

SUTPHIN PLAZA HOTEL

QUEENS, NEW YORK

Remedial Action Work Plan

NYC VCP Site Number: 14CVCP258Q

OER Project Number: 14EHAN169Q

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REMEDIAL ACTION WORK PLAN

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LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AS/SVE	Air Sparging/Soil Vapor Extraction
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
C/D	Construction/Demolition
COC	Certificate of Completion
CQAP	Construction Quality Assurance Plan
CSOP	Contractors Site Operation Plan
DCR	Declaration of Covenants and Restrictions
ECs/ICs	Engineering and Institutional Controls
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
BCA	Brownfield Cleanup Agreement
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYC BCP	New York City Brownfield Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
NYCRR	New York Codes Rules and Regulations
NYC OER	New York City Office of Environmental Remediation
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
ORC	Oxygen-Release Compound
OSHA	United States Occupational Health and Safety Administration

PE	Professional Engineer
PID	Photo Ionization Detector
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan or Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design
RI	Remedial Investigation
RMZ	Residual Management Zone
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVOC	Semi-Volatile Organic Compound
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

CERTIFICATION

I, Ravi K. Korlipara, Ph.D., P.E., am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the Sutphin Plaza Hotel Site; NYC VCP Site Number 14CVCP258Q.

I, Victoria D. Whelan, am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the Sutphin Plaza Hotel Site; NYC VCP Site Number 14CVCP258Q.

I certify that this Remedial Action Work Plan (RAWP) has a plan for handling, transport and disposal of soil, fill, fluids and other materials removed from the property in accordance with applicable City, State and Federal laws and regulations. Importation of all soil, fill and other material from off-Site will be in accordance with all applicable City, State and Federal laws and requirements. This RAWP has provisions to control nuisances during the remediation and all invasive work, including dust and odor suppression.

Ravi K. Korlipara

Name

070038

NYS PE License Number

Ravi K. Korlipara
Signature

5/13/15

Date



Victoria Whelan
QEP Name

Victoria Whelan
QEP Signature

5/14/15

Date

#00140003



EXECUTIVE SUMMARY

Sutphin Plaza Hotel, LLC, has applied to the New York City Voluntary Brownfield Cleanup Program (NYC VCP) to investigate and remediate a 9,202-square foot site located at 93-94 Sutphin Blvd in Queens, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms to applicable laws and regulations.

Site Location and Current Usage

The Site is located at 93-43 Sutphin Blvd in Downtown Jamaica of Queens, New York and is identified as Block 9998 and Lot(s) 42, 43, 47, 48 and portions of 52 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 9,202-square feet and is bounded by the Long Island Rail Road to the north, 94th Avenue to the south, a commercial property to the east, and Sutphin Boulevard to the west. A map of the Site boundary is shown in Figure 2. Currently, the Site is used as a marketing center and contains a one story building with a basement on Lots 42, 43, and 47 with MTA storage on Lots 48 and 52.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of a transient franchise hotel with approximately 239 rooms in general. The building will be 27-stories tall and contain about 140,513 gross square feet. It will house a cellar, sub-cellar and a sub-sub cellar with building services, meeting rooms, and automated parking. A lobby and restaurant will be at ground level.

Layout of the proposed site development is presented in Appendix 2. The current zoning designation is C6-4 within Special Downtown Jamaica District. The proposed use is consistent with existing zoning for the property.

Redevelopment plans will include demolition of the current structure on the property followed by excavation of soils.. Since excavation for construction will be performed to a depth

of 35 feet and groundwater has been detected at 21 feet, excavation will extend into the saturated groundwater zone and, therefore, dewatering will be a necessary part of the construction process.

Summary of the Remedy

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. Preparation of a Community Protection Statement and performance of all required NYC VCP citizen participation activities according to an approved Citizen Participation Plan.
2. Performance of a community air monitoring program (CAMP) for particulates and volatile organic compounds (VOCs).
3. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency of one composite sample per 800 to 1,000 (approximate) cubic yards of material to be excavated as per disposal facilities requirements. A Waste Characterization Report documenting sample procedures, location, analytical results shall be submitted to NYCOER prior to the start of the remedial action.
4. Establishment of Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
5. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
6. Excavation and removal of soil/fill exceeding Track 1 SCOs. The entire property will be excavated to depths of approximately 35 feet below grade. Approximately, 15,000 tons of soils will be excavated and removed from this site.

7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a photoionization detector (PID).
8. Management of excavated materials including temporarily stockpiling and segregating to prevent co-mingling of contaminated material and non-contaminated materials as described in Appendix E.
9. Removal of underground storage tanks (if encountered during excavation) and closure of petroleum spills, if encountered, in compliance with applicable local, State and Federal laws and regulations.
10. Transportation and off-site disposal of soil/fill material at facilities in accordance with all applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities.
11. Collection and analysis of confirmatory samples above the groundwater in the native sand to determine the performance of the remedy with respect to attainment of SCOs.
12. Import of materials to be used for backfill in compliance with this plan and in accordance with applicable laws and regulations.
13. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements for extracted groundwater, in compliance with applicable laws and regulations. Since groundwater is at a depth of 21 feet below ground surface, dewatering is required and dewatering permits will be obtained from NYCDEP, including submission of dewatering and sampling plans, and pretreatment design details, as required for this purpose.
14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
15. Maintenance of records as described in this RAWP, including waste disposal manifests, clean fill/top soil sampling results, and appropriate health and safety forms and documentation.

16. Submission of a Remedial Action Report (RAR) that describes remedial activities, certifies remedial requirements have been achieved, and if Track 1 SCOs are not achieved, describes all ECs and ICs to be implemented at the Site, and lists any deviations from this RAWP.

If Unrestricted Use (Track 1) SCOs are not achieved, the following construction elements will be implemented as Engineering and Institutional Controls:

17. As part of development, since construction will extend below the water table to a depth of 35 feet, installation of a waterproofing system / vapor barrier beneath the building slabs and behind the foundation sidewalls of the proposed building.
18. As part of development, construction and maintenance of an engineered composite cover consisting of a concrete building slab to prevent human exposure to residual soil/fill remaining at the Site.
19. As part of development, installation of a sub-grade air exchange and ventilation system in the parking cellar in accordance with the NYC Building and Mechanical Codes, as applicable, and any pertinent indoor air quality standards;
20. Submission of an approved Site Management Plan (SMP) in the RAR 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; 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 Office of Environmental Remediation created the New York City Voluntary Cleanup Program (NYC VCP) to provide governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action Work Plan (“cleanup plan”) describes the findings of prior environmental studies that show the location of 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.

Remedial Investigation and Cleanup Plan. Under the NYC VCP, a thorough cleanup 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 identify contaminant sources present on the property. The cleanup plan has been designed to address all contaminant sources that have been identified during the study of this property.

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

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

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

Site Safety Coordinator. This project has a designated Site safety coordinator to implement the Health and Safety Plan. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is Tom Brown and can be reached at (516)576-8844.

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 include 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 NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager Victoria Whelan at 516-576-8844 or NYC Office of Environmental Remediation Project Manager Eric Ilijevich at (212) 788-8841.

Quality Assurance. This cleanup plan requires that evidence be provided to illustrate that all cleanup work required under the plan has been completed properly. This evidence will be summarized in the final report, called the Remedial Action Report. This report will be submitted to the NYC Office of Environmental Remediation and will be thoroughly reviewed.

Storm-Water Management. To limit the potential for soil erosion and discharge, this cleanup plan has provisions for storm-water management. The main elements of the storm water 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 are 7am to 4pm and days of operation are Monday through Friday.

Signage. While the cleanup is in progress, a placard will be prominently posted at the main entrance of the property with a laminated project Fact Sheet that states that the project is in the NYC Voluntary Cleanup Program, provides project contact names and numbers, and locations of project documents can be viewed.

Complaint Management. The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager Viral Patel at 732-642-6423, the NYC Office of Environmental Remediation Project Manager Eric Ilijevich at (212) 788-8841., or call 311 and mention the Site is in the NYC Voluntary Cleanup 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, odors 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 all 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-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 a Remedial Action Report) that will be available for you to review in the public document repository online. Access to the document repository is available at Queens Central Library, 89-11 Merrick Blvd., Jamaica, NY 11432, (718) 990-0700.

Long-Term Site Management. If long-term protection is required after the cleanup is complete, the property owner will be required if a Track 1 Cleanup has not been completed 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 in the property's deed or established through a city environmental designation. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved cleanup is still effective.

REMEDIAL ACTION WORK PLAN

1.0 SITE BACKGROUND

Sutphin Plaza Hotel, LLC, has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 93-43 Sutphin Blvd in Downtown Jamaica, Queens, New York (the “Site”). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) and site-specific Construction Health and Safety Plan (CHASP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 SITE LOCATION AND CURRENT USAGE

The Site is located at 93-43 Sutphin Blvd in Downtown Jamaica of Queens, New York and is identified as Block 9998 and Lot(s) 42, 43, 47, 48 and portions of 52 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 9,202-square feet and is bounded by the Long Island Rail Road to the north, 94th Avenue to the south, a commercial property to the east, and Sutphin Boulevard to the west. A map of the Site boundary is shown in Figure 2. Currently, the Site is used as a marketing center and contains a one story building with a basement on Lots 42, 43, and 47 with MTA storage on Lots 48 and 52.

1.2 PROPOSED REDEVELOPMENT PLAN

The proposed future use of the Site will consist of a transient franchise hotel with approximately 239 rooms in general. The building will be 27-stories tall and contain about 140,513 gross square feet. It will house a cellar, sub-cellar and a sub-sub cellar with building services, meeting rooms, and automated parking. A lobby and restaurant will be at ground level.

Layout of the proposed site development is presented in Appendix 2. The current zoning designation is C6-4 within Special Downtown Jamaica District. The proposed use is consistent with existing zoning for the property.

Redevelopment plans will include demolition of the current structure on the property followed by excavation of soils. The excavation depth is 35 feet for three sub-levels. Since groundwater has been detected at 21 feet, excavation will extend to the groundwater interface, therefore dewatering will be a necessary part of the construction process.

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

1.3 DESCRIPTION OF SURROUNDING PROPERTY

According to the OER's SPEED application the Site is bound by a building zoned C6-4 for industrial and manufacturing to the east, a vacant lot to the south, Jamaica Station (zoned M1-1) to the west, and a MTA lot and the LIRR (zoned M1-4 and C6-4 for transportation and utilities) to the north. There are no schools, day cares or hospitals within a 500-foot radius.

The Phase I ESA conducted in January 2013 identified the following surrounding property environmental information:

- A north adjacent property, addressed at 93-02 Sutphin Boulevard, was identified as a registered UST facility, RCRA Generator (no violations listed), ERNS site (involving 2008 train derailment; the nature and details of which do not suggest a significant concern) and NY Spill site. Spill No. 0650386 involved soil and groundwater contamination due to tanks; groundwater was flowing to the southwest. This spill is considered "active" by the NYSDEC.
- A west adjacent property, addressed at 93-50 Sutphin Boulevard, was identified as a former RCRA Generator (no violations listed), registered UST facility, US Historic Auto Station and LTANK spill site. Spill No. 9907900 involved soil contamination due to tanks and is considered "inactive" by the NYSDEC.

- A south adjacent property, listed as Warehouse and addressed at 94-01 Sutphin Boulevard, was identified as a registered AST facility.
- A west adjacent property, listed as Air Tran-Parking Lot, addressed at 144-27 94th Avenue, was identified as a registered AST facility.
- A southwest adjacent property, listed as Johnson Avenue Yard and addressed at 94th Street and Sutphin Boulevard, was identified as a NYSDEC listed Spills/Historic Spills site. Spill No. 0107538 involved the release of 50 gallons of hydraulic oil due to a hydraulic hose failure; this spill is considered “inactive” by the NYSDEC.

Zoning information has been collected from the OER Speed database and the Phase I ESA attached in Appendix B.

Figure 2 shows the surrounding land usage.

1.4 REMEDIAL INVESTIGATION

A remedial investigation was performed and the results are documented in a companion document called “*Remedial Investigation Report, Sutphin Plaza Hotel*”, dated April, 2014 (RIR).

Summary of Past Uses of Site and Areas of Concern

A Phase I ESA was performed on the Property in January 2013 by LCS Inc. The following recognized environmental conditions (RECs) were identified:

- According to the EDR report, the subject property was identified as an E-Designation site. This designation is described as being associated with a gasoline UST testing protocol, air quality (HVAC Fuel limited to natural gas) and window and wall attenuation and alternative ventilation.
- Railroad tracks have been located north adjacent to the subject property since at least 1901.
- A filling station was located west adjacent to the subject property from as least 1963 through 1967 and in at least 1985 and 1986.

- A north adjacent property, addressed at 93-02 Sutphin Blvd, was identified as a registered UST facility, RCRA generator (no violations listed), ERNS site (involving 2008 train derailment) and NY Spill site. Spill No. 0650386 involved soil and groundwater contamination due to tanks; groundwater was flowing to the southwest. This spill is considered “active” by the NYSDEC.
- A suspected west adjacent property, addressed as 93-50 Sutphin Blvd. was identified as a registered UST facility and US historical Auto Station site.

The Phase I ESA is included in Appendix B.

The RIR was based on a meeting with NYC OER, and the scope of the proposed redevelopment, CA RICH performed the following scope of work in accordance with the NYCOER approved Phase II Work Plan (Appendix 2):

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed eight soil borings across the Site, and collected fifteen soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed three groundwater monitoring wells on the Site and collected three groundwater samples for chemical analysis to evaluate groundwater quality;
4. Installed four soil vapor probes on Site and collected four samples for chemical analysis.

Summary of Environmental Findings

1. Elevation of the property is approximately 40 feet above mean sea level.
2. Depth to groundwater ranges from 22 to 25 feet below grade.
3. Groundwater flow is generally towards southeast beneath the Site.
4. Bedrock was not encountered at the Site.

5. The stratigraphy of the site, from the surface down, consists of native tan/brown medium grain sand with well-rounded pebbles.
6. Soil sample results were compared to NYSDEC Part 375-6 Unrestricted Use (Track 1) and Restricted Residential Use (Track 2) Soil Cleanup Objectives (SCOs). Soil samples showed that VOCs, PCBs and pesticides were all below detectable concentrations and did not exceed Unrestricted Residential Use SCOs for any soil sample. Seven SVOCs including benzo(a)anthracene (at 10 ppm), benzo(a)pyrene (at 9.8 ppm), benzo(b)fluoranthene (at 8.3 ppm), benzo(k)fluoranthene (at 8 ppm), chrysene (at 9.4 ppm), dibenzo(a,h)anthracene (at 1.5 ppm), and indeno(1,2,3-cd)pyrene (at 6.9 ppm) were detected above Restricted Residential Use SCOs within one shallow soil sample (SB-7). Metals including copper (max. of 84 ppm), mercury (max. of 0.19 ppm), lead (max. of 512 ppm) and zinc (max. of 239 ppm) were detected exceeding Unrestricted Use SCOs in one shallow boring (SB-7). Of these metals, lead also exceeded Restricted Residential Use SCOs. None of metals exceeded Restricted Commercial Use SCOs. Overall, soil chemistry was unremarkable and does not indicate any disposal conditions.
7. Groundwater samples collected were compared to NYSDEC 6NYCRR Part 703.5 Groundwater Quality Standards (GQS). The groundwater samples showed no detectable concentrations of pesticides or PCBs. Samples collected during the RI detected one VOC, methylene chloride (maximum of 5.3 µg/L) and one SVOC, Bis(2-ethylhexyl)phthalate (maximum of 20 µg/L), exceeding their respective GQS in one groundwater sample. Both of these contaminants are also known laboratory contaminant. Several metals were identified, but only barium (maximum of 1.18 mg/L) and manganese (max. of 0.422 mg/L) exceeded their respective GQSs.
8. Soil vapor samples collected during the RI were compared to the compounds listed in Table 3.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion. Soil vapor samples collected during the RI showed a wide range of VOCs at trace concentrations. Most compounds were detected at less than 20 µg/m³ except

for trichlorofluoromethane (max. of 77.6 $\mu\text{g}/\text{m}^3$). Chlorinated VOCs including 1,1,1-trichloroethane (TCA) (max. of 11 $\mu\text{g}/\text{m}^3$) and tetrachloroethylene (PCE) (max of 18 $\mu\text{g}/\text{m}^3$) were detected in soil vapor. Concentrations of TCA and PCE are below the monitoring ranges established by NYSDOH matrix and does not require any action.

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

2.0 REMEDIAL ACTION OBJECTIVES

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

Groundwater

- Prevent direct exposure to contaminated groundwater.

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.

Soil Vapor

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

3.0 REMEDIAL ALTERNATIVES ANALYSIS

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

1. Protection of human health and the environment;
2. Compliance with SCGs;
3. Short-term effectiveness and impacts;
4. Long-term effectiveness and permanence;
5. Reduction of toxicity, mobility, or volume of contaminated material;
6. Implementability;
7. Cost effectiveness;
8. Community Acceptance;
9. Land use; and
10. Sustainability.

The following is a detailed description of the alternatives analysis and remedy selection to address impacted media at the Site. As required, a minimum of two remedial alternatives (including a Track 1 scenario) are evaluated, as follows:

Alternative 1 would involve the following remedial actions:

- Establishment of 6NYCRR Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives.
- Removal of all soil/ fill exceeding Unrestricted Use (Track 1) SCOs throughout the Site and confirmation that Track 1 SCOs have been achieved with post-excavation endpoint sampling. Excavation for development purposes would take place to a depth of approximately 35 feet bgs. If soil/fill containing analytes at concentrations above Track 1

SCOs is still present after removal of soil required for construction, additional excavation will be performed to ensure complete removal of soil that does not meet Track 1 SCOs.

- No Engineering or Institutional Controls are required for a Track 1 cleanup, but a waterproofing/vapor barrier system would be installed beneath the building foundation and behind the foundation sidewalls of the new buildings as part of development to prevent any potential future exposures from off-Site soil vapor.
- Placement of a composite cover consisting of a concrete building slab over the entire site; and
- As part of new development, construction of a ventilated parking garage in accordance with NYC Building and Mechanical Code requirements, and any applicable indoor air quality standards.

Alternative 2 would involve the following remedial actions:

- Establishment of Site-specific (Track 4) SCOs.
- Removal of all soil/ fill exceeding Track 4 Site-specific SCOs and confirmation that SCOs have been achieved with post-excavation endpoint sampling. Excavation for development purposes would take place to a minimum depth of approximately 35 feet bgs.
- Construction of a ventilated parking garage in accordance with NYC Building and Mechanical Code requirements, and any applicable indoor air quality standards.
- Installation of a waterproofing/vapor barrier membrane.
- Placement of a final composite cover system consisting of the building slab over the entire site to prevent exposure to remaining soil/fill;
- Establishment of use restrictions including prohibitions on the use of groundwater from the site and prohibitions on sensitive site uses, such as farming or vegetable gardening, to eliminate future exposure pathways.

- Establishment of an approved Site Management Plan (SMP) to ensure long-term management of engineering and institutional controls (EC/ICs) including the performance of periodic inspections and certification that the controls are performing as they were intended. SMP will note that the property owner and property owner's successors and assigns must comply with the approved SMP; and
- Continued registration as an E-designation property to memorialize the remedial action and the Engineering and Institutional Controls required by this RAWP.

3.1 THRESHOLD CRITERIA

Protection of Public Health and the Environment

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

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

Alternative 2 would achieve comparable protections of human health and the environment by removing most contaminated soil/fill and by ensuring that remaining soil/fill on-Site meets Track 4 Site Specific SCOs as well as by placement of Engineering and Institutional Controls (EC/ICs) including a composite cover system. The composite cover system would prevent direct contact with any remaining soil/fill. Implementing ICs including a Site Management Plan and continued "E" designation of property would ensure that the composite cover system remains intact and protective. Establishment of Track 4 Site Specific SCOs would minimize the risk of contamination leaching into groundwater.

For both Alternatives, potential exposure to contaminated soils and groundwater during construction would be minimized by implementing a Construction Health and Safety Plan, an approved Soil and Materials Management Plan and Community Air Monitoring Plan (CAMP). Potential future migration of off-Site vapors into the new building would be prevented by a ventilated parking garage as well as, by installing a vapor barrier/waterproofing system beneath the new building's basement slab and continuing the vapor barrier around foundation walls.

3.2. BALANCING CRITERIA

Compliance with Standards, Criteria and Guidance (SCGs)

This evaluation criterion assesses the ability of the alternative to achieve applicable standards, criteria and guidance. Alternative 1 would achieve compliance with the remedial goals, chemical specific SCGs and RAOs for soil through removal of soil to achieve Track 1 Unrestricted Use SCOs and groundwater protection standards. Compliance with SCGs for soil vapor would also be achieved by ventilated sub-grade parking garage as well as by installing a vapor barrier/waterproofing system beneath the new building's basement slab and continuing the vapor barrier around foundation walls as part of new development.

Alternative 2 would achieve compliance with the remedial goals, chemical specific SCGs and RAOs for soil through removal of soil to achieve Track 4 Site Specific SCOs. Compliance with SCGs for soil vapor would also be achieved by installing a sub-grade ventilated parking garage as well as by installing a vapor barrier/waterproofing system beneath the new building's basement slab and continuing the vapor barrier around foundation walls. A Site Management Plan would ensure that these controls remained protective for the long term. Compliance with groundwater SCGs would be achieved over the long term by excavation and removal of soil exceeding Track 4 Site-specific SCOs.

Health and Safety measures contained in the CHASP and CAMP that comply with the applicable SCGs shall be implemented during Site redevelopment in this RAWP. For both Alternatives, focused attention on means and methods employed during the remedial action would ensure that handling and management of contaminated material would be in compliance with applicable

SCGs. United States Occupational Health and Safety Administration (OSHA) requirements for on-site construction safety will also be followed by the site Contractors. These measures would protect on-Site workers and the surrounding community from exposures to Site related contaminants.

Short-term effectiveness and impacts

This evaluation criterion assesses the effects of the alternative during the construction and implementation phase until remedial action objectives are met. Under this criterion, alternatives are evaluated with respect to their effects on public health and the environment during implementation of the remedial action, including protection of the community, environmental impacts, time until remedial response objectives are achieved, and protection of workers during remedial actions.

Both alternatives have similar short term impacts during their respective implementation, as each requires excavation to at least 35 feet bgs. The most significant short-term adverse impacts and risks to the community would be the potential complications involved with designing support of excavation. Both remedial alternatives would result in similar dust generation impacts associated with excavation, handling, load out of materials, and truck traffic. Truck traffic will be routed on the most direct course using major thoroughfares where possible and flaggers will be used to protect pedestrians at Site entrances and exits. Focused attention to means and methods during the remedial action, including community air monitoring and appropriate truck routing will minimize or negate the overall impact of these activities.

Both alternatives would employ appropriate measures to prevent short term impacts, including a Construction Health and Safety Plan and a Soil/Materials Management Plan (SMMP), during all on-Site soil disturbance activities and would minimize the release of contaminants into the environment. Both alternatives provide short term effectiveness in protecting the surrounding community by decreasing the risk of contact with on-Site contaminants. Construction workers operating under appropriate management procedures and a CHASP would be protected from on-Site contaminants (personal protective equipment would be worn consistent with the document risk within the respective work zones).

Long-term effectiveness and permanence

This evaluation criterion addresses the results of a remedial action in terms of its permanence and quantity/nature of waste or residual contamination remaining at the Site after response objectives have been met, such as permanence of the remedial alternative, magnitude of remaining contamination, adequacy of controls including the adequacy and suitability of ECs/ICs that may be used to manage contaminant residuals that remain at the Site and assessment of containment systems and ICs that are designed to eliminate exposures to contaminants, and long-term reliability of Engineering Controls.

Alternative 1 would achieve long-term effectiveness and permanence related to on-site contamination by permanently removing all impacted soil/fill and enabling unrestricted usage of the property. Removal of on-Site contaminant sources would also prevent continued and future groundwater contamination. Installation of a waterproofing/ vapor barrier membrane, as well as construction of a ventilated parking garage would prevent potential future migration of soil vapors into the new building.

Alternative 2 – The Track 4 remedy would provide long-term effectiveness by removing the majority of on-Site contamination and attaining Track 4 Site-specific SCOs; by establishing Engineering Controls including a composite cover system, and establishing Institutional Controls, including use restrictions, a SMP, and continuation of the restrictive declaration to memorialize these controls for the long term. The SMP will ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and use restrictions continue to be in place and are functioning as they were intended assuring that protections designed into the remedy would provide continued high level of protection in perpetuity.

Both alternatives would result in removal of soil contamination exceeding the SCOs providing a high level, effective and permanent remedy over the long-term with respect to a remedy for contaminated soil, which will prevent any migration to groundwater. The potential exists for residual VOC concentrations in groundwater and soil vapor due to an off-site source. Potential exposure by soil vapor VOC intrusion would be prevented by the subsurface levels of the proposed structure being used primarily as a ventilated parking garage and the installation of a

vapor barrier. Therefore, the long-term effectiveness of this remedy will eliminate risks and satisfy the objectives of this criterion.

Reduction of toxicity, mobility, or volume of contaminated material

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

Alternative 1 – The Track 1 remedy provides the maximum reduction of toxicity, mobility, and volume of contaminated material through the removal of historic fill and soil exceeding Track 1 SCOs.

Alternative 2 – would remove most of the impacted soil present on the Site and remaining soil beneath the composite cover would meet Track 4 Site-specific SCOs. Alternative 1 would eliminate a greater total mass of contaminants on Site.

Implementability

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

Both alternatives will utilize standard methods that are commonly available and routinely applied by the industry. They use standard materials, procedures, and services that are well established. The reliability of the remedy is also high. There are no special difficulties associated with any of the activities proposed.

Cost effectiveness

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

Alternative 1 –Excavation and off-site disposal of soil is necessary to accommodate the proposed development. As the Site will be remediated to an unrestricted-use level, there are no operations, maintenance, or monitoring costs associated with the proposed remedy.

Alternative 2 – The Track 4 remedy offers similar short-term costs as the Track 1 remedy. The short-term costs of Alternative 1 are potentially higher based on greater excavation quantities of material. Long-term costs associated with Alternative 2 are likely higher than Alternative 1 based on the implementation of an SMP and placement of a deed restriction.

Historic fill at the Site was found during the RI to extend to a depth of up to 2 feet below grade, and the new building requires excavation of the entire property to a depth of 35 feet below grade. Costs associated with both Alternatives would be comparable. However, long-term costs would be higher for Alternative 2 than Alternative 1 based on implementation of a Site Management Plan. In both cases, appropriate public health and environmental protections are achieved.

The remedial plan creates an approach that combines the remedial action with the redevelopment of the Site, including the construction of the building foundation and subgrade structures. The remedial plan is also cost effective in that it will take into consideration the selection of the closest and most appropriate disposal facilities to reduce transportation and disposal costs during the excavation of historic fill and other soils during the redevelopment of the Site.

Community Acceptance

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

Based on the overall goals of the remedial program, no adverse community opinion is anticipated for either alternative. However, this RAWP will be subject to and undergo public review under the NYC VCP and will provide the opportunity for public input on the selected remedial actions. Any public comments related to environmental remediation will be considered by New York City Office of Environmental Remediation (NYCOER) prior to approval of this plan. The Citizen Participation Plan for the project is provided in Appendix I.

Land use

This evaluation criterion addresses the proposed use of the property. This evaluation has considered reasonably anticipated future uses of the Site and takes into account: current use and historical and/or recent development patterns; applicable zoning laws and maps; NYS Department of State's Brownfield Opportunity Areas (BOA) pursuant to section 970-r of the general municipal law; applicable land use plans; proximity to real property currently used for residential use, and to commercial, industrial, agricultural, and/or recreational areas; environmental justice impacts, Federal or State land use designations; population growth patterns and projections; accessibility to existing infrastructure; proximity of the site to important cultural resources and natural resources, potential vulnerability of groundwater to contamination that might emanate from the site, proximity to flood plains, geography and geology; and current Institutional Controls applicable to the site.

The current, intended, and reasonably anticipated future land use of the Site and its surroundings are compatible with the selected remedy of soil remediation. The proposed development is a commercial building, which will cover the entire Site footprint. The reasonably anticipated future use of the Site and its surroundings will be documented by the applicant in the NYC VCP application, which will include the following conclusions:

The proposed use will not cause or increase a disproportionate burden on the community in which the Site is located. In addition, temporary short-term project impacts are being mitigated

through site management controls and truck traffic controls during remediation activities. Following remediation, the Site will meet either Track 1 Unrestricted Use SCOs or Track 4 Site-specific SCOs, which are appropriate for its planned commercial use.

The Site is not in close proximity to important cultural resources, including federal or state historic or heritage sites or Native American religious sites, natural resources, waterways, wildlife refuges, wetlands, or critical habitats of endangered or threatened species. The Site is located in an urban area with limited proximity to fish or wildlife. Both alternatives would prevent any potential exposure pathways of contaminant migration affecting fish or wildlife. Municipal water supply wells are not present in Queens; therefore, groundwater from the Site cannot affect municipal water supply wells or recharge areas. The Site does not lie in a Federal Emergency Management Agency (FEMA)-designated flood plain. Both alternatives are equally protective of natural resources and cultural resources.

