out of the lane, or even off the road.

To avoid hydroplaning, keep the tires properly inflated and maintain good tread on the tires. If tires need to be replaced on a company vehicle, notify the branch manager or their designee. Slow down when roads are wet, and stay away from puddles. Try to drive in the tire tracks left by the cars in front of the vehicle. If the car begins to hydroplane, do not brake or turn suddenly. This could throw the car into a skid. Ease the foot off the gas until the car slows; accelerate slowly once traction is regained. If braking is needed, do so gently with light pumping actions. If the car has ABS, brake normally; the car's computer will mimic a pumping action, as necessary.

If weather conditions worsen to the point where the driver is not comfortable driving, pull the vehicle over to a safe location until conditions improve. Do not drive during severe weather conditions. Do not attempt to drive on roads with standing water or that have been flooded. Find an alternate route if these conditions exist.

1.6.4 Off Road

If operation of a vehicle is required off public or private roads or in situations where four-wheel-drive vehicles are required, the appropriate vehicle for the situation will be used.

Be sure any gear or equipment is secured inside the vehicle so it doesn't bounce around while the vehicle is off-road.

- Know the underside of the vehicle. Look under the vehicle and learn where the lowest-hanging parts are located so they are not damaged.
- Scout tricky terrain on foot. Don't hesitate to get out of the vehicle to examine, up close, the terrain and soil conditions. And be sure to scout out what's on the other side of a hill ahead of time so there are no surprises.
- Drive cautiously. Drive, "as slow as possible, as fast as necessary." Remember to use the gears to efficiently manage engine power, braking, and torque.
- Create a mental picture. Look ahead and visualize the paths to the vehicle will travel. Follow those paths.
- Drive straight up and down hills. Avoid diagonal lines that put the vehicle in a situation where it might roll.

1.7 Driver Training

GEI employees are required to complete driver safety training every 3 years. This training is managed by the People Team and will be assigned through GEI's e-learning provider.

1.8 Injury Reporting

GEI employees will report incidents involving GEI personnel or subcontractor personnel, such as: lost time injuries, injuries requiring medical attention, near miss incidents, fires, fatalities, accidents involving the public, chemical spills, vehicle accidents, and property damage. The following steps must be followed when an incident occurs:

1. In life-threatening situations, immediately call 9-1-1.
2. Stop work activity to address any injury, illness, property damage, spill or other emergency.
3. **Immediately** report any incidents to your Supervisor/Project Manager and Regional Health & Safety Officer.
4. If your injury or illness is not life-threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional.
5. Complete an Incident Report Form **immediately** after addressing the incident. Report forms are available on GEI's Safety App (for smart phones) and on the Safety page on the GEI intranet.

For vehicle accidents involving another vehicle or damage to property, the employee will take pictures of each vehicle or property involved in the incident and obtain a police report. In some municipalities police will not be dispatched to a non-injury accident, but every effort needs to be made to try and obtain the report.

1.8.1 Injury Triage Service

If a GEI employee experiences a work-related injury that is not life-threatening, the employee will initiate a call to Medcor Triage at 1-800-775-5866. The injured employee will detail any medical symptoms or complaints which will be evaluated by a Registered Nurse (RN) specially trained to perform telephonic triage. The RN will recommend first aid self-treatment or refer the injured employee for an off-site medical evaluation by a health professional at a clinic within GEI's workers compensation provider network. GEI employees are still required to follow our Accident Reporting procedures as listed above.

1.9 Limitations

Follow safety procedures as defined in the site-specific HASP.

1.10 References

National Safety Council
Oklahoma Safety Council
GEI Consultants, Inc. Employee Handbook

1.11 Attachments

None

1.12 Contact

SafetyTeam@geiconsultants.com

1.13 Review History

- December 2017
- November 2016
- May 2014
- November 2013
- January 2011

STANDARD OPERATING PROCEDURES

SOP No. HS-006 Excavations and Trenches

1.1 Objective

The objective of this Standard Operating Procedure (SOP) is to highlight the hazards and safety procedures when work activities include excavations and/or trenches. The following guidelines will be followed when excavations or trenches are present on GEI projects.

1.2 General

This SOP is intended for use by employees engaged in work on project sites that include trenching and/or excavation operations. The site-specific health and safety plan (HASP) must include a hazard assessment for the project that identifies the potential for trenching and excavation hazards and the control methods to be implemented by GEI employees. These hazards must be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

An “excavation” is any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal.

A “trench” (trench excavation) is a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet.

Do not enter a trench or excavation without consulting with the Project Manager, Corporate Health and Safety Officer (CHSO), or Regional Health and Safety Officer (RHSO).

1.2.1 Personal Protective Equipment

Employees will be provided with the personal protective equipment (PPE) necessary to help protect them from the hazards of work activities related to excavations and/or trenches. All employees will wear a hard hat, steel toe or composite toe boots, and safety glasses at a minimum. In addition, face shields, gloves, fall protection and hearing protection may be required. PPE must be maintained in good condition, kept clean and properly stored when not in use. More information regarding PPE is located in Section 6 of GEI’s Corporate Health and Safety Program.

1.3 Hazards

Hazards associated with excavations and trenches can include collapse, falls, falling objects, hazardous atmospheres, and incidents involving mobile equipment. One cubic yard of soil can weigh as much as a car.

1.4 Entry

GEI employees will not enter trenches or excavations that do not comply with OSHA 29 CFR 1926.650. If a project requires GEI employees to enter a trench or excavation, the trench or excavation must meet the following requirements described in the following sections.

Do not enter a trench or excavation without consulting with the Project Manager, Corporate Health and Safety Officer (CHSO), or Regional Health and Safety Officer (RHSO).

1.4.1 Competent Person

The excavation must be inspected prior to the start of each shift by a competent person who most likely will work for the contractor performing the work. The competent person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to workers, soil types and protective systems required, and who is authorized to take prompt corrective measures to eliminate these hazards and conditions. GEI generally does not act as the competent person.

1.4.2 Soil Type

The competent person for the project will determine what the soil type is and what type of protective system will be implemented. The type of soil where the excavation or trench is being dug has significant influence on what type of protective system will need to be in place. There are four types of soil: stable rock, type A, type B, and type C. As you progress from stable rock to type C, the cohesive properties of the soil change the soil becomes less stable.

1.4.3 Protective System

A protective system is required for trenches or excavations greater than 5 feet in depth unless the excavation is made entirely in stable rock. In special situations the competent person may require a protection system for an excavation that is less than 5 feet deep. The competent person is responsible for assessing the soil type and the protective systems required for a specific trench when an excavation is less than 20 feet deep. If the excavation is greater than 20 feet in depth, the protection system requires a design by a registered professional engineer or based on tabulated data prepared and/or approved by a registered professional engineer.

The protective system will be designed based on soil type, depth of excavation, water level, loads adjacent to the excavation, changes in weather conditions, or other operations in the area. Protective systems can include sloping or benching of the sidewalls, shoring the sidewalls using an approved support system, or shielding workers with a trench box or other similar type of support.

The different types of protective systems include:

Benching is a method of protecting workers from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels of steps, usually with vertical or near vertical surfaces between levels. Benching cannot be done with Type C soil.

Sloping involves cutting back the trench wall at an angle inclined away from the excavation.

Shoring requires installing aluminum hydraulic or other types of support structures to prevent soil movement and cave-ins.

Shielding protects workers by using trench boxes or other types of supports to prevent soil cave-ins.

Designing a protective system can be complex because many factors must be considered: soil classification, depth of cut, water content of soil, changes caused by weather or climate, surcharge loads (e.g., spoil, other materials to be used in the trench) and other operations in the vicinity.

1.4.4 Access and Egress

Excavations and trenches greater than 4 feet in depth require a safe access and egress including ladders, steps, or ramps. These points of access and egress are to be no greater than 25 feet of lateral travel in any direction.

1.4.5 Atmospheric Hazards

Where oxygen deficiency (atmospheres containing less than 20.7% oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation will be tested before employees enter excavation.

1.5 Subcontractor Oversight

When GEI is overseeing excavation activities performed by a subcontractor, the following safety hazards should be monitored:

- Care must be taken not to create new hazards like narrow walkways along edges of an excavation.
- Heavy equipment must not be parked or working at the edge of the excavation.
- Spoils should not be stockpiled within 2 feet of the trench edges.
- Confirm with subcontractor that underground utilities have been located before any excavation or trenching activities begin (*refer to SOP HS-014 Utility Mark-out*).
- Confirm with the subcontractor that the excavation or trench has been tested for hazardous atmospheres before entering.
- Confirm with the subcontractor that the excavation or trench has been inspected by a competent person before each work shift and after any type of precipitation. If hazards are identified during this inspection, verify that the hazards are controlled prior to entering the trench or excavation.
- GEI employees will not work under raised or suspended loads.
- Excavations/trenches must be protected at the end of a work shift if they are to be left open. These trenches/excavations must be covered and a sign that reads “Hole” must be placed in a location that will notify anyone of the hazard. Or a secure barricade will need to be installed.

In circumstances where GEI employees are working on sites where a contractual agreement with the excavation contractor does not exist and we cannot confirm the above stated conditions, entry into trenches or excavations will not be conducted. Any safety concerns that arise should be communicated to the Project Manager and, if necessary, the client.

1.6 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened.

The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.7 Limitations

Follow safety procedures as defined in the site-specific HASP. Appropriate PPE must be worn correctly to provide the intended level of protection.

Some states, including Massachusetts, require a trench permit prior to trenching or excavation activities. Verification of local requirements will be evaluated in the planning stage.

1.8 References

OSHA 29 CFR 1926.650 – Subpart P; *Excavations*

OSHA Construction eTool – <http://www.osha.gov/SLTC/etools/construction/index.html>

OSHA FactSheet Trenching and Excavation Safety – viewed on 9/13/2016

https://www.osha.gov/OshDoc/data_Hurricane_Facts/trench_excavation_fs.pdf

1.9 Attachments

None

1.10 Contact

Health&SafetyTeam@geiconsultants.com

1.11 Review History

- September 2016
- May 2014
- November 2013
- January 2011
- Initial Version Date Unknown

STANDARD OPERATING PROCEDURES

SOP No. HS-008a Non-Powered Hand Tools

1.1 Objective

This Standard Operating Procedure (SOP) is intended for use by employees working with non-powered hand tools. The site-specific health and safety plan (HASP) should include a hazard assessment for the project that identifies the hazards associated with the non-powered hand tools that will be used. These hazards should be reviewed during the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.2 General

Misuse of hand tools accounts for the majority of accidents and injuries involving hand tools. Only use a tool for the task which it was designed for. If the right tool isn't available contact the Project Manager and discuss what is needed. Improper maintenance is another leading cause of injuries. Employees using hand tools may be exposed to a number of other potentially serious hazards: falling objects (i.e., objects can fall as a result of contact with tools or objects which are abrasive or splash), harmful dust, fumes mists, vapors, and gases, as well as contact with electrical power sources.

1.2.1 Condition of Tools

All hand tools, whether furnished by GEI or the employee, will be maintained in safe working condition. All hand tools must be inspected before use. Never use a tool if its handle has splinters, burrs, cracks, splits or if the head of the tool is loose. Never use impact tools such as hammers, chisels, punches or steel stakes having mushroomed (flattened) heads. Tag worn, damaged or defective tools "Out of Service" and do not use them; notify your Branch Manager or Project Manager so that the tool can be replaced or repaired. If the tools cannot be repaired they will be disposed of properly. GEI does not issue or permit the use of unsafe hand tools.

1.2.2 Personal Protective Equipment

Employees using hand tools will be provided with the personal protective equipment (PPE) necessary to protect them from the hazard of the tool as well as the associated hazards with using the tool. (i.e., projectile debris, dust, etc.). All employees will wear work gloves, steel toe or composite toe boots, and safety glasses at a minimum. In addition, face shields and hearing protection may be required. Most hand injuries can be avoided with the proper use of PPE. PPE must be maintained in good condition, kept clean and properly stored when not in use. More information regarding PPE is located in Section 6 of GEI's Corporate Health and Safety Program.

1.2.3 General Safe Practices

Never wear sandals, open-toed or canvas shoes when working with tools. Always tie back long hair. Avoid loose-fitting clothes which might become entangled in a tool. Always remove rings and other jewelry. Make sure your grip and footing are secure when using large tools. Never carry tools up ladders; use a tool belt, hoist, or a rope. Use extra caution when using tools at heights – a falling tool could kill a co-worker. Always pass a tool to another person by the handle – never toss it to them. Never use a tool with hands are wet, oily, or greasy. Select ergonomically-designed tools for work tasks when movements are repetitive and forceful. Always make sure observers are at a safe distance. Always secure work with a vice, clamp, or other support.

1.3 Non-Power Hand Tools

Non-powered hand tools include anything from axes to wrenches. Even though the tool is powered by human inertia, injuries from improper use of non-powered hand tools often involve severe disabilities.