Sustainability of the Remedial Action

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

Both alternatives are comparable with respect to the opportunity to achieve sustainable remedial action. The overall sustainability of both alternatives is low. The excavated material would likely be landfilled (no recycling and reuse of non-virgin materials) and not require consumption of virgin material resources as imported backfill. There would also be significant energy consumption and greenhouse gas emissions associated with truck trips for soil disposal. To the extent practicable, energy efficient building materials, appliances, and equipment will be utilized to complete the development. A sustainability statement for the Site is provided as Appendix D.

4.0 REMEDIAL ACTION

4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

The preferred remedial action will be a Track 1 Alternative. The preferred remedial action alternative achieves protection of public health and the environment for the intended use of the property. The preferred remedial action alternative will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action alternative is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants. The preferred remedial action alternative is cost effective and implementable and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP citizen participation activities according to an approved Citizen Participation Plan.
2. Performance of a community air monitoring program (CAMP) for particulates and volatile organic compounds (VOCs).
3. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency of one composite sample per 800 to 1,000 (approximate) cubic yards of material to be excavated as per disposal facilities requirements. A Waste Characterization Report documenting sample procedures, location, analytical results shall be submitted to NYCOER prior to the start of the remedial action.
4. Establishment of Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
5. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
6. Excavation and removal of soil/fill exceeding Track 1 SCOs. The entire property will be excavated to depths of approximately 35 feet below grade. Approximately, 15000 tons of soils will be excavated and removed from this site.

7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a photoionization detector (PID).
8. Management of excavated materials including temporarily stockpiling and segregating to prevent co-mingling of contaminated material and non-contaminated materials as described in Appendix E.
9. Removal of underground storage tanks (if encountered during excavation) and closure of petroleum spills, if encountered, in compliance with applicable local, State and Federal laws and regulations.
10. Transportation and off-site disposal of soil/fill material at facilities in accordance with all applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities.
11. Collection and analysis of confirmatory end-point samples above the groundwater in the native sand to determine the performance of the remedy with respect to attainment of SCOs.
12. Import of materials to be used for backfill (if needed) in compliance with this plan and in accordance with applicable laws and regulations.
13. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations. Since groundwater is at a depth of 21 feet below ground surface, dewatering is required and dewatering permits will be obtained from NYCDEP.
14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
15. Maintenance of records as described in this RAWP, including waste disposal manifests, clean fill/top soil sampling results, and appropriate health and safety forms and documentation.
16. Submission of a Remedial Action Report (RAR) that describes remedial activities, certifies remedial requirements have been achieved, and if Track 1 SCOs are not

achieved, describes all ECs and ICs to be implemented at the Site, and lists any deviations from this RAWP.

If Unrestricted Use (Track 1) SCOs are not achieved, the following construction elements will be implemented as Engineering and Institutional Controls:

17. As part of development, installation of a vapor barrier beneath the building slabs and behind the foundation sidewalls of the proposed building.
18. As part of development, construction and maintenance of an engineered composite cover consisting of a concrete building slab to prevent human exposure to residual soil/fill remaining at the Site.
19. As part of development, installation of a sub-grade air exchange and ventilation system in the parking cellar in accordance with the NYC Building and Mechanical Codes, and any applicable indoor air quality standards;
20. Submission of an approved Site Management Plan (SMP) in the RAR 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; 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.

4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT

Track 1 Soil Cleanup Objectives (SCOs) are proposed for this project. The SCOs for this Site are listed in Table 12. If Unrestricted Use Track 1 SCOs are not achieved, Track 2 Restricted Commercial Use SCOs as listed in 6 NYCRR Part 375, Table 6.8 (b) will be used. The site soils already meet Track 2 Restricted Commercial Use SCOs.

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 3. The location of planned excavations is shown in Figure 5.

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 Action Report.

Estimated Soil/Fill Removal Quantities

The total quantity of soil/fill expected to be excavated and disposed off-Site is 15,000 tons.

The proposed disposal locations for Site-derived impacted materials are listed below. Additional disposal locations established at a later date will be reported promptly to the OER Project Manager.

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

<u>Disposal Facility</u>	<u>Waste Type</u>	<u>Estimated Quantities</u>
TBD	Native Material	
TBD	Historic Fill material	
TBD		

End-Point Sampling

Removal actions for development purposes under this plan will be performed in conjunction with confirmation soil sampling. Four confirmation samples will be collected from the native sand above the groundwater table at locations identified on Figure 4. The samples will be compared to Track 1 SCOs; analytes will include VOCs, SVOCs, pesticides, PCBs and metals according to analytical methods described below.

Hot-spot removal actions, whether established under this RAWP or identified during the remedial program, will be performed in conjunction with post remedial end-point samples to ensure that hot-spots are fully removed. Analytes for end-point sampling will be those parameters that are driving the hot-spot removal action and will be approved by OER. Frequency for hot-spot end-point sample collection is as follows:

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.

New York State ELAP certified labs will be used for all confirmation and end-point sample analyses. Labs performing confirmation and end-point sample analyses will be reported in the RAR. The RAR will provide a tabular and map summary of all confirmation and end-point sample results and will include all data including non-detects and applicable standards and/or guidance values. End-point samples will be Confirmation samples will be analyzed for compounds and elements as described above utilizing the following methodology:

Soil analytical methods will include:

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

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

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

Collected samples will be appropriately packaged, placed in coolers, and shipped via overnight courier or delivered directly to the analytical laboratory by field personnel. Samples

will be containerized in appropriate laboratory provided glassware and shipped in plastic coolers. Samples will be preserved through the use of ice or “cold-paks” to maintain a temperature of 4°C.

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

Decontamination of non-dedicated sampling equipment will consist of the following:

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

Field blanks will be prepared by pouring distilled or deionized water over decontaminated equipment and collecting the water in laboratory provided containers. Trip blanks will be used whenever samples are transported to the laboratory for analysis of VOCs. Trip blanks will not be used for samples to be analyzed for metals, SVOCs, or pesticides. One blind duplicate sample will be prepared and submitted for analysis every 20 samples.

One duplicate and one matrix spike/matrix spike duplicate will be collected for every 20 samples.

Import and Reuse of Soils

Import of soils onto the property and reuse of soils already onsite will be performed in conformance with the Soil/Materials Management Plan in Appendix 3. It is not anticipated to import soil or reuse soil on this Site.

4.3 ENGINEERING CONTROLS

The excavation required for the proposed Site development will achieve Unrestricted Use Track 1 SCOs. Engineering Controls are not required to address residual contamination at the Site. If Track 1 SCOs are not achieved, the following Engineering Controls will be incorporated into the foundation design:

- composite cover system consisting a concrete building slab;
- a sub-grade ventilated parking garage; and
- waterproofing/vapor barrier system (system is part of development since construction will extend below the water table to a depth of 35 feet).

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 is comprised of a concrete building slab. Thickness and details of reinforced concrete building slab to be determined during design stage based on structural considerations, but no less than four (4) inches thick.

Figure 6 shows the location of each cover type built at the Site.

The composite cover system is a permanent engineering control for the Site. The system will be inspected and reported at specified intervals as required by this RAWP and the SMP. A Soil Management Plan will be included in the Site Management Plan 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 Site Management Plan in the RAR.

Parking Ventilation System

As part of the development plan, a parking garage will be constructed in the sub-cellar and cellar and will be ventilated in accordance with the NYC Building and Mechanical codes, and any applicable indoor air quality standards. The operation of this ventilation system will prevent

accumulation of potential soil vapor in the parking garage, and further prevent migration of soil vapor into the occupied above-grade spaces of the building.

Waterproofing/vapor barrier system

Migration of soil vapor will be mitigated with a combination of building slab and vapor barrier. As the excavation will extend into ground water a waterproofing system is required for construction purposes and will act as Engineering Control if Track I SCOs are not met.

If Track I SCOs are not met the project's Professional Engineer licensed by the State of New York will have primary direct responsibility for overseeing the implementation of the waterproofing/vapor barrier. The Remedial Action Report will include photographs (maximum of two photos per page) of the installation process, PE/RA certified letter (on company letterhead) from primary contractor responsible for installation oversight and field inspections, and a copy of the manufacturer's certificate of warranty.

If Track I SCOs are not met, design diagrams, specifications and manufacturer documentation for Vapor Barrier/ Waterproofing Membrane will be submitted to NYCOER prior to installation.

4.4 INSTITUTIONAL CONTROLS

Track 1 remedial actions do not require Engineering Controls. If Track 1 SCOs are not achieved, Institutional Controls (IC) will be utilized in this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. Institutional Controls are listed below. Long-term employment of EC/ICs will be implemented under a site-specific Site Management Plan (SMP) that will be included in the RAR. Institutional Controls for this remedial action are:

- The property will continue to be registered with an E-Designation by the NYC Buildings Department. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the Site Management Plan which will note that the property owner and property owner's successors and assigns must comply with the approved SMP;
- Submittal of a Site Management Plan in the RAR for approval by OER that provides procedures for appropriate operation, maintenance, monitoring, inspection, reporting and

certification of ECs. 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 commercial use and will not be used for a higher level of use without prior approval by OER.

4.5 SITE MANAGEMENT PLAN

Site Management is not required for Track 1 remedial actions. However, if Track 1 SCOs are not achieved, Site Management will be the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by the DCR and this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site

Management responsibilities defined in the DCR and the Site Management Plan 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 Brownfield Cleanup Agreement with OER. This includes a plan for: (1) implementation of EC's and ICs; (2) implementation of monitoring programs; (3) operation and maintenance of EC's; (4) inspection and certification of EC's; and (5) reporting.

Site management activities, reporting, and EC/IC certification will be scheduled by OER on a periodic basis to be established in 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 March 31 of the year following the reporting period.

4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

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

Investigations reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA). As part of the VCP process, a QHHEA was performed to determine whether the Site poses an existing or future health hazard to the Site's exposed or potentially exposed population. The sampling data from the RI were evaluated to determine whether there is any health risk by characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport. This QHHEA was prepared in accordance with Appendix 3B and Section 3.3 (b) 8 of the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation.

Known and Potential Sources

Based on the RI evaluation of the AOCs, the COCs are summarized below by media type:

Soil

- Metals including Lead, arsenic, copper, mercury, and zinc were identified, but only lead exceeded Unrestricted Use SCOs.
- Seven SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo-(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene exceeded Restricted Residential Use SCOs within one shallow soil samples.

Groundwater COCs

- One VOC, methylene chloride and one SVOC bis(2-ethylhexyl)phthalate exceeded their respective GQS.
- Several metals were identified, but only barium and manganese exceeded their respective GQSs.

Soil Vapor COCs

- Soil vapor samples collected during the RI showed a wide range of VOCs at trace levels. All compounds were below the monitoring ranges established by NYSDOH guidance matrix.

Nature, Extent, Fate and Transport of Contaminants

The information compiled during the RI has confirmed the majority of the property is underlain by a medium grain tan sand native material. On lot 48 and 52 a more coarse and darker brown sand and gravel exists from 0-7 feet below grade. Several SVOCs were detected in one shallow boring. One SVOC, bis(2-ethylhexyl)phthalate that was detected in groundwater was not detected in soils. Low levels of metals were detected in soils but were not found in groundwater. Dissolved metals including barium and manganese were detected above GQS. The chlorinated VOCs in soil vapor were not detected or were well below guidance issued by New York State DOH and were not found in any of the on-Site soil or groundwater samples collected.

Potential Routes of Exposure

An exposure pathway begins with a source and mechanism of contaminant release, resulting in the contamination of a receiving matrix (environmental medium). A complete exposure pathway also requires a point of potential contact with the contaminated matrix (i.e., exposure point), an exposure route (i.e., inhalation, ingestion, or dermal contact), and a receptor population. An exposure pathway is considered complete when all five elements of an exposure pathway are documented.

An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway has not existed in the past, does not exist in the present, and will never exist in the future. Three potential primary routes exist by which chemicals can enter the body:

- Ingestion of water, fill, or soil;
- Inhalation of vapors and particulates; and
- Dermal contact with water, fill, soil, or building materials.

Potential Points of Exposure

Current Conditions: The potential for exposure to surficial historic fill is limited under current conditions because site is capped with concrete and/or asphalt parking and access is restricted with a fence. Groundwater is not contaminated and is not exposed at the Site and because the site is served by the public water supply and groundwater use for potable supply is prohibited, there is no potential for exposure. There were no soil vapor detections of concern.

Construction/Remedial Conditions: Once development activities begin, construction workers will come in direct contact with surface, subsurface soils and groundwater, as a result of on-Site construction and excavation work. On-site construction workers potentially could ingest, inhale or have dermal contact with any exposed soil, fill, or groundwater. Similarly, off Site receptors could be exposed to dust and vapors from excavation activities. During construction, on-Site and off-Site exposure to contaminated dust will be addressed through Soil/Materials Management Plan, dust controls and through the implementation of CAMP and the CHASP.

Proposed Future Conditions: Under future remediated conditions, the property will be fully capped, limiting potential direct exposure to soil and groundwater remaining in place. A waterproofing/vapor barrier system and sub-grade ventilated parking garage will prevent exposure to potential on-site or off-site soil vapors. The Site is served by a public water supply, and groundwater is not used at the Site for potable supply.

Receptor Populations

On-Site Receptors – The Site is currently vacant and uncapped. Access to Site is restricted by an 8 foot high, chained and locked, perimeter fence. Onsite receptors are limited to trespassers and site representatives and visitors granted access to the property. During redevelopment of the Site, the on-Site potential receptors will include construction workers, site representatives, and visitors. Once the Site is redeveloped, the on-Site potential sensitive receptors will include adult and child building residents, workers and visitors.

Off-Site Receptors - Potential off-Site receptors within a 0.25-mile radius of the Site include: adult and child residents, and commercial and construction workers, pedestrians, trespassers, and cyclists, based on the following:

1. Commercial Businesses (up to 0.25 mile) – existing and future
2. Residential Buildings (up to 0.25 mile) – existing and future
3. Building Construction/Renovation (up to 0.25 mile) – existing and future
4. Pedestrians, Trespassers, Cyclists (up to .25 mile) – existing and future
5. Schools (up to .25 mile) – existing and future

Overall Human Health Exposure Assessment

There are potential complete exposure pathways (i.e., source, route to exposure, receptor population) for the current site condition. Under current conditions, on-Site exposure pathways exist for those given access to the Site or trespassers. There is a potential complete exposure pathway that requires mitigation during implementation of the remedy. There is no complete exposure pathway under future conditions after the site is developed. This assessment takes into consideration the reasonably anticipated use of the Site, which includes one building for commercial use. Potential post-construction use of groundwater is not considered an option

because groundwater in this area of New York City is not used as a potable water source. There are no surface waters in close proximity to the Site that could be impacted or threatened.

During remedial construction, on-Site and off-Site exposures to contaminated dust from historic fill material will be addressed through dust controls, and through the implementation of the Community Air Monitoring Program, the Soil/Materials Management Plan, and a Construction Health and Safety Plan. After the remedial action is complete, there will be no remaining exposure pathways to on-Site soil/fill, as all soil above Unrestricted Use SCOs will have been removed and a vapor barrier system will have been installed as part of development.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 PROJECT ORGANIZATION AND OVERSIGHT

Principal personnel who will participate in the remedial action include Site Safety Coordinator, Tom Brown. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Ravi K. Korlipara, and Victoria D. Whelan, respectively.

5.2 SITE SECURITY

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

5.3 WORK HOURS

The hours for operation of remedial construction will be in accordance with the New York City Department of Buildings construction code requirements.

5.4 CONSTRUCTION HEALTH AND SAFETY PLAN

The Health and Safety Plan is included in Appendix 4. The Site Safety Coordinator will be Tom Brown. Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations. The HASP pertains to remedial and invasive work performed at the Site until the issuance of the Notice of Completion.

All field personnel involved in remedial activities will participate in training required under 29 CFR 1910.120, including 40-hour hazardous waste operator training and annual 8-hour refresher training. Site Safety Officer will be responsible for maintaining workers training records.

Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign an HASP acknowledgment. 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 log book or specific form.

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

5.5 COMMUNITY AIR MONITORING PLAN

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

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/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. Exceedences of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the OER Project Manager and included in the Daily Report.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

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

Particulate Monitoring, Response Levels, and Actions

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

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed $150 \text{ mcg}/\text{m}^3$ above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than $150 \text{ mcg}/\text{m}^3$ 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 $150 \text{ mcg}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

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

5.6 AGENCY APPROVALS

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

5.7 SITE PREPARATION

Pre-Construction Meeting

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 to assure safety. Utility companies and other responsible authorities will be contacted to locate and mark the locations, and a copy of the Markout Ticket will be retained by the contractor prior to the start of drilling, excavation or other invasive subsurface operations. Overhead utilities may also be present within the anticipated work zones. Electrical hazards associated with drilling in the vicinity of overhead utilities will be prevented by maintaining a safe distance between overhead power lines and drill rig masts.

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

Dewatering

Dewatering is anticipated during excavation and foundation construction activities at the Site. Dewatering will be completed in accordance with a New York City Department of Environmental Protection (NYCDEP) permit. All dewatering will be conducted in accordance with NYCDEP regulations regarding discharge to the municipal sewer (including appropriate groundwater sampling and permitting) and NYSDEC regulations regarding groundwater discharge.

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 roads 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 NYC VCP 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 potable 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 holes, 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, haybales; 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. Storm-water 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 offsite areas may require characterization based on site conditions, at the discretion of OER. If onsite 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. 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 onsite or offsite 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.

5.8 Traffic Control

Drivers of trucks leaving the NYC VCP 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 the truck will head down 94th Street which inturn leads into the Van Wycke Expressway.

5.9 DEMOBILIZATION

Demobilization will include:

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

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

5.10 REPORTING AND RECORD KEEPING

Daily Reports

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

- Project number and statement of the activities and an update of progress made and locations of 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 excursions, if any;
- 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 RAWP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RAWP will be communicated directly to the OER project manager by personal communication. Daily reports will be included as an Appendix in the Remedial Action Report.

An alpha-numeric site map will be used to identify locations described in reports submitted to OER and is shown in Figure 7.

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 RAR in digital format (i.e. jpeg files).

5.11 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.

5.12 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

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

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

6.0 REMEDIAL ACTION REPORT

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

- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan (if Track 1 is not achieved);
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;
- Tabular summary of all end point sampling results and all material characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action and DUSR;
- Test results or other evidence demonstrating that remedial systems are functioning properly;
- Account of the source area locations and characteristics of all contaminated material removed from the Site including a map showing source areas;
- Account 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.
 - Reports and supporting material will be submitted in digital form.

- **Remedial Action Report Certification**

The following certification will appear in front of the Executive Summary of the Remedial Action Report. The certification will include the following statements:

I, Ravi K. Korlipara, PH.D., P.E., am currently a professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the Sutphin Plaza Hotel Site; Site number.

I, Victoria D Whelan, am a Qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the Sutphin Plaza Hotel Site; Site number 14CVCP258Q.

I certify that the OER-approved Remedial Action Work Plan and Stipulations in a letter dated month day, year, if any, were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

7.0 SCHEDULE

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a 24 month remediation period is anticipated. At this time a schedule has not been determined for construction; it will be submitted to OER once it is received.

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

APPENDIX

1

CITIZEN PARTICIPATION PLAN

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

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

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

Repositories. A document repository is maintained in the nearest public library that maintains evening and weekend hours. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project. Sutphin Plaza Hotel, LLC will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

Queens Central Library 89-11 Merrick Blvd.

Jamaica, NY 11432

Repository Telephone Number: (718) 990-0700

Repository Hours of Operation: 9-5pm

Digital Documentation. NYC OER strongly encourages the use of digital documents in repositories as a means of minimizing paper use while also increasing convenience in access and ease of use.

Identify Issues of Public Concern. At this time the Enrollee has not identified any specific issues of concern to stakeholders proximate to the project site. If issues are identified at a later date, they will be presented to OER.

Public Notice and Public Comment. Public notice to all members of the Project Contact List is required at three major steps during the performance of the cleanup program (listed below) and at other points that may be required by OER. Notices will include Fact Sheets with descriptive project summaries, updates on recent and upcoming project activities, repository information, and important phone and email contact information. All notices will be prepared by Sutphin Plaza Hotel, LLC, reviewed and approved by OER prior to distribution and mailed by Sutphin Plaza Hotel, LLC. Public comment is solicited in public notices for all work plans developed under the NYC Voluntary Cleanup Program. Final review of all work plans by OER

will consider all public comments. Approval will not be granted until the public comment period has been completed.

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

- **Public Notice of the availability of the Remedial Investigation Report and Remedial Action Work Plan and a 30-day public comment period on the Remedial Action Work Plan.**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the availability of the Remedial Investigation Report and Remedial Action Work Plan and the initiation of a 30-day public comment period on the Remedial Action Work Plan. The Fact Sheet summarizes the findings of the RIR and provides details of the RAWP. The public comment period will be extended an additional 15 days upon public request. A public meeting or informational session will be conducted by OER upon request.

- **Public Notice announcing the approval of the RAWP and the start of remediation**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the approval of the RAWP and the start of remediation.

- **Public Notice announcing the completion of remediation, designation of Institutional and Engineering Controls and issuance of the Notice of Completion**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the completion of remediation, providing a list of all Institutional and Engineering Controls implemented for to the Site and announcing the issuance of the Notice of Completion.

APPENDIX

2

SUSTAINABILITY STATEMENT

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

Reuse of Clean, Recyclable Materials. Reuse of clean, locally-derived recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction. Reuse of clean, recyclable materials will be utilized if possible during construction. An estimate of the quantity (in tons) of clean, non-virgin materials (reported by type of material) reused under this plan will be quantified and reported in the RAR.

Reduce Consumption of Virgin and Non-Renewable Resources. Reduced consumption of virgin and non-renewable resources lowers the overall environmental impact of the project on the region by conserving these resources. It is not anticipated that soil will be imported to the site.

An estimate of the quantity (in tons) of virgin and non-renewable resources, the use of which will be avoided under this plan, will be quantified and reported in the RAR.

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

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

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

An estimate of the volume of clean fuels used during remedial activities will be quantified and reported in the RAR.

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

An estimate of the area of the Site that utilizes recontamination controls under this plan will be reported in the RAR in square feet.

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

An estimate of the enhanced storm-water retention capability of the redevelopment project will be included in the RAR.

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

The number of Green Buildings that are associated with this brownfield redevelopment property will be reported in the RAR. The total square footage of green building space created as a function of this brownfield redevelopment will be quantified for residential, commercial and industrial/manufacturing uses.

Paperless Brownfield Cleanup Program. Sutphin Plaza Hotel, LLC is participating in OER's Paperless Brownfield Cleanup Program. Under this program, submission of electronic documents will replace submission of hard copies for the review of project documents, communications and milestone reports.

Low-Energy Project Management Program. Sutphin Plaza Hotel, LLC is participating in OER's low-energy project management program. Under this program, whenever possible,

meetings are held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation.

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

New trees will be planted along Sutphin Blvd. An estimate of the land area that will be vegetated, including the number of trees planted or preserved, will be reported in square feet in the RAR.

APPENDIX 3

SOIL/MATERIALS MANAGEMENT PLAN

1.1 SOIL SCREENING METHODS

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional and will be reported in the RAR. Soil screening will be performed during invasive work performed during the remedy and development phases prior to issuance of the Notice of Completion.

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 RAWP;
- ensure that the presence of utilities and easements on the Site has been investigated and that any identified risks from work proposed under this plan are properly addressed by appropriate parties;
- ensure that all loaded outbound trucks are inspected and cleaned if necessary before leaving the Site;
- ensure that all egress points for truck and equipment transport from the Site will be kept clean of Site-derived materials during Site remediation.

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

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

1.5 OFF-SITE MATERIALS TRANSPORT

Loaded vehicles leaving the Site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with applicable laws and regulations, including use of licensed haulers in accordance with 6 NYCRR Part 364. If loads contain wet material capable of causing leakage from trucks, truck liners will be used. Queuing of trucks will be performed on-Site, when possible in order to minimize off Site disturbance. Off-Site queuing will be minimized.

Outbound truck transport routes are anticipated to be, heading along 94th Avenue to the Van Wyck Expressway. This routing takes into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c) minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

1.6 MATERIALS DISPOSAL OFF-SITE

The following documentation will be established and reported by the PE/QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE/QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in Queens, New York 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 RAR.

The Remedial Action Report will include an itemized account of the destination of all material removed from the Site during this remedial action. Documentation associated with

disposal of all material will include records and approvals for receipt of the material. This information will be presented in the RAR.

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 RAR. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the RAR. 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

It is not anticipated to reuse the on-site soil. In case plans change, soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site. The soil cleanup objectives for on-Site reuse are listed in Table 12. '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 comparable soil/fill material, and addressed pursuant to the NYC VCP agreement subject to Engineering and Institutional Controls. The

PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed.

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

1.8 DEMARCATION

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

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

1.9 IMPORT OF BACKFILL SOIL FROM OFF-SITE SOURCES

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. At this time it is not anticipated to import backfill.

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 RAWP. The RAR 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.

Source Screening and Testing

Inspection of imported fill material will include visual, olfactory and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and
- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

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

Recycled concrete aggregate (RCA) will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the RAR. 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 STORM-WATER POLLUTION PREVENTION

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this RAWP (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

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 the Remedial Action Report.

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 the Remedial Action Report.

Other Nuisances

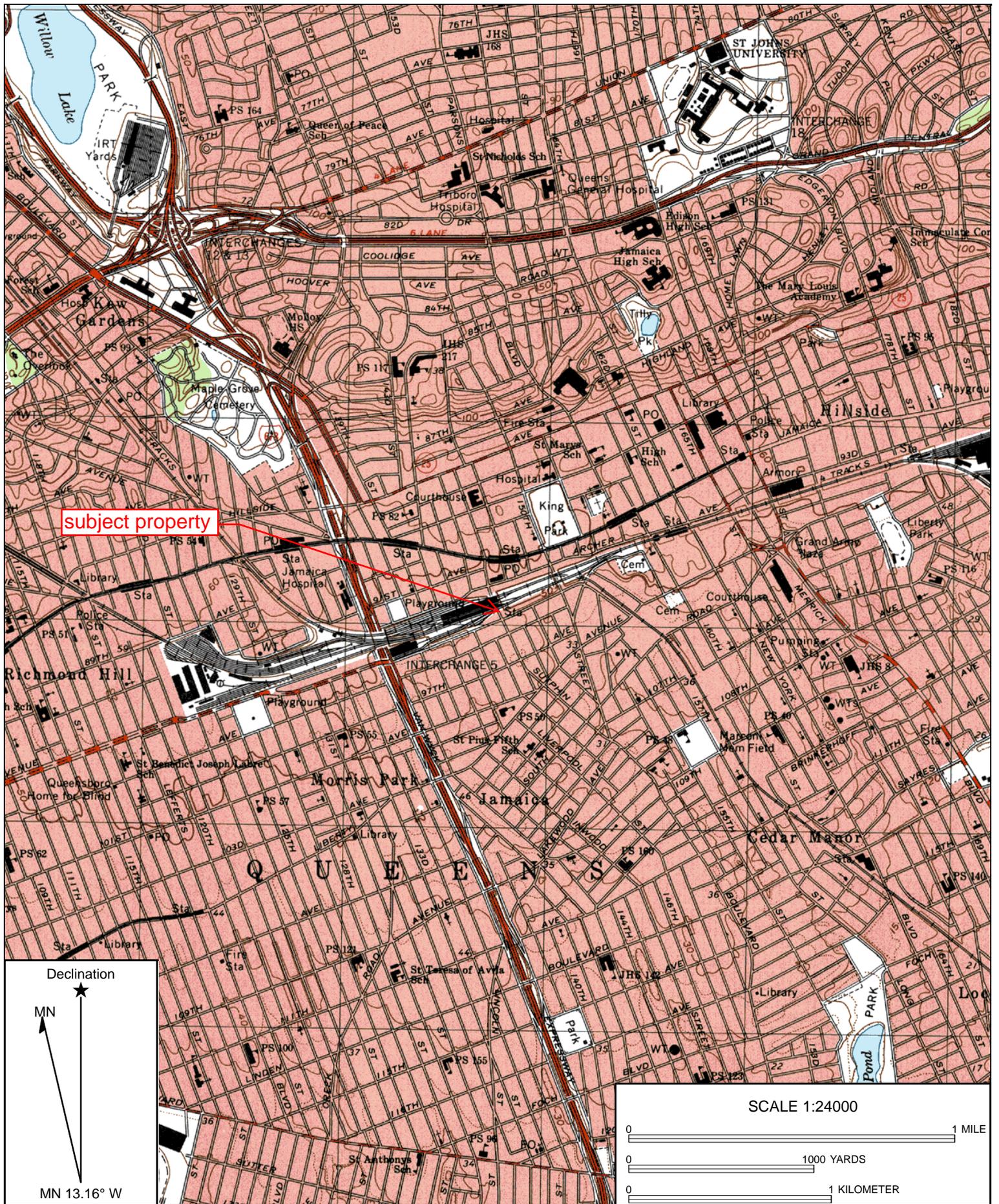
Noise control will be exercised during the remedial program. All remedial work will conform, at a minimum, to NYC noise control standards.

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

APPENDIX 4

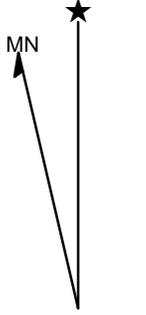
HEALTH AND SAFETY PLAN

FIGURES



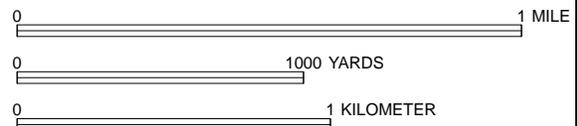
subject property

Declination



MN 13.16° W

SCALE 1:24000



Name: JAMAICA 1994

Date: 12/26/12

Scale: 1 inch = 2,000 ft.

Adopted from LCB, Inc. January 2013 Phase I

Location: 040° 41' 58.73" N 073° 48' 27.18" W

Copyright (C) 2009 MyTopo

Figure 1

Long Island Rail Road Tracks

Long Island Railroad Overpass

MTA Lot

Block: 9998
Lot: 52

Block: 9998
Lot: 48

Approximate
Property
Boundary

Block: 9998
Lot: 47

Jamaica Station

SUTPHIN BOULEVARD

Bilco
Doors

Existing
Building

Adjacent Commercial Building

Block: 9998
Lot: 42

Block: 9998
Lot: 43

94TH AVENUE

Bilco
Doors

Vacant Lot



CA RICH CONSULTANTS, INC.

Environmental Specialists Since 1982
17 Dupont Street, Plainview, New York 11803

TITLE:

Site Location Map

DATE:

4/16/2014

SCALE:

As Shown

FIGURE:

2

DRAWN BY:

J.T.C./T.R.B.

DRAWING NO:

2014-3

93-41 through 93-51 Sutphin Blvd. &
147-01 through 147-05 94th Avenue
Jamaica, Queens, NY

APPR. BY:

V.W.

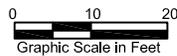
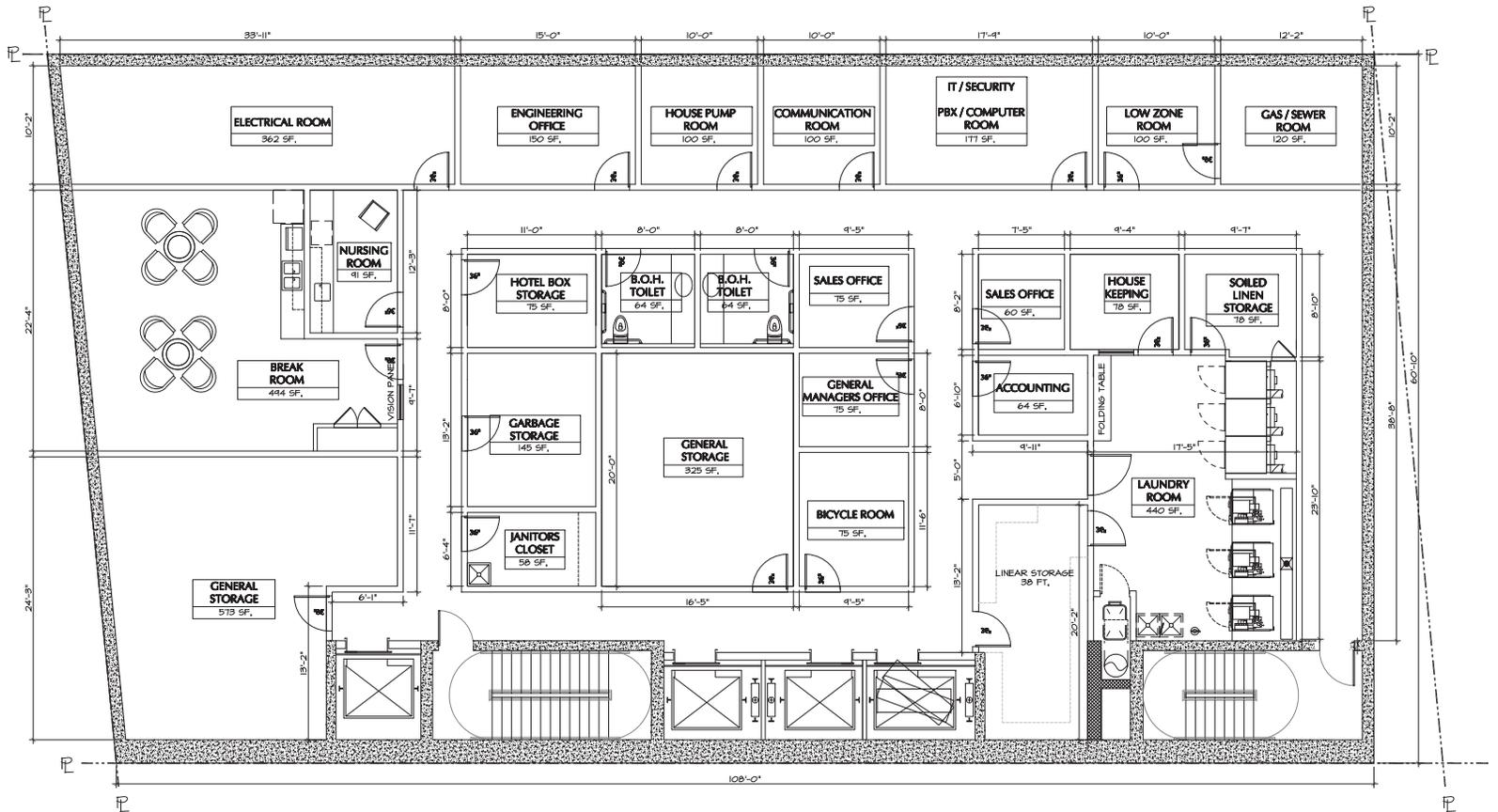


Figure 3



A SUBCELLAR #2 FLOOR PLAN - T.O.S.



93-43 Sutphin Blvd.
JAMAICA, QUEENS 11435
BLOCK: 9998 LOTS: 42,43,47,48,52

PROJECT NO. 1649.00

- DEVELOPER _____
- STRUCTURAL ENGINEER _____
- MECHANICAL ENGINEER _____
- OWNER _____
- ISSUE _____
- SCALE _____
- KEY PLAN _____

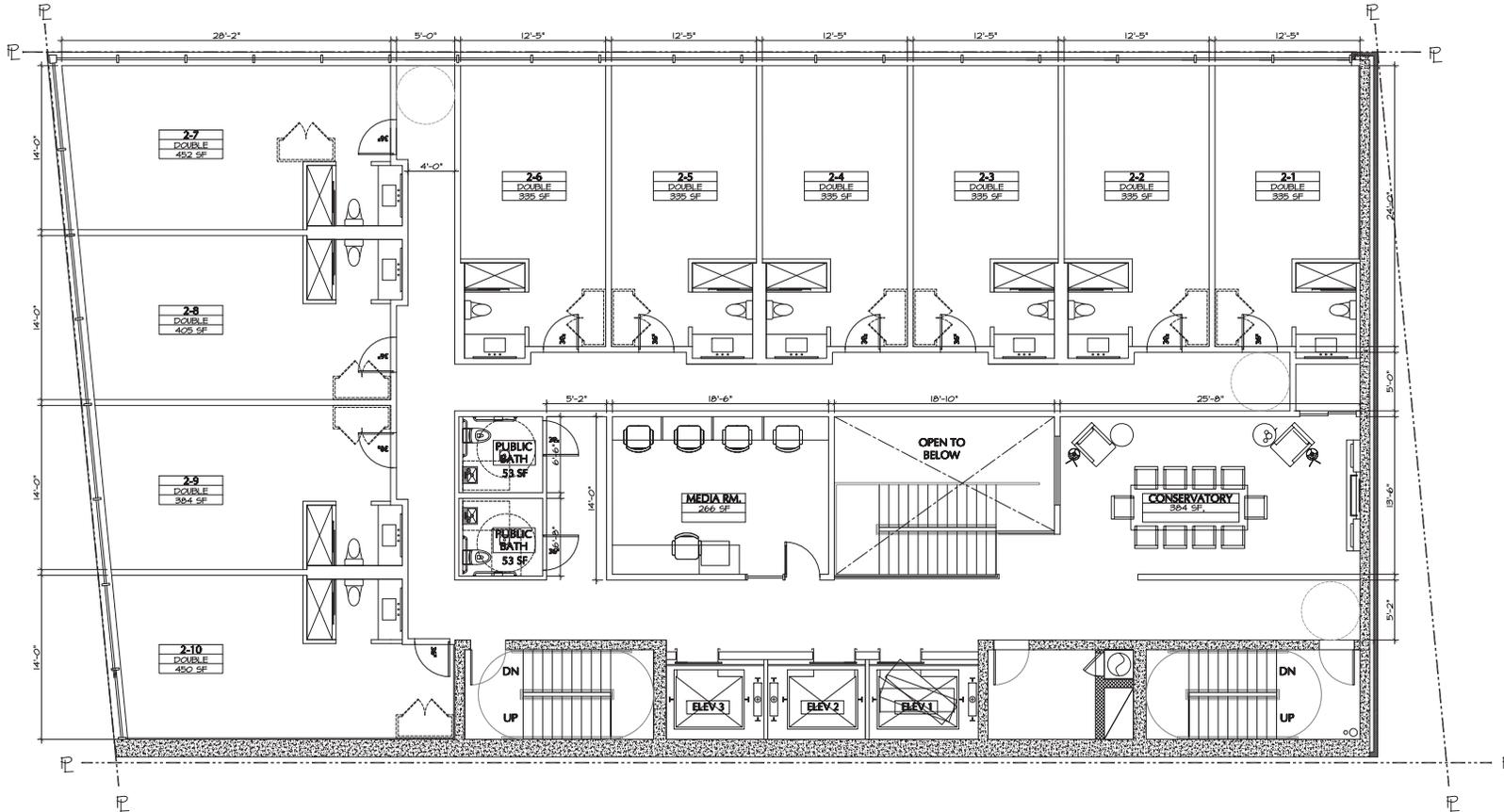
PROJECT
93-43 SUTPHIN BLVD.
JAMAICA, QUEENS 11435
DRAWING
SUBCELLAR #2 PLAN

DATE AND REVISION	DATE
PROJECT NO.	1649.00
DRAWING NO.	102.00
CHECKED BY	J.C. CHEN
DESIGNED BY	J.C. CHEN
DATE	10/1/14

A-102.00

000 FILE NO. _____ OF 01

Figure 3



A SECOND FLOOR PLAN - T.O.S.

1/8"=1'-0"



93-43 Sutphin Blvd.
 JAMAICA, QUEENS 11435
 BLOCK: 9998 LOTS: 42,43,47,48,52

PROJECT NO. 1649.00

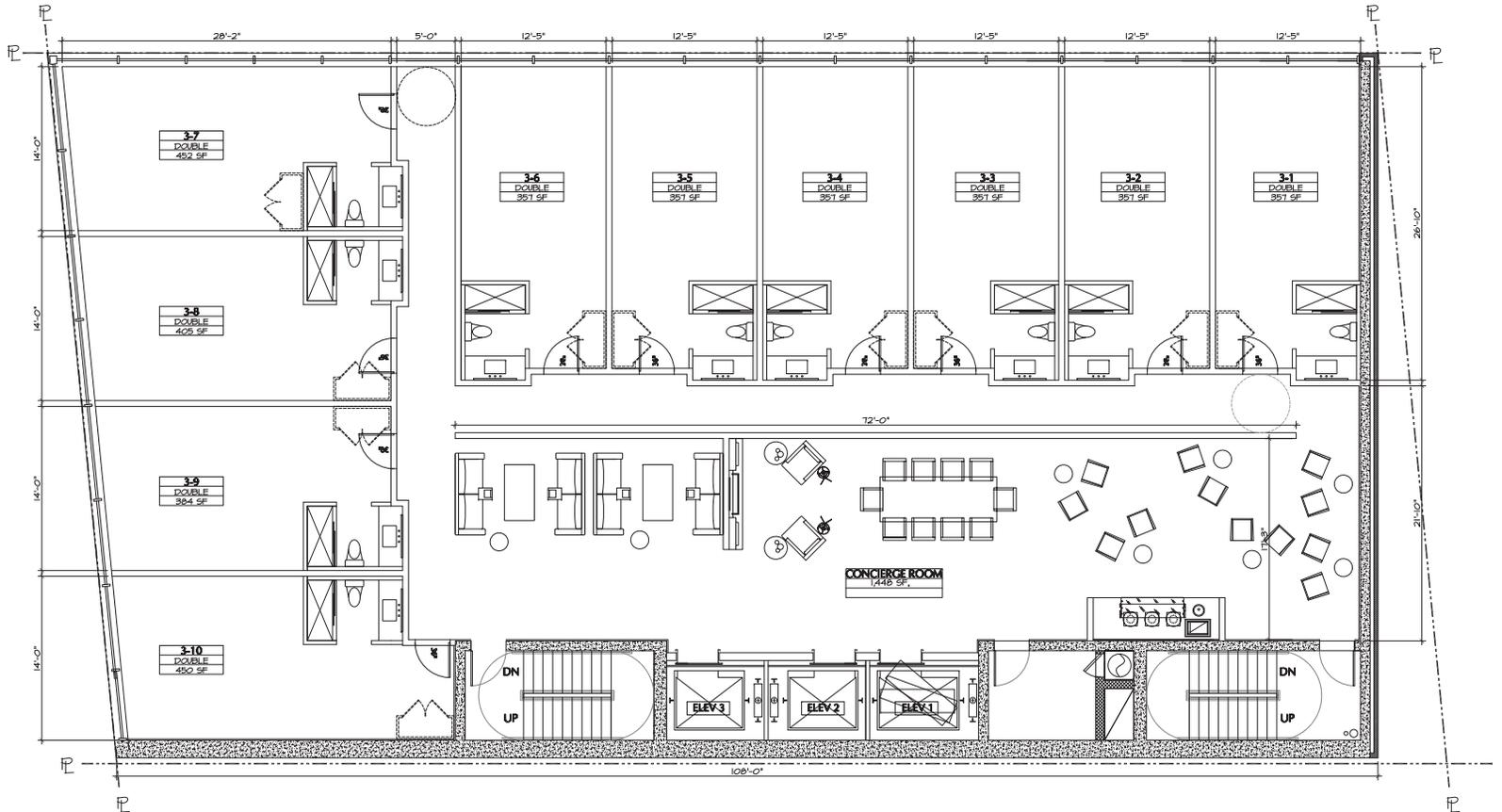
DEVELOPER _____
 STRUCTURAL ENGINEER _____
 MECHANICAL ENGINEER _____
 OWNER _____
 ISSUE _____
 SCALE _____
 KEY PLAN _____

PROJECT
 93-43 SUTPHIN BLVD.
 JAMAICA, QUEENS 11435

DRAWING
2ND FLOOR PLAN

DATE AND DESCRIPTION _____
 DRAWN BY _____
 CHECKED BY _____
 PROJECT NO. _____
 DRAWING NO. _____
 SHEET NO. _____
A-105.00
 OF 12

Figure 3



A THIRD FLOOR PLAN - T.O.S.

1/8"=1'-0"



93-43 Sutphin Blvd.
 JAMAICA, QUEENS 11435
 BLOCK: 9998 LOTS: 42,43,47,48,52

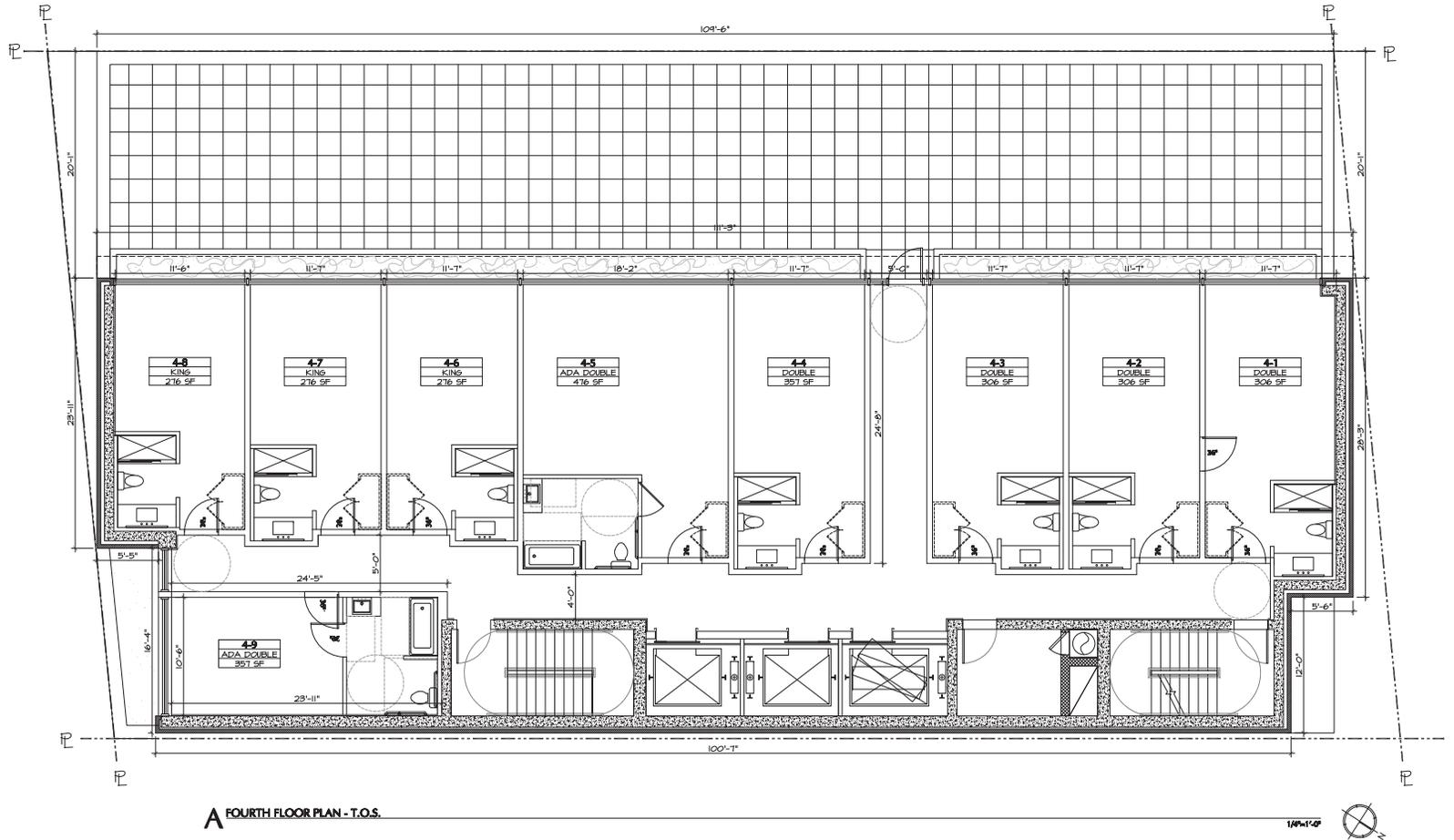
PROJECT NO. 1649.00

DEVELOPER _____
 STRUCTURAL ENGINEER _____
 MECHANICAL ENGINEER _____
 OWNER _____
 ISSUE _____
 SCALE _____
 KEY PLAN _____

PROJECT
93-43 SUTPHIN BLVD.
 JAMAICA, QUEENS 11435
 DRAWING
3RD FLOOR PLAN

DATE AND DESCRIPTION _____
 DRAWN BY _____
 CHECKED BY _____
 PROJECT NO. _____
 DRAWING NO. _____
 SHEET NO. _____
A-106.00
 GRID FILE NO. _____ OF 12

Figure 3



A FOURTH FLOOR PLAN - T.O.S.

93-43 Sutphin Blvd.
JAMAICA, QUEENS 11435
BLOCK: 9998 LOTS: 42,43,47,48,52

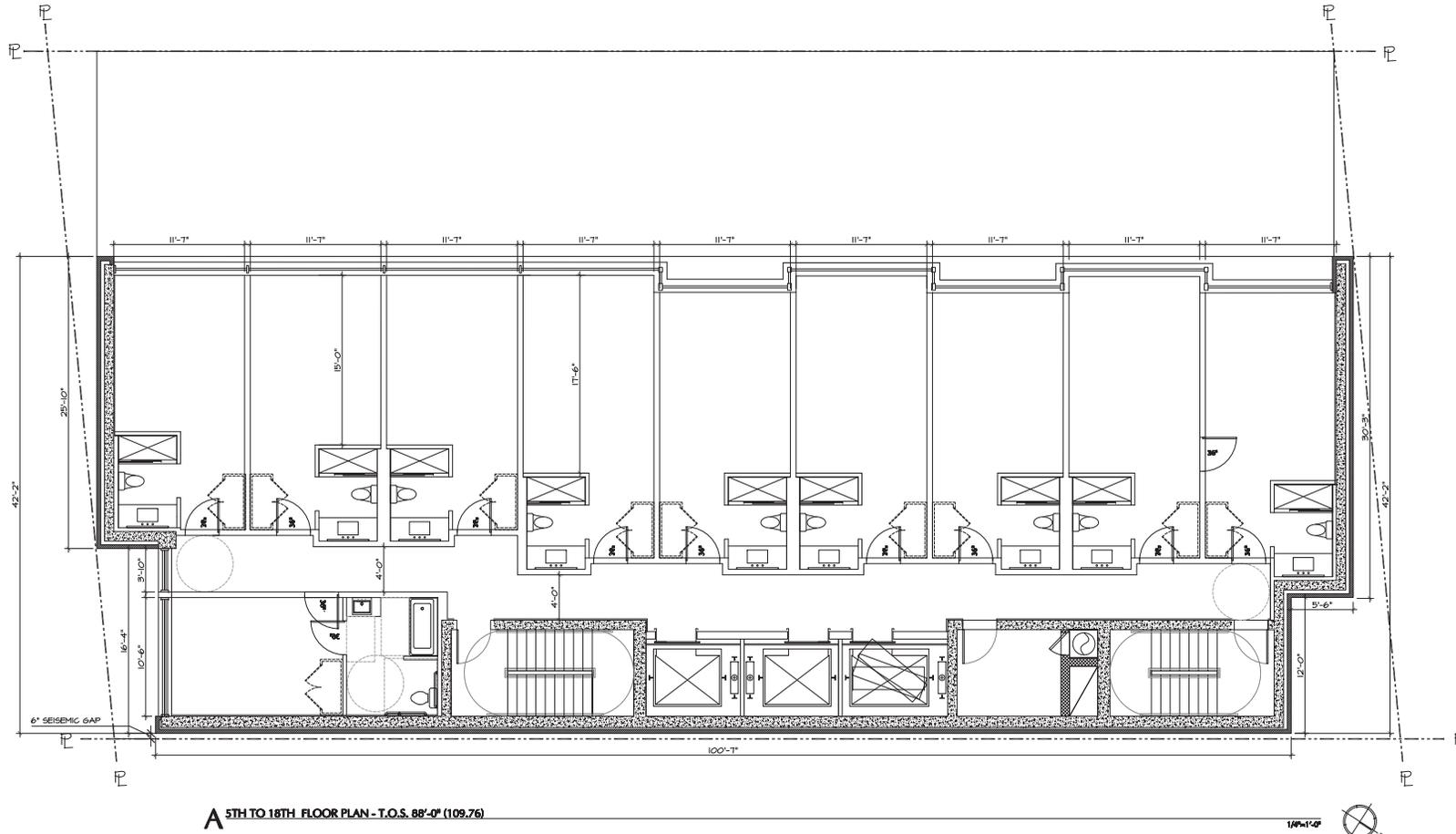
PROJECT NO. 1649.00

DEVELOPER _____
STRUCTURAL ENGINEER _____
MECHANICAL ENGINEER _____
OWNER _____
ISSUE _____
SCALE _____
KEY PLAN _____

PROJECT
93-43 SUTPHIN BLVD.
JAMAICA, QUEENS 11435
DRAWING
4TH FLOOR PLAN

DATE AND DESCRIPTION _____
PROJECT NO. _____
DRAWING NO. _____
CHECKED BY _____
DATE _____
DRAWN BY _____
DATE _____
A-107.00
GOOD FILE NO. _____ OF 12

Figure 3



A 5TH TO 18TH FLOOR PLAN - T.O.S. 88'-0" (109.76)

93-43 Sutphin Blvd.
 JAMAICA, QUEENS 11435
 BLOCK: 9998 LOTS: 42,43,47,48,52

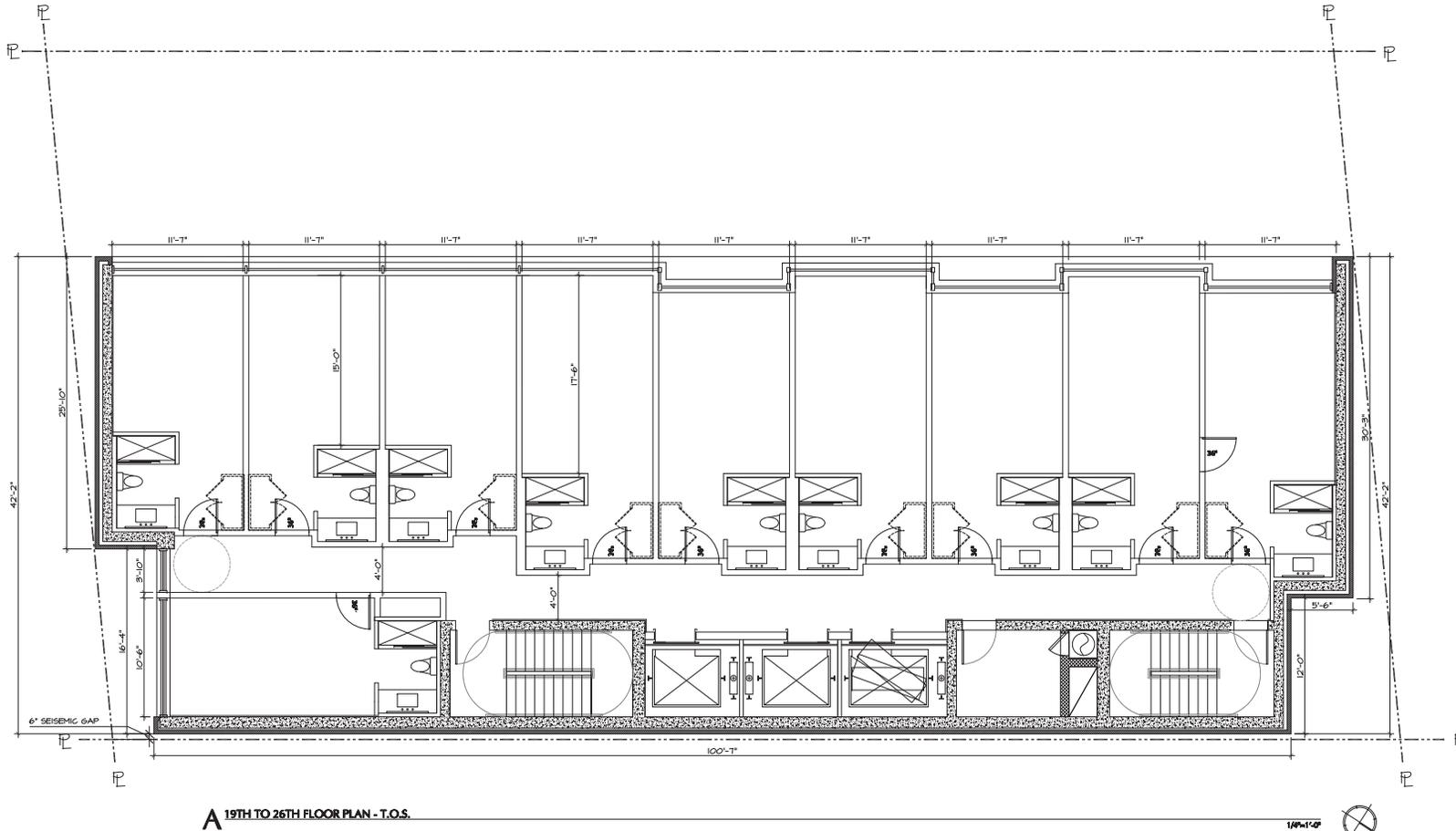
PROJECT NO. 1649.00

DEVELOPER _____
 STRUCTURAL ENGINEER _____
 MECHANICAL ENGINEER _____
 OWNER _____
 ISSUE _____
 SCALE _____
 KEY PLAN _____

PROJECT
 93-43 SUTPHIN BLVD.
 JAMAICA, QUEENS 11435
 DRAWING
 5TH-18TH FLOOR PLAN

DATE AND DESCRIPTION _____
 PROJECT NO. _____
 DRAWING NO. J.C. 04 _____
 CHECK BY: SHAW DESIGN _____
 DWG NO. _____
 A-108.00
 GRID FILE NO. _____ OF 12

Figure 3



A 19TH TO 26TH FLOOR PLAN - T.O.S.