1.3.1 Knives

Only use a knife with a sharpened blade. Pull the knife through the object and away from your body; pulling motions are easier to manage. Never use a knife if its handle has splinters, burrs, cracks, splits or if the blade is loose. Knives should never be used as screwdrivers, pry bars, or can openers. Never pick up knives by their blades. Always carry knives with their tips/points toward the floor. Never carry knives, scissors, or other sharp tools in pockets. Never attempt to catch a falling knife. When not in use, knives should be stored in sheaths. Box cutters will be self-retracting.

1.3.2 Wrenches

Never use wrenches that are bent, cracked, badly chipped, or having loose or broken handles. Discard any wrench with spread or battered jaws; if the handle is bent; or if a wrench has broken or battered points and notify your Branch Manager so that a replacement can be made. Never slip a pipe over a single head wrench handle to increase leverage. Never use a shim to make a wrench fit. Pull on a wrench using a slow, steady motion. Do not use push force on a wrench; you could lose your balance if the wrench slips.

1.3.3 Screwdrivers

Always match the size and type of screwdriver blade to fit the head of the screw. Do not hold the work piece against your body while using a screwdriver. Never put your fingers near the tip of a screwdriver when tightening a screw. Never use a screwdriver to make a starting hole for screws. Never use a screwdriver as a chisel, pry bar, or nail puller. When performing electrical work, always use an insulated screwdriver. Never use a screwdriver to test the charge of a battery.

1.3.4 Hammers

Never use a hammer if your hands are oily, greasy or wet. Always check behind you before swinging a hammer. Use a claw hammer for pulling nails. Never strike nails or other objects with the “cheek” of the hammer. Do not strike a hardened steel surface, such as a cold chisel, with a claw hammer. Never strike one hammer against another hammer. Never use a hammer as a wedge or a pry bar.

1.3.5 Pliers

Never use pliers which are cracked, broken, or sprung. Never use pliers as a wrench or a hammer. Do not attempt to force pliers by using a hammer on them. Never slip a pipe over the handles of pliers to increase leverage. When performing electrical work, always use insulated pliers. When using diagonal cutting pliers, shield loose pieces of cut material from flying into the air by using a cloth or your gloved hand.

1.3.6 Snips

Never use snips as a hammer, screwdriver, or pry bar. Always wear safety glasses or safety goggles when using snips to cut materials. Always wear work gloves when cutting materials with snips. Keep the blade aligned by tightening the nut and bolt of the snips. Never use straight cut snips to cut curves. Always use the locking clip on the snips when you have finished using them. Never leave or store snips in the open position.

1.3.7 Hand Saws

Always keep handsaws sharp and free of rust to prevent them from binding or jumping. Never carry a saw by the blade. Always hold the work piece firmly against a work table. Keep control of saws by releasing downward pressure at the end of the stroke. Never use an adjustable blade saw such as a hacksaw, coping saw, keyhole saw, or bow saw, if the blade is not taut. Oil saw blades after each use. Never force the saw through the cut as this may cause the saw to buckle or fly out of the groove and cause injury.

1.3.8 Chisels

Only use sharpened chisels. Never use chisels having mushroomed (flattened) striking heads. Whenever possible, hold a chisel by using a tool holder. Clamp small work pieces in a vise and chip towards the stationary jaw of the vise. Chip or cut away from yourself and keep both hands in back of the cutting edge. Always wear safety glasses or a face shield.

1.3.9 Vise and Clamps

Never use a vise having worn or broken jaw inserts, or having cracks or fractures in the body of the vise. Position the work piece in the vise so the entire face of the jaw supports the work piece. When clamping a long work piece in a vise, support the far end of the work piece by using an adjustable pipe stand or saw horse. Never slip a pipe over the handle of a vise to increase leverage. Never use a C-clamp for hoisting materials. Never use a C-clamp as a permanent fastening device.

1.3.10 Jacks

A manufacturer's rated capacity must be clearly marked on all jacks and all jacks must have a stop indicator. When using a jack, never exceed the capacity of the stop indicator. Jacks should be lubricated and inspected regularly. When setting up a jack, ensure the base is centered on a firm, level surface. The jack head should also be placed against a level surface. Lift force should be applied evenly. Put a block under the base of the jack when the foundation is not firm. If it seems likely the cap could slip, place a block between the jack cap and load. Immediately block the load after it is lifted.

1.4 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or supervisor/project manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health & Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.5 Limitations

Follow safety procedures as defined in the site-specific HASP or in the manufacturer's specifications. Appropriate PPE must be worn correctly to provide the intended level of protection. If a hand tool is being used that is not identified in this SOP consult the manufacturer's literature and contact the Safety Team so we can include the information in a future version of this SOP.

1.6 References

OSHA Standards for the Construction Industry, Subpart I
Risk Analytics, LLC Hand Tools Training, 2006

1.7 Attachments

None

1.8 Contact

Health&SafetyTeam@geiconsultants.com

1.9 Review History

- July 2016
- May 2014
- August 2011
- October 2010
- One revision date unable to be found

STANDARD OPERATING PROCEDURES

SOP No. HS-008b Powered Hand Tools

1.1 Objective

This Standard Operating Procedure (SOP) is intended for use by employees working with powered hand tools. The site-specific health and safety plan (HASP) should include a hazard assessment for the project that identifies the hazards associated with the powered hand tools that will be used. These hazards should be reviewed during the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.2 General

Misuse of hand tools accounts for the majority of accidents and injuries involving hand tools. Only operate power tools according to the manufacturer's instructions. Employees using power tools may be exposed to a number of potentially serious hazards including being hit by flying material from the work piece; hit by a flying part of a broken tool; explosion or fire resulting from sparks from a tool igniting combustible materials; electric shock from a broken tool, frayed or defective power cord, or improper grounding; exposure to harmful dust, fumes, mists, vapors, and gases. Hazards are usually caused by misuse, improper maintenance, improper or inefficient training, and complacency.

1.2.1 Condition of Tools

All hand tools, whether furnished by GEI or the employee, will be maintained in safe working condition with regular maintenance. Always inspect each tool, as well as power cords and attachments, for damage before use. Make sure the power is off and locked out before inspecting. Insure the tool guards are in place and functioning. Ensure that blades, bits, and other attachments are securely fastened. Tag worn, damaged, or defective tools "Out of Service" and do not use them; notify your Branch Manager or Project Manager so that the tool can be replaced or repaired. If the tools cannot be repaired they will be disposed of properly. GEI does not issue or permit the use of unsafe hand tools.

1.2.2 Personal Protective Equipment

Employees using hand tools will be provided with the personal protective equipment (PPE) necessary to help protect them from the hazards of the tool as well as the associated hazards with using the tool. (i.e., projectile debris, dust, etc.). All employees will wear work gloves, steel toe or composite toe boots, and safety glasses at a minimum. In addition, face shields and hearing protection may be required. Most hand injuries can be avoided with the proper use of PPE. PPE must be maintained in good condition, kept clean and properly stored when not in use. More information regarding PPE is located in Section 6 of GEI's Corporate Health and Safety Program.

1.2.3 General Safe Practices

Never wear sandals, open-toed or canvas shoes when working with tools. Always tie back long hair. Avoid loose-fitting clothes which might become entangled in a tool. Always remove rings and other jewelry. Never use a tool without its guard in place. Make sure your grip and footing are secure when using large tools. Never carry tools up ladders; use a tool belt, hoist, or a rope. Use extra caution when using tools at heights – a falling tool could kill a co-worker. Always pass a tool to another person by the handle – never toss it to them. Select ergonomically-designed tools for work tasks when movements are repetitive and forceful. Always make sure observers are at a safe distance. Always secure work with a vice, clamp, or other support. Moving work surfaces can cause the tool to “kick back.” Use extra caution when using power tools around flammable materials. Use fire curtains when appropriate and keep a properly charged fire extinguisher within a reasonable distance. Never surprise someone using a power tool. Check above, underneath, and behind solid surfaces if possible, to make sure it’s safe to proceed and there isn’t another person working on the other side.

1.2.4 Guarding

When power tools are designed to accommodate guards, they will be equipped with such guards prior to, and at all times during use. All guards will be in good condition and be adequate to provide protection to the employee. Regulations stipulate that the following parts of a power tool must be guarded: gears, sprockets, chain drives, belts, pulleys, drums, revolving or reciprocating parts, exposed shafts and projecting shaft ends, collars, clutches, and couplings.

1.2.5 Safety Switches

Safety switches allow the tool to be turned “off” quickly. Hand-held power tools must be equipped with a positive on-off, a momentary on-off, or a constant pressure switch. A positive on-off is a standard on-off switch. Platen sanders, disc sanders, scroll saws, and grinders with less than 2-inch-diameter discs may have a standard on-off switch. A momentary on-off can be turned “off” by a single motion of the same finger or fingers that turn it on. Drills, reciprocating and saber saws, grinders, and belt sanders may have a momentary on-off switch. A constant pressure switch shuts off power upon release. Circular saws and chain saws may have a constant pressure switch. Always test switch to insure it is functioning properly.

1.2.6 Blind Operations

A "blind" operation is any circumstance using any type of saw, drill, or other cutting or penetrating tool where you can't see behind what is being cut. When making a blind cut or drilling operation, be sure that hidden electrical wiring, water pipes, or any mechanical hazards are not in the blade path. If wires are present, they must be disconnected at the power source by a qualified person or avoided. Contact with live wires could cause lethal shock or fire. Water pipes should be drained and capped. Always hold the tool by the insulated grasping surfaces.

1.2.7 Kickback

Kickback is a sudden, uncontrolled reaction to a pinched blade, causing the tool to lift up and out of the work piece toward the operator. Misuse, buildup of sap or dirt on the blade, insufficient *set*, dullness, and unguided cuts, can all cause kickback. Avoid kickback by keeping saw blades sharp, having proper amount of *set* in the teeth, keeping saw blades clean, and support large panels so they will not pinch the blade. Set blade depth to no more than 1/4 inch greater than the thickness of the material being cut. Release the switch immediately if the blade binds or the saw stalls.

1.2.8 Power Tool Accessories

The choice of a wrong accessory or incorrect use can result in serious injury. Read and understand the recommendations in the owner/operators manual for the tool and the accessory literature. Don't use an accessory or attachment unless: the power tool manufacturer recommends its use on their product; the accessory's limitations and specifications match the limitations and specification of the power tool; the use of the accessory does not require the removal of any guards; and you understand the instructions that describe the safe use of the accessory or attachment. Always unplug tools before installing, adjusting, and changing any accessory or attachment of any kind.

1.3 Types of Power-Operated Hand Tools

Power tools include electric, battery-powered, liquid fuel, hydraulic, pneumatic (air), and powder-actuated. Power tools operate at high speeds; when things go wrong, it happens fast.

1.3.1 Electric Power-Operated – Corded

Electric power-operated tools that use a cord will either be double-insulated type or have a three-wire cord plugged into a grounded receptacle, grounded according to Occupational Safety and Health Administration (OSHA) regulations. A ground fault circuit interrupter (GFCI) will be used between the power operated tool and the power source. Test the GFCI before each use and use a portable GFCI if necessary. Power tools should always be stored in a dry place when not in use. Never use a tool in wet/damp conditions unless designed to be used in such an environment. Never carry power tools by the cord or yank the cord to disconnect it. Always keep tools and cords away from heat, oil, and sharp edges. Always disconnect power tools when not in use and when changing accessories such as blades and bits.

1.3.2 Electric Power-Operated – Battery (Cordless)

Electric power-operated tools that run on batteries should be charged in a dry location and away from all combustible materials. Do not operate cordless tools in or near flammable liquids or explosive atmospheres. Motors in these tools may spark and ignite fumes. Always recharge a cordless tool and its battery with its own specified charging unit. Never attempt to recharge a cordless tool in a recharging unit not specifically recommended for that tool. Remove batteries or lock the switch in its "OFF" position before changing accessories, adjusting or cleaning tools. This removes the power supply while hands are in vulnerable

locations such as near switches, bits, or blades. Do not store the battery pack in a container with metal objects such as wire, nails, or coins as it could short the battery. Do not expose the battery pack to moisture, frost, or temperature extremes of over 110 degrees Fahrenheit or under -20 degrees Fahrenheit.

1.3.3 Liquid Fuel Power Tools

Liquid fuel power tools will be stopped, turned “off,” and cooled while being refueled, serviced, or maintained. Fuel will be transported, handled, and stored in accordance with federal regulations. Safety Data Sheets (SDS) for fuel or chemicals will be accessible during use of the tools. The tool must be used in a well-ventilated area as the carbon monoxide generated can displace or deplete oxygen. Before refilling a fueled powered tool fuel tank, shut down the engine and allow it to cool as fuel fumes, combined with the heat from the tool, can cause an explosion. Use only Type 1 or Type 2 approved flammable liquid containers. Properly clean any spills from the refueling process.