93-43 Sutphin Blvd.
 JAMAICA, QUEENS 11435
 BLOCK: 9998 LOTS: 42,43,47,48,52

PROJECT NO. 1649.00

DEVELOPER _____
 STRUCTURAL ENGINEER _____
 MECHANICAL ENGINEER _____
 OWNER _____
 ISSUE _____
 SCALE _____
 KEY PLAN _____

PROJECT
 93-43 SUTPHIN BLVD.
 JAMAICA, QUEENS 11435
 DRAWING
 19TH-26TH FLOOR PLAN

DATE AND DESCRIPTION	DATE
PROJECT NO.	
DESIGNED BY: J.C. CHEN	
CHECKED BY: DAVID CHEN	
DRAWN BY:	
DATE:	
A-109.00	
GOOD FILE NO.	OF 12

Long Island Rail Road Tracks

Long Island Railroad Overpass

MTA Lot

Block: 9998
Lot: 52

Block: 9998
Lot: 48

Approximate
Property
Boundary

Block: 9998
Lot: 47

Jamaica Station

SUTPHIN BOULEVARD

Bilco
Doors

Existing
Building

Adjacent Commercial Building

Block: 9998
Lot: 42

Block: 9998
Lot: 43

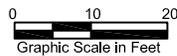
94TH AVENUE

Bilco
Doors

Vacant Lot

LEGEND

- Proposed Endpoint Sample Location



CA RICH CONSULTANTS, INC.

Environmental Specialists Since 1982
17 Dupont Street, Plainview, New York 11803

TITLE: Endpoint Sample Locations		DATE: 4/16/2014
FIGURE: 4		SCALE: As Shown
DRAWING NO: 2014-4	DRAWN BY: J.T.C./T.R.B.	
		APPR. BY: V.W.

Long Island Rail Road Tracks

Long Island Railroad Overpass

MTA Lot

Block: 9998
Lot: 52

Block: 9998
Lot: 48

Approximate
Property
Boundary

Block: 9998
Lot: 47

Jamaica Station

SUTPHIN BOULEVARD

Bilco
Doors

Existing
Building

Adjacent Commercial Building

Block: 9998
Lot: 42

Block: 9998
Lot: 43

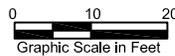
94TH AVENUE

Bilco
Doors

Vacant Lot

LEGEND

 Excavation to 30 feet



CA RICH CONSULTANTS, INC.

Environmental Specialists Since 1982
17 Dupont Street, Plainview, New York 11803

TITLE: Site Excavation Diagram		DATE: 4/16/2014
FIGURE: 5		SCALE: As Shown
DRAWING NO: 2014-5	DRAWN BY: J.T.C./T.R.B.	
DRAWING NO: 2014-5		APPR. BY: V.W.

93-41 through 93-51 Sutphin Blvd. &
147-01 through 147-05 94th Avenue
Jamaica, Queens, NY

Long Island Rail Road Tracks

Long Island Railroad Overpass

MTA Lot

Approximate Property Boundary

Future Building

Adjacent Commercial Building

Concrete Slab Below a Ventilated Parking Garage

Bilco Doors

Jamaica Station

SUTPHIN BOULEVARD

Concrete Sidewalk

94TH AVENUE

Bilco Doors

Vacant Lot

— Building Outline

CA RICH CONSULTANTS, INC.

Environmental Specialists Since 1982
17 Dupont Street, Plainview, New York 11803

TITLE:

Site-Wide Cover System

DATE:

4/16/2014

SCALE:

As Shown

FIGURE:

6

DRAWN BY:

J.T.C./T.R.B.

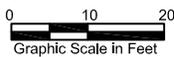
DRAWING NO:

2014-6

93-41 through 93-51 Sutphin Blvd. &
147-01 through 147-05 94th Avenue
Jamaica, Queens, NY

APPR. BY:

V.W.



Long Island Rail Road Tracks

Long Island Railroad Overpass

MTA Lot

Approximate Property Boundary

Future Building

Adjacent Commercial Building

Jamaica Station

SUTPHIN BOULEVARD

A
B
C
D
E

1 2 3

94TH AVENUE

Vacant Lot



CA RICH CONSULTANTS, INC.

Environmental Specialists Since 1982
17 Dupont Street, Plainview, New York 11803

TITLE:

Alpha Numeric Grid

DATE:

4/16/2014

SCALE:

As Shown

FIGURE:

7

DRAWN BY:

J.T.C./T.R.B.

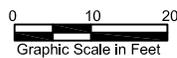
DRAWING NO:

2014-7

APPR. BY:

V.W.

93-41 through 93-51 Sutphin Blvd. &
147-01 through 147-05 94th Avenue
Jamaica, Queens, NY



TABLES

Table 1
Analytical Results of Volatile Organic Compounds In Soil Samples
Sutphin Plaza
93-41 to 93-51 Sutphin Blvd. and 147-01 to 147-09 94th Avenue
Queens, New York

Sample ID Matrix Date Sampled	SB-1 (0-2 feet) Soil 3/10/2014		SB-1 (12feet) Soil 3/10/2014		SB-2 (0-2 feet) Soil 3/10/2014		SB-2 (4-5 feet) Soil 3/10/2014		SB-3 (0-2 feet) Soil 3/10/2014		SB-3 (5 feet) Soil 3/10/2014		SB-4 (0-2 feet) Soil 3/10/2014		SB-4 (5 feet) Soil 3/10/2014		SB-5 (0-2 feet) Soil 3/10/2014		SB-5 (5 feet) Soil 3/10/2014		SB-6 (0-2 feet) Soil 3/14/2014		SB-6 (10 feet) Soil 3/14/2014		SB-7 (0-2 feet) Soil 3/24/2014		SB-7 (20 feet) Soil 3/24/2014		SB-8 (0-1 feet) Soil 3/24/2014		NYSDEC Part 375** Unrestricted SCOs		NYSDEC Part 375** Restricted Residential SCOs			
	Units	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q			
1,1,1,2-Tetrachloroethane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
1,1,1-Trichloroethane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	680	100,000		
1,1,2,2-Tetrachloroethane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
1,1,2-Trichloro-1,2,2-trifluoroethane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
1,1,2-Trichloroethane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
1,1-Dichloroethane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	270	26,000		
1,1-Dichloroethene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	330	100,000		
1,1-Dichloropropene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
1,2,3-Trichlorobenzene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
1,2,3-Trichloropropane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
1,2,4,5-Tetramethylbenzene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
1,2,4-Trichlorobenzene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
1,2,4-Trimethylbenzene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	3,600	52,000		
1,2-Dibromo-3-chloropropane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
1,2-Dibromoethane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
1,2-Dichlorobenzene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	1,100	100,000		
1,2-Dichloroethane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	20	3,100		
1,2-Dichloropropane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
1,3,5-Trimethylbenzene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	8,400	52,000		
1,3-Dichlorobenzene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	2,400	49,000		
1,3-dichloropropane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
1,4-Dichlorobenzene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	1,800	13,000		
1,4-Dioxane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	100	13,000		
2,2-Dichloropropane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
2-Butanone	10	U	10	U	9.9	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	12	U	10	U	11	U	120	NVG		
2-Chloroethyl vinyl ether	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
2-Chlorotoluene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
2-Hexanone	10	U	10	U	9.9	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	12	U	10	U	11	U	11	U	NVG	NVG
2-Propanol	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
4-Chlorotoluene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
4-Isopropyltoluene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
4-Methyl-2-pentanone	10	U	10	U	9.9	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	12	U	10	U	11	U	11	U	NVG	NVG
Acetone	5.1	BJ	5.3	BJ	5.0	BJ	4.5	BJ	4.9	BJ	4.4	BJ	3.8	BJ	4.3	BJ	4.0	BJ	3.9	BJ	3.0	BJ*	3.8	BJ*	3.5	BJ*	3.5	BJ*	4.8	BJ*	50	100,000	50	100,000		
Benzene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	60	4,800		
Bromobenzene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
Bromochloromethane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
Bromodichloromethane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
Bromoform	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
Bromomethane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
Carbon disulfide	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
Carbon tetrachloride	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	760	2,400		
Chlorobenzene	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	1,100	100,000		
Chlorodifluoromethane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
Chloroethane	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1	U	5.2	U	5.9	U	5.1	U	5.5	U	NVG	NVG		
Chloroform	5.1	U	5.1	U	5.0	U	5.1	U	5.1	U	5.1	U	5.1																							

Table 2
Analytical Results of Semi-Volatile Organic Compounds In Soil Samples
Sutphin Plaza
93-41 to 93-51 Sutphin Blvd. and 147-01 to 147-09 94th Avenue
Queens, New York

Sample ID Matrix Date Sampled	SB-1 (0-2 feet) Soil 3/10/2014		SB-1 (12feet) Soil 3/10/2014		SB-2 (0-2 feet) Soil 3/10/2014		SB-2 (4-5 feet) Soil 3/10/2014		SB-3 (0-2 feet) Soil 3/10/2014		SB-3 (5 feet) Soil 3/10/2014		SB-4 (0-2 feet) Soil 3/10/2014		SB-4 (5 feet) Soil 3/10/2014		SB-5 (0-2 feet) Soil 3/10/2014		SB-5 (5 feet) Soil 3/10/2014		SB-6 (0-2 feet) Soil 3/14/2014		SB-6 (10 feet) Soil 3/14/2014		SB-7 (0-2 feet) Soil 3/24/2014		SB-7 (20 feet) Soil 3/24/2014		SB-8 (0-1feet) Soil 3/24/2014		NYSDEC Part 375* Unrestricted SCOs		NYSDEC Part 375* Restricted Residential SCOs					
	Units	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q	ug/kg	Q			
1,2,4-Trichlorobenzene	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
1,2-Dichlorobenzene	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	1,100	100,000
1,3-Dichlorobenzene	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	2,400	49,000
1,4-Dichlorobenzene	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	1,800	13,000
2,3,4,6-Tetrachlorophenol	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
2,4,5-Trichlorophenol	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
2,4,6-Trichlorophenol	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
2,4-Dichlorophenol	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
2,4-Dimethylphenol	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
2,4-Dinitrophenol	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
2,4-Dinitrotoluene	520	U	510	U	510	U	500	U	510	U	510	U	500	U	490	U	490	U	510	U	510	U	520	U	2900	U	520	U	550	U	550	U	550	U	550	U	NVG	NVG
2,6-Dinitrotoluene	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
2-Chloronaphthalene	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
2-Chlorophenol	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
2-Methylnaphthalene	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
2-Methylphenol	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	330	100,000
2-Nitroaniline	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
2-Nitrophenol	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
3,3'-Dichlorobenzidine	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
3+4-Methylphenol	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	330	100,000
3-Nitroaniline	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
4,6-Dinitro-2-methylphenol	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
4-Bromophenyl phenyl ether	520	U	510	U	510	U	500	U	510	U	510	U	500	U	490	U	490	U	510	U	510	U	520	U	2900	U	520	U	550	U	550	U	550	U	550	U	NVG	NVG
4-Chloro-3-methylphenol	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
4-Chloroaniline	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
4-Chlorophenyl phenyl ether	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
4-Nitroaniline	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
4-Nitrophenol	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
Acenaphthene	520	U	510	U	78	J	500	U	510	U	510	U	500	U	490	U	490	U	510	U	510	U	520	U	1200	J	520	U	31	J	20,000	U	20,000	U	20,000	U		
Acenaphthylene	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
Acetophenone	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
Aniline	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
Anthracene	260	U	260	U	110	Jm	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	100,000	100,000
Atrazine	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
Azobenzene	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
Benzaldehyde	260	U	260	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	NVG	NVG
Benzidine	520	U	510	U	510	U	500	U	510	U	510	U	500	U	490	U	490	U	510	U	510	U	520	U	2900	U	520	U	550	U	550	U	550	U	550	U	NVG	NVG
Benzo(a)anthracene	520	U	510	U	190	Jm	35	Jm	44	J	510	U	500	U	490	U	490	U	510	U	510	U	520	U	10000	m	520	U	340	m	1,000	U	1,000	U	1,000	U		
Benzo(a)pyrene	260	U	260	U	160	J	26	J	48	J	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	1,000	1,000
Benzo(b)fluoranthene	260	U	260	U	140	J	32	J	62	J	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	1,000	1,000
Benzo(g,h,i)perylene	260	U	260	U	95	J	250	U	37</																													

TABLE 3
Analytical Results for Pesticides in Soil Samples
Sutphin Plaza
93-41 to 93-51 Sutphin Blvd. and 147-01 to 147-09 94th Avenue
Queens, New York

Sample ID	SB-1 (0-2 feet)		SB-1 (12feet)		SB-2 (0-2 feet)		SB-2 (4-5 feet)		SB-3 (0-2 feet)		SB-3 (5 feet)		SB-4 (0-2 feet)		SB-4 (5 feet)		SB-5 (0-2 feet)		SB-5 (5 feet)		SB-6 (0-2 feet)		SB-6 (10 feet)		SB-7 (0-2 feet)		SB-7 (20 feet)		SB-8 (0-2 feet)		*Part 375	*Part 375		
	Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Unrestricted	Restricted Residential		
Date Sampled	3/10/2014		3/10/2014		3/10/2014		3/10/2014		3/10/2014		3/10/2014		3/10/2014		3/10/2014		3/10/2014		3/10/2014		3/14/2014		3/14/2014		3/24/2014		3/24/2014		3/24/2014		Use	Use		
Units	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q	<u>ug/kg</u>	Q		
Pesticides via EPA Method 8081	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	3.0	U	2.6	U	2.7	U				
4,4'-DDD	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.1	JP	2.6	U	2.7	U	3.3	13,000		
4,4'-DDE	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	1.5	J	1.4	J	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	6.6	2.6	U	1.6	JP	3.3	8,900	
4,4'-DDT	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	3.9	P	2.6	U	2.7	U	3.3	7,900
Aldrin	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.6	U	2.7	U	5	97
alpha-BHC	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	12	U	11	U	3.6	J	20	480
beta-BHC	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.6	U	2.7	U	36	360		
Chlordane	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.6	U	2.7	U	94	4,200
Chlorobenzilate	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.6	U	2.7	U	NVG	NVG
DBCP	2.6	U	4	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.6	U	2.7	U	NVG	NVG
delta-BHC	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.6	U	2.7	U	40	100,000
Dieldrin	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.6	U	2.7	U	5	200		
Endosulfan I	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.6	U	2.7	U	2,400	24,000
Endosulfan II	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.6	U	2.7	U	2,400	24,000
Endosulfan sulfate	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	1.8	JP	2.6	U	2.7	U	2,400	24,000
Endrin	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.6	U	2.7	U	14	11,000
Endrin aldehyde	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.6	U	2.7	U	NVG	NVG
Endrin ketone	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.8	J	2.6	U	2.7	U	NVG	NVG
gamma-BHC	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	12	U	11	U	11	U	100	1,300
Heptachlor	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	1.7	J	2.6	U	2.7	U	42	2,100
Heptachlor epoxide	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.6	U	3.7	NVG	NVG	
Hexachlorobenzene	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.6	U	2.7	U	330	1,200
Hexachlorocyclopentadiene	2.6	U	1.2	J	2.5	U	1.3	J	2.6	U	1.7	J	2.6	U	2.5	U	1.4	J	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.1	J	1.3	JP	NVG	NVG
Methoxychlor	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	3.9	2.6	U	2.7	U	NVG	NVG	
Toxaphene	2.6	U	2.6	U	2.5	U	2.6	U	2.6	U	2.5	U	2.6	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.6	U	2.9	U	2.6	U	2.7	U	NVG	NVG

Notes:

All concentrations are reported in micrograms per kilogram (ug/kg) or part P - Secondary column exceeds 40% difference for GC test

*6 NYCRR Part 375; Subparts 375-1 to 375-4 & 375-6;

Table 375-6.8(a). Restricted and Unrestricted Use Soil Cleanup Objectives

NVG=No Value Given

U - Below the detection limits

Bold indicates that value is above 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives.

Table 6				
Analytical Results for Volatile Organic Compounds In Groundwater				
Sutphin Plaza				
93-41 to 93-51 Sutphin Blvd. and 147-01 to 147-09 94th Avenue				
Queens, New York				
Sample ID	MW-1	MW-2	MW-3	NYSDEC
Matrix	groundwater	groundwater	groundwater	TOGs**
Date Sampled	3/24/2014	3/24/2014	3/24/2014	
Units	ug/L	ug/L	ug/L	ug/L
Volatile Organic Compounds				
1,1,1,2-Tetrachloroethane	2.0 U	2.0 U	2.0 U	5
1,1,1-Trichloroethane	2.0 U	2.0 U	2.0 U	5
1,1,2,2-Tetrachloroethane	2.0 U	2.0 U	2.0 U	5
1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U	2.0 U	2.0 U	5
1,1,2-Trichloroethane	2.0 U	2.0 U	2.0 U	1
1,1-Dichloroethane	2.0 U	2.0 U	2.0 U	5
1,1-Dichloroethene	2.0 U	2.0 U	2.0 U	5
1,1-Dichloropropene	2.0 U	2.0 U	2.0 U	1
1,2,3-Trichlorobenzene	2.0 U	2.0 U	2.0 U	5
1,2,3-Trichloropropane	2.0 U	2.0 U	2.0 U	5
1,2,4,5-Tetramethylbenzene	2.0 U	2.0 U	2.0 U	5
1,2,4-Trichlorobenzene	2.0 U	2.0 U	2.0 U	5
1,2,4-Trimethylbenzene	2.0 U	2.0 U	2.0 U	NVG
1,2-Dibromo-3-chloropropane	2.0 U	2.0 U	2.0 U	5
1,2-Dibromoethane	2.0 U	2.0 U	2.0 U	NVG
1,2-Dichlorobenzene	2.0 U	2.0 U	2.0 U	3
1,2-Dichloroethane	2.0 U	2.0 U	2.0 U	0.6
1,2-Dichloropropane	2.0 U	2.0 U	2.0 U	5
1,3,5-Trimethylbenzene	2.0 U	2.0 U	2.0 U	5
1,3-Dichlorobenzene	2.0 U	2.0 U	2.0 U	3
1,3-dichloropropane	2.0 U	2.0 U	2.0 U	5
1,4-Dichlorobenzene	2.0 U	2.0 U	2.0 U	3
1,4-Dioxane	2.0 U	2.0 U	2.0 U	NVG
2,2-Dichloropropane	2.0 U	2.0 U	2.0 U	5
2-Butanone	5.0 U	5.0 U	5.0 U	NVG
2-Chloroethyl vinyl ether	4.0 U	4.0 U	4.0 U	NVG
2-Chlorotoluene	2.0 U	2.0 U	2.0 U	NVG
2-Hexanone	5.0 U	5.0 U	5.0 U	NVG
2-Propanol	2.0 U	2.0 U	2.0 U	NVG
4-Chlorotoluene	2.0 U	2.0 U	2.0 U	NVG
4-Isopropyltoluene	2.0 U	2.0 U	2.0 U	5
4-Methyl-2-pentanone	5.0 U	5.0 U	5.0 U	NVG
Acetone	2.4 BJ ^m	2.0 BJ [*]	1.8 BJ [*]	50
Benzene	2.0 U	2.0 U	2.0 U	1
Bromobenzene	2.0 U	2.0 U	2.0 U	5
Bromochloromethane	2.0 U	2.0 U	2.0 U	NVG
Bromodichloromethane	2.0 U	2.0 U	2.0 U	5
Bromoform	2.0 U	2.0 U	2.0 U	50
Bromomethane	4.0 U	4.0 U	4.0 U	5
Carbon disulfide	2.0 U	2.0 U	2.0 U	NVG
Carbon tetrachloride	2.0 U	2.0 U	2.0 U	5
Chlorobenzene	2.0 U	2.0 U	2.0 U	5
Chlorodifluoromethane	2.0 U	2.0 U	2.0 U	NVG
Chloroethane	2.0 U	2.0 U	2.0 U	5
Chloroform	2.0 U	2.0 U	2.0 U	7
Chloromethane	2.0 U	2.0 U	2.0 U	NVG
cis-1,2-Dichloroethene	2.0 U	2.0 U	2.0 U	5
cis-1,3-Dichloropropene	2.0 U	2.0 U	2.0 U	0.4
Cyclohexane	2.0 U	2.0 U	2.0 U	NVG
Dibromochloromethane	2.0 U	2.0 U	2.0 U	50
Dibromomethane	2.0 U	2.0 U	2.0 U	5
Dichlorodifluoromethane	2.0 U	2.0 U	2.0 U	NVG
Diisopropyl ether	2.0 U	2.0 U	2.0 U	NVG
Ethanol	10 U	10 U	10 U	NVG
Ethylbenzene	2.0 U	2.0 U	2.0 U	5
Freon-114	2.0 U	2.0 U	2.0 U	NVG
Hexachlorobutadiene	2.0 U	2.0 U	2.0 U	0.5
Isopropylbenzene	2.0 U	2.0 U	2.0 U	5
m,p-Xylene	4.0 U	4.0 U	4.0 U	5
Methyl Acetate	2.0 U	2.0 U	2.0 U	NVG
Methyl tert-butyl ether	2.0 U	2.0 U	2.0 U	10
Methylene chloride	5.1 B*	5.3 B*	5.1 B*	5
Naphthalene	2.0 U	2.0 U	2.0 U	10
n-Butylbenzene	2.0 U	2.0 U	2.0 U	5
n-Propylbenzene	2.0 U	2.0 U	2.0 U	5
o-Xylene	2.0 U	2.0 U	2.0 U	5
p-Diethylbenzene	2.0 U	2.0 U	2.0 U	NVG
p-Ethyltoluene	2.0 U	2.0 U	2.0 U	NVG
sec-Butylbenzene	2.0 U	2.0 U	2.0 U	5
Styrene	2.0 U	2.0 U	2.0 U	5
t-Butyl alcohol	10 U	10 U	10 U	NVG
tert-Butylbenzene	2.0 U	2.0 U	2.0 U	5
Tetrachloroethene	2.0 U	2.0 U	2.0 U	5
Toluene	2.0 U	2.0 U	2.0 U	5
trans-1,2-Dichloroethene	2.0 U	2.0 U	2.0 U	5
trans-1,3-Dichloropropene	2.0 U	2.0 U	2.0 U	NVG
Trichloroethene	2.0 U	2.0 U	2.0 U	5
Trichlorofluoromethane	2.0 U	2.0 U	2.0 U	5
Vinyl acetate	2.0 U	2.0 U	2.0 U	NVG
Vinyl chloride	2.0 U	2.0 U	2.0 U	5

Notes:
ug/L - micrograms per liter or parts per billion
<DL - below the detection limits
NVG - No Value Given
m - Analyte was manually integrated for GC/MS
B - Analyte detected in associated Method Blank
J - Estimated Value
* - Calibration exceeds method requirement

Boxed and bold indicates exceedance groundwater standards or guidance values

**NYSDEC Technical and Operational Guidance Series (1.1.1)
Ambient Water Quality Standards and Guidance Values
and Groundwater Effluent Limitations; June 1998

Table 7							
Analytical Results for Semi-Volatile Organic Compounds In Groundwater							
Sutphin Plaza							
93-41 to 93-51 Sutphin Blvd. and 147-01 to 147-09 94th Avenue							
Queens, New York							
Sample ID	MW-1	MW-2	MW-3	NYSDEC			
Matrix	groundwater	groundwater	groundwater	TOGS*			
Date Sampled	3/24/2014	3/24/2014	3/24/2014				
Semi-Volatile Organic Compounds							
Units	ug/L	Q	ug/L	Q	ug/L	Q	ug/L
1,2,4-Trichlorobenzene	5.0	U	5.7	U	5.7	U	5
1,2-Dichlorobenzene	5.0	U	5.7	U	5.7	U	3
1,3-Dichlorobenzene	5.0	U	5.7	U	5.7	U	3
1,4-Dichlorobenzene	5.0	U	5.7	U	5.7	U	3
2,3,4,6-Tetrachlorophenol	5.0	U	5.7	U	5.7	U	NVG
2,4,5-Trichlorophenol	5.0	U	5.7	U	5.7	U	NVG
2,4,6-Trichlorophenol	5.0	U	5.7	U	5.7	U	NVG
2,4-Dichlorophenol	5.0	U	5.7	U	5.7	U	5
2,4-Dimethylphenol	5.0	U	5.7	U	5.7	U	50
2,4-Dinitrophenol	10	U	11	U	11	U	10
2,4-Dinitrotoluene	10	U	11	U	11	U	5
2,6-Dinitrotoluene	5.0	U	5.7	U	5.7	U	5
2-Chloronaphthalene	5.0	U	5.7	U	5.7	U	10
2-Chlorophenol	5.0	U	5.7	U	5.7	U	NVG
2-Methylnaphthalene	5.0	U	5.7	U	5.7	U	NVG
2-Methylphenol	5.0	U	5.7	U	5.7	U	NVG
2-Nitroaniline	5.0	U	5.7	U	5.7	U	5
2-Nitrophenol	5.0	U	5.7	U	5.7	U	NVG
3,3'-Dichlorobenzidine	10	U	11	U	11	U	5
3+4-Methylphenol	5.0	U	5.7	U	5.7	U	1
3-Nitroaniline	5.0	U	5.7	U	5.7	U	5
4,6-Dinitro-2-methylphenol	10	U	11	U	11	U	NVG
4-Bromophenyl phenyl ether	10	U	11	U	11	U	NVG
4-Chloro-3-methylphenol	5.0	U	5.7	U	5.7	U	NVG
4-Chloroaniline	5.0	U	5.7	U	5.7	U	NVG
4-Chlorophenyl phenyl ether	5.0	U	5.7	U	5.7	U	NVG
4-Nitroaniline	5.0	U	5.7	U	5.7	U	5
4-Nitrophenol	5.0	U	5.7	U	5.7	U	NVG
Acenaphthene	10	U	11	U	11	U	20
Acenaphthylene	5.0	U	5.7	U	5.7	U	NVG
Acetophenone	5.0	U	5.7	U	5.7	U	NVG
Aniline	5.0	U	5.7	U	5.7	U	NVG
Anthracene	5.0	U	5.7	U	5.7	U	50
Atrazine	5.0	U	5.7	U	5.7	U	NVG
Azobenzene	5.0	U	5.7	U	5.7	U	NVG
Benzaldehyde	5.0	U	5.7	U	5.7	U	NVG
Benzidine	10	U	11	U	11	U	NVG
Benzo(a)anthracene	10	U	11	U	11	U	0.002
Benzo(a)pyrene	5.0	U	5.7	U	5.7	U	NVG
Benzo(b)fluoranthene	5.0	U	5.7	U	5.7	U	0.002
Benzo(g,h,i)perylene	5.0	U	5.7	U	5.7	U	NVG
Benzo(k)fluoranthene	5.0	U	5.7	U	5.7	U	0.002
Benzoic acid	5.0	U	5.7	U	5.7	U	NVG
Benzyl alcohol	10	U	11	U	11	U	NVG
Biphenyl	5.0	U	5.7	U	5.7	U	NVG
Bis(2-chloroethoxy)methane	5.0	U	5.7	U	5.7	U	NVG
Bis(2-chloroethyl)ether	5.0	U	5.7	U	5.7	U	NVG
Bis(2-chloroisopropyl)ether	5.0	U	5.7	U	5.7	U	NVG
Bis(2-ethylhexyl)phthalate	10	U	20	U	11	U	5
Butyl benzyl phthalate	10	U	11	U	11	U	NVG
Caprolactam	5.0	U	5.7	U	5.7	U	NVG
Carbazole	5.0	U	5.7	U	5.7	U	NVG
Chrysene	5.0	U	5.7	U	5.7	U	0.002
Dibenzo(a,h)anthracene	5.0	U	5.7	U	5.7	U	NVG
Dibenzofuran	5.0	U	5.7	U	5.7	U	NVG
Diethyl phthalate	5.0	U	5.7	U	5.7	U	NVG
Dimethyl phthalate	5.0	U	5.7	U	5.7	U	NVG
Di-n-butyl phthalate	5.0	U	5.7	U	5.7	U	50
Di-n-octyl phthalate	5.0	U	5.7	U	5.7	U	50
Fluoranthene	5.0	U	5.7	U	5.7	U	50
Fluorene	5.0	U	5.7	U	5.7	U	50
Hexachlorobenzene	5.0	U	5.7	U	5.7	U	0.04
Hexachlorobutadiene	5.0	U	5.7	U	5.7	U	0.5
Hexachlorocyclopentadiene	10	U	11	U	11	U	5
Hexachloroethane	5.0	U	5.7	U	5.7	U	5
Indeno(1,2,3-c,d)pyrene	5.0	U	5.7	U	5.7	U	0.002
Isophorone	5.0	U	5.7	U	5.7	U	50
Naphthalene	5.0	U	5.7	U	5.7	U	10
Nitrobenzene	5.0	U	5.7	U	5.7	U	0.4
N-Nitrosodimethylamine	5.0	U	5.7	U	5.7	U	NVG
N-Nitrosodi-n-propylamine	5.0	U	5.7	U	5.7	U	NVG
N-Nitrosodiphenylamine	5.0	U	5.7	U	5.7	U	50
Parathion	10	U	11	U	11	U	NVG
Pentachlorophenol	10	U	11	U	11	U	NVG
Phenanthrene	5.0	U	5.7	U	5.7	U	50
Phenol	5.0	U	5.7	U	5.7	U	NVG
Pyrene	5.0	U	5.7	U	5.7	U	50
Pyridine	5.0	U	5.7	U	5.7	U	50

Notes:

ug/L - micrograms per liter or parts per billion

U- Below the detection limits

NVG - No Value Given

*NYSDEC Technical and Operational Guidance Series (1.1.1)

Ambient Water Quality Standards and Guidance Values

and Groundwater Effluent Limitations; June 1998

Table 8

Analytical Results for Pesticides In Groundwater

Sutphin Plaza

93-41 to 93-51 Sutphin Blvd. and 147-01 to 147-09 94th Avenue

Queens, New York

Sample ID	MW-1	MW-2	MW-3	NYSDEC TOGS*
Matrix	groundwater	groundwater	groundwater	
Date Sampled	3/24/2014	3/24/2014	3/24/2014	
Pesticides				
Units	<u>ug/L</u> <u>Q</u>	<u>ug/L</u> <u>Q</u>	<u>ug/L</u> <u>Q</u>	<u>ug/L</u>
4,4'-DDD	0.050 U	0.057 U	0.057 U	NVG
4,4'-DDE	0.050 U	0.057 U	0.021 J	NVG
4,4'-DDT	0.050 U	0.057 U	0.057 U	NVG
Aldrin	0.050 U	0.057 U	0.057 U	NVG
alpha-BHC	0.050 U	0.057 U	0.057 U	0.01
Alpha-Chlordane	0.25 U	0.29 U	0.29 U	0.05
beta-BHC	0.050 U	0.057 U	0.057 U	0.04
Chlorobenzilate	0.050 U	0.057 U	0.057 U	NVG
DBCP	0.050 U	0.057 U	0.057 U	NVG
delta-BHC	0.050 U	0.057 U	0.057 U	0.04
Dieldrin	0.050 U	0.057 U	0.057 U	0.004
Endosulfan I	0.050 U	0.057 U	0.057 U	NVG
Endosulfan II	0.050 U	0.057 U	0.057 U	NVG
Endosulfan sulfate	0.050 U	0.057 U	0.057 U	NVG
Endrin	0.050 U	0.057 U	0.057 U	NVG
Endrin aldehyde	0.050 U	0.019 JP	0.057 U	5
Endrin ketone	0.050 U	0.057 U	0.057 U	NVG
gamma-BHC	0.050 U	0.057 U	0.057 U	0.05
gamma-Chlordane	0.25 U	0.29 U	0.29 U	0.05
Heptachlor	0.050 U	0.057 U	0.057 U	NVG
Heptachlor epoxide	0.050 U	0.057 U	0.057 U	NVG
Hexachlorobenzene	0.050 U	0.057 U	0.057 U	0.04
Hexachlorocyclopentadiene	0.24 U	0.18 U	0.21 U	5
Methoxychlor	0.050 U	0.057 U	0.057 U	NVG
Toxaphene	0.50 U	0.57 U	0.57 U	NVG

Notes:

ug/L - micrograms per liter or parts per billion

U - below the detection limits

P- >40% diff for detected concentration between the two GC columns

NVG - No Value Given

J - Estimated Value

**NYSDEC Technical and Operational Guidance Series (1.1.1)*

Ambient Water Quality Standards and Guidance Values

and Groundwater Effluent Limitations; June 1998

Table 9

**Analytical Results for PCBs In Groundwater
Sutphin Plaza**

**93-41 to 93-51 Sutphin Blvd. and 147-01 to 147-09 94th Avenue
Queens, New York**

Sample ID	MW-1		MW-2		MW-3		NYSDEC TOGS**	
Matrix	groundwater		groundwater		groundwater			
Date Sampled	3/24/2014		3/24/2014		3/24/2014			
PCBs	Units	<u>ug/L</u>	<u>Q</u>	<u>ug/L</u>	<u>Q</u>	<u>ug/L</u>	<u>Q</u>	<u>ug/L</u>
Aroclor-1016		0.50	U	0.57	U	0.57	U	0.09 *
Aroclor-1221		0.50	U	0.57	U	0.57	U	0.09 *
Aroclor-1232		0.50	U	0.57	U	0.57	U	0.09 *
Aroclor-1242		0.50	U	0.57	U	0.57	U	0.09 *
Aroclor-1248		0.50	U	0.57	U	0.57	U	0.09 *
Aroclor-1254		0.50	U	0.57	U	0.57	U	0.09 *
Aroclor-1260		0.50	U	0.57	U	0.57	U	0.09 *
Aroclor-1262		0.50	U	0.57	U	0.57	U	0.09 *
Aroclor-1268		0.50	U	0.57	U	0.57	U	0.09 *

Notes:

ug/L - micrograms per liter or parts per billion

U below the detection limits

** Applies to the sum of these compounds*

***NYSDEC Technical and Operational Guidance Series (1.1.1)*

Ambient Water Quality Standards and Guidance Values

and Groundwater Effluent Limitations; June 1998

Table 10

**Analytical Results for Dissolved Metals In Groundwater
Sutphin Plaza
93-41 to 93-51 Sutphin Blvd. and 147-01 to 147-09 94th Avenue
Queens, New York**

Sample ID	MW-1	MW-2	MW-3	NYSDEC TOGS*
Matrix	groundwater	groundwater	groundwater	
Date Sampled	3/24/2014	3/24/2014	3/24/2014	
Dissolved Metals				
Units	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>
Aluminum	0.0536	0.0366	0.0247	NVG
Antimony	0.0200 U	0.0200 U	0.0200 U	0.003
Arsenic	0.0250 U	0.0250 U	0.0250 U	0.025
Barium	0.0739	1.18	0.117	1
Beryllium	0.0200 U	0.0200 U	0.0200 U	0.003
Cadmium	0.0100 U	0.0100 U	0.0100 U	0.005
Calcium	33.1	28.6	28.4	NVG
Chromium	0.0200 U	0.0200 U	0.0200 U	0.05
Cobalt	0.0200 U	0.0200 U	0.0200 U	NVG
Copper	0.0200 U	0.0200 U	0.0200 U	0.2
Iron	0.114	0.0901	0.0586	0.3
Lead	0.0150 U	0.0150 U	0.0150 U	0.025
Magnesium	3.64	5.67	5.56	35
Manganese	0.172	0.422	0.0739	0.3
Mercury	0.000250 U	0.000250 U	0.000250 U	0.0007
Nickel	0.0200 U	0.0200 U	0.00508 J	0.1
Potassium	14.2	40.3	18.9	NVG
Selenium	0.0250 U	0.0250 U	0.0250 U	0.01
Silver	0.0200 U	0.0200 U	0.0200 U	0.05
Sodium	14.5	11.2	32.0	20
Thallium	0.0150 U	0.0150 U	0.0150 U	0.0005
Vanadium	0.0200 U	0.0200 U	0.0200 U	NA
Zinc	0.0205	0.0221	0.0349	2

Notes:

mg/L - milligrams per liter or parts per million

U- below the detection limits

NVG - No Value Given

J - Estimated Value

Boxed and bold indicates exceedance of groundwater standards or guidance values

**NYSDEC Technical and Operational Guidance Series (1.1.1)*

Ambient Water Quality Standards and Guidance Values

and Groundwater Effluent Limitations; June 1998

Table 11
Volatile Organic Compounds in Soil Vapor Samples
Sutphin Plaza
93-41 to 93-51 Sutphin Blvd. and 147-01 to 147-09 94th Ave.
Queens, New York

Sample ID Matrix Date Sampled	SV-1 Soil Vapor 3/14/2014	SV-2 Soil Vapor 3/24/2014	SV-3 Soil Vapor 3/14/2014	SV-4 Soil Vapor 3/14/2014	*NYSDOH 2006 Matrix1/Matrix 2 Sub-Slab Vapor
Volatile Organic Compounds					
Units	<u>ug/m³</u>	<u>ug/m³</u>	<u>ug/m³</u>	<u>ug/m³</u>	<u>ug/m³</u>
Acetone	11	4	5.2	6.2	NVG
1,3-Butadiene	ND	ND	ND	ND	NVG
Benzene	ND	ND	ND	ND	NVG
Bromodichloromethane	ND	ND	ND	ND	NVG
Bromoform	ND	ND	ND	ND	NVG
Bromomethane	ND	ND	ND	ND	NVG
Bromoethene	ND	ND	ND	ND	NVG
Benzyl Chloride	ND	ND	ND	ND	NVG
Carbon disulfide	ND	ND	ND	ND	NVG
Chlorobenzene	ND	ND	ND	ND	NVG
Chloroethane	ND	ND	ND	ND	NVG
Chloroform	7.3	2.8	2.0 J	6.3	NVG
Chloromethane	ND	ND	ND	ND	NVG
3-Chloropropene	ND	ND	ND	ND	NVG
2-Chlorotoluene	ND	ND	ND	ND	NVG
Carbon tetrachloride	ND	ND	ND	ND	5
Cyclohexane	ND	ND	ND	ND	NVG
1,1-Dichloroethane	ND	ND	ND	ND	NVG
1,1-Dichloroethylene	ND	ND	ND	ND	100
1,2-Dibromoethane	ND	ND	ND	ND	NVG
1,2-Dichloroethane	ND	ND	ND	ND	NVG
1,2-Dichloropropane	ND	ND	ND	ND	NVG
1,4-Dioxane	ND	ND	ND	ND	NVG
Dichlorodifluoromethane	12	7.9	20	10	NVG
Dibromochloromethane	ND	ND	ND	ND	NVG
trans-1,2-Dichloroethylene	ND	ND	ND	ND	NVG
cis-1,2-Dichloroethylene	ND	ND	ND	ND	100
cis-1,3-Dichloropropene	ND	ND	ND	ND	NVG
m-Dichlorobenzene	ND	ND	ND	ND	NVG
o-Dichlorobenzene	ND	ND	ND	ND	NVG
p-Dichlorobenzene	ND	ND	ND	ND	NVG
trans-1,3-Dichloropropene	ND	ND	ND	ND	NVG
Ethanol	30.3	3.4	11	9.2	NVG
Ethylbenzene	ND	ND	ND	ND	NVG
Ethyl Acetate	ND	ND	ND	ND	NVG
4-Ethyltoluene	ND	ND	ND	ND	NVG
Freon 113	ND	5.1	ND	ND	NVG
Freon 114	ND	ND	ND	ND	NVG
Heptane	ND	ND	ND	ND	NVG
Hexachlorobutadiene	ND	ND	ND	ND	NVG
Hexane	ND	3.5	ND	ND	NVG
2-Hexanone	ND	ND	ND	ND	NVG
Isopropyl Alcohol	8.8	ND	3.7	3.2	NVG
Methylene chloride	2.8	14	3	ND	NVG
Methyl ethyl ketone	ND	ND	ND	ND	NVG
Methyl Isobutyl Ketone	ND	ND	ND	ND	NVG
Methyl Tert Butyl Ether	ND	ND	ND	ND	NVG
Methylmethacrylate	ND	ND	ND	ND	NVG
Propylene	ND	1.4	ND	ND	NVG
Styrene	ND	ND	ND	ND	NVG
1,1,1-Trichloroethane	11	2.2	ND	3.0 J	100
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	NVG
1,1,2-Trichloroethane	ND	ND	ND	ND	NVG
1,2,4-Trichlorobenzene	ND	ND	ND	ND	NVG
1,2,4-Trimethylbenzene	ND	ND	ND	ND	NVG
1,3,5-Trimethylbenzene	ND	ND	ND	ND	NVG
2,2,4-Trimethylpentane	ND	ND	ND	ND	NVG
Tertiary Butyl Alcohol	ND	ND	ND	ND	NVG
Tetrachloroethylene	1.6 J	6.3	12	18	NVG
Tetrahydrofuran	27	ND	ND	ND	NVG
Toluene	14	1.5	11	11	NVG
Trichloroethylene	1.2	ND	1.2	1.3	5
Trichlorofluoromethane	77.6	15	4.0 J	20	NVG
Vinyl chloride	ND	ND	ND	ND	5
Vinyl Acetate	ND	ND	ND	ND	NVG
m,p-Xylene	3.9	ND	2.8 J	3.6	NVG
o-Xylene	ND	ND	ND	ND	NVG
Xylenes (total)	3.9	ND	2.8 J	3.6	NVG
Notes:					
J- Analyte detected below quantitation limits.					
ND- Not detected					
NVG- No Value Given					
*NYSDOH guidance for evaluating Soil Vapor in the State of New York Oct. 2006 Matrix 1 & 2 levels for "No Further Action"					
ug/m ³ - micrograms per cubic meters					

Table 12
Track 1 Soil Cleanup Objectives (SSSCOs)
Sutphin Plaza Hotel, LLC.
Queens, NY

Compound/Constituent	Track 1 SSSCOs
VOCs	Unrestricted Residential SCOs
SVOCs	Unrestricted Residential SCOs
Pesticides	Unrestricted Residential SCOs
PCBs	Unrestricted Residential SCOs
Metals	Unrestricted Residential SCOs

Notes:
VOCs = Volatile Organic Compound
SVOC = Semi-Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls

APPENDIX 1

CITIZEN PARTICIPATION PLAN

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

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

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

Repositories. A document repository is maintained in the nearest public library that maintains evening and weekend hours. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project. Sutphin Plaza Hotel, LLC will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

Queens Central Library 89-11 Merrick Blvd.

Jamaica, NY 11432

Repository Telephone Number: (718) 990-0700

Repository Hours of Operation: 9-5pm

Digital Documentation. NYC OER strongly encourages the use of digital documents in repositories as a means of minimizing paper use while also increasing convenience in access and ease of use.

Identify Issues of Public Concern. At this time the Enrollee has not identified any specific issues of concern to stakeholders proximate to the project site. If issues are identified at a later date, they will be presented to OER.

Public Notice and Public Comment. Public notice to all members of the Project Contact List is required at three major steps during the performance of the cleanup program (listed below) and at other points that may be required by OER. Notices will include Fact Sheets with descriptive project summaries, updates on recent and upcoming project activities, repository information, and important phone and email contact information. All notices will be prepared by Sutphin Plaza Hotel, LLC, reviewed and approved by OER prior to distribution and mailed by Sutphin Plaza Hotel, LLC. Public comment is solicited in public notices for all work plans developed under the NYC Voluntary Cleanup Program. Final review of all work plans by OER

will consider all public comments. Approval will not be granted until the public comment period has been completed.

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

- **Public Notice of the availability of the Remedial Investigation Report and Remedial Action Work Plan and a 30-day public comment period on the Remedial Action Work Plan.**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the availability of the Remedial Investigation Report and Remedial Action Work Plan and the initiation of a 30-day public comment period on the Remedial Action Work Plan. The Fact Sheet summarizes the findings of the RIR and provides details of the RAWP. The public comment period will be extended an additional 15 days upon public request. A public meeting or informational session will be conducted by OER upon request.

- **Public Notice announcing the approval of the RAWP and the start of remediation**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the approval of the RAWP and the start of remediation.

- **Public Notice announcing the completion of remediation, designation of Institutional and Engineering Controls and issuance of the Notice of Completion**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the completion of remediation, providing a list of all Institutional and Engineering Controls implemented for to the Site and announcing the issuance of the Notice of Completion.

APPENDIX 2

SUSTAINABILITY STATEMENT

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

Reuse of Clean, Recyclable Materials. Reuse of clean, locally-derived recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction. Reuse of clean, recyclable materials will be utilized if possible during construction. An estimate of the quantity (in tons) of clean, non-virgin materials (reported by type of material) reused under this plan will be quantified and reported in the RAR.

Reduce Consumption of Virgin and Non-Renewable Resources. Reduced consumption of virgin and non-renewable resources lowers the overall environmental impact of the project on the region by conserving these resources. It is not anticipated that soil will be imported to the site.

An estimate of the quantity (in tons) of virgin and non-renewable resources, the use of which will be avoided under this plan, will be quantified and reported in the RAR.

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

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

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

An estimate of the volume of clean fuels used during remedial activities will be quantified and reported in the RAR.

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

An estimate of the area of the Site that utilizes recontamination controls under this plan will be reported in the RAR in square feet.

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

An estimate of the enhanced storm-water retention capability of the redevelopment project will be included in the RAR.

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

The number of Green Buildings that are associated with this brownfield redevelopment property will be reported in the RAR. The total square footage of green building space created as a function of this brownfield redevelopment will be quantified for residential, commercial and industrial/manufacturing uses.

Paperless Brownfield Cleanup Program. Sutphin Plaza Hotel, LLC is participating in OER's Paperless Brownfield Cleanup Program. Under this program, submission of electronic documents will replace submission of hard copies for the review of project documents, communications and milestone reports.

Low-Energy Project Management Program. Sutphin Plaza Hotel, LLC is participating in OER's low-energy project management program. Under this program, whenever possible, meetings are held using remote communication technologies, such as videoconferencing and

teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation.

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

New trees will be planted along Sutphin Blvd. An estimate of the land area that will be vegetated, including the number of trees planted or preserved, will be reported in square feet in the RAR.

APPENDIX 3

SOIL/MATERIALS MANAGEMENT PLAN

1.1 SOIL SCREENING METHODS

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional and will be reported in the RAR. Soil screening will be performed during invasive work performed during the remedy and development phases prior to issuance of the Notice of Completion.

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 RAWP;
- ensure that the presence of utilities and easements on the Site has been investigated and that any identified risks from work proposed under this plan are properly addressed by appropriate parties;
- ensure that all loaded outbound trucks are inspected and cleaned if necessary before leaving the Site;
- ensure that all egress points for truck and equipment transport from the Site will be kept clean of Site-derived materials during Site remediation.

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

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

1.5 OFF-SITE MATERIALS TRANSPORT

Loaded vehicles leaving the Site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with applicable laws and regulations, including use of licensed haulers in accordance with 6 NYCRR Part 364. If loads contain wet material capable of causing leakage from trucks, truck liners will be used. Queuing of trucks will be performed on-Site, when possible in order to minimize off Site disturbance. Off-Site queuing will be minimized.

Outbound truck transport routes are anticipated to be, heading along 94th Avenue to the Van Wycke Expressway. This routing takes into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c) minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

1.6 MATERIALS DISPOSAL OFF-SITE

The following documentation will be established and reported by the PE/QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE/QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in Queens, New York 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 RAR.

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

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 RAR. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the RAR. 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

It is not anticipated to reuse the on-site soil. In case plans change, soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site. The soil cleanup objectives for on-Site reuse are listed in Table 12. '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 comparable soil/fill material, and addressed pursuant to the NYC VCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed.

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

1.8 DEMARCATION

After completion of hotspot removal and any other invasive remedial activities, and prior to backfilling, the top of the residual soil/fill will be defined by one of three methods: (1) placement of a demarcation layer. The demarcation layer will consist of geosynthetic fencing or equivalent

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

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

1.9 IMPORT OF BACKFILL SOIL FROM OFF-SITE SOURCES

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. At this time it is not anticipated to import backfill.

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 RAWP. The RAR 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.

Source Screening and Testing

Inspection of imported fill material will include visual, olfactory and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and
- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

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

Recycled concrete aggregate (RCA) will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the RAR. 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 STORM-WATER POLLUTION PREVENTION

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this RAWP (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

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 the Remedial Action Report.

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 the Remedial Action Report.

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 4

Construction Health and Safety Plan



Construction Health & Safety Plan

**Sutphin Plaza
93-43 Sutphin Blvd.
Jamaica, New York**

June 2014

Prepared for:

**Sutphin Plaza Hotel, LLC
150 Express Street
Plainview, NY 11803**

Prepared by:

**CA RICH CONSULTANTS, INC.
17 Dupont Street
Plainview, New York 11803-1614**

Construction Health & Safety Plan

93-43 Sutphin Blvd.
Jamaica, NY

Soil Excavation

1.0 INTRODUCTION

This Construction Health and Safety Plan ("CHASP") is developed for utilization during construction activities located at the above-referenced site in Queens, New York (the Site or Property). The HASP is to be enforced by CA RICH's Project Health and Safety Manager, the on-site Health & Safety Coordinator (HSC) or their assignee. The on-site HSC will interact with the Project Manager and is vested with the authority to make field decisions including the termination of on-site activities if an imminent health and safety hazard, condition or related concern arises. Information and protocol in the CHASP is applicable to all on-site personnel who will be entering the designated work zone.

2.0 POTENTIAL HAZARDS

2.1 Chemical Hazards

The known chemicals or constituents of concern according to CA RICH's Remedial Investigation Report (RIR) consist of low levels of Semi-Volatile Organic Compounds (SVOCs), including, SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene which were detected in Site soils.

During the construction activities, CA RICH will operate as if there is a potential hazard from the above-listed compounds. Physical properties and toxicological information is included in Appendix A.

2.2 Other Health & Safety Risks

Normal physical hazards associated with using excavation equipment and hand tools as well as hazards associated with adverse climatic conditions (heat & cold) or physical site-related debris represent a certain degree of risk to be assumed by on-site personnel.

Certain provisions in this Plan, specifically the use of personnel protective equipment, may tend to increase the risk of physical injury, as well as susceptibility to cold or heat stress. This is primarily due to restrictions in dexterity, hearing, sight, and normal body heat transfer inherent in the use of protective gear.

3.0 RISK MANAGEMENT

3.1 Work / Exclusion Zones

The project plans currently anticipate the excavation depth for the building to be 35 feet below grade. All work (including, but not limited to the grading and excavation) activities conducted will establish a work/exclusion zone. Access to this area will be limited to properly trained, properly protected personnel directly involved with the work. Enforcement of the work/exclusion zone boundaries is the responsibility of the on-site Health & Safety Coordinator (HSC) or his/her properly trained assignee.

3.2 Personnel Protection

Health & Safety regulatory personnel have developed different levels of personnel protection to deal with differing degrees of potential risks of exposure to chemical constituents. The levels are designated as **A**, **B**, **C**, and **D** and are ranked according to the amount of personnel protection afforded by each level. Level **A** is the highest level of protection and Level **D** is the lowest level of protection.

The different levels are primarily dependent upon the degree of respiratory protection necessary, in conjunction with appropriate protective clothing. Levels of protection mandate a degree of respiratory protection. However, flexibility exists within the lower levels (B, C, and D) concerning proper protective clothing.

The four levels of protection were developed for utilization in situations which involve suspected or known atmospheric and/or environmental hazards including airborne contamination and skin-affecting substances. It is anticipated that all of the work will be performed using Level D protection (no respiratory protection with protective clothing requirements limited to long sleeved shirts, long pants or coveralls, work gloves and leather work boots).

Level D may be modified by the HSC to include protective clothing or equipment (Saran-coated disposable coveralls or PVC splash suits, safety glasses, hard hat with face shield, and chemically resistant boots) based upon physical hazards, skin contact concerns, and real-time monitoring.

Real-time air monitoring for total airborne organics using either an Organic Vapor Analyzer (OVA) or a Photo-Ionization Detector (PID) will determine if and when an upgrade from Level D to a higher level of respiratory protection is warranted. Decisions for an upgrade from Level D to higher levels of protection, mitigative actions, and/or suspension of work are the responsibility of the Project Manager and/or the designated on-site HSC.

3.3 Air Monitoring

The HSC or his/her properly trained assignee will conduct "Real Time" air monitoring for total organic vapors and total particulates. 'Real-time' monitoring refers to the utilization of instrumentation, which yields immediate measurements. The utilization of real time monitoring helps determine immediate or long-term risks to on-site personnel and the general public, the appropriate level of personnel respiratory protection necessary, and actions to mitigate the recognized hazard.

3.3.1. Particulate Monitoring

A. Instrumentation

Dust particulates in air will be monitored using a light scattering technique MINIRAM Model PDM-3 Miniature Real-time Aerosol Monitor (MINIRAM) or equivalent. The MINIRAM is capable of measuring airborne dust particles within the range of 10 to 100,000 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Particulate monitoring will only be necessary during major excavation activities.

B. Application

Dust monitoring will occur at regular intervals during major excavation activities. Monitoring will be conducted in upgradient and downgradient locations, relative to prevailing wind direction) along the perimeter of the work zone. The HSC or his assignee will perform the monitoring. As outlined in the NYSDOH Community Air Monitoring Plan, if particulate levels in the downwind location are $150 \text{ mg}/\text{m}^3$ greater than those measured in the upwind location, dust suppression techniques shall be employed.

3.3.2 Organic Vapor

A. Instrumentation

Real-time monitoring for total organic vapor (TOV) utilizes either a PID or flame ionization detector (FID). The appropriate PID is an intrinsically safe HNU Systems Model PI-101, MiniRae PID or equivalent, which is factory calibrated to benzene. The appropriate FID is a Foxboro model 128 OVA or equivalent, which is factory calibrated to methane.

B. Application

Organic vapor monitoring is performed as outlined in the NYSDOH Community Air Monitoring Plan. Specifically, monitoring shall be conducted at the downwind perimeter of the work zone periodically during work activities. If TOV levels exceed 5 milligrams per meter cubed (mg/m^3) above established pre-work background levels, work activities will be halted and monitoring will be continued under the provision of a Vapor Emission Response Plan (outlined in Section 5).

3.4 Worker Training

Personnel overseeing the excavation of the contaminated soil will be properly trained. This includes the Health & Safety Coordinator and the Project Health and Safety Manager.

Prior to any work, all workers involved with the project should be aware of the potential chemical, physical and biological hazards discussed in this document, as well as the general safety practices outlined below. A safety briefing by the on-site HSC and/or assistant assignee shall take place at the outset of work activities.

The HSC will be available to address environmentally-related health & safety issues a site worker (such as an equipment operator or laborer) may have regarding the site conditions. Once an issue is brought to the HCS's attention, he or she will evaluate the issue and apply the procedures outlined in this Health & Safety Plan.

3.5 General Safety Practices

The following safety practices shall be followed by all project personnel.

1. Avoid unnecessary skin exposure to subsurface materials. Sleeved shirts tucked into long pants (or coveralls), work gloves, and steel-toe leather work boots are required unless modified gear is approved by the HSC. Remove any excess residual soil from clothes prior to leaving the site.
2. No eating, drinking, gum or tobacco chewing, or smoking allowed in designated work areas. Thoroughly wash hands prior to these activities outside the work area. Avoid sitting on the ground during breaks or while eating and drinking. Thoroughly wash all exposed body areas at the end of the workday.
3. Some symptoms of acute exposure include: dizziness, light-headedness, drowsiness, headache, and nose/eye/skin irritation. If these symptoms are experienced or strong odor is detected, leave the work area and immediately report the incident to the on-site HSC.

3.6 Enforcement

Enforcement of the Site Safety Plan will be the responsibility of the HSC or the assignee. The Coordinator should be on-site as needed, based on the work being performed and performs or directly oversees all aspects of the Health & Safety Plan including: air monitoring; environmental mitigation; personnel respiratory and skin protection; general safety practices; documentation; emergency procedures and protocol; and reporting and recordkeeping as described below.

3.7 Reporting & Recordkeeping

Incidents involving injury, symptoms of exposure, discovery of potentially hazardous materials, or unsafe work practices and/or conditions should be immediately reported to the HSC.

A logbook must be maintained on-site to document all aspects of HASP enforcement. The log is paginated and dated with entries made on a daily basis in waterproof ink, initialed by the HSC or assignee. Log entries should include date and time of instrument monitoring, instrument type, measurement method, test results, calibration and maintenance information, as well as appropriate mitigative actions responding to detections. Miscellaneous information to be logged may include weather conditions, reported complaints or symptoms, regulatory inspections, and reasons to upgrade personnel protection above the normal specification (Level D).

3.8 Mitigative Measures

The primary mitigative measure anticipated for this project is dust suppression. Prior to commencing work each day, the excavation contractor should attach a hose to a nearby fire hydrant and attach a spray nozzle to the hose. This should be used to hose down trucks as they leave the Site and to set up a misting operation when excavating soil on dry days. The excavation contractor must obtain the necessary hydrant permit.

4.0 EMERGENCIES

4.1 EMERGENCY RESPONSE SERVICES

- | | | |
|-----|--|-----------------------|
| (1) | HOSPITAL
Jamaica Hospital
8900 Van Wyck Expy
Richmond Hill, NY 11418 | (718) 526-5251 |
| (2) | AMBULANCE | 911 |
| (3) | FIRE DEPARTMENT
HAZARDOUS MATERIALS | 911 |
| (4) | POLICE DEPARTMENT | 911 |
| (5) | POISON CONTROL CENTER | (800) 222-1222 |

The preceding list and associated attached map (Figure 1) illustrating the fastest route to the nearest hospital must be conspicuously posted in areas of worker congregation and adjacent to all on-site telephones (if any).