1.3.4 Hydraulic Power Tools

The fluid used in hydraulic power tools will be fire-resistant and approved for use with the hydraulic powered tool as specified by the manufacturer. The purpose of the specialized fluid is to allow the tool to be safely used in extreme temperatures.”

1.3.5 Pneumatic Power Tools

Pneumatic (air) power tools will be properly maintained and operated according to the manufacturer’s safe operating procedures. Make sure air hose connections are secure. Use a short wire or positive locking coupler to attach the air hose to the tool. Check hoses regularly for cuts, bulges, and abrasions (tag and replace if defective). Ensure the safety clip for attachments is installed and secure. Ensure the muzzle is in contact with the surface. Never point the tool at anyone. Avoid using on easily penetrated materials unless they are backed by material that will prevent fastener from passing through. Don’t drive fasteners into very hard or brittle material that could chip, splatter, or make the fasteners ricochet. Avoid using compressed air for cleaning.

1.3.6 Powder-Actuated Tools

Only employees who have been trained in the operation of the particular tool in use will be allowed to operate a power-actuated tool. Never use in an explosive or flammable atmosphere. Never load the tool unless it will be used immediately. Never leave a loaded tool unattended. Never point the tool at anyone. Always keep hands and feet clear of the barrel end. Always select a powder level that will do the work without excessive force. Avoid using on easily penetrated materials unless they are backed by material that will prevent fastener from passing through. Don’t drive fasteners into very hard or brittle material that could chip, splatter, or make the fasteners ricochet.

1.4 Powered Hand Tools

1.4.1 Drills

Be sure the trigger switch actuates properly. If equipped with a lock-on, be sure it releases freely. Be sure the chuck is tightly secured to the spindle. Tighten the drill bit securely as prescribed by the manual. Check auxiliary handles to be sure they are securely installed. Never force a drill; apply only enough pressure to keep the drill bit cutting smoothly. If the drill binds in the work, release the trigger immediately. Unplug the drill from the power source and then remove the bit from the work piece. Never attempt to free a jammed bit by starting and stopping the drill. Review the manufacture's manual for how to unjam the equipment. Unplug the tool before changing bits, accessories, or attachments.

1.4.2 Saws

Circular Saws

Always use sharp blades. Dull blades can cause binding, stalling, and possible kickback. Check blades carefully before each use for proper alignment and possible defects. Be sure all cords are out of the blade path and are sufficiently long to freely complete the cut. Clamp materials whenever possible. Never hold a work piece in your hand when sawing.

Set blade depth to no more than 1/4 inch greater than the thickness of the material being cut. Always allow the blade to reach full speed before the work piece is contacted. Never overreach and never reach under the saw or work piece. Never use a circular saw for cutting logs or roots, trimming trees, or shrubs.

Reciprocating Saws

Always use sharp blades. Dull blades cause binding, stalling, and possible kickback. Only use the blade specifically recommended for the job being done. Be sure all cords are out of the blade path and are sufficiently long to freely complete the cut. Position yourself to maintain full control of the tool and avoid cutting above shoulder height. The work piece must be clamped securely and the shoe of the saw held firmly against the work. When making anything other than a through cut, allow the tool to come to a complete stop before removing the blade from the work piece. Remember that the blade and blade clamp may be hot immediately after cutting. Avoid contact until they have cooled.

Jig/Saber Saws

Check that the blades are secured in position before plugging in. Make sure the cord is not in the line of cut. Firmly position the tool's base plate/shoe on the work piece before turning on the tool. Keep your hands and fingers well clear of moving parts. After making partial cuts, turn "off" and remove the blade from the work piece only after the blade has fully stopped. Maintain firm contact between the base and the material being cut, throughout cutting procedures. Remember that the blade and blade clamp may be hot immediately after cutting. Keep your hands away until cooled down and never overreach.

1.4.3 Abrasive Wheels and Tools

Sanders

Sanding dust can be highly explosive if the concentration becomes too great. Ensure the work area has adequate ventilation. Always use of exhaust type systems or bag collection. Check the power supply to be sure the switch and switch lock are in the "off" position. Always use the appropriate size disk or belt. Use jigs or fixtures to hold your work piece whenever possible. When sanding, always be aware of the cord location.

Never force a sander – the weight of the tool applies adequate pressure. Do not expose the tool to liquids, or to use in wet locations. When adjusting the tracking of the belt, be certain to avoid accidental contact with yourself or other objects.

Grinders

Test grinding wheels before mounting by tapping the wheel lightly with a nonmetallic implement. If it produces a ringing sound, it is in good condition. If it sounds dull, replace the wheel. Never use a cracked wheel. Use only those wheels and discs marked with a rated speed at or above the speed rating on the nameplate of the tool. Never operate a grinder without the proper guards in place. Always allow the wheel to come up to full speed before you contact the work piece. Do not apply excessive pressure to the wheel or disc. Use grinding wheels when working with hard materials, and use rotary files for soft materials such as aluminum, brass, copper, and wood. Using grinding wheels on soft materials will excessively load the wheel and could cause the wheel to shatter or disintegrate.

Power

Grinding machines will be supplied with sufficient power to maintain the spindle speed at safe levels under all conditions of normal operations. Follow manufacturer recommendations for sufficient power supply.

Guarding

Grinding machines will be equipped with safety guards in conformance with the requirements of the American National Standards Institute (ANSI) B7.1-1970.

Routers

Always disconnect the plug from the electrical outlet before changing bits or making any adjustments. Install router bits securely. Make certain that the cutter shaft is engaged in the collet at least ½-inch. Always face the cutter blade opening away from your body. The switch should be in the "off" position before plugging into the power outlet. Always allow the motor to reach full speed before feeding the router into the work. Never attempt to remove debris while the router is operating. Secure clamping devices on the work piece before operating router. When removing a router from your work piece, always be very careful not to turn the base and bit toward you.

1.4.4 Woodworking Tools

Disconnect Switches

Fixed power driven woodworking tools will be provided with a disconnect switch that can either be locked or tagged in the “off” position.

Speeds

The operating speed will be etched or otherwise permanently marked on all circular saws over 20 inches in diameter or operating at over 10,000 peripheral feet per minute. Blades used on these types of saws must be rated to operate at or below the operating speed of the saw.

Self-feed

Automatic feeding devices will be installed on machines whenever the nature of the work will permit. Feeder attachments will have the feed rolls or other moving parts covered or guarded so as to protect the operator from hazardous points.

Guarding

Portable, power-driven circular saws will be equipped with guards above and below the base plate or shoe.

Personal Protective Equipment

Project-specific PPE will be identified in the HASP based on the hazards present during work tasks. Required PPE must be worn when operating power tools. More information regarding PPE is located in Section 6 of GEI’s Health and Safety Program.

Other Requirements

Woodworking tools and machinery will meet other applicable requirements of ANSI 01.1-1961, Safety Code for Woodworking Machinery.

1.4.5 Jacks – Lever and Ratchet, Screw, and Hydraulic

General Requirements

The manufacturer’s rated capacity will be legibly marked on all jacks and will not be exceeded. All jacks will have a positive stop to prevent over-travel.

Blocking

When the working area does not have a solid working surface and it is necessary to provide a firm foundation, the base of the jack will be blocked or cribbed.

Operation and Maintenance

Hydraulic jacks exposed to freezing temperatures will be supplied with adequate antifreeze liquid. Jacks will be properly lubricated at regular intervals. Jacks will be thoroughly inspected, before each use. Repair or replacement parts will be examined for possible defects. Tag worn, damaged or defective jacks “Out of Service” and do not use them; notify your

Branch Manager so that the jack can be replaced or repaired. Parts subjected to wear will be inspected on a regular basis and repaired or replaced as needed.

1.5 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.6 Limitations

Follow safety procedures as defined in the site-specific HASP. Appropriate PPE must be worn correctly to provide the intended level of protection. Read and understand the recommendations in the owner/operators manual for the tool, and the accessory literature.

1.7 References

OSHA Standards for the Construction Industry, Subpart I

Risk Analytics Power Tool Safety Training, 2006

1.8 Attachments

None

1.9 Contact

Health&SafetyTeam@geiconsultants.com

1.10 Review History

- July 2016
- May 2015 – Separated from SOP HS-008

STANDARD OPERATING PROCEDURES

SOP NO. HS-009 Hazardous Substances Exposure Management

1.1 Objective

This Standard Operating Procedure (SOP) is intended to outline the steps GEI employees will take to identify potential hazards associated with exposure to hazardous substances, the risks associated with these hazards, and the proper controls to use to minimize exposure. The site-specific health and safety plan (HASP) should include a hazard assessment for the project that identifies the potential of encountering a hazardous substance and the control methods to be implemented by GEI employees. These hazards should be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.2 General

A hazardous substance is any substance that has one or more of the following intrinsic properties:

- Explosiveness
- Flammability
- Ability to oxidize
- Human toxicity (acute or chronic)
- Corrosiveness (to human tissue or metal)
- Ecotoxicity (with or without bioaccumulation)
- Capacity, on contact with air or water, to develop one or more of the above properties

1.3 Hazard Identification

An initial identification of hazards should be done based on a review of available documents including lists of chemicals used on site, analytical data from soil, surface water, groundwater, air, spill history, site history, equipment on site, maps, photos, and a preliminary survey.

Once hazardous substances are identified the regulated exposure limits need to be identified. Each substance may have a state/federal exposure value for each of the following (if applicable):

Action Level – An airborne level, typically one-half of the permissible exposure limit (PEL) designated in Occupational Safety and Health Administration's (OSHA's) substance-specific standards, 29 CFR 1910, Subpart Z, calculated as an

8-hour time weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance.

Ceiling Limit – The exposure limit a worker's exposure may never exceed.

Sampling and Analytical Error – A statistical estimate of the uncertainty associated with a given exposure measurement.

Short-Term Exposure Limit (STEL) – The average exposure to a contaminant to which a worker may be exposed during a short time period (typically 15-30 minutes).

Time Weighted Average (TWA) – The average exposure to a contaminant over a given period of time, typically 8 hours.

1.4 Risk Identification

Once the presence and concentrations of specific hazardous substances and health hazards have been established, the risks associated with these substances will be identified. GEI employees and GEI subcontractors who will be working on the site will be informed of risks that have been identified.

Risks to consider include, but are not limited to:

- Potential exposures exceeding the permissible exposure limits and published exposure levels
- Potential Immediately Dangerous to Life and Health (IDLH) concentrations
- Potential skin absorption and irritation sources
- Potential eye irritation sources
- Potential hazardous atmospheres, including oxygen deficiency and fire and explosion hazards

1.5 Engineering Controls, Work Practices, and Personal Protective Equipment for Employee Protection

Engineering controls, work practices, and personnel protective equipment (PPE) for substances regulated in OSHA Subpart G (Occupational Health and Environmental Control) and Subpart Z (Toxic and Hazardous Substances) will be implemented in to protect employees from exposure to hazardous substances and safety and health hazards.

1.5.1 Elimination/Substitution

The first control method should be to try and eliminate or substitute the hazards with a safer alternative. This is the most effective solution as shown in Figure 1 below. If you can remove the hazard then you no longer need to find a way to protect the employee

from it. Or you can substitute a different piece of equipment or chemical to use that doesn't pose the same hazard and doesn't create a new one.

1.5.2 Engineering Controls

Engineering controls implement physical change to the workplace, which eliminates/reduces the hazard on the job/task. Examples include:

- Change the process to minimize contact with hazardous chemicals
- Isolate or enclose the process
- Use of wet methods to reduce generation of dusts or other particulates
- General dilution ventilation
- Use of fume hoods

1.5.3 Administrative Controls (Work Practices)

Administrative controls establish efficient processes or procedures to help protect the employee. Examples of these are:

- Rotate job assignments
- Adjust work schedules so that workers are not overexposed to a hazardous chemical

1.5.4 Personal Protective Equipment

The use of PPE to reduce exposure to risk factors is the last line of defense. All other options should be exhausted before use of PPE. Examples of PPE are:

- Chemical protective clothing
- Respiratory protection
- Gloves
- Eye or hearing protection
- Steel toe boots

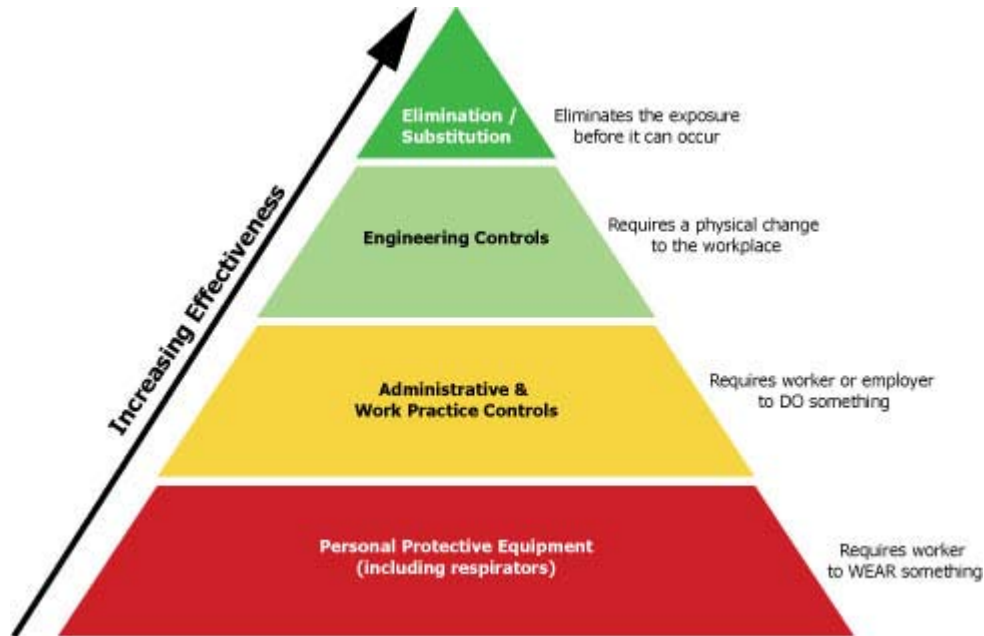


Figure 1: Hazard Mitigation Effectiveness Pyramid

1.5.5 Engineering Controls, Work Practices, and PPE for Substances Regulated in Subparts G and Subpart Z

Engineering controls and work practices will be instituted to reduce and maintain employee exposure at or below the PELs for substances regulated by 29 CFR Part 1910.

Engineering controls that may be feasible include the use of pressurized cabs or control booths on equipment, and/or the use of remotely operated material handling equipment. Work practices may include removing non-essential employees from potential exposure during opening of drums, wetting down dusty operations, and positioning employees upwind of potential hazards.

If engineering controls and work practices are not feasible, or not required, a reasonable combination of engineering controls, work practices, and PPE will be used to reduce and maintain at or below the PELs or dose limits for substances regulated by 29 CFR Part 1910, Subpart Z.

GEI will not implement a schedule of employee rotation as a means of compliance with PELs or dose limits except when there is no other feasible way of complying with the airborne or dermal dose limits for ionizing radiation.

The provisions of 29 CFR, subpart G, will be followed.

1.5.6 Engineering Controls, Work Practices, and Personal Protective Equipment for Substances Not Regulated in Subparts G and Subparts Z

An appropriate combination of engineering controls, work practices, and PPE will be used to reduce and maintain employee exposure to or below published exposure levels for hazardous substances and health hazards not regulated by 29 CFR Part 1910, Subparts G and Subparts Z. GEI will use published literature and Safety Data Sheets (SDS) as a guide in making the determination of what level of protection is appropriate for hazardous substances and health hazards for which there is no permissible exposure limit or published exposure limit.

1.5.7 Decontamination Procedures

Decontamination procedures will be developed, communicated to employees, and implemented before employees or equipment enter areas on site where potential for exposure to hazardous substances exists. Procedures will be developed to minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances.

GEI employees leaving a contaminated area will be properly decontaminated; contaminated clothing and equipment leaving a contaminated area will be properly disposed of or decontaminated.

Decontamination procedures will be monitored by the site safety officer (SSO) to determine their effectiveness. When such procedures are found to be ineffective, the site safety officer will contact the Corporate Health and Safety Officer and appropriate steps will be taken to correct deficiencies.

Location

Decontamination will be performed in areas that will minimize the exposure to employees, equipment, and the environment.

Equipment and Solvents

Equipment and solvents used for decontamination will be decontaminated or disposed of properly.

Personal Protective Clothing and Equipment

Protective clothing and equipment will be decontaminated, cleaned, laundered, maintained, or replaced as needed to maintain their effectiveness.

Employees whose clothing comes in contact with hazardous substances will immediately remove that clothing and follow the directions on packaging or SDS sheet for how to properly clean the exposed area. The clothing will be disposed of or decontaminated before it is removed from the work zone.

Commercial Laundries or Cleaning Establishments

Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment will be informed of the potentially harmful effects of exposures to hazardous substances.

Showers and Changing Rooms

Where the decontamination procedure indicates a need for regular showers and change rooms outside of a contaminated area, these will be provided and meet the requirements of 29 CFR 1910.141 (Sanitation). If temperature conditions prevent the effective use of water, then other effective means for cleansing will be provided and used.

1.6 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Health and Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.7 Limitations

None

1.8 References

OSHA 1910.120 Hazardous Waste Operations and Emergency Response

OSHA 1910 Subpart G Occupational Health and Environment Control

OSHA 1910 Subpart Z Toxic and Hazardous Substances

OSHA 1910.141 General Environmental Controls – Sanitation

<http://www.business.govt.nz/worksafe/information-guidance/legal-framework/hsno-act-1996/defining-hazardous-substances/> (Viewed 7/8/2016)

<https://www.osha.gov/SLTC/hazardoustoxicsubstances/> (Viewed 7/8/2016)

<https://www.osha.gov/SLTC/hazardoustoxicsubstances/control.html> (Viewed 7/11/2016)

1.9 Attachments

None

1.10 Contact

Health&SafetyTeam@geiconsultants.com

1.11 Review History

- July 2016
- May 2014
- November 2013
- August 2011 known as Hazard Identification and Management
- February 2011 known as HS-008 Contaminant Properties

STANDARD OPERATING PROCEDURES

SOP No. HS-010 Inclement Weather

1.1 Objective

This Standard Operating Procedure (SOP) is intended for use by employees engaged in work with the potential to be affected by inclement weather. The site-specific health and safety plan (HASP) should include a hazard assessment for the project that identifies the potential for working in inclement weather and the control methods to be implemented by GEI employees. These hazards should be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.2 General

Employees should be aware of local weather conditions and monitor advisories issued by the National Weather Service and other local reporting services. Depending on location and season, storms are capable of producing heavy rain, floods, extreme temperatures, high wind conditions, lightning, tornados, and/or snowfall.

1.2.1 Heavy Rain

If working or driving in a rain storm, use extreme caution. When driving, turn your low beam lights on when the rainfall becomes heavy. Employees should be aware of the following:

- Heavy rain decreases visibility, especially when driving.
- Surfaces and tools become slippery.
- If you are working in the rain and your clothes become wet there is a risk of hypothermia when exposed to winds, even in warm temperatures.
- If the storms are going to produce thunder and/or lightning, leave the work area immediately and move to a safe area.
- Use your best judgment to determine if the rainfall becomes too heavy to continue working safely.

1.2.2 Lightning

Lightning can strike as far as 10 miles from the area where it is raining. That's approximately the distance you can hear thunder. **If you can hear thunder, you are within striking distance. Seek safe shelter immediately.** This can be within a building or vehicle. Wait 30 minutes after the last clap of thunder or flash of lightning before going outside again.

1.2.3 Flooding

Flooding may occur as a result of heavy rain in a short period of time. Flooding can be particularly acute in canyon areas where dry creek beds can turn into raging rivers from rainfall in distant or higher elevation areas. Be aware of this and your surroundings and move to a safe place if you begin to see signs that flooding may occur. Signs of potential flooding include sudden appearance of water in dry creek beds, increased water flow in rivers or streams, or quick rise in water levels.

Do not attempt to drive through areas or streets that are flooded. Seek alternate routes. Be particularly cautious at night when flooded areas are difficult to see. Urban flooding can stop traffic; increase the potential for traffic accidents; and can trap people in vehicles.

1.2.4 Extreme Temperatures

Work activities may take place in extreme heat or cold. Be prepared if these conditions are anticipated. Have the appropriate personal protective equipment (PPE) available; exercise proper fluid intake; and take breaks to prevent heat and cold stress. For more information about these conditions see the heat stress and cold stress programs found in GEI's Health and Safety Program.

1.2.5 High Winds, Tropical Storms, and Tornadoes

High Winds can be extremely dangerous. Appropriate measures will be taken to secure equipment and loose items when working in windy conditions. The project manager should be contacted about the weather conditions and, if necessary, work should be postponed.

Tropical storms are described as storms with sustained winds ranging from 39 to 73 miles per hour (mph) and hurricanes produce sustained winds that exceed 74 mph. When winds approach 40 mph (gale force winds) twigs begin to break off of trees and vehicles will veer off of the road. When winds approach 40 mph or the GEI employee feels unsafe based on the activities being performed, stop work and seek shelter as soon as possible. Blowing or falling debris and overhanging limbs/signs can be a significant hazard. If possible, avoid driving in these conditions; 70 percent of injuries during hurricanes are a result of vehicle accidents. Note that tall or elevated equipment will have manufacturer's safe operating wind speeds defined that could be less than 40 mph. The operator's manual should be consulted prior to operation of the equipment.

A tornado is a violent, dangerous, rotating column of air that is in contact with both the surface of the earth and a cumulonimbus cloud or, in rare cases, the base of a cumulus cloud. The Fujita Scale is used to rate the intensity of a tornado by examining the damage caused by the tornado after it has passed over a man-made structure. Based on the Fujita Scale, or F-Scale, numbers begin at F0: 40-72 mph and go to F6: 319-379 mph (F6 is

generally theoretical). Nearly three-fourths of tornados are on the weak F0-F1 scale with just over two-thirds of deaths resulting from the violent F4-F5 tornados.

If a tornado is seen, stop work and seek shelter immediately. If a tornado siren is sounded move immediately to safety indoors and then move to a windowless interior space, basement, stairwell, or designated fall-out shelter. Windows should not be opened before an oncoming tornado. If there is no shelter available, seat belt yourself into your stationary vehicle or seek a depression or low spot on the land surface.

1.2.6 Snowfall and Ice Conditions

Working in the winter months may result in activities taking place during periods of snowfall or icy conditions. If you are working during or after snow has fallen, dress appropriately for the conditions. Snow and ice can cause working surfaces to become slippery. Clear snow and ice from work areas to prevent slip hazards. Use caution when performing snow or ice removal activities to prevent injuries. Driving in snowy and icy conditions is also hazardous. Reduce speed and use caution if you must drive in these conditions.

If the weather conditions deteriorate and you do not feel safe working in these conditions, stop work, move to a safe indoor location, and contact your project manager to let them know the weather, work conditions, and your location.

1.3 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.4 Limitations

Follow safety procedures as defined in the site-specific HASP. Appropriate PPE must be worn correctly to provide the intended level of protection. Protection in extreme weather conditions can best be accomplished if the conditions are anticipated and actions are taken. Monitor local weather conditions prior to starting work.

1.5 References

Center for Disease Control and Prevention – Natural Disasters and Severe Weather
<http://www.bt.cdc.gov/disasters/>

National Lightning Safety Institute

NOAA, National Weather Service

Office of Climate, Water, and Weather Services

1.6 Attachment

None

1.7 Contact

Safety Team

Health&SafetyTeam@geiconsultants.com

1.8 Review History

- Previous revision dates were not documented
- May 2014
- July 2016

STANDARD OPERATING PROCEDURES

SOP No. HS-011 Ladders – Fixed and Portable

1.1 Objective

GEI employees may be required to use ladders to access equipment or work areas as part of work activities. Ladders can be used on construction or manufacturing sites and in office settings. All GEI employees will receive training on the use and hazards associated with ladders. The following guidelines must be followed when GEI employees use a fixed ladder or a portable ladder, such as an extension or stepladder.

1.2 General

This standard operating procedure (SOP) is intended for use by all employees. The site-specific health and safety plan (HASP) must include a hazard assessment for the project that identifies ladder usage by GEI employees. These hazards must be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.3 Ladder Selection

The selection of the ladder will be dependent on the intended use of the ladder. Factors to consider when selecting the proper ladder are:

- Expected working height
- Expected load to be placed on the ladder
- Conductivity of the ladder material.

1.4 Ladder Inspection

Ladders must be inspected before use by a competent person. Items to look for include:

- The ladder must be Occupational Safety and Health Administration (OSHA) and American National Standard Institute (ANSI) compliant.
- The weight placed on the ladder (person and equipment) must not exceed the ladder's specified load capacity noted on the ladder.
- Rungs, cleats, and steps must be parallel, level, and uniformly spaced when the ladder is in position for use; round rungs are prohibited.

If a structural defect in the ladder is observed (e.g., cracks, loose rungs, splinters, sharp edges, oil, grease, mud, and other slipping hazards), the ladder must be immediately removed from service for repair or disposal. Tag defective ladders "Out of Service" and do not use them; notify your Branch Manager so that the ladder can be replaced or repaired. If the ladder cannot be repaired it must be labeled as broken or disassembled and then disposed of properly. GEI does not issue or permit the use of unsafe ladders.