4.2 EMERGENCY PROCEDURES

4.2.1 Contact or Exposure to Suspected Hazardous Materials

In the event of a fire, chemical discharge, medical emergency, workers are instructed to immediately notify the HSC and proper emergency services (posted). Should physical contact with unknown or questionable materials occur, immediately wash the affected body areas with clean water and notify the HSC. Anyone experiencing symptoms of exposure should exit the work area, notify the HSC, and seek medical attention.

4.2.2 Ingress/egress

Clear paths of ingress/egress to work zones and site entrances/exits must be maintained at all times. Unauthorized personnel are restricted from accessing the site.

5.0 COMMUNITY AIR MONITORING PLAN

Real-time air monitoring, for volatile compounds and particulate levels at the perimeter of the work area is necessary. This plan includes the following:

- Volatile organic compounds must be monitored at the downwind perimeter of the work area on a continuous basis. If total organic vapor levels exceed 5 ppm above background, work activities must be halted and monitoring continued under the provisions of a Vapor Emission Response Plan. All readings must be recorded and be available for regulatory personnel to review.
- Particulates should be continuously monitored upwind, downwind and within the work area at temporary particulate monitoring stations during excavation activities. If the downwind particulate level is 150 µg/m³ greater than the upwind particulate level, then dust suppression techniques must be employed. All readings must be recorded and be available for regulatory personnel to review.

Vapor Emissions Response Plan

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the work area, activities will be halted and monitoring continued. If the organic vapor level decreases below 5 ppm above background, work activities can resume. If the organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities can resume provided:

- The organic vapor level 200 ft. downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 mg/m³ over background.

If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. When work shutdown occurs, downwind air monitoring as directed by the Safety Officer will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

Major Vapor Emission

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, the site soil will be misted with water and the downwind area will be monitored. If the water mist does not mitigate the elevated levels all work activities must be halted.

If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If efforts to abate the emission source are unsuccessful and, if organic vapor levels are approaching 5 ppm above background for more than 30 minutes in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect;

However, the Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm above background.

Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts as listed in the Health & Safety Plan of the Remedial Action Plan will go into effect.
2. The local police authorities will immediately be contacted by the Safety Officer and advised of the situation.
3. Frequent air monitoring will be conducted at 30 minute intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer.

6.0 HEALTH & SAFETY PLAN REFERENCES

1. American Conference Governmental Industrial Hygienists, 1989; Threshold Limit Values and Biological Exposure Indices, 111 Pp.
2. Geoenvironmental Consultants, Inc.; 1987; Safety & Operations At Hazardous Materials Sites.
3. NIOSH Guide To Chemical Hazards, 2002, US Department Of Health And Human Services, Centers For Disease Control.
4. US Department Of Labor Occupational Safety & Health Administration, 1989; Hazardous Waste Operations And Emergency Response Interim Final Rule, 29 CFR Part 1910.
5. Sax, N. I. Dangerous Properties Of Industrial Materials; © 1984.
6. CA RICH Consultants, Inc.; February 2014; Remedial Investigation Report.

7.0 KEY PERSONNEL

<u>Responsibility</u>	<u>Name and Phone Number</u>	<u>Task Description</u>
Project Manager	<u>Victoria Whelan (516) 830-6282</u>	Oversee and coordinate all technical aspects for the project
Site Safety Officer	<u>Jessica Proscia (516) 576-8844</u>	Coordinate and inspect all health and safety operations from the project site
Client Representative	<u>Viral Patel (732) 642-6423</u>	
Project Manager Alternate	<u>Jason Cooper (516) 833-2535</u>	
Site Safety Officer Alternate	<u>Thomas Brown (516) 576-8844</u>	

FIGURE



Trip to:

Jamaica Hospital
8900 Van Wyck Expy

Richmond Hill, NY 11418

(718) 526-5251

0.99 miles / 2 minutes

Estimated Fuel Cost: **\$.19**

Notes

4 Ways to Avoid Running Out of Money During Retirement

If you have a \$500,000 portfolio, download the guide by *Forbes* columnist Ken Fisher's firm. Even if you have something else in place, this must-read guide includes research and analysis you can use right now. Don't miss it!

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FISHER INVESTMENTS*

	[9200 - 9216] Sutphin Blvd, Queens, NY 11435	Download Free App
	1. Start out going south on Sutphin Blvd toward 94th Ave . Map	0.1 Mi <i>0.1 Mi Total</i>
	2. Take the 1st right onto 94th Ave . Map <i>World Wide Food is on the corner</i> <i>If you reach 95th Ave you've gone a little too far</i>	0.4 Mi <i>0.5 Mi Total</i>
	3. Take the 1st right onto Van Wyck Expy . Map <i>Van Wyck Expy is just past 138th Pl</i> <i>If you are on Atlantic Ave and reach 134th St you've gone about 0.1 miles too far</i>	0.4 Mi <i>0.9 Mi Total</i>
	4. Turn left onto Jamaica Ave . Map <i>Jamaica Ave is 0.1 miles past 90th Ave</i> <i>GULF is on the corner</i> <i>If you reach 138th St you've gone a little too far</i>	0.05 Mi <i>0.9 Mi Total</i>
	5. Take the 1st left onto Van Wyck Expy . Map <i>Golden Lion Gourmet Deli is on the corner</i> <i>If you reach Metropolitan Ave you've gone a little too far</i>	0.08 Mi <i>1.0 Mi Total</i>
	6. 8900 VAN WYCK EXPY . Map <i>Your destination is just past 89th Ave</i> <i>If you reach 91st Ave you've gone about 0.1 miles too far</i>	
	Jamaica Hospital 8900 Van Wyck Expy, Richmond Hill, NY 11418 (718) 526-5251	

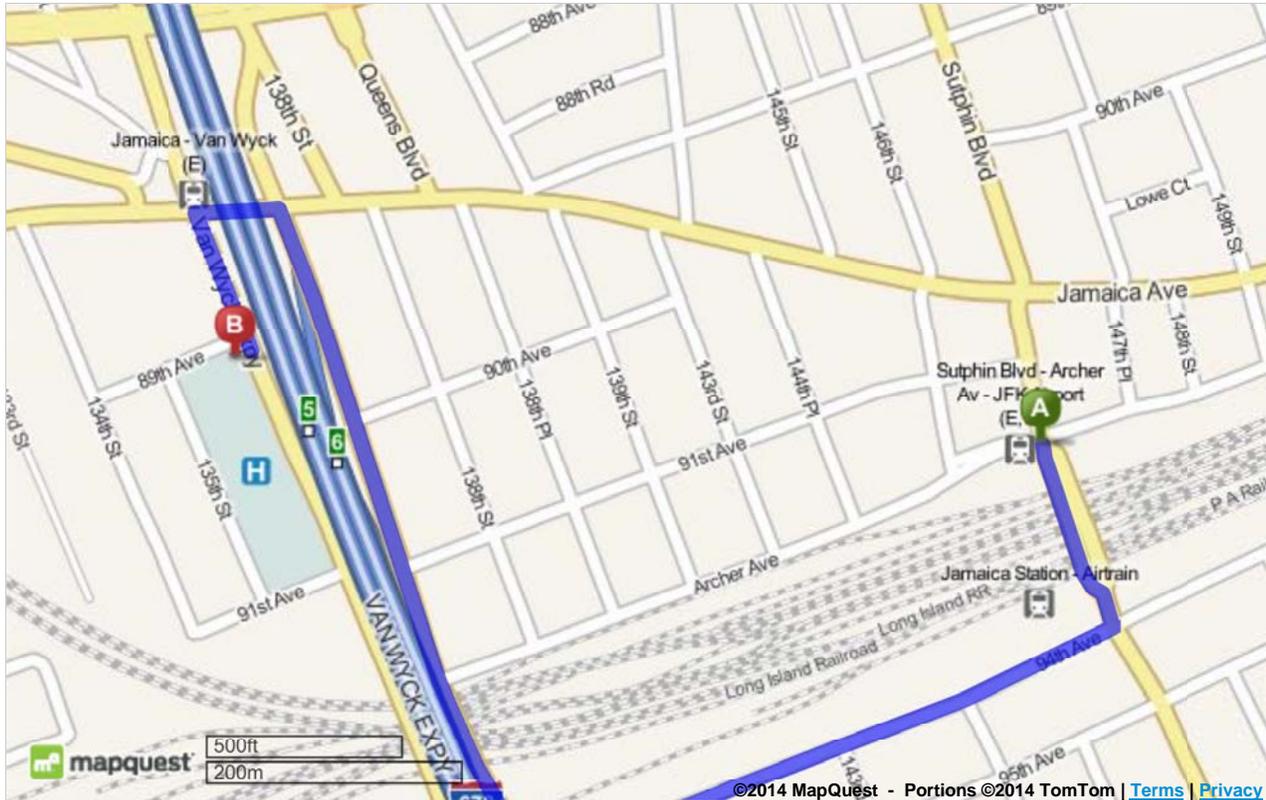
Total Travel Estimate: **0.99 miles - about 2 minutes**

Estimated Fuel Cost: **\$.19**

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Appendix A

Toxicological Information



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Arsenic (inorganic compounds, as As)

Synonyms & Trade Names Arsenic metal: Arsenia

Other synonyms vary depending upon the specific As compound. [Note: OSHA considers "Inorganic Arsenic" to mean copper acetoarsenite and all inorganic compounds containing arsenic except ARSINE.]

CAS No. 7440-38-2 (metal)	RTECS No. CG0525000 (metal) (/niosh-rtecs/CG802C8.html)	DOT ID & Guide 1558 152 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=152) (http://www.cdc.gov/Other/disclaimer.html) (metal) 1562 152 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=152) (http://www.cdc.gov/Other/disclaimer.html) (dust)
Formula As (metal)	Conversion	IDLH Ca [5 mg/m ³ (as As)] See: 7440382 (/niosh/idlh/7440382.html)
Exposure Limits NIOSH REL : Ca C 0.002 mg/m ³ [15-minute] See Appendix A (nengapdx.html) OSHA PEL : [1910.1018] TWA 0.010 mg/m ³		Measurement Methods NIOSH 7300 (/niosh/docs/2003-154/pdfs/7300.pdf), 7301 (/niosh/docs/2003-154/pdfs/7301.pdf), 7303 (/niosh/docs/2003-154/pdfs/7303.pdf), 7900 (/niosh/docs/2003-154/pdfs/7900.pdf), 9102 (/niosh/docs/2003-154/pdfs/9102.pdf); OSHA ID105 (http://www.osha.gov/dts/sltc/methods/inorganic/id105/id105.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Metal: Silver-gray or tin-white, brittle, odorless solid.

MW: 74.9	BP: Sublimes	MLT: 1135°F (Sublimes)	Sol: Insoluble	VP: 0 mmHg (approx)	IP: NA
Sp.Gr: 5.73 (metal)	Fl.P: NA	UEL: NA	LEL: NA		

Metal: Noncombustible Solid in bulk form, but a slight explosion hazard in the form of dust when exposed to flame.

Incompatibilities & Reactivities Strong oxidizers, bromine azide [Note: Hydrogen gas can react with inorganic arsenic to form the highly toxic gas arsine.]

Exposure Routes inhalation, skin absorption, skin and/or eye contact, ingestion

Symptoms Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen]

Target Organs Liver, kidneys, skin, lungs, lymphatic system

Cancer Site [lung & lymphatic cancer]

Personal Protection/Sanitation (See [protection codes \(protect.html\)](#))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated/Daily
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See [procedures \(firstaid.html\)](#))
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations
 (See [Appendix E \(nengapdx.html\)](#))

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canister having an N100, R100, or P100 filter.

[Click here \(pgintrod.html#nrp\)](#) for information on selection of N, R, or P filters.

Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection \(pgintrod.html#mustread\)](#)

See also: [INTRODUCTION \(/niosh/npg/pgintrod.html\)](#) See ICSC CARD: [0013 \(/niosh/ipcsneng/neng0013.html\)](#)
 See [MEDICAL TESTS: 0017 \(/niosh/docs/2005-110/nmed0017.html\)](#)

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Lead

Synonyms & Trade Names

Lead metal, Plumbum

CAS No. 7439-92-1	RTECS No. OF7525000 (/niosh-rtecs/OF72D288.html)	DOT ID & Guide
Formula Pb	Conversion	IDLH 100 mg/m ³ (as Pb) See: 7439921 (/niosh/idlh/7439921.html)

Exposure Limits

NIOSH REL *: TWA (8-hour) 0.050 mg/m³ [See Appendix C \(nengapdx.html\)](#) [*Note: The REL also applies to other lead compounds (as Pb) -- see Appendix C.]
OSHA PEL *: [1910.1025] TWA 0.050 mg/m³ [See Appendix C \(nengapdx.html\)](#) [*Note: The PEL also applies to other lead compounds (as Pb) -- see Appendix C.]

Measurement Methods

NIOSH 7082 (</niosh/docs/2003-154/pdfs/7082.pdf>), **7105** (</niosh/docs/2003-154/pdfs/7105.pdf>), **7300** (</niosh/docs/2003-154/pdfs/7300.pdf>), **7301** (</niosh/docs/2003-154/pdfs/7301.pdf>), **7303** (</niosh/docs/2003-154/pdfs/7303.pdf>), **7700** (</niosh/docs/2003-154/pdfs/7700.pdf>), **7701** (</niosh/docs/2003-154/pdfs/7701.pdf>), **7702** (</niosh/docs/2003-154/pdfs/7702.pdf>), **9100** (</niosh/docs/2003-154/pdfs/9100.pdf>), **9102** (</niosh/docs/2003-154/pdfs/9102.pdf>), **9105** (</niosh/docs/2003-154/pdfs/9105.pdf>);
OSHA ID121
(<http://www.osha.gov/dts/sltc/methods/inorganic/id121/id121.html>)
 (<http://www.cdc.gov/Other/disclaimer.html>), **ID125G**
(<http://www.osha.gov/dts/sltc/methods/inorganic/id125g/id125g.html>)
 (<http://www.cdc.gov/Other/disclaimer.html>), **ID206**
(<http://www.osha.gov/dts/sltc/methods/inorganic/id206/id206.html>)
 (<http://www.cdc.gov/Other/disclaimer.html>)
See: [NMAM \(/niosh/docs/2003-154/\)](/niosh/docs/2003-154/) or [OSHA Methods \(http://www.osha.gov/dts/sltc/methods/index.html\)](http://www.osha.gov/dts/sltc/methods/index.html)
(<http://www.cdc.gov/Other/disclaimer.html>)

Physical Description

A heavy, ductile, soft, gray solid.

MW: 207.2	BP: 3164°F	MLT: 621°F	Sol: Insoluble	VP: 0 mmHg (approx)	IP: NA
Sp.Gr: 11.34	Fl.P: NA	UEL: NA	LEL: NA		

Noncombustible Solid in bulk form.

Incompatibilities & Reactivities

Strong oxidizers, hydrogen peroxide, acids



Search the Pocket Guide

Enter search terms separated by spaces.

Mercury compounds [except (organo) alkyls] (as Hg)

Synonyms & Trade Names Mercury metal: Colloidal mercury, Metallic mercury, Quicksilver
Synonyms of "other" Hg compounds vary depending upon the specific compound.

CAS No. 7439-97-6 (metal)

RTECS No.
OV4550000 (metal)
(/niosh-rtecs/OV456D7o.html)

DOT ID & Guide 2809 172 (<http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=172>)
(<http://www.cdc.gov/Other/disclaimer.html>) (metal)

Formula Hg
(metal)

Conversion

IDLH 10 mg/m³ (as Hg)
See: [7439976 \(/niosh/idlh/7439976.html\)](/niosh/idlh/7439976.html)

Exposure Limits

NIOSH REL :

Hg Vapor: TWA 0.05 mg/m³ [skin]
Other: C 0.1 mg/m³ [skin]

OSHA PEL † ([nengapdxg.html](http://www.cdc.gov/Other/disclaimer.html)): TWA 0.1 mg/m³

Measurement Methods

NIOSH 6009 (</niosh/docs/2003-154/pdfs/6009.pdf>);

OSHA ID140

(<http://www.osha.gov/dts/sltc/methods/inorganic/id140/id140.html>)
 (<http://www.cdc.gov/Other/disclaimer.html>)

See: **NMAM** (</niosh/docs/2003-154/>) or **OSHA Methods**
(<http://www.osha.gov/dts/sltc/methods/index.html>)
(<http://www.cdc.gov/Other/disclaimer.html>)

Physical Description Metal: Silver-white, heavy, odorless liquid. [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.]

MW:
200.6

BP:
674°F

FRZ:
-38°F

Sol:
Insoluble

VP: 0.0012 mmHg

IP: ?

Sp.Gr:
13.6
(metal)

Fl.P:
NA

UEL:
NA

LEL: NA

Metal: Noncombustible Liquid

Incompatibilities & Reactivities Acetylene, ammonia, chlorine dioxide, azides, calcium (amalgam formation), sodium carbide, lithium, rubidium, copper

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria

Target Organs Eyes, skin, respiratory system, central nervous system, kidneys

Personal Protection/Sanitation (See [protection codes \(protect.html\)](#))

Skin: Prevent skin contact

Eyes: No recommendation

Wash skin: When contaminated

Remove: When wet or contaminated

Change: Daily

First Aid (See [procedures \(firstaid.html\)](#))

Eye: Irrigate immediately

Skin: Soap wash promptly

Breathing: Respiratory support

Swallow: Medical attention immediately

Respirator Recommendations

Mercury vapor:

NIOSH

Up to 0.5 mg/m³:

(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern[†]

(APF = 10) Any supplied-air respirator

Up to 1.25 mg/m³:

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode

(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern[†](canister)

Up to 2.5 mg/m³:

(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern[†]

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern[†]

(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode

(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and cartridge(s) providing protection against the compound of concern(canister)

(APF = 50) Any self-contained breathing apparatus with a full facepiece

(APF = 50) Any supplied-air respirator with a full facepiece

Up to 10 mg/m³:

(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern

Any appropriate escape-type, self-contained breathing apparatus

Other mercury compounds: NIOSH/OSHA

Up to 1 mg/m³:

(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern[†]

(APF = 10) Any supplied-air respirator

Up to 2.5 mg/m³:

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode

(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern†(canister)

Up to 5 mg/m³:

(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern†

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern†

(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode

(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and cartridge(s) providing protection against the compound of concern(canister)

(APF = 50) Any self-contained breathing apparatus with a full facepiece

(APF = 50) Any supplied-air respirator with a full facepiece

Up to 10 mg/m³:

(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern

Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection \(pgintrod.html#mustread\)](#)

See also: [INTRODUCTION \(/niosh/npg/pgintrod.html\)](#) See ICSC CARD: [0056](#)

[\(/niosh/ipcsneng/neng0056.html\)](#) See MEDICAL TESTS: [0136 \(/niosh/docs/2005-110/nmed0136.html\)](#)

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Chromium metal

Synonyms & Trade Names Chrome, Chromium

CAS No. 7440-47-3	RTECS No. GB4200000 (/niosh-rtecs/GB401640.html)	DOT ID & Guide
Formula Cr	Conversion	IDLH 250 mg/m ³ (as Cr) See: 7440473 (/niosh/idlh/7440473.html)
Exposure Limits NIOSH REL : TWA 0.5 mg/m ³ See Appendix C (nengapdx.html) OSHA PEL *: TWA 1 mg/m ³ See Appendix C (nengapdx.html) [*Note: The PEL also applies to insoluble chromium salts.]		Measurement Methods NIOSH 7024 (/niosh/docs/2003-154/pdfs/7024.pdf), 7300 (/niosh/docs/2003-154/pdfs/7300.pdf), 7301 (/niosh/docs/2003-154/pdfs/7301.pdf), 7303 (/niosh/docs/2003-154/pdfs/7303.pdf), 9102 (/niosh/docs/2003-154/pdfs/9102.pdf) ; OSHA ID121 http://www.osha.gov/dts/sltc/methods/inorganic/id121/id121.html (http://www.cdc.gov/Other/disclaimer.html), ID125G http://www.osha.gov/dts/sltc/methods/inorganic/id125g/id125g.html (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods http://www.osha.gov/dts/sltc/methods/index.html http://www.cdc.gov/Other/disclaimer.html

Physical Description Blue-white to steel-gray, lustrous, brittle, hard, odorless solid.

MW: 52.0	BP: 4788°F	MLT: 3452°F	Sol: Insoluble	VP: 0 mmHg (approx)	IP: NA
Sp.Gr: 7.14	Fl.P: NA	UEL: NA	LEL: NA		

Noncombustible Solid in bulk form, but finely divided dust burns rapidly if heated in a flame.

Incompatibilities & Reactivities Strong oxidizers (such as hydrogen peroxide), alkalis

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin; lung fibrosis (histologic)

Target Organs Eyes, skin, respiratory system

Personal Protection/Sanitation (See [protection codes \(protect.html\)](#))

Skin: No recommendation

Eyes: No recommendation

Wash skin: No recommendation

Remove: No recommendation

Change: No recommendation

First Aid (See [procedures \(firstaid.html\)](#))

Eye: Irrigate immediately

Skin: Soap wash

Breathing: Respiratory support

Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

Up to 2.5 mg/m³:

(APF = 5) Any quarter-mask respirator.

[Click here \(pgintrod.html#nrp\)](#) for information on selection of N, R, or P filters.*

Up to 5 mg/m³:

(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100.

[Click here \(pgintrod.html#nrp\)](#) for information on selection of N, R, or P filters.*

(APF = 10) Any supplied-air respirator*

Up to 12.5 mg/m³:

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode*

(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter.*

Up to 25 mg/m³:

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.

[Click here \(pgintrod.html#nrp\)](#) for information on selection of N, R, or P filters.

(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter*

(APF = 50) Any self-contained breathing apparatus with a full facepiece

(APF = 50) Any supplied-air respirator with a full facepiece

Up to 250 mg/m³:

(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.

[Click here \(pgintrod.html#nrp\)](#) for information on selection of N, R, or P filters.

Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection \(pgintrod.html#mustread\)](#)

See also: [INTRODUCTION \(/niosh/npg/pgintrod.html\)](/niosh/npg/pgintrod.html) See ICSC CARD: [0029 \(/niosh/ipcsneng/neng0029.html\)](/niosh/ipcsneng/neng0029.html)

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Chromium(III) compounds (as Cr)

Synonyms & Trade Names Synonyms vary depending upon the specific Chromium(III) compound. [Note: Chromium(III) compounds include soluble chromic salts.]

CAS No.	RTECS No.	DOT ID & Guide
	Conversion	IDLH 25 mg/m ³ [as Cr(III)] See: cr3m3 (/niosh/idlh/cr3m3.html)
Exposure Limits NIOSH REL : TWA 0.5 mg/m ³ See Appendix C (nengapdxc.html) OSHA PEL : TWA 0.5 mg/m ³ See Appendix C (nengapdxc.html)		Measurement Methods NIOSH 7024  (/niosh/docs/2003-154/pdfs/7024.pdf), 7300  (/niosh/docs/2003-154/pdfs/7300.pdf), 7301  (/niosh/docs/2003-154/pdfs/7301.pdf), 7303  (/niosh/docs/2003-154/pdfs/7303.pdf), 9102  (/niosh/docs/2003-154/pdfs/9102.pdf) ; OSHA ID121 (http://www.osha.gov/dts/sltc/methods/inorganic/id121/id121.html)  (http://www.cdc.gov/Other/disclaimer.html), ID125G (http://www.osha.gov/dts/sltc/methods/inorganic/id125g/id125g.html)  (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html)  (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Appearance and odor vary depending upon the specific compound.

Properties vary depending upon the specific compound.				

Incompatibilities & Reactivities Varies**Exposure Routes** inhalation, ingestion, skin and/or eye contact

Symptoms irritation eyes; sensitization dermatitis

Target Organs Eyes, skin

Personal

Protection/Sanitation (See [protection codes](#) ([protect.html](#)))

Skin: Prevent skin contact

Eyes: Prevent eye contact

Wash skin: When contaminated

Remove: When wet or contaminated

Change: No recommendation

First Aid (See [procedures \(firstaid.html\)](#))

Eye: Irrigate immediately

Skin: Water flush promptly

Breathing: Respiratory support

Swallow: Medical attention immediately

Respirator Recommendations

NIOSH/OSHA

Up to 2.5 mg/m³:

(APF = 5) Any quarter-mask respirator.

[Click here \(pgintrod.html#nrp\)](#) for information on selection of N, R, or P filters.*

Up to 5 mg/m³:

(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100.

[Click here \(pgintrod.html#nrp\)](#) for information on selection of N, R, or P filters.*

(APF = 10) Any supplied-air respirator*

Up to 12.5 mg/m³:

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode*

(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter.*

Up to 25 mg/m³:

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.

[Click here \(pgintrod.html#nrp\)](#) for information on selection of N, R, or P filters.

(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter*

(APF = 50) Any self-contained breathing apparatus with a full facepiece

(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-

contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.

[Click here \(pgintrod.html#nrp\)](#) for information on selection of N, R, or P filters.

Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection \(pgintrod.html#mustread\)](#)

See also: [INTRODUCTION \(/niosh/npg/pgintrod.html\)](#) See [MEDICAL TESTS: 0052 \(/niosh/docs/2005-110/nmed0052.html\)](#)

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Benzene

Synonyms & Trade Names Benzol, Phenyl hydride

CAS No. 71-43-2	RTECS No. CY1400000 (/niosh-rtecs/CY155CCo.html)	DOT ID & Guide 1114 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula C ₆ H ₆	Conversion 1 ppm = 3.19 mg/m ³	IDLH Ca [500 ppm] See: 71432 (/niosh/idlh/71432.html)

Exposure Limits

NIOSH REL : Ca TWA 0.1 ppm ST 1 ppm See [Appendix A \(nengapdx.html\)](http://nengapdx.html)
OSHA PEL : [1910.1028] TWA 1 ppm ST 5 ppm See [Appendix F \(nengapdx.html\)](http://nengapdx.html)

Measurement Methods

NIOSH 1500 ([/niosh/docs/2003-154/pdfs/1500.pdf](http://niosh/docs/2003-154/pdfs/1500.pdf)), **1501** ([/niosh/docs/2003-154/pdfs/1501.pdf](http://niosh/docs/2003-154/pdfs/1501.pdf)), **3700** ([/niosh/docs/2003-154/pdfs/3700.pdf](http://niosh/docs/2003-154/pdfs/3700.pdf)), **3800** ([/niosh/docs/2003-154/pdfs/3800.pdf](http://niosh/docs/2003-154/pdfs/3800.pdf));
OSHA 12
(<http://www.osha.gov/dts/sltc/methods/organic/org012/org012.html>)
 (<http://www.cdc.gov/Other/disclaimer.html>), **1005**
(<http://www.osha.gov/dts/sltc/methods/validated/1005/1005.html>)
 (<http://www.cdc.gov/Other/disclaimer.html>)
See: **NMAM** ([/niosh/docs/2003-154/](http://niosh/docs/2003-154/)) or **OSHA Methods**
(<http://www.osha.gov/dts/sltc/methods/index.html>)
(<http://www.cdc.gov/Other/disclaimer.html>)

Physical Description Colorless to light-yellow liquid with an aromatic odor. [Note: A solid below 42°F.]

MW: 78.1	BP: 176°F	FRZ: 42°F	Sol: 0.07%	VP: 75 mmHg	IP: 9.24 eV
Sp.Gr: 0.88	Fl.P: 12°F	UEL: 7.8%	LEL: 1.2%		

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers, many fluorides & perchlorates, nitric acid

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]

Target Organs Eves. skin. respiratory system. blood. central nervous system. bone marrow

Cancer Site [leukemia]**Personal Protection/Sanitation** (See [protection codes \(protect.html\)](#))**Skin:** Prevent skin contact**Eyes:** Prevent eye contact**Wash skin:** When contaminated**Remove:** When wet (flammable)**Change:** No recommendation**Provide:** Eyewash, Quick drench**First Aid** (See [procedures \(firstaid.html\)](#))**Eye:** Irrigate immediately**Skin:** Soap wash immediately**Breathing:** Respiratory support**Swallow:** Medical attention immediately**Respirator Recommendations**(See [Appendix E \(nengapdx.html\)](#))**NIOSH****At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:**

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister

Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection \(pgintrod.html#mustread\)](#)See also: [INTRODUCTION \(/niosh/npg/pgintrod.html\)](#) See ICSC CARD: [0015 \(/niosh/ipcsneng/nengo015.html\)](#) See MEDICAL TESTS: [0022 \(/niosh/docs/2005-110/nmed0022.html\)](#)

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Ethyl benzene

Synonyms & Trade Names Ethylbenzol, Phenylethane

CAS No. 100-41-4	RTECS No. DAO700000 (/niosh- rtecs/DAAAE6o.html)	DOT ID & Guide 1175 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula CH ₃ CH ₂ C ₆ H ₅	Conversion 1 ppm = 4.34 mg/m ³	IDLH 800 ppm [10%LEL] See: 100414 (/niosh/idlh/100414.html)
Exposure Limits NIOSH REL : TWA 100 ppm (435 mg/m ³) ST 125 ppm (545 mg/m ³) OSHA PEL † (nengapdxg.html): TWA 100 ppm (435 mg/m ³)		Measurement Methods NIOSH 1501 (/niosh/docs/2003-154/pdfs/1501.pdf); OSHA 7 (http://www.osha.gov/dts/sltc/methods/organic/org001/org001.html) (http://www.cdc.gov/Other/disclaimer.html), 1002 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1002/1002.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with an aromatic odor.