1.5 Use of Ladders

- Ladders are to be used only for the purpose for which they were designed.
- Ladders will not be tied or fastened together to provide longer sections unless they are specifically designed for such use.
- Placement of a ladder will only be on a stable, level surface unless secured to prevent accidental displacement.
- Areas around the top and bottom of ladders will be kept clear of equipment and debris.
- Ladders used near exposed energized electrical equipment will have nonconductive side-rails.
- When climbing or descending a ladder the employee must face the ladder, maintain three points of contact, and not carry objects or use backpacks that may throw off balance and cause a fall.
- The top or top step of a ladder will not be used as a step or work surface.
- The second to top step will also not be used.
- Do not lean away from a ladder; stay centered on the ladder.

1.6 Use of Portable Ladders

A portable ladder is one that can be readily moved or carried. The two common types of portable ladders are extension ladders and stepladders.

- When using an extension ladder, the base of the ladder must be placed at a working angle of one quarter ($\frac{1}{4}$) of the working length of the ladder from the top support. For example: when using a 12-foot ladder, the base of the ladder must be 3-feet away from the structure.
- If an extension ladder is being used to access an upper landing surface, the ladder side rails must extend a minimum of 3 feet above the landing surface.
- If a stepladder is to be used, a metal spreader or locking device must be present and locked in place prior to use.
- The cross-bracing on the rear section of the stepladder will not be used for climbing unless the ladder is designed and steps are provided for climbing on both the front and rear sections.
- The top or top step of a stepladder will not be used as a step or work surface.
- The second to top step will also not be used.
- If a structural defect in the ladder is observed (e.g., cracks, loose rungs, slivers, sharp edges, oil, grease, mud, and other slipping hazards), the ladder must be immediately

removed from service for repair or disposal. Tag defective ladders “Out of Service” and do not use them; notify your Branch Manager so that the ladder can be replaced or repaired. If the ladder cannot be repaired it must be labeled or disassembled and then disposed of properly. GEI does not issue or permit the use of unsafe ladders.

1.7 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.8 Limitations

Follow safety procedures as defined in the site-specific HASP.

1.9 References

OSHA 29 CFR 1926.1053 – Subpart X; *Stairways and Ladders*

OSHA Construction eTool - <http://www.osha.gov/SLTC/etools/construction/falls/4ladders.html>

1.10 Attachments

None

1.11 Contact

Health&SafetyTeam@geiconsultants.com

1.12 Review History

- June 2016
- May 2014
- November 2013
- August 2011
- October 2010

STANDARD OPERATING PROCEDURES

SOP No. HS-012 Noise Exposures

1.1 Objective

This Standard Operating Procedure (SOP) is intended for use by employees engaged in work with elevation noise levels. The site-specific health and safety plan (HASP) should include a hazard assessment for the project that identifies the potential for work in loud environments and the control methods to be implemented by GEI employees. These hazards should be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.2 General

Working in loud environments can cause hearing damage and loss if the proper protection is not in place. The following procedures describe methods to mitigate unhealthy noise levels and protect hearing.

1.3 Hazard Identification

If projects involve noise levels above OSHA regulations, employees should take steps to remove the noise exposure. Common sources of elevated noise levels are heavy equipment, power tools, pumps, and generators. GEI has an established Hearing Conservation Program located in the GEI Health and Safety Program.

1.4 Risk Identification

Hearing protection is required if noise levels in a work area are known to be above 85 decibels (dB), which can be measured with a noise meter. When decibel levels are not known, hearing protection is required if you need to raise your voice to talk to someone standing within a normal speaking distance from you.

1.5 Mitigation

There are three options that can be used to help mitigate a noise hazard:

- 1.) Remove the hazard by taking away the source of the noise.
- 2.) Remove the employee from the source of the noise.
- 3.) Provide the employee with appropriate personal protective equipment (PPE).

The first option for employee protection is to remove the hazard by taking away the source of the noise or using engineering controls to reduce the level.

If this cannot be accomplished, the next control measure is to remove the employee from the source. This can be done by moving the work area to a quieter location or distancing the employee from the noise source. For example, GEI employees do not need to be standing next to an operating drill rig or other heavy equipment. By distancing themselves from heavy equipment or other noise sources the need for hearing protection can be eliminated/reduced.

The final option, if the above two options aren't feasible, disposable ear plugs that are made available to GEI employees are to be used. Additional means of hearing protection will be provided, such as ear muffs, if the disposable ear plugs are not adequate.

When using hearing protection, employees will need to make a greater effort to be aware of the surroundings which may include moving equipment, traffic, and other site hazards.

1.6 Proper Use of Hearing Protection

DISPOSABLE EAR PLUG FITTING INSTRUCTIONS

Before fitting any ear plugs, make sure your hands are clean.
Foam ear plugs are disposable and not intended for reuse.

Hold the ear plug between your thumb and forefinger. Roll and compress the entire ear plug to a small, crease-free cylinder. While still rolling, use your other hand to reach over your head and pull up and back on your outer ear. This straightens the ear canal, making way for a snug fit.



Insert the ear plug and hold for 20 to 30 seconds. This allows the ear plug to expand and fill your ear canal.



Test the fit. In a noisy environment, and with earplugs inserted, cup both hands over your ears and release. You should not notice a significant difference in the noise level. If the noise seems to lessen when your hands are cupped over your ears, your ear plugs are not fitted properly. Carefully remove the earplugs (see instructions below) and refit following instructions, above.



Always remove ear plugs slowly, twisting them to break the seal. If you remove them too quickly, you could damage your ear drum.



REUSABLE EAR PLUG FITTING INSTRUCTIONS

Before fitting any ear plugs, make sure your hands are clean.

Reusable ear plugs should be inspected and cleaned often in soapy water. If they become hard, torn, or deformed they should be discarded and replaced.

Reach around your head and pull up and back on your outer ear. This straightens out the ear canal, making way for a snug fit. Hold the stem end of the ear plug and insert it well inside your ear canal until you feel it sealing and the fit is comfortable.



Test the fit. In a noisy environment, and with ear plugs inserted, cup both hands over your ears and release. You should not notice a significant difference in the noise level. If the noise seems to lessen when your hands are cupped over your ears, your ear plugs are not fitted properly. Carefully remove the ear plugs (see instructions below) and refit following instructions, above.



Always remove ear plugs slowly, twisting them to break the seal. If you remove them too quickly, you could damage your ear drum.



1.7 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety

Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, People Team, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.8 Limitations

Follow safety procedures as defined in the site-specific HASP. Appropriate PPE must be worn correctly to provide the intended level of protection.

1.9 References

OHSA 29 CFR 1910.95 – Occupational Noise Exposure

OHSA 29 CFR 1926.101 – Hearing Protection

Texas American Safety Company (TASCO)

1.10 Attachments

None

1.11 Contact

Health&SafetyTeam@geiconsultants.com

1.12 Review History

- June 2016
- May 2014
- November 2013
- February 2011
- November 2010

STANDARD OPERATING PROCEDURE

SOP HS-014 Utility Mark-out

1.1 Objective

This Standard Operating Procedure (SOP) provides guidance for utility mark-out procedures related to drilling, excavation, or other sub-surface or intrusive activities to avoid injury to GEI employees or property damage. This SOP is applicable when GEI is responsible for its operation or our subcontractor's operation for utility mark-out. A utility mark out is when paint, flags or other markers are put in place to identify the location of an underground utility.

Clients or local agencies may have additional requirements or procedures to mark out of utilities. If local utility mark-out procedures differ from those described within this SOP, applicable state or municipal regulations should be followed.

1.2 General

This SOP is intended for use by employees engaged in work with sub-surface or intrusive activities. The site-specific health and safety plan (HASP) should include a hazard assessment for the project that identifies the potential for subsurface hazards and the control methods to be implemented by GEI employees. These hazards should be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.2.1 Contractor/GEI Responsibilities

- The contractor or GEI employee will pinpoint each exploration area with white paint, flags, or stakes. personal protection equipment (PPE), including eye protection when using spray paint will be worn.
 - Exploration locations should be marked-out with sample identification number(s) and type of sample (e.g., boring, test-pit, or monitoring well).
 - The contractor compiles information about the work areas on a request form specified by the state utility mark-out program and submits it. Work area location maps can be sent to the utility mark-out program to clarify locations.
 - The mark-out program customer service representative will provide a mark-out ticket number and a list of utilities notified upon receipt of the request information. This information will be recorded on the GEI documentation form in Appendix B and/or in other project documents.
 - If known, the contractor or GEI employee will also notify non-member utility operators (e.g., apartment complexes, commercial complexes, railroads with communication cables, etc.).
-

1.2.2 Utility Mark Outs

- Utility companies or their sub-contractors will only mark-out, or clear, utilities under their responsibility. Generally, this means that they will only mark-out utilities within the public right-of-way up to private property boundaries. Information needed to determine the location of utilities on private properties will be requested from the property owner. This may include available property drawings or as-built figures. If this information is not available, additional non-intrusive surveys of the property may be required by a private utility locator to find underground utilities by using techniques such as ground penetrating radar (GPR).
- American Public Works Association (APWA) Uniform Color Code For Marking Underground Utility Lines are:
 1. **White** – Proposed Excavation
 2. **Pink** – Temporary Survey Markings
 3. **Red** – Electric Power Lines, Cables, Conduit and Lighting Cables
 4. **Yellow** – Gas, Oil, Steam, Petroleum, and Gaseous Material
 5. **Orange** – Communications, Alarm, Signal Lines, Cables or Conduit
 6. **Blue** – Water
 7. **Purple** – Radioactive Materials
 8. **Green** – Sanitary and Storm Sewers and Drain Lines

1.2.3 Utility Mark Out Review

- Before the intrusive work activities begin, the contractor or GEI employee will verify that each utility company has completed a utility location for the work area or the location has been cleared by a private locator and record this on the mark-out request information sheet.
- A visual survey of the project area will be done prior to the start of intrusive activities. This visual inspection will be done to identify signs, manholes, utility boxes, or other evidence of an underground utility is present and has been considered.
- The contractor or GEI employee can begin work on the scheduled work date and time if the utility operators have responded, taking care to find and preserve markings that have been made.
- Completed clearance documentation will be located on the excavation site during excavation activities and kept in project files.

1.2.4 Excavations

- When excavating near a buried utility, observe the approximate location around that utility.
- If exposing a utility, proper support and protection must be provided so that the utility will not be damaged.
- If the excavation work requires significant spans of the utility to be exposed, it is the contractor's responsibility to support the infrastructure (to prevent sagging or collapse) as needed. Contact the utility operator for support, guidance, or assistance.
- When the excavation is complete, provide proper backfill for utilities that have been exposed.
- Take care not to damage the conduit or protective coating of a utility. If the damage occurs, leave the damaged utility exposed and immediately call the utility owner.
- If a gas line is encountered, everyone will be evacuated according to the site evacuation procedures and the contractor must notify police, fire, and emergency personnel. No attempt should be made to tamper with or correct the damaged utility. All site personnel are to evacuate to the site's predetermined meeting point or a location a minimum of 300 feet away from the incident location.
- If the contractor needs to dig within the approximate location of a combustible, hazardous fluid, or gas line (natural gas, propane or gasoline), soft digging is required (hand digging, vacuum extraction) to a maximum depth of 5 feet. The approximate location is defined as 24 inches on either side of the designated center line of the utility if the diameter is not provided or 24 inches from each outside edge if the diameter is provided.

1.3 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Health & Safety Officer (RHSO).

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification and/or the receipt of the Incident Report Form, RHSO will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.4 Limitations

- Follow safety procedures as defined in the site-specific HASP. Appropriate PPE must be worn correctly to provide the intended level of protection.
- Mark-out notification time usually does not include holidays. Make sure holidays are considered and mark-out time is scheduled accordingly. Under no circumstances are intrusive activities allowed to be performed prior to the required mark-out.
- Do not use white paint if precipitation is eminent. Consider using stakes if snow is predicted.

1.5 References

Reference the website for the “Call Before You Dig – 811” for the utility mark-out agency for the state you working in prior to site work. If you have issues locating the appropriate agency, contact the Safety Team for assistance.

1.6 Attachments

Attachment A – Standard Utility Color Codes

Attachment B – GEI Utility Clearance Documentation Form

1.7 Contact

Health&SafetyTeam@geiconsultants.com

1.8 Review History

- June 2016
- May 2014
- November 2013
- February 2011
- November 2010

ATTACHMENT A**COLOR CODE FOR UTILITY MARKING**

(BASED ON 'THE AMERICAN PUBLIC WORKS ASSOCIATION' RECOMMENDATIONS AND
THE ANSI STANDARD Z-53.1 FOR SAFETY COLORS)

UTILITY	COLOR
PROPOSED EXCAVATION	WHITE
ELECTRIC POWER LINES, CABLES, CONDUIT AND LIGHTING CABLES	RED
POTABLE WATER	BLUE
STEAM, CONDENSATE, GAS OR OIL COMPRESSED AIR	YELLOW
TELECOMMUNICATIONS, ALARM OR SIGNAL LINES, CABLES OR CONDUIT	ORANGE
TEMPORARY SURVEY MARKINGS	PINK
SEWER AND STORM DRAINS	GREEN
CHILLED WATER, RECLAIMED WATER, IRRIGATION AND SLURRY LINES	PURPLE
OTHER	LIGHT BLUE

ATTACHMENT B

Utility Clearance Documentation

Please print clearly.

For more room, use back of page.

Client: _____

GEI Project Name & Number: _____

Site: _____

Excavation/Drilling Location ID: _____

Excavator/Driller: _____

GEI PM: _____ GEI Field Team Leader: _____

Utility Drawings Reviewed: _____

Provided By: _____ Reviewed By: _____

Utility Clearance Call Date: _____ Name of Utility: _____

Utility Clearance Call Date: _____ Name of Utility: _____

Utility Clearance Received from (utility & rep name): _____ Date: _____

Utility Clearance Received from (utility & rep name): _____ Date: _____

Company that completed clearance: _____ Date: _____

GEI Staff Responsible for Oversight: _____

Metal Detector Survey (yes/no): _____ Drilling Location Cleared by: _____

Contractor Name: _____ Company Name: _____

Contractor Signature: _____ Date: _____

GEI Staff Responsible for Oversight: _____

Private Location Clearance Required (yes/no): _____ Date: _____

Contractor Name: _____ Company Name: _____

Contractor Signature: _____ Date: _____

Methods used for utility location (i.e. GPR, electronic pipe location) _____

GEI Staff Responsible for Oversight: _____

Hand clearing Performed (yes/no): _____ Methods: _____ Date: _____

Contractor Name: _____ Company Name: _____

Contractor Signature: _____ Date: _____

GEI Staff Responsible for Oversight: _____

GEI Consultants, Inc. Representative (name & title): _____

GEI Consultants, Inc. Representative Signature: _____ Date: _____

Based upon the best available information, appropriate utility clearance procedures were performed for the invasive work specified. If client ordered site specific deviations from existing GEI utility clearance procedures, they are approved by the client signature below:

Client Representative (name & title): _____

Client Representative Signature: _____ Date: _____

GEI Consultants

STANDARD OPERATING PROCEDURES

SOP No. HS-015 Respirator Fit Test Procedure

1.1 Objective

The objective of this Standard Operating Procedure (SOP) is to standardize the respirator fit testing procedures performed by the GEI Safety Team members or their designees. Respirator fit testing will be performed in accordance to OSHA 29 CFR 1910.134(f)(1) – (8) and OSHA 29 CFR 1910.134 Appendix A. This SOP is not intended to fit test employees that will be using GEI supplied air respirators.

1.2 General

Based on an employee's role at GEI there might be times when the use of a full or half-faced air purifying respirator is required. These types of respirators have filters, cartridges, or canisters that remove contaminants from the air by passing the ambient air through the air-purifying element before it reaches the user. Information about respiratory protection can be found in GEI's Respiratory Protection Program, which can be found on the Safety page of the intranet.

Prior to GEI employees being required to use a respirator with a negative or positive pressure tight-fitting face piece, the employee must be medically cleared by a GEI-contracted occupational health physician. When an employee is cleared, the physician will provide a copy of the clearance form to the Corporate Health and Safety Officer (CHSO) who in turn will provide it to the employee. The employee must also be fit tested to determine the make, model, style, and size respirator that will be issued for use. GEI employees performing respirator fit testing procedures must be trained and approved by the CHSO and/or a Regional Health and Safety Officer (RHSO).

1.3 Required Equipment

The following equipment will be needed to perform respirator fit testing:

- A copy of this written GEI fit testing procedure.
- A fit testing kit consisting of a test hood, an accepted testing agent (i.e., saccharin, bitrex, isoamyl acetate [banana oil], and irritant smoke), nebulizers (device for producing a fine spray of liquid) to administer the test agent, and a copy of the Rainbow Passage or other reading material.
- A sufficient number of respirators and sizes. High Efficiency Particulate Air (HEPA) filters will be used for tests using saccharin, bitrex, or irritant smoke. A combination of organic vapor and HEPA filter will be used for tests using isoamyl acetate.
- A Respirator Fit Test Form (Attachment A).

1.4 Execution

1.4.1 Pre-Test Screening

Before an employee can be fit tested the following questions will be asked to make sure that the employee is able to wear a respirator:

- Certificate for Respirator Use. After an employee's annual physical they will be presented with a certificate for respirator use if they are deemed to have the necessary fitness level to don a respirator by the exam physician. Once an employee has this certificate they can be fit tested.
- Does the employee have medical conditions that may be aggravated by taking part in this fit test? Conditions may include allergies to the test agent(s) being used; neck or shoulder injuries; respiratory allergies; or a cold symptoms.
- Is the employee taking medications that are inhibiting their sensitivity to taste or smell?
- Has the employee had anything to eat, drink, or smoke within 30 minutes of the fit test? If so, delay the testing for 30 minutes.
- Can the employee demonstrate proper donning and doffing of the respirator and perform the user seal check? If not, the fit test examiner will demonstrate and review these actions.

After the user seal check has been completed, have the employee continue to wear the respirator for a 5-minute comfort assessment period.

If the employee passes the pre-test screening, proceed to the fit test.

1.4.2 Fit Testing

- With the respirator removed, check to see if the employee has sensitivity to the test agent being used. This is done by choosing one sensitivity test agent (saccharin, bitrex, or isoamyl acetate), and spraying (with a nebulizer) a mist onto the employee's tongue. If the agent can be detected, proceed with the fit test. If the employee cannot detect the test agent, a different agent may be needed. If the employee has an existing condition that does not allow them to detect a type of agent, a quantitative test may be required.
- Have the employee don the respirator and perform the user seal check.
- Place the test hood on the employee being tested.
- Using the nebulizer with the test solution, maintain an adequate concentration of aerosol inside the test hood by injecting 10-15 squeezes every 30 seconds.
- Instruct the employee to indicate if they can detect the testing agent at a point during the testing process.

- After the initial aerosol is injected into the test hood, instruct the employee to perform the following exercises for 60 seconds each.
 - Normal Breathing.
 - Deep Breathing; breathe slowly and deeply.
 - Turning Head from Side to Side; inhale at extreme positions at each side.
 - Moving Head Up and Down; inhale at the “up” position.
 - Jog in Place.
 - Normal Breathing.
 - Talking – Recite the Rainbow Passage, count backward from 100, or recite a memorized poem or song.
- Finally, remove the test hood from the employee and use irritant smoke to verify that the respirator seal is a good one. Introduce a small amount of irritant smoke around the seal of the face piece while the employee breathes normally to verify that the employee does not react to the smoke.
- If all of the above exercises were completed without the employee detecting the test agent, the test is successful. If the employee indicates that they detected the test agent, a different respirator must be tried and the entire procedure repeated.

1.5 Documentation

The attached fit test form will be used to document the fit testing; a copy will be given to the employee and a copy sent to Health&SafetyTeam@geiconsultants.com

1.6 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential

for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.7 Limitations

Only trained employees designated by the CHSO or RHSO may conduct respirator fit testing.

1.8 References

Occupational Safety and Health Administration Training Institute Education Center Respiratory Protection Course Manual, May 2003

Occupational Safety and Health Administration Respiratory Protection Standard
(29 CFR1910.134 (f)(1) –(8) and Appendix A

Allegro Industries Qualitative Fit Test Kit Instructions, Part No. 2040

1.9 Attachments

Respiratory Fit Test Form

The Rainbow Passage

1.10 Contact

Health&SafetyTeam@geiconsultants.com

1.11 Review History

- June 2016
- May 2014
- November 2013
- August 2011
- June 2009 at this time it was HS-024

Respiratory Fit Test Form

Name:

Respirator Manufacturer & Type:

Respirator Size:

Date:

Name of Tester:

Respirator Fit Testing

This fit testing has been conducted in compliance with OSHA 29 CFR 1910.134(f)(1)-(8) and OSHA 29 CFR 1910.134. Respirators are an effective method of protection against designated hazards when properly selected and worn. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the employee. Sometimes, employees may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. You should do the following:

1. Read and heed instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose cartridges certified for use to protect against the contaminant of concern. The National Institute for Occupational Safety and Health (NIOSH) or Mine Safety and Health Administration (MSHA) label or statement of certification should appear on the respirator or respirator packaging. Contact the RSHO or CHSO for new cartridges.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against or in atmospheres with less than 20.5% oxygen. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep your respirator in the storage bag supplied to you from the RSHO and put your name on the bag so that you do not mistakenly use someone else's respirator. Inspect your respirator daily when in use.

The Rainbow Passage

When the sunlight strikes raindrops in the air, they act as a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(Source: *The Rainbow Passage*, a public-domain text, can be found on page 127 of the 2nd edition of Grant Fairbanks' *Voice and Articulation Drillbook*. New York: Harper & Row.)

STANDARD OPERATING PROCEDURES

SOP No. HS-016 Traffic Hazard Management

1.1 Objective

The objective of this Standard Operating Procedure (SOP) is to prevent or limit the potential for GEI personnel to encounter traffic hazards during field activities.

1.2 General

This SOP is intended for use by employees engaged in work with the potential for traffic hazards. The site-specific health and safety plan (HASP) will include a hazard assessment for the project that identifies the potential for exposure to traffic hazards and the control methods to be implemented by GEI employees, including review or attainment of necessary permits, traffic control plans, and flagger/police detail requirements for the local jurisdiction. Routine checks of the work zone will be made to ensure there are adequate levels of protection. These hazards will be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.3 Traffic Hazard Management

Traffic Hazard Management is the process of identifying and managing the potential risks associated with the movement of traffic through, around, or past a work area. This Traffic Hazard Management SOP is designed to assist employees in identifying and managing these hazards. Work areas should be as safe as possible. It is the responsibility of GEI employees to follow the Traffic Hazard Management SOP and adhere to these safety standards. Safety is not negotiable.

Under no circumstances are GEI employees permitted to commence work in a situation that the employee believes or knows their health and safety, or the health and safety of others, is at risk.

Major risk factors for work site Traffic Hazard Management include:

- The speed of traffic moving through a work site.
- The distance and clearance between moving traffic, workers, vehicles and equipment, and over-head power lines.
- Traffic volume and vehicle composition.
- Nature and conditions at the work site and approaches to the work site.

- Other factors such as the time of day, sight distance, weather, presence of pedestrians, or cyclists, and the type of work being carried out.
- Other hazards in proximity to the work site (e.g., power lines, open excavations) that may have conflicting safety management measures that need to be considered when developing the HASP.

1.4 Site Preparation

The following management measures will be considered whenever working in traffic areas. In addition, remain aware of the amount of traffic around the working area. The work space should be large enough for the job to be completed safely. Check permit, traffic control plans, and flagger/police detail requirements for the local jurisdiction. Perform routine checks of the work zone to make sure there are adequate levels of protection.

1.4.1 Traffic Barriers and Warning Signs

GEI employees will comply with the U.S. Department of Transportation's (DOT) Manual on Uniformed Traffic Control Devices (MUTCD) and/or state regulations for temporary traffic barriers (cones, barriers) and sign placement when required for working in traffic areas. Clearly define the work site by placing traffic barriers around the work space to indicate the space that is needed to safely perform the work. The traffic barrier will help make the work site more visible to other workers, pedestrians, cyclists, and moving vehicles. Place traffic barriers in such a way as to give yourself and equipment adequate space to work within the barriers. OSHA suggests placing the first warning sign at a distance calculated to be 4 to 8 times (in feet) the speed limit (in MPH).

1.4.2 Adequate Light

Requirements for night conditions and work areas with poor visibility are similar to day requirements. However there are a number of additional things to consider, such as visibility of the work site to advancing traffic and sufficient lighting. OSHA requires lighting for workers on foot and equipment operators to be at least 5-foot-candles or greater.

Visibility of the work area can be increased by employing the following measures:

- Using parked vehicles hazard and flashing lights.
- Wearing reflective personal protective equipment (PPE), such as a safety vest, in good condition.
- Providing adequate lighting to illuminate the work area with lights positioned so that there is no glare to approaching drivers.
- Placing reflective advance warning signs and traffic barriers so that they are visible to road users.

1.4.3 Distance from the Nearest Traffic Lane

Work areas located along roadsides will have a minimum clearance as defined by DOT's MUTCD and/or state or local DOT regulations for traffic barrier and sign placement.

1.4.4 PPE

The proper PPE, as outlined in the project HASP, will be worn when appropriate. The color/type of safety vest will comply with site regulations.