MW: 106.2	BP: 277°F	FRZ: -139°F	Sol: 0.01%	VP: 7 mmHg	IP: 8.76 eV
Sp.Gr: 0.87	Fl.P.: 55°F	UEL: 6.7%	LEL: 0.8%		

Class IB Flammable Liquid: FLP. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma

Target Organs Eyes, skin, respiratory system, central nervous system

Personal Protection/Sanitation (See [protection codes \(protect.html\)](http://www.cdc.gov/Other/disclaimer.html))

Skin: Prevent skin contact

Eyes: Prevent eye contact

Wash skin: When contaminated

Remove: When wet (flammable)

Change: No recommendation

First Aid (See [procedures \(firstaid.html\)](http://www.cdc.gov/Other/disclaimer.html))

Eye: Irrigate immediately

Skin: Water flush promptly

Breathing: Respiratory support

Swallow: Medical attention immediately

Respirator Recommendations**NIOSH/OSHA****Up to 800 ppm:**

(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister

(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*

(APF = 10) Any supplied-air respirator*

(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister

Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection \(pgintrod.html#mustread\)](#)

See also: [INTRODUCTION \(/niosh/npg/pgintrod.html\)](#) See ICSC CARD: [0268 \(/niosh/ipcsneng/nengo268.html\)](#)

See MEDICAL TESTS: [0098 \(/niosh/docs/2005-110/nmed0098.html\)](#)

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m-Xylene

Synonyms & Trade Names 1,3-Dimethylbenzene; meta-Xylene; m-Xylol

CAS No. 108-38-3	RTECS No. ZE2275000 (/niosh-rtecs/ZE22B6B8.html)	DOT ID & Guide 1307 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula C ₆ H ₄ (CH ₃) ₂	Conversion 1 ppm = 4.34 mg/m ³	IDLH 900 ppm See: 95476 (/niosh/idlh/95476.html)
Exposure Limits NIOSH REL : TWA 100 ppm (435 mg/m ³) ST 150 ppm (655 mg/m ³) OSHA PEL † (nengapdxg.html): TWA 100 ppm (435 mg/m ³)		Measurement Methods NIOSH 1501 (/niosh/docs/2003-154/pdfs/1501.pdf), 3800 (/niosh/docs/2003-154/pdfs/3800.pdf); OSHA 1002 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1002/1002.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with an aromatic odor.

MW: 106.2	BP: 282°F	FRZ: -54°F	Sol: Slight	VP: 9 mmHg	IP: 8.56 eV
Sp.Gr: 0.86	Fl.P: 82°F	UEL: 7.0%	LEL: 1.1%		

Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.

Incompatibilities & Reactivities Strong oxidizers, strong acids

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis

Target Organs Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys

Personal Protection/Sanitation (See [protection codes \(protect.html\)](#))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)

First Aid (See [procedures \(firstaid.html\)](#))
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Change: No recommendation

Respirator Recommendations

NIOSH/OSHA

Up to 900 ppm:

(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*

(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*

(APF = 10) Any supplied-air respirator*

(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister

Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection \(pgintrod.html#mustread\)](#)

See also: [INTRODUCTION \(/niosh/npg/pgintrod.html\)](#) See ICSC CARD: [0085 \(/niosh/ipcsneng/neng0085.html\)](#)

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o-Xylene

Synonyms & Trade Names 1,2-Dimethylbenzene; ortho-Xylene; o-Xylol

CAS No. 95-47-6	RTECS No. ZE2450000 (/niosh-rtecs/ZE256250.html)	DOT ID & Guide 1307 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula C ₆ H ₄ (CH ₃) ₂	Conversion 1 ppm = 4.34 mg/m ³	IDLH 900 ppm See: 95476 (/niosh/idlh/95476.html)
Exposure Limits NIOSH REL : TWA 100 ppm (435 mg/m ³) ST 150 ppm (655 mg/m ³) OSHA PEL † (nengapdxg.html): TWA 100 ppm (435 mg/m ³)		Measurement Methods NIOSH 1501 (/niosh/docs/2003-154/pdfs/1501.pdf), 3800 (/niosh/docs/2003-154/pdfs/3800.pdf); OSHA 1002 http://www.osha.gov/dts/sltc/methods/mdt/mdt1002/1002.html (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods http://www.osha.gov/dts/sltc/methods/index.html http://www.cdc.gov/Other/disclaimer.html

Physical Description Colorless liquid with an aromatic odor.

MW: 106.2	BP: 292°F	FRZ: -13°F	Sol: 0.02%	VP: 7 mmHg	IP: 8.56 eV
Sp.Gr: 0.88	Fl.P: 90°F	UEL: 6.7%	LEL: 0.9%		

Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.

Incompatibilities & Reactivities Strong oxidizers, strong acids

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis

Target Organs Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys

Personal Protection/Sanitation (See [protection codes \(protect.html\)](#))

Skin: Prevent skin contact

Eyes: Prevent eye contact

Wash skin: When contaminated

Remove: When wet (flammable)

First Aid (See [procedures \(firstaid.html\)](#))

Eye: Irrigate immediately

Skin: Soap wash promptly

Breathing: Respiratory support

Swallow: Medical attention immediately

RECOMMENDATION: (See Table 1)

Change: No recommendation

Respirator Recommendations

NIOSH/OSHA

Up to 900 ppm:

(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*

(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*

(APF = 10) Any supplied-air respirator*

(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister

Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection \(pgintrod.html#mustread\)](#)

See also: [INTRODUCTION \(/niosh/npg/pgintrod.html\)](#) See ICSC CARD: [0084 \(/niosh/ipcsneng/neng0084.html\)](#)

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p-Xylene

Synonyms & Trade Names 1,4-Dimethylbenzene; para-Xylene; p-Xylol

CAS No. 106-42-3	RTECS No. ZE2625000 (/niosh-rtecs/ZE280DE8.html)	DOT ID & Guide 1307 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula C ₆ H ₄ (CH ₃) ₂	Conversion 1 ppm = 4.41 mg/m ³	IDLH 900 ppm See: 95476 (/niosh/idlh/95476.html)
Exposure Limits NIOSH REL : TWA 100 ppm (435 mg/m ³) ST 150 ppm (655 mg/m ³) OSHA PEL † (nengapdxg.html): TWA 100 ppm (435 mg/m ³)		Measurement Methods NIOSH 1501 (/niosh/docs/2003-154/pdfs/1501.pdf), 3800 (/niosh/docs/2003-154/pdfs/3800.pdf); OSHA 1002 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1002/1002.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with an aromatic odor. [Note: A solid below 56°F.]

MW: 106.2	BP: 281°F	FRZ: 56°F	Sol: 0.02%	VP: 9 mmHg	IP: 8.44 eV
Sp.Gr: 0.86	Fl.P: 81°F	UEL: 7.0%	LEL: 1.1%		

Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.

Incompatibilities & Reactivities Strong oxidizers, strong acids

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis

Target Organs Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys

Personal Protection/Sanitation (See [protection codes \(protect.html\)](#))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)

First Aid (See [procedures \(firstaid.html\)](#))
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Change: No recommendation

Respirator Recommendations

NIOSH/OSHA

Up to 900 ppm:

(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*

(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*

(APF = 10) Any supplied-air respirator*

(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister

Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection \(pgintrod.html#mustread\)](#)

See also: [INTRODUCTION \(/niosh/npg/pgintrod.html\)](#) See ICSC CARD: [0086 \(/niosh/ipcsneng/neng0086.html\)](#)

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Chlorodiphenyl (54% chlorine)

Synonyms & Trade Names Aroclor® 1254, PCB, Polychlorinated biphenyl**CAS No.** 11097-69-1**RTECS No.**[TQ1360000 \(/niosh-rtecs/TQ14Co80.html\)](/niosh-rtecs/TQ14Co80.html)**DOT ID & Guide** 2315 171<http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=171>
<http://www.cdc.gov/Other/disclaimer.html>**Formula** C₆H₃Cl₂C₆H₂Cl₃
(approx)**Conversion****IDLH** Ca [5 mg/m³]See: [IDLH INDEX \(/idlh/intridl4.html\)](/idlh/intridl4.html)

Exposure Limits

NIOSH REL *: Ca TWA 0.001 mg/m³ See [Appendix A \(nengapdx.html\)](#) [*Note: The REL also applies to other PCBs.]**OSHA PEL** : TWA 0.5 mg/m³ [skin]

Measurement Methods

NIOSH 5503 (</niosh/docs/2003-154/pdfs/5503.pdf>);**OSHA PV2088**<http://www.osha.gov/dts/sltc/methods/partial/t-pv2088-01-8812-ch/t-pv2088-01-8812-ch.html> <http://www.cdc.gov/Other/disclaimer.html>See: [NMAM \(/niosh/docs/2003-154/\)](/niosh/docs/2003-154/) or [OSHA Methods](#)<http://www.osha.gov/dts/sltc/methods/index.html> <http://www.cdc.gov/Other/disclaimer.html>**Physical Description** Colorless to pale-yellow, viscous liquid or solid (below 50°F) with a mild, hydrocarbon odor.**MW:** 326
(approx)**BP:** 689-
734°F**FRZ:**
50°F**Sol:**
Insoluble**VP:** 0.00006 mmHg**IP:** ?**Sp.Gr(77°F):**
1.38**Fl.P:** NA**UEL:**
NA**LEL:** NA

Nonflammable Liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans, and chlorinated dibenzo-p-dioxins.

Incompatibilities & Reactivities Strong oxidizers**Exposure Routes** inhalation, skin absorption, ingestion, skin and/or eye contact**Symptoms** irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen]

Chlorodiphenyl

Target Organs Skin, eyes, liver, reproductive system

Cancer Site [in animals: tumors of the pituitary gland & liver, leukemia]

Personal Protection/Sanitation (See protection codes ([protect.html](#)))

Skin: Prevent skin contact

Eyes: Prevent eye contact

Wash skin: When contaminated

Remove: When wet or contaminated

Change: Daily

Provide: Eyewash, Quick drench

First Aid (See procedures ([firstaid.html](#)))

Eye: Irrigate immediately

Skin: Soap wash immediately

Breathing: Respiratory support

Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.

[Click here \(pgintrod.html#nrp\)](#) for information on selection of N, R, or P filters.

Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection \(pgintrod.html#mustread\)](#)

See also: [INTRODUCTION \(/niosh/npg/pgintrod.html\)](#) See ICSC CARD: [0939](#)

[\(/niosh/ipcsneng/nengo939.html\)](#) See MEDICAL TESTS: [0176 \(/niosh/docs/2005-110/nmedo176.html\)](#)

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Tetrachloroethylene

Synonyms & Trade Names Perchloroethylene, Perchloroethylene, Perk, Tetrachlorethylene

CAS No. 127-18-4	RTECS No. KX3850000 (/niosh-rtecs/KX3ABF10.html)	DOT ID & Guide 1897 160 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=160) (http://www.cdc.gov/Other/disclaimer.html)
Formula Cl ₂ C=CCl ₂	Conversion 1 ppm = 6.78 mg/m ³	IDLH Ca [150 ppm] See: 127184 (/niosh/idlh/127184.html)
Exposure Limits NIOSH REL : Ca Minimize workplace exposure concentrations. See Appendix A (nengapdx.html) OSHA PEL † (nengapdxg.html): TWA 100 ppm C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm		Measurement Methods NIOSH 1003 (/niosh/docs/2003-154/pdfs/1003.pdf); OSHA 1001 http://www.osha.gov/dts/sltc/methods/mdt/mdt1001/1001.html (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods http://www.osha.gov/dts/sltc/methods/index.html http://www.cdc.gov/Other/disclaimer.html

Physical Description Colorless liquid with a mild, chloroform-like odor.

MW: 165.8	BP: 250°F	FRZ: -2°F	Sol: 0.02%	VP: 14 mmHg	IP: 9.32 eV
Sp.Gr: 1.62	Fl.P: NA	UEL: NA	LEL: NA		

Noncombustible Liquid, but decomposes in a fire to hydrogen chloride and phosgene.

Incompatibilities & Reactivities Strong oxidizers; chemically-active metals such as lithium, beryllium & barium; caustic soda; sodium hydroxide; potash

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, liver, kidneys, central nervous system

Cancer Site [in animals: liver tumors]

Personal Protection/Sanitation (See [protection codes \(protect.html\)](#))**Skin:** Prevent skin contact**Eyes:** Prevent eye contact**Wash skin:** When contaminated**Remove:** When wet or contaminated**Change:** No recommendation**Provide:** Eyewash, Quick drench**First Aid** (See [procedures \(firstaid.html\)](#))**Eye:** Irrigate immediately**Skin:** Soap wash promptly**Breathing:** Respiratory support**Swallow:** Medical attention immediately**Respirator Recommendations****NIOSH****At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:**

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister

Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection \(pgintrod.html#mustread\)](#)See also: [INTRODUCTION \(/niosh/npg/pgintrod.html\)](#) See ICSC CARD: [0076](#)[\(/niosh/ipcsneng/neng0076.html\)](#) See MEDICAL TESTS: [0179 \(/niosh/docs/2005-110/nmedo179.html\)](#)

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Search the Pocket Guide

SEARCH

Enter search terms separated by spaces.

Trichloroethylene

Synonyms & Trade Names Ethylene trichloride, TCE, Trichloroethene, Trilene**CAS No.** 79-01-6**RETECS No.** [KX456D70](http://www.niosh-rtecs.com/KX456D70.html)
([/niosh-rtecs/KX456D70.html](http://www.niosh-rtecs.com/KX456D70.html))**DOT ID & Guide** 1710 160 (<http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=160>)
(<http://www.cdc.gov/Other/disclaimer.html>)**Formula** ClCH=CCl₂**Conversion** 1 ppm = 5.37 mg/m³**IDLH** Ca [1000 ppm]
See: [79016](http://www.niosh.gov/IDLH/79016.html) ([/niosh/idlh/79016.html](http://www.niosh.gov/IDLH/79016.html))

Exposure Limits

NIOSH REL : Ca See Appendix A ([nengapdx.html](http://www.niosh.gov/AppendixA.html))
See Appendix C ([nengapdx.html](http://www.niosh.gov/AppendixC.html))**OSHA PEL** † ([nengapdx.html](http://www.niosh.gov/AppendixG.html)): TWA 100 ppm C
200 ppm 300 ppm (5-minute maximum peak
in any 2 hours)

Measurement Methods

NIOSH 1022 ([/niosh/docs/2003-154/pdfs/1022.pdf](http://www.niosh.gov/docs/2003-154/pdfs/1022.pdf)),
3800 ([/niosh/docs/2003-154/pdfs/3800.pdf](http://www.niosh.gov/docs/2003-154/pdfs/3800.pdf));**OSHA 1001**<http://www.osha.gov/dts/sltc/methods/mdt/mdt1001/1001.html>
 (<http://www.cdc.gov/Other/disclaimer.html>)See: **NMAM** ([/niosh/docs/2003-154/](http://www.niosh.gov/docs/2003-154/)) or **OSHA Methods**
(<http://www.osha.gov/dts/sltc/methods/index.html>)
(<http://www.cdc.gov/Other/disclaimer.html>)**Physical Description** Colorless liquid (unless dyed blue) with a chloroform-like odor.**MW:**
131.4**BP:**
189°F**FRZ:** -99°F**Sol:** 0.1%**VP:** 58 mmHg**IP:** 9.45 eV**Sp.Gr:**
1.46**Fl.P:** ?**UEL(77°F):**
10.5%**LEL(77°F):**
8%

Combustible Liquid, but burns with difficulty.

Incompatibilities & Reactivities Strong caustics & alkalis; chemically-active metals (such as barium, lithium, sodium, magnesium, titanium & beryllium)**Exposure Routes** inhalation, skin absorption, ingestion, skin and/or eye contact**Symptoms** irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]**Target Organs** Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system**Cancer Site** [in animals: liver & kidney cancer]**Personal Protection/Sanitation** (See [protection codes \(protect.html\)](http://www.niosh.gov/protect.html))**First Aid** (See [procedures \(firstaid.html\)](http://www.niosh.gov/firstaid.html))
Eye: Irrigate immediately

Control Measures

Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation
Provide: Eyewash, Quick drench

First Aid Measures

Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister

Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection ([pgintrod.html#mustread](#))

See also: INTRODUCTION ([/niosh/npg/pgintrod.html](#)) See ICSC CARD: 0081 ([/niosh/ipcsneng/neng0081.html](#))

See MEDICAL TESTS: 0236 ([/niosh/docs/2005-110/nmedo236.html](#))

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Toluene

Synonyms & Trade Names Methyl benzene, Methyl benzol, Phenyl methane, Toluol

CAS No. 108-88-3

RTECS No.
[XS5250000 \(/niosh-
rtecs/XS501BDo.html\)](#)

DOT ID & Guide 1294 **130** (<http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130>)
(<http://www.cdc.gov/Other/disclaimer.html>)

Formula C₆H₅CH₃

Conversion 1 ppm =
3.77 mg/m³

IDLH 500 ppm
See: [108883 \(/niosh/idlh/108883.html\)](#)

Exposure Limits

NIOSH REL : TWA 100 ppm (375 mg/m³)
ST 150 ppm (560 mg/m³)

OSHA PEL † ([nengapdxg.html](#)): TWA 200
ppm C 300 ppm 500 ppm (10-minute
maximum peak)

Measurement Methods

NIOSH 1500 ([/niosh/docs/2003-154/pdfs/1500.pdf](#)), **1501**
 ([/niosh/docs/2003-154/pdfs/1501.pdf](#)), **3800**
([/niosh/docs/2003-154/pdfs/3800.pdf](#)), **4000**
([/niosh/docs/2003-154/pdfs/4000.pdf](#));

OSHA 111

(<http://www.osha.gov/dts/sltc/methods/organic/org111/org111.html>)
 (<http://www.cdc.gov/Other/disclaimer.html>)
See: **NMAM** ([/niosh/docs/2003-154/](#)) or **OSHA Methods**
(<http://www.osha.gov/dts/sltc/methods/index.html>)
(<http://www.cdc.gov/Other/disclaimer.html>)

Physical Description Colorless liquid with a sweet, pungent, benzene-like odor.

MW:

92.1

BP:

232°F

FRZ:

-139°F

Sol(74°F):

0.07%

VP: 21 mmHg

IP: 8.82 eV

Sp.Gr:

0.87

Fl.P:

40°F

UEL:

7.1%

LEL: 1.1%

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys

Personal Protection/Sanitation (See
[protection codes \(protect.html\)](#))

Skin: Prevent skin contact

First Aid (See [procedures \(firstaid.html\)](#))

Eye: Irrigate immediately

Skin: Soap wash promptly

Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: No recommendation

Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

Up to 500 ppm:

(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*

(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister

(APF = 10) Any supplied-air respirator*

(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister

Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection \(pgintrod.html#mustread\)](#)

See also: [INTRODUCTION \(/niosh/npg/pgintrod.html\)](#) See ICSC CARD: [0078](#)

[\(/niosh/ipcsneng/neng0078.html\)](#) See MEDICAL TESTS: [0232 \(/niosh/docs/2005-110/nmedo232.html\)](#)

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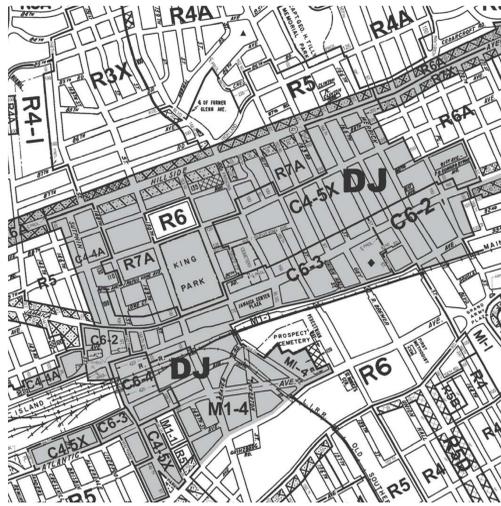
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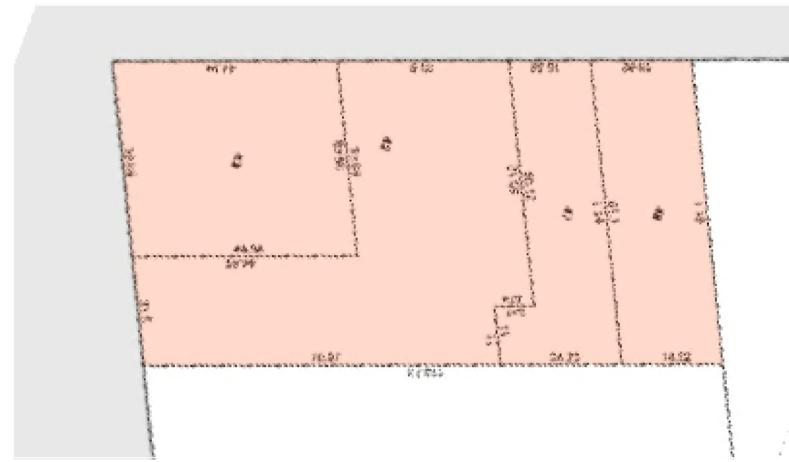


APPENDIX 5

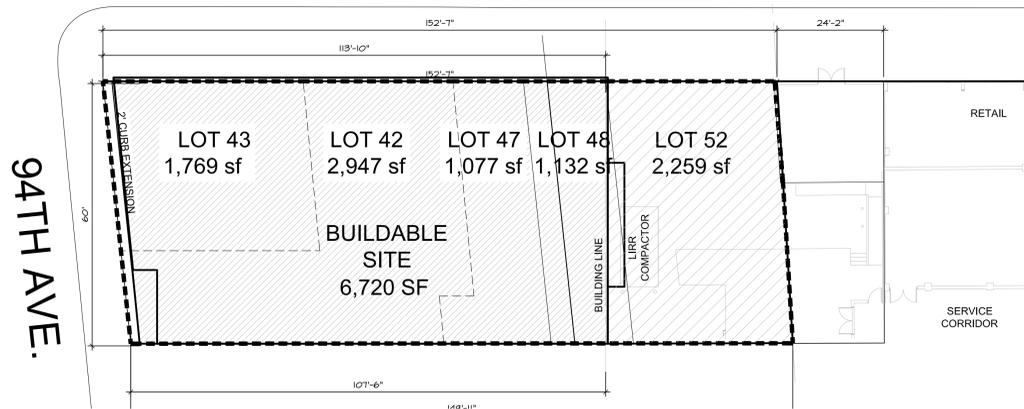
Proposed Development Plans



E ZONING MAP NTS



D TAX MAP NTS



C PLOT PLAN 1/16" = 1'

LOT LIST	
LOT 42	2,947 SF
LOT 43	1,769 SF
LOT 47	1,077 SF
LOT 48	1,132 SF
LOT 52	2,259 SF
TOTAL SF	9,184 SF

ZONING ANALYSIS			
ZONING C6-4			
93-94 Sutphin Blvd.			
Map: #14d Block: 9998 Lot: 42,43,47,48 Commercial: C6-4 within Special Downtown Jamaica District			
TOPIC	PERMITTED (SF)	PROPOSED (SF)	REFERENCE
Site Area		9,184.0	
Area beyond 100 Ft of corner		3,761.0	
Area within 100 Ft of corner		5,423.0	
Area of Adjacent Retail		559.0	
Max. allowed SF for Commercial FAR	12	110,208.0	115-21
Far from Adjacent Retail	0	0.0	
Total Buildable		110,208.0	115-21
Standard Height & Setbacks			
Max Base Height		none req.	115-232
Min Base Height		40'	115-232
Max. Building Height		290'	115-234
Setback		none req.	115-232
Rear yard (not required for corner lot)	30'	0'	
Side Yard	Not Required		33-25
Street Wall Requirements	streetwall must occupy 70% of lot frontage		
Sidewalk Widening	2' sidewalk widening along 94th street		115-31
Min. legal window	Residential	30'-0"	23-861
Parking			
Parking for hotel (C4-4)	1 per 12 rooms	19.9	115-51 / 36-21
General retail / food use (C4-4)	1/1,000 sf	tbd	115-51 / 36-21
Total Parking		tbd	
Loading Dock Requirements	1 per 300,000 sf.		1
Lot Coverage			
Lot Coverage: interior lot	70%	2,632.7	115-21
Lot Coverage: corner lot	80%	4,338.4	
Total Lot Coverage		6,971.1	6,572.00

B ZONING ANALYSIS & AREA SCHEDULE

93-43 Sutphin Blvd. FAR Calculations					
	GROSS AREA	CORE	MECHANICAL	WALL DEDUCTION	TOTAL FAR
1ST FL	6,572.00	685.00	475.00	198.00	5,899.00
2ND FL	6,693.00	685.00	35.00	140.00	6,518.00
3RD FL	6,693.00	685.00	35.00	140.00	6,518.00
4TH FL	4,324.00	685.00	35.00	160.00	4,129.00
5TH FL	4,471.00	685.00	35.00	146.00	4,290.00
6TH FL	4,471.00	685.00	35.00	146.00	4,290.00
7TH FL	4,471.00	685.00	35.00	146.00	4,290.00
8TH FL	4,471.00	685.00	35.00	146.00	4,290.00
9TH FL	4,471.00	685.00	35.00	146.00	4,290.00
10TH FL	4,471.00	685.00	35.00	146.00	4,290.00
11TH FL	4,471.00	685.00	35.00	146.00	4,290.00
12TH FL	4,471.00	685.00	35.00	146.00	4,290.00
13TH FL	4,471.00	685.00	35.00	146.00	4,290.00
14TH FL	4,471.00	685.00	35.00	146.00	4,290.00
15TH FL	4,471.00	685.00	35.00	146.00	4,290.00
16TH FL	4,471.00	685.00	3,786.00	146.00	539.00
17TH FL	4,471.00	685.00	35.00	146.00	4,290.00
18TH FL	4,471.00	685.00	35.00	146.00	4,290.00
19TH FL	4,471.00	685.00	35.00	146.00	4,290.00
20TH FL	4,471.00	685.00	35.00	146.00	4,290.00
21ST FL	4,364.00	685.00	35.00	146.00	4,183.00
22ND FL	4,471.00	685.00	35.00	146.00	4,290.00
23RD FL	4,471.00	685.00	35.00	146.00	4,290.00
24TH FL	4,471.00	685.00	35.00	146.00	4,290.00
25TH FL	4,471.00	685.00	35.00	146.00	4,290.00
26TH FL	4,471.00	685.00	35.00	146.00	4,290.00
27TH FL (ROOF)	384.00	369.00	35.00	0.00	349.00
TOTAL FAR	122,921.00	18,179.00	5,136.00		113,935.00
TOTAL FAR					113,935.00
FAR ALLOWED	from zoning sheet				110,280.00
FAR TO BE PURCHASED					3,655.00

A ZONING FLOOR AREA & UNIT DISTRIBUTION SCHEDULE

Floor	ADA	Double Queen	King	Total
2	0	10	0	10
3	0	10	0	10
4	2	2	5	9
5	1	3	6	10
6	1	3	6	10
7	1	3	6	10
8	1	3	6	10
9	1	3	6	10
10	1	3	6	10
11	1	3	6	10
12	1	3	6	10
13	1	3	6	10
14	1	3	6	10
15	1	3	6	10
16	0	0	0	MECHANICAL
17	1	3	6	10
18	1	3	6	10
19	0	4	6	10
20	0	4	6	10
21	0	4	6	10
22	0	4	6	10
23	0	4	6	10
24	0	4	6	10
25	0	4	6	10
26	0	4	6	10
27				ROOFTOP BAR
Total	15	89	125	239
Total (%)	6%	37%	52%	
Area	364 SF	327 SF	303 SF	

93-43 SUTPHIN BOULEVARD
JAMAICA, QUEENS, NY 11435
BLOCK: 998 LOTS: 42,43,47,48,52
PROJECT NO. 1649.00

DEVELOPER
ABLE MANAGEMENT GROUP
150 EXPRESS STREET
PLAINVIEW, NY 11803

STRUCTURAL ENGINEER

MECHANICAL ENGINEER

ISSUE
DESIGN DEVELOPMENT PROGRESS SET
SCALE
AS NOTED
KEY PLAN

PROJECT
93-43 SUTPHIN BOULEVARD
JAMAICA, QUEENS, NY 11435

DRAWING

SEAL AND SIGNATURE
DATE: 12/10/2014
PROJECT NO.: 1649.00
DRAWING BY:
CHK BY:
DWG NO.:
A-002.00
CAD FILE NO.: OF XX

ZONING ANALYSIS
93-43 Sutphin Blvd.
Map #14d Block: 9998 Lot: 42,43,47,48
Zoning: C6-4 in Special Downtown Jamaica District
Use Group 5A
Use Groups Allowed: 1-12