1.5 Equipment Operation

Vehicles and heavy equipment operators should use a spotter when possible if it is necessary to drive in reverse to reduce risk of collision with oncoming traffic. If it is necessary to drive against the flow of traffic make sure this area is within the work zone and properly blocked off from oncoming traffic.

1.6 Pedestrian Safety

When working near pedestrian traffic, a safe alternate pedestrian route will be established. Refer to local regulations when establishing pedestrian walkways.

1.7 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Health & Safety Officer (RHSO).

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the RHSO will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.8 Limitations

Follow safety procedures as defined in the site-specific HASP, federal DOT, and local jurisdictions. Appropriate PPE must be worn correctly to provide the intended level of protection.

1.9 References

DOT's Manual on Uniformed Traffic Control Devices (2009 Edition)

Hazard Exposure and Risk Assessment Matrix for Hurricane Response and Recovery

Work: <https://www.osha.gov/SLTC/etools/hurricane/work-zone.html>

1.10 Attachments

None

1.11 Contact

Health&SafetyTeam@geiconsultants.com

1.12 Review History

- November 2016
- May 2014
- November 2013
- August 2011
- October 2010 Initially HS-027 Traffic Hazards

STANDARD OPERATING PROCEDURES

SOP No. HS-018 Working Around Heavy Equipment

1.1 Objective

The objective of this Standard Operating Procedure (SOP) is to prevent or limit the physical hazards when working around heavy equipment.

1.2 General

This SOP is intended for use by employees engaged in work with the potential for working near heavy equipment. The project site-specific health and safety plan (HASP) should include a hazard assessment for working near heavy equipment to be implemented by GEI employees. These hazards should be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.3 Heavy Equipment Precautions

Heavy equipment (e.g., excavators, backhoes, drill rigs, etc.), can present many physical hazards that can result in serious injury or death if the proper safety precautions are not followed. The following is a list of precautions to be aware of when working around heavy equipment:

- Wear appropriate personal protective equipment (PPE), including at a minimum reflective, high-visibility safety vest, hard hat, safety glasses, and steel/composite toe boots.
- Always keep your distance from moving equipment.
- Do not assume the operator knows where you are or where you are going.
- Make sure to make eye contact and receive acknowledgement of your presence with the operator.
- Avoid working near heavy equipment, but if unavoidable, communicate your location with the operators. If using hand signals, discuss the signals with the equipment operator prior to starting work.
- Watch for moving equipment. Construction sites can have a lot of activity and equipment may be moving in an unpredictable manner.
- Do not rely on back-up or other alarms. They may not be working or you may not hear them with the noise of other activities taking place in the area.
- Stay out of the swing radius of cranes, excavators, or other equipment that swings or rotates.
- Do not walk beside a moving vehicle, the vehicle may turn, slip, or the load may shift causing the vehicle to go off course.
- Do not ride on the outside of a moving equipment.

- Never walk under or stand too close to a load suspended by cranes or hoists.
- Do not walk behind a piece of equipment that is backing up without acknowledgment from the operator it is safe to proceed. If working next to heavy equipment is unavoidable, be aware of the hazards including pinch points and moving parts. Use a spotter to watch the work area for moving equipment.
- If necessary, ask the operator to stop equipment operation to perform your work tasks.
- Verify the location and operation of emergency shut-off devices on the equipment.
- Be aware of the fuels and chemicals associated with the equipment. Have a spill prevention and response plan in place that includes the appropriate containment materials (i.e., spill kit).
- Do not wear loose fitting clothing when working around moving equipment (i.e., drill rig augers).
- Do not operate heavy equipment.
- Do not use cellular telephones near operating equipment.

1.4 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.5 Limitations

Follow safety procedures as defined in the site-specific HASP. Appropriate PPE must be worn correctly to provide the intended level of protection.

1.6 References

OSHA 29 CFR 1926.600 – Subpart O; Motor Vehicles, Mechanized Equipment, and Marine Operations.

www.toolboxtopics.com/Construction/ (Viewed 10/16)

Caterpillar Safety – <http://safety.cat.com/> (Viewed 10/16)

1.7 Attachments

None

1.8 Contact

Health&SafetyTeam@geiconsultants.com

1.9 Review History

- October 2016
- May 2014
- November 2013
- August 2011
- October 2010

STANDARD OPERATING PROCEDURES

SOP No. HS-025 Manual Lifting

1.1 Objective

The purpose of this Standard Operating Procedure (SOP) is to identify and reduce potential work-related musculoskeletal disorder (WMSD) hazards. The SOP is intended to comply with state regulations and safe work practices developed by the Occupational Safety and Health Administration (OSHA). Modifications to meet these requirements will be made to this program as changing laws or regulations dictate.

1.2 General

Lifting heavy items is one of the leading causes of injury in the workplace. Overexertion and cumulative trauma when lifting are significant factors for injuries. When employees use smart lifting practices and work in their “power zone”, they are less likely to suffer from back sprains, muscle pulls, wrist/elbow/spinal and other injuries caused by lifting heavy objects. Common things to consider prior to lifting an object are: weight of the object, awkward postures, high-frequency and long duration lifting, inadequate handholds, and physical/environmental factors.

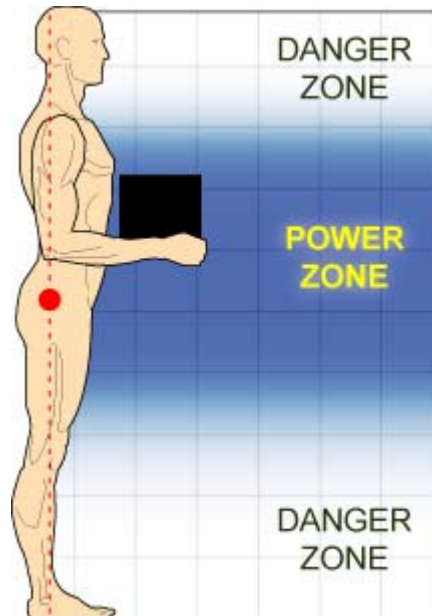


Figure 1: Lifting Power Zone

1.3 Safe Lifting Guidelines

The following safe lifting guidelines will be followed by employees involved in manual lifting activities:

- Before manual lifting is performed, a hazard assessment must be completed. The assessment must consider size, bulk, and weight of the object(s), if mechanical lifting equipment is required, if two-man lift is required, whether vision is obscured while carrying and the walking surface and path where the object is to be carried.
- Get a co-worker to help if equipment or other item is too heavy to lift.
- If possible, use powered equipment instead of manually lifting heavy materials. Lifting equipment such as dollies, hand trucks, lift-assist devices, jacks, or carts can be provided for employees.
- Reduce lifts from shoulder height and from floor height by repositioning the shelf or bin to closer to the power zone.
- Make sure walkways are clear of tripping hazards before moving materials.
- Use your legs and keep your back in a natural position while lifting. Keep the load close to your torso.



- Test the load to be lifted to estimate its weight, size, and bulk and to determine the proper lifting method.
- Do not twist while carrying a load. Instead, shift your feet and take small steps in the direction you want to turn.
- Make sure there are appropriately marked and sufficiently safe clearances for aisles and at loading docks or passageways where mechanical-handling equipment is used.
- Properly stack loose or unboxed materials which might fall from a pile by blocking, interlocking, or limiting the height of the pile to prevent falling hazards.
- Bags, containers, bundles, etc. should be stored in tiers that are stacked, blocked, interlocked, and limited in height so that they are stable and secure to prevent sliding or collapse.

- Storage areas should be kept free from accumulation of materials that could lead to tripping, fire, or explosion.
- Work methods and stations should be designed to minimize the distance between the person and the object being handled.

Supervisors should periodically evaluate work areas and employees' work techniques to assess the potential for and prevention of injuries. New operations should be evaluated to engineer out hazards before work processes are implemented.

1.4 Regulations

OSHA does not have a standard which sets limits on how much a person may lift or carry. They do however state that lifting loads heavier than about 50 pounds will increase the risk of injury.

The National Institute for Occupational Safety and Health (NIOSH) has developed a mathematical model that helps predict the risk of injury based on the weight being lifted and other criteria. The NIOSH model is based on previous medical research into the compressive forces needed to cause damage to bones and ligaments of the back. The mathematical model is incorporated in the *Applications Manual for the Revised NIOSH Lifting Equation*, which can be found on the NIOSH website (<http://www.cdc.gov/niosh/docs/94-110/>). It should be noted, however, that this NIOSH document provides only voluntary guidelines.

If there is a situation that arises where an employee is required to perform manual lifting on a reoccurring basis, the NIOSH Lifting Equation will be used to determine the appropriate weight that employee can safely lift. The lifting equation establishes a maximum load of 50 pounds for employees that are less likely to have to lift something, and don't have to do any long distance travel or maneuvering of the item. This 50 pounds is then adjusted to account for:

- how often the employee is lifting
- twisting the back during lifting
- the vertical distance the load is lifted
- the distance of the load from the body
- the distance the employee must move while lifting the load
- how easy it is to hold onto the load

GEI uses 50 pounds as a standard. However each individual should not attempt to carry loads heavier than they can safely manage.

1.5 Training

Training will include general principles of ergonomics, correct manual lifting techniques to avoid musculoskeletal injuries, recognition of hazards and injuries, procedures for reporting hazardous conditions, and methods and procedures for early reporting of injuries.

1.6 Lifting Assistance

If employees are assigned a task that involves repetitive lifting and carrying of equipment the Safety Team and Project Manager should be contacted to conduct an ergonomic evaluation. The task should be discussed to determine if there is an alternative method that can be used. The alternative method should institute an engineering or administrative control to reduce/limit the amount of lifting that is required of the employee. Some examples include providing smaller containers to reduce the weight of what needs to be lifted; providing a device that helps carry awkwardly-shaped objects easier; or using a winch, fork lift, or other device to lift the item(s) for the employee.

1.7 Injury Reporting

Injuries experienced during manual lifting activities should receive prompt medical attention. If a GEI employee suffers an injury on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Health and Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health & Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future musculoskeletal injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.8 Limitations

Follow safety procedures for manual lifting.

1.9 References

OSHA Technical Manual (OTM), Section VII: Chapter 1 - Back Disorders and Injuries
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=29936 (Viewed 7/12/2016)
<https://www.osha.gov/SLTC/etools/electricalcontractors/materials/heavy.html> (Viewed 7/12/2016)

1.10 Attachments

None

1.11 Contact

Health&SafetyTeam@geiconsultants.com

1.12 Review History

- July 2016
- August 2014

STANDARD OPERATING PROCEDURES

SOP NO. HS-026 Hazard Identification and Management

1.1 Objective

This Standard Operating Procedure (SOP) is intended to outline the steps GEI employees will take to identify potential hazards on site, the risks associated with these hazards, and the proper engineering controls, work practices, and personal protective equipment (PPE) to use to minimize the associated risks.

1.2 Hazard Identification

Establishing proper work procedures by conducting a job hazard analysis will should be performed for all projects involving field work. An initial identification of hazards will be completed based on past and current property usage of the site, what tasks are required to perform the job, what equipment is needed to complete the assigned tasks, what hazards are in the working area etc.

The site-specific health and safety plan (HASP) will include a hazard assessment for the project that identifies the potential hazards and how to alleviate the hazard. These hazards will be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.3 Risk Assessment

A risk assessment will be performed for all aspects of field work. This analysis is to determine the quantitative or qualitative value of risk related to a tangible situation and a recognized hazard. Identification, studies, and monitoring of any hazard to determine its potential, origin, characteristics, and behavior are examples of what could be included and performed during a risk assessment. The assessment will increase awareness of workplace hazards and provide an opportunity to identify and control workplace hazards.

1.3.1 Assessment Guidelines

It is necessary to consider certain general guidelines for assessing the foot, head, eye and face, and hand hazard situations that exist in an occupational operation or process, and to match the protective devices to the particular hazard.

Assessments should be conducted:

- Prior to starting any work at the site
- As conditions change
- Workplace layout changes
- Environmental changes
- Process changes

- Yearly or other pre-determined interval

1.3.2 Hazard Sources

Some examples of hazard sources include but are not limited to:

- Items, materials, or machinery in motion
- Extreme temperatures
- Chemical exposures
- Harmful dust
- Light radiation
- Falling objects or potential from dropping objects
- Sharp objects
- Rolling or pinching objects
- Layout of workplace and location of co-workers
- Electrical hazards
- Noise exposures
- Confined spaces
- Working near or on water
- Fall hazards
- Traffic or other activities taking place on the site
- Air quality issues

1.4 Prevention – Control Methods

Control methods should be considered in the following hierarchy:

- Elimination
- Substitution
- Engineering Controls
- Administrative Controls
- Personal Protective Equipment

1.4.1 Elimination and Substitution

Elimination and substitution, while most effective at reducing hazards, also tend to be the most difficult to implement in an existing process. If the process is still at the design or development stage, elimination and substitution of hazards may be inexpensive and

simple to implement. For an existing process, major changes in equipment and procedures may be required to eliminate or substitute for a hazard. Employees should work with the Safety Team to find solutions.

1.4.2 Engineering Controls

Engineering controls are used to remove a hazard or place a barrier between the work and the hazard. It's implemented to control the hazard at the source. Examples may include machine guards, sound deadening/dampening panels, traffic barriers, guardrails, and shields.

1.4.3 Administrative Controls

Administrative controls change the work procedures such as programs, schedules, and supervision to reduce employee exposure to hazards. The controls are frequently used with existing processes where hazards are not particularly well controlled. Examples of administrative controls are requiring frequent breaks or implementing a specific method to perform a task.

1.4.4 Personal Protective Equipment Selection

To select the proper PPE, the potential hazards must be known. The protective equipment selected must ensure a level of protection *greater than* the minimum required in order to help protect employees. The user must be supplied with a properly fitting protective device and given instructions on care and use. Users must be aware of all warning labels for and limitation of the PPE. Employees must be aware that the PPE does not eliminate the hazard.

1.4.5 Hazard Re-Assessment

As necessary, the workplace should be re-assessed for hazards by identifying and evaluating new equipment and processes, reviewing accident records, and re-evaluating the suitability of previously selected PPE. Re-assessment should occur at a defined regular schedule interval.

1.5 Job Safety Analysis

A job safety analysis (JSA) sometimes referred to as a job hazard analysis (JHA) or an activity hazard analysis (AHA) is the breaking down of any method or procedure into its component parts to determine the hazards connected with each key step and the requirements for performing it safely.

When a JSA is being created, make sure it isn't too general where the resulting information is not enough to assess the hazard and select proper controls, and be careful not to add unnecessary steps.

1.6 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threatening, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Health & Safety Officer (RHSO).

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the RHSO will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.7 Limitations

Limitations may arise on a project specific basis and will be addressed as they arise.

1.8 Attachments

None.

1.9 References

Risk Analytics, LLC Hazard Assessment Training Program, January 2011

1.10 Contact

Health&SafetyTeam@geiconsultants.com

1.11 Review History

- November 2016
- June 2015

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TO ACCOMPANY PROJECT HASPs and DISCUSS WITH PROJECT TEAMS

Field work will continue to be performed so long as project sites are accessible, and the work can be performed safely. If you have a question about project or site accessibility, ask the GEI project manager and/or client contact about whether there are any access restrictions in place. If your project is suspended, contact your project manager and branch manager to discuss other assignments.

While working in an outdoor environment is better than enclosed areas, the primary precautions we need to continue to take are distancing and good hygiene.

1.0 COVID-19 and Symptoms

DO NOT report to work if you are sick.

- If you experience a fever or symptoms associated with COVID-19 (fever, cough, shortness of breath), stay at home and contact your licensed healthcare provider.
- If you, a household member, or someone you have come into first-hand contact with someone who has a confirmed COVID-19 diagnosis, **DO NOT** come to work.
- If you have tested positive for COVID-19, **DO NOT** come to work even if you are not experiencing any symptoms of illness.

2.0 Reporting

GEI has developed two reporting applications (APPs) for employees to use when reporting COVID-19 symptoms, exposures, or positives tests and for completing daily COVID-19 screening when working in a GEI office or project location. These APPs are available to download to your smartphone (instructions can be found on the [GEI COVID-19 Response Page](#)) or can be used from the GEI COVID Response SharePoint and MS Teams platforms.

2.1 COVID-19 Reporting

If you experience COVID-19 related symptoms, have been in close contact with someone with COVID-19 or have tested positive for COVID-19 yourself, complete the COVID-19 Reporting APP after you have contacted your licensed healthcare provider. After submitting information into the reporting app, you will be contacted by a member of the Contact Tracing Team to discuss your situation and provide direction on where to locate appropriate care or testing facilities and discuss return to work timeframes based on the recommendations from the licensed healthcare provider, the continued monitoring of your health, results of COVID-19 tests (if administered), and the information described in Section 3.5. If your project has specific COVID-19 reporting requirements, these will need to be followed in addition to GEI's reporting.

When an employee tests positive for COVID-19 and has been in an office space, deep-cleaning procedures will be triggered.

Employees who have been in direct or indirect contact with an individual who has tested positive for COVID-19 a member of the People Team will be in contact to notify you of the potential exposure and provide guidance.

2.2 Daily Screening/Check In

If you will be working at a GEI office, project location, or another location other than your home you must complete GEI's Daily Check In screening. This is done using the Check In APP and is to be done each day before you enter the work location.

The Check In APP will require you to respond to three screening questions:

- Do you have a cough, shortness of breath or difficulty breathing OR a fever above 100 degrees?
- Do you have any TWO of the following symptoms: chills, repeated shaking with chills, muscle pain, headache, sore throat, or new loss of taste or smell?
- Have you been exposed to, or tested positive for COVID-19?

Answering yes to any of these questions will prompt you to not enter the workplace and contact your healthcare provider. A member of GEI's Contact Tracing Team will contact you following this submission. Answering no to all of these questions will allow you to safely proceed to work.

The APP automatically will check you into the home office location you are assigned. If you are entering a place other than this office, type in the location and click submit.

2.3 Project-Specific Monitoring/Screening

Clients, general contractors, or projects may have screening procedures in addition to those provided in this document. Understand what these are and what you will need to be able to follow them before arriving at the project site and performing work. In addition to understanding these procedures, plan for the additional time that may be needed to meet these requirements.

If you observe a person on a project site showing COVID-19 symptoms, regardless of whether it is the client, a contractor, or a visitor onsite, **immediately** notify the site manager and your project manager/supervisor.

3.0 Distancing & PPE

COVID-19 spreads from person-to-person primarily through droplets that are emitted from the initial person to a distance of 6 feet.

- Maintain a distance of at least **6 feet (2 meters)** from others. This includes during site meetings and breaks and while performing work tasks. Meetings should be held outside or by phone/video.
- Minimize the number of employees in one location to the extent possible. Follow local restrictions for maximum number of people congregated in one location at a time.
- If tasks need to be performed close to others (within 6 feet) and that cannot be avoided, wear appropriate PPE including a face mask (surgical or cloth), gloves, and eye protection.

NOTE: Face masks are not a substitute for distancing. Masks are meant to protect others in case you are infected. Contact the Safety Team (safetyteam@geiconsultants.com) to discuss any special circumstances and the PPE needed.

- Wear nitrile gloves as much as practicable and change them frequently. As practicable, wash your hands or use sanitizer between glove changes. Wash your hands after wearing gloves.
- Minimize and stagger time in office spaces to performing essential duties such as picking up and dropping off equipment and samples. If you need to spend more time in a project office (e.g., a construction trailer), it's important that the workspace allows for proper social distancing.
- When traveling to project sites, travel in separate vehicles. Do not travel in the same vehicle.

4.0 Hygiene Practices

Practice the following:

- Frequent hand washing with soap and warm water for 20 seconds, especially after being in a public place, or after blowing your nose, coughing or sneezing. Bringing containers of water and soap with you is a good solution if it isn't present at the project site. If soap and water are not readily available, use hand sanitizer (containing 60% alcohol) until soap and water can be used.

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- Cover coughs or sneezes with a tissue, then dispose of the tissue in the trash and wash hands. Cough/sneeze into your elbow if a tissue is not available.
- Avoid touching your face with your hands.
- Restroom availability may be limited. Many public locations are now closed or do not allow access into buildings. Identify accessible restrooms prior to beginning work. If unavailable, portable restrooms should be considered.
- When filling water bottles (for drinking or hand washing) keep the bottle away from the spigot to avoid transfer of germs or contaminants. Do not share water bottles.
- Wipe down surfaces with disinfectant routinely (at least once per day). This includes field equipment and other items that may have been used by others. This is especially important while working in construction trailers. When using company and personal vehicles, wipe surfaces including the steering wheel, gear shifter, controls, and door handles ***before and after*** use.
- Handshaking, hugging, or other personal contact to greet others is prohibited. Use greeting from a distance such as a wave.
- Avoid sharing field equipment and other materials with others. Before using field equipment or putting it away, wipe it down with disinfectant or wash it with soap and water. Take extra caution using disinfectants while collecting environmental samples to ensure that the samples are not compromised.
- Do not share PPE including personal hand sanitizer dispensers. Use best practices to minimize contact when using publicly shared dispensers.

More detail on ways to protect yourself through distancing and hygiene can be found at MIT Medical's website: <https://medical.mit.edu/three-ways-to-protect>

5.0 Use of Public Places

- If your project requires you to stay in a hotel, practice the disinfecting precautions described above.
- If you will be eating food/drinks, order take-out or use delivery services at restaurants. Wash your hands before eating.
- Minimize the use of public transportation traveling to and from project sites. Use your personal vehicle (preferred), GEI vehicle, or a ride service such as Lyft.
- If you have concerns, discuss them with the project manager, your supervisor, branch manager, and/or with your Regional Safety Manager (RSM) or with Steve Hawkins, Safety Director.

6.0 Resources

Additional information can be found through the resources below:

- Centers for Disease Control and Prevention (CDC)_
<https://www.cdc.gov/coronavirus/2019-ncov/index.html>
- Public Health Agency of Canada
<https://www.canada.ca/en/public-health/services/diseases/coronavirus-disease-covid-19.html>
- Provincial and Local Agency Resources_
<https://www.ontario.ca/page/2019-novel-coronavirus#section-0>
- World Health Organization_
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

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7.0 Notifications and Concerns

The precautions included in this guidance and in other GEI's employee communications should be practiced at all project site locations and offices. While COVID-19 related information is not expected to be reported through GEI's incident reporting process, the expectation is that all employees will communicate any inconsistencies or concerns with practices at project sites to their project manager, supervisor, branch manager, and RSM. This will allow us to make corrections/updates and provide proper protective measures.

Information about preventing COVID-19 exposure is changing regularly. The information included in this guide are general steps we can take while performing field assignments and should be included in HASPs and safety briefings. If you have specific situations, questions, or concerns please discuss them with the Project Manager, your RSM, or Steve Hawkins.

APPENDIX 4

VAPOR BARRIER MANUFACTURER SPECIFICATIONS



Stego® Wrap 20-Mil Vapor Barrier

STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00, 03 30 00

1. Product Name

Stego Wrap 20-Mil Vapor Barrier

2. Manufacturer

Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description

USES: Stego Wrap 20-Mil Vapor Barrier is used as a below-slab vapor barrier, and as a protection course for below grade waterproofing applications.

COMPOSITION: Stego Wrap 20-Mil Vapor Barrier is a multi-layer plastic extrusion manufactured with only the highest grade of prime, virgin, polyolefin resins.

ENVIRONMENTAL FACTORS:

Stego Wrap 20-Mil Vapor Barrier can be used in systems for the control of soil gases (radon, methane), soil poisons (oil by-products) and sulfates.

5. Installation

UNDER SLAB: Unroll Stego Wrap 20-Mil Vapor Barrier over an aggregate, sand or tamped earth base. Overlap all seams a minimum of six inches and tape using Stego Tape or Crete Claw® Tape. All penetrations must be sealed using a combination of Stego Wrap and Stego accessories.

For additional information, please refer to Stego's complete installation instructions.

6. Availability & Cost

Stego Wrap 20-Mil Vapor Barrier is available nationally via building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' sales department.

7. Warranty

Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are

accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance

None required.

9. Technical Services

Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or via the website.

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGO WRAP 20-MIL VAPOR BARRIER

PROPERTY	TEST	RESULTS
Under Slab Vapor Retarders	ASTM E 1745 Class A, B & C – Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs	Exceeds Class A, B & C
Water Vapor Permeance	ASTM F 1249 – Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor	0.0071 perms
Puncture Resistance	ASTM D 1709 – Test Methods for Impact Resistance of Plastic Film by Free-Falling Dart Method	3500+ grams*
Tensile Strength	ASTM D 882 – Test Method for Tensile Properties of Thin Plastic Sheeting	97.7 lbf/in.
Permeance After Conditioning (ASTM E 1745 Sections 7.1.2 - 7.1.5)	ASTM E 154 Section 8, F 1249 – Permeance after wetting, drying, and soaking ASTM E 154 Section 11, F 1249 – Permeance after heat conditioning ASTM E 154 Section 12, F 1249 – Permeance after low temperature conditioning ASTM E 154 Section 13, F 1249 – Permeance after soil organism exposure	0.0088 perms 0.0081 perms 0.0084 perms 0.0077 perms
Thickness	ACI 302.1R-04 – Minimum Thickness (10 mils)	20 mils
Roll Dimensions		14 ft. wide x 105 ft. long or 1,470 ft ²
Roll Weight		140 lbs.

Note: perm unit = grains/(ft² *hr* in.Hg)

* The material maxed out the testing equipment and did not fail at 3746 grams.