SITE INFORMATION		ZONING PROVISIONS - The provisions of this chapter shall apply within the Special Downtown Jamaica District. The regulations of all other chapters of this Resolution are applicable, except as superceded, supplemented, or modified by the provisions of this chapter. In the event of a conflict between the provisions of this chapter and the other regulations of this Resolution, the provisions of this chapter shall control (115)
Total Lot Area	9,184.00 SF	
Corner Lot Portion	5,423.00 SF	
Interior Lot Portion	3,761.00 SF	

SUMMARY				
Definitions-Mixed use Building	Provided			
Special Mixed Use Districts	Specified	Special Long Island City District; Queens Plaza Subdistrict		115
Permitted Uses Mixed Use District	Provided			
General Provisions-Mixed Use district	Provided			

FAR				
C6-4 Art. XI Chapter 5				
Max Commercial	12.00	110,208.00	113,419.00	115-21
Total Lot FAR	12.00	110,208.00	113,419.00	115-21

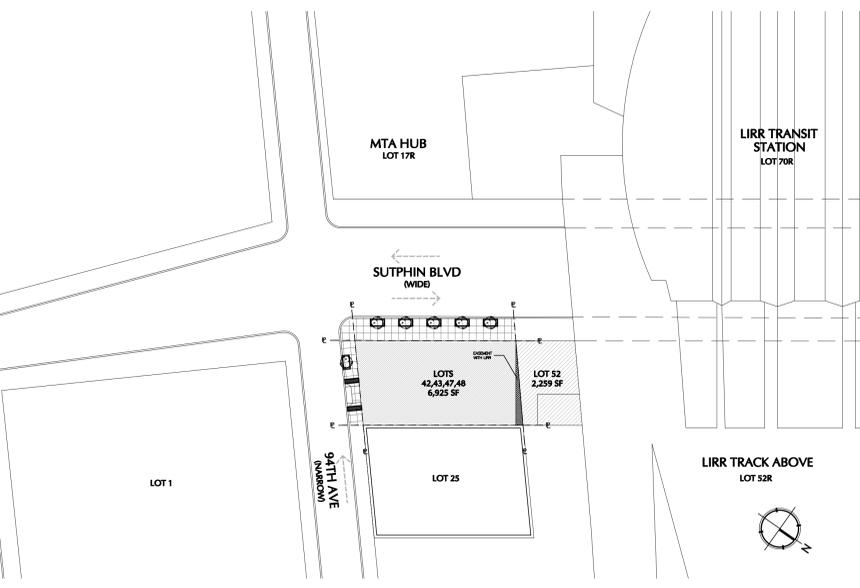
LOT COVERAGE				
Lot Coverage Corner Lot	80%	4338.40		115-21
Lot Coverage Interior Lot	70%	2632.70		115-21
Total Lot Coverage		6971.10	6,693.00	115-21

HEIGHT & SETBACK C6-4 Art. XI Chapter 5				
Min. Base Height	40'-0"	40'		115-232
Max. Base Height	NA	NA		115-232
Max. Building Height	290'-0"	276'-0"		115-234
Set back	None Required	20'-11"		115-232

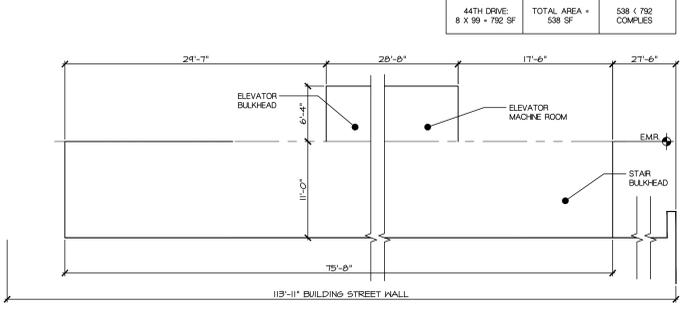
MISC-AS PER COMMERCIAL DISTRICT				
Sidewalk Widening Requirement	2' Widening along 94th st. mandatory		2 ft	115-31
Max. legal window distance	20'-0"			33-51; 24-651
Lot Line Windows	10% of façade area per story			Table 704.8 J
Yards				
Front	Not Required			
Side	Not Req'd. 8ft if prov			33-25
Rear	Not required Corner Lot			33-261

PARKING/BICYCLES (C4-4 Equivalent per 115-51)				
Parking (C4-4)	1 per 12 rooms	11.58	Offsite Parking Proposed	115-51; 36-21
Waiver of requirement (C4-4)	Lots under 10,000 sf.	Waived		36-344
Total parking Onsite	0	0.00		
Loading Dock Requirement (C4-4)	1 per 300,000 sf	1.00		36-62
	Min Berth size	33' x 12'	33' x 12'	36-681
Bicycle Count - Residential	1 per 10,000 SF	11		36-711
	Area is excluded from ZFA			36-75
	15sf/bicycle in a rack		11x15 SF= 165 SF min. Required	
	9sf/Bicycle w/ approved layout		11x9 SF=99 SF min. Required	

F ZONING ANALYSIS & AREA SCHEDULE



E PLOT PLAN

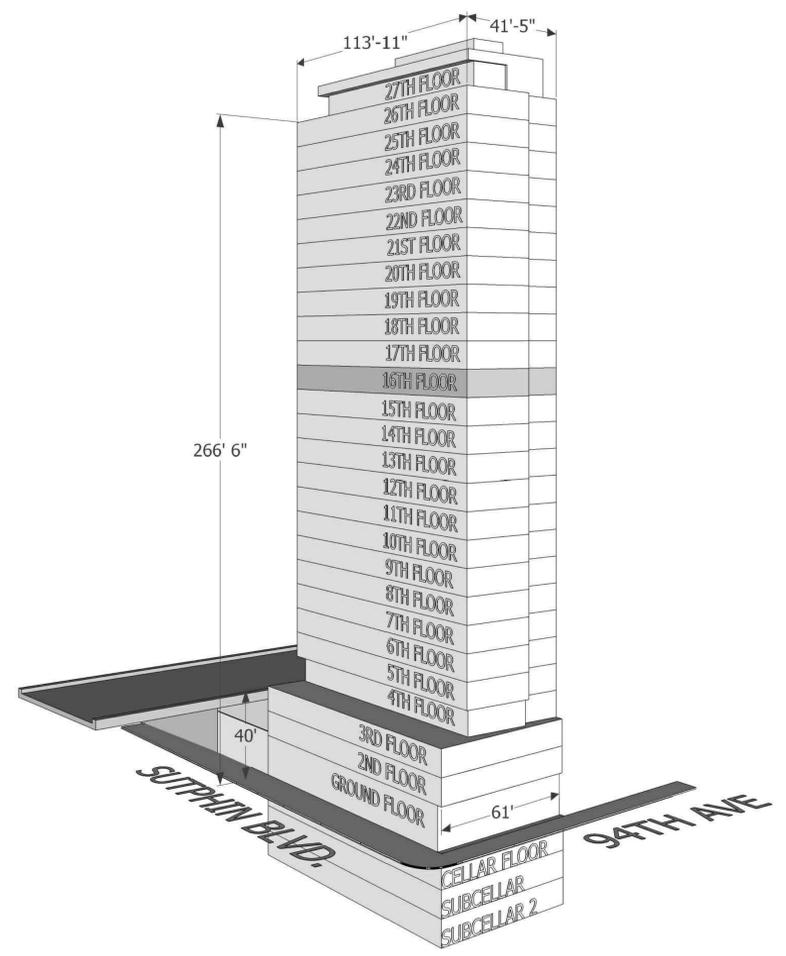


D BULKHEAD CALCULATIONS

UNIT BREAKDOWN					
FLOOR	ADA DOUBLE	DOUBLE QUEEN	KING	KING SUITE	Totals
CELLAR					
1 FL.					
2 FL.		10			10
3 FL.		10			10
4 FL.	2	2	5		9
5 FL.	1	3	6		10
6 FL.	1	3	6		10
7 FL.	1	3	6		10
8 FL.	1	3	6		10
9 FL.	1	3	6		10
10 FL.	1	3	6		10
11 FL.	1	3	6		10
12 FL.	1	3	6		10
13 FL.	1	3	6		10
14 FL.	1	3	6		10
15 FL.	1	3	6		10
16 FL.					MECH.
17 FL.	1	3	6		10
18 FL.	1	3	6		10
19 FL.		4	6		10
20 FL.		4	6		10
21 FL.		4	6		10
22 FL.		4	6		10
23 FL.		4	6		10
24 FL.		4	6		10
25 FL.		4	6		10
26 FL.		4	6		10
27 FL.					0
Totals	15	93	131	0	239
%	6.28%	38.91%	54.81%	0.00%	100%

C UNIT DISTRIBUTION SCHEDULE

B AXONOMETRIC - SUTPHIN BLVD AND 94TH



FLOOR AREA SCHEDULE - 26 STORIES - 276'-0" TALL

	GROSS AREA	CORE	HALL	BIKE STORAGE	MECHANICAL DEDUCTIONS	RECREATION INDOOR	RECREATION OUTDOOR	EXTERIOR WALL DEDUCTION (OVER 8')	TOTAL FAR
SUB-CELLAR 1	4,659.00	685.00	774.00					2,309.00	0.00
SUB-CELLAR 2	6,744.00	685.00	1,307.00						0.00
CELLAR	6,744.00	685.00	533.00						0.00
1ST FL	6,576.00	685.00	627.00		475.00			198.00	5,903.00
2ND FL	6,691.00	685.00	1,279.00		35.00			140.00	6,516.00
3RD FL	6,691.00	685.00	954.00		35.00			140.00	6,516.00
4TH FL	4,327.00	685.00	699.00		35.00			160.00	4,132.00
5TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
6TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
7TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
8TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
9TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
10TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
11TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
12TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
13TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
14TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
15TH FL	4,432.00	685.00	558.00		3,747.00			146.00	539.00
16TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
17TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
18TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
19TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
20TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
21ST FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
22ND FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
23RD FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
24TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
25TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
26TH FL	4,432.00	685.00	558.00		35.00			146.00	4,251.00
27TH FL ROOF	577.00	369.00			35.00		3,273.00		542.00
TOTAL	140,513.00	20,234.00	17,891.00	0.00	5,097.00	2,309.00	3,273.00	3,850.00	113,419.00
FAR									113,419.00
TOTAL FAR									113,419.00
FAR ALLOWED									110,208.00
FAR TO BE PURCHASED									3,211.00

A ZONING FLOOR AREA CALCULATION

93-43 Sutphin Blvd.
JAMAICA, QUEENS 11435
BLOCK: 9998 LOTS: 42,43,47,48,52

PROJECT NO. 1649.00

DEVELOPER

STRUCTURAL ENGINEER

MECHANICAL ENGINEER

OWNER

ISSUE

SCALE

KEY PLAN

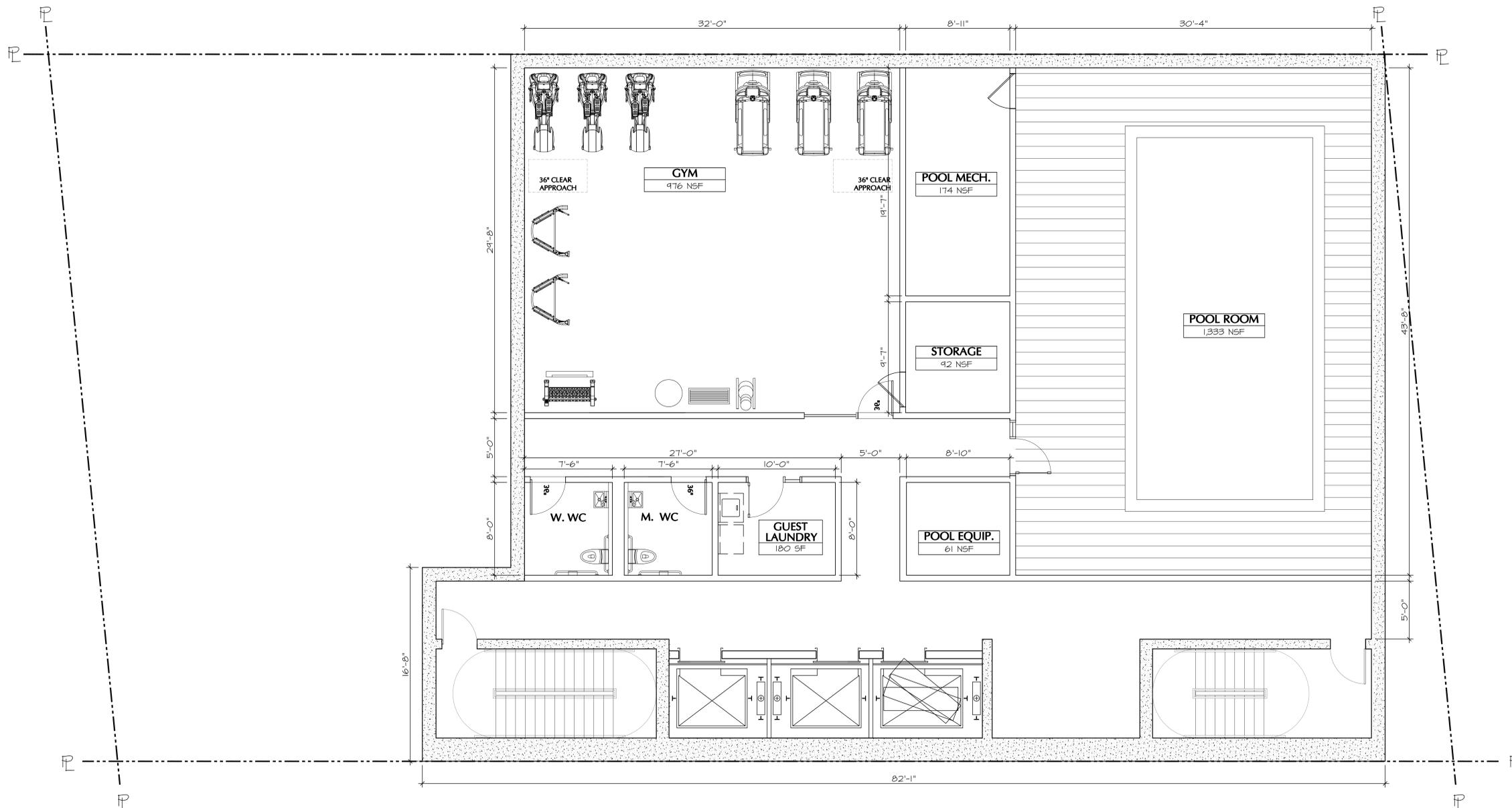
PROJECT
93-43 SUTPHIN BLVD.
JAMAICA, QUEENS 11435

DRAWING
ZONING ANALYSIS
PLAN AND BULK DIAGRAM

SEAL AND SIGNATURE _____ DATE: _____
DRAWING NO.: _____
CHK BY: _____
DWG NO.: _____

A-003.00

CADD FILE NO.: _____ # OF XX



A SUBCELLAR #1 FLOOR PLAN - T.O.S.

1/4"=1'-0"



93-43 Sutphin Blvd.
 JAMAICA, QUEENS 11435
 BLOCK: 9998 LOTS: 42,43,47,48,52

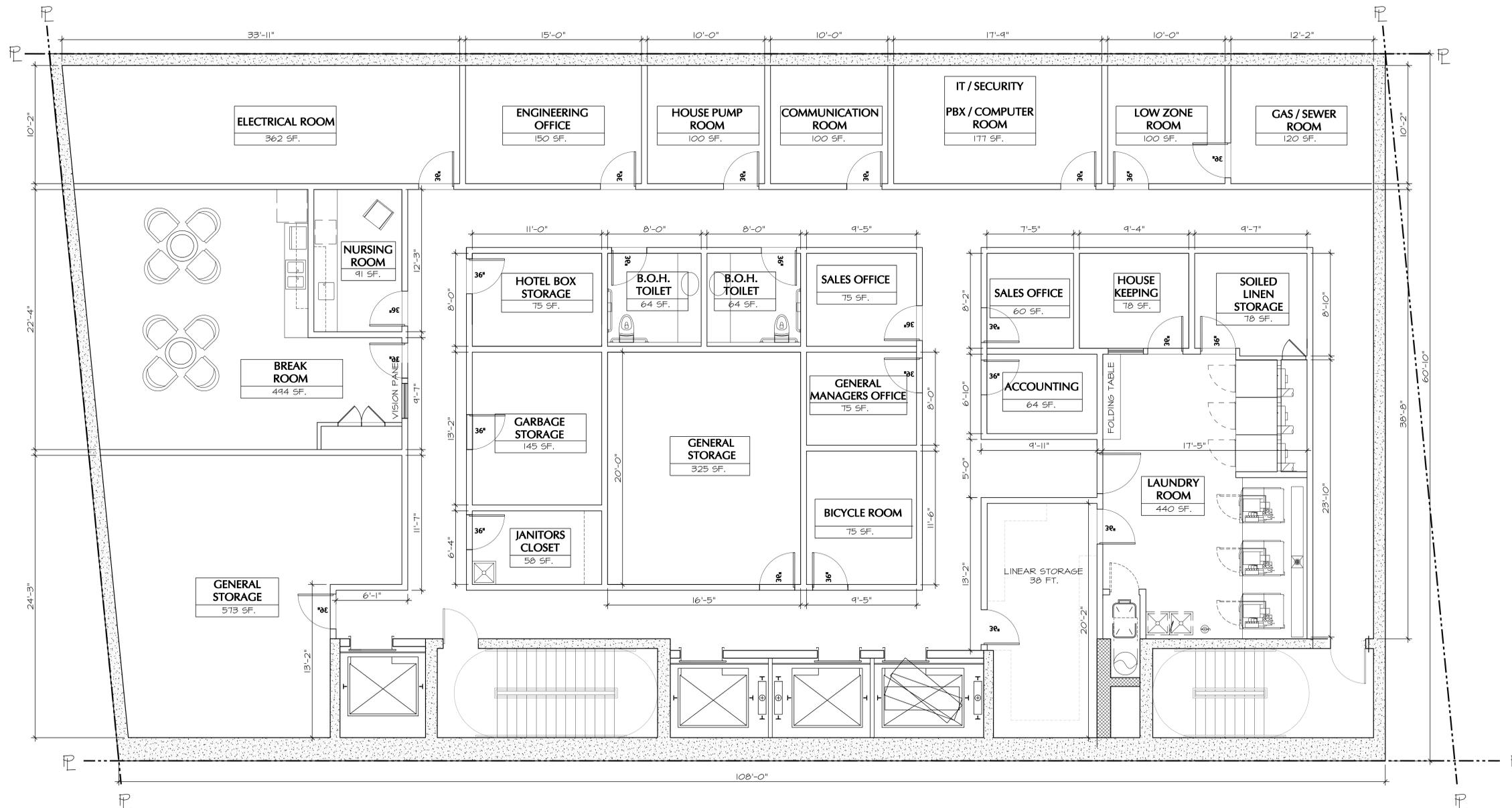
PROJECT NO. 1649.00

DEVELOPER _____
 STRUCTURAL ENGINEER _____
 MECHANICAL ENGINEER _____
 OWNER _____
 ISSUE _____
 SCALE _____
 KEY PLAN _____

PROJECT
 93-43 SUTPHIN BLVD.
 JAMAICA, QUEENS 11435

DRAWING
 SUBCELLAR #1 PLAN

SEAL AND SIGNATURE _____ DATE _____
 PROJECT NO. _____
 DRAWING BY: J.F. O.A.
 CHK BY: DAVID CROSS
 DWG NO. _____
A-101.00
 CAD FILE NO. _____ OF XX



A SUBCELLAR #2 FLOOR PLAN - T.O.S.

1/4"=1'-0"



93-43 Sutphin Blvd.
 JAMAICA, QUEENS 11435
 BLOCK: 9998 LOTS: 42,43,47,48,52

PROJECT NO. 1649.00

DEVELOPER
STRUCTURAL ENGINEER
MECHANICAL ENGINEER
OWNER
ISSUE
SCALE
KEY PLAN

PROJECT
 93-43 SUTPHIN BLVD.
 JAMAICA, QUEENS 11435

DRAWING
 SUBCELLAR #2 PLAN

SEAL AND SIGNATURE	DATE
PROJECT NO.	
DRAWING BY: J.E. O.A.	
CHK BY: DAVID CROSS	
DWG NO.	
A-102.00	
CADD FILE NO.	OF XX

93-43 Sutphin Blvd.
 JAMAICA, QUEENS 11435
 BLOCK: 9998 LOTS: 42,43,47,48,52

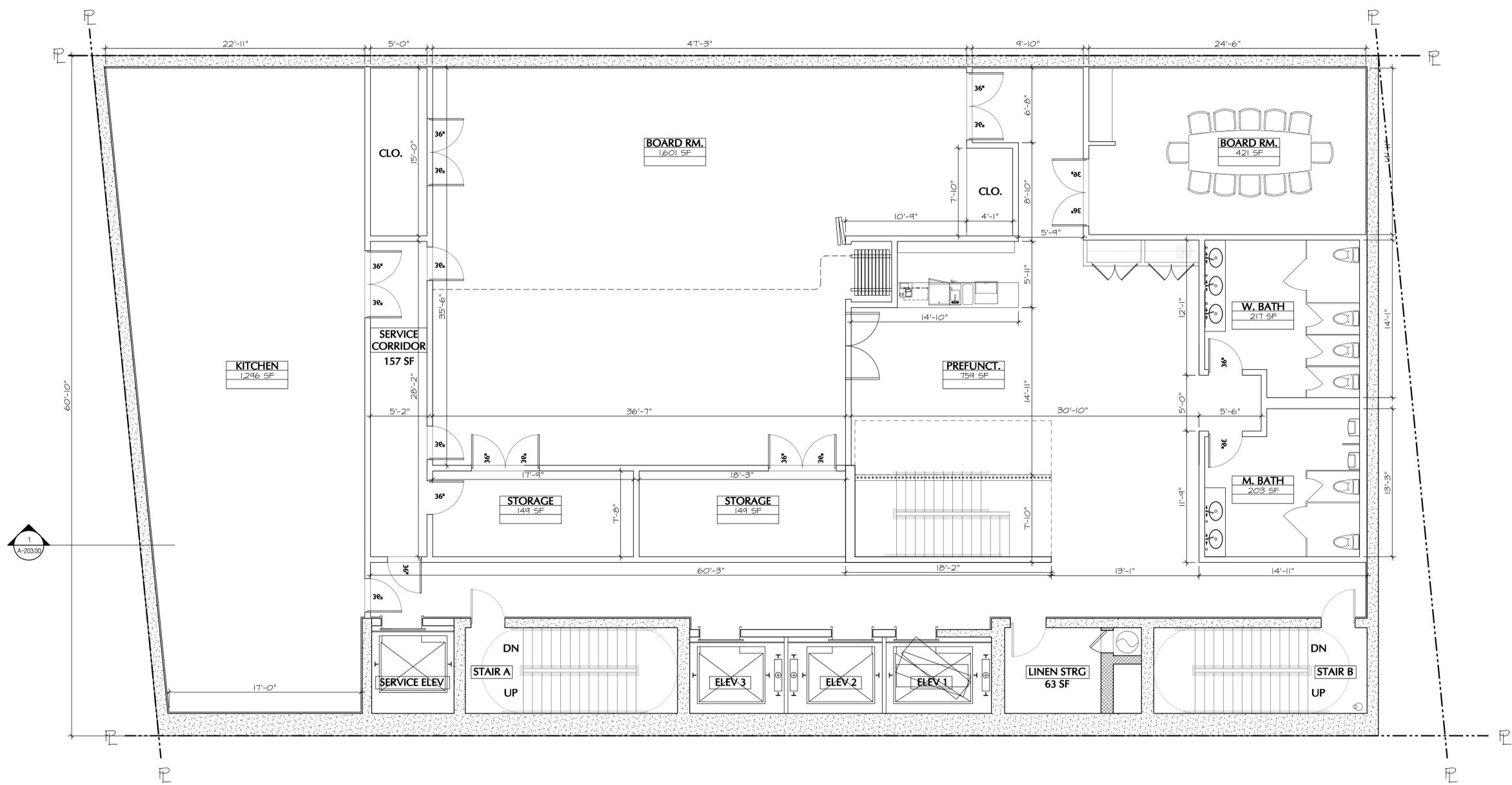
PROJECT NO. 1649.00

DEVELOPER
STRUCTURAL ENGINEER
MECHANICAL ENGINEER
OWNER
ISSUE
SCALE
KEY PLAN

PROJECT
 93-43 SUTPHIN BLVD.
 JAMAICA, QUEENS 11435

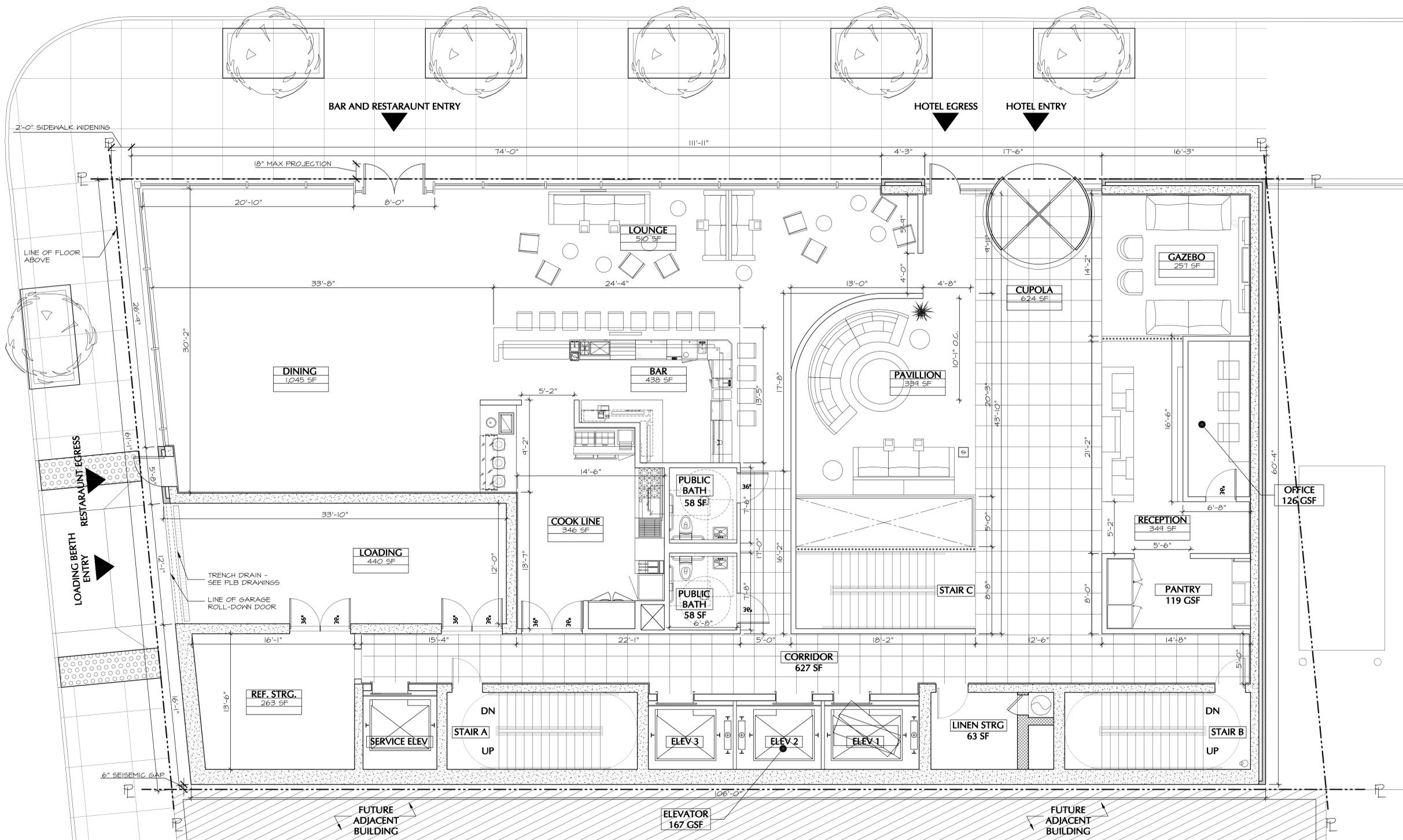
DRAWING
 CELLAR FLOOR PLAN

SEAL AND SIGNATURE	DATE
	PROJECT NO.
	DRAWING BY: J.F. O.A.
	CHK BY: DAVID CROSS
	DWG NO.
	A-103.00
	CADD FILE NO. OF XX



A CELLAR FLOOR PLAN - T.O.S.

1/4"=1'-0"



A GROUND FLOOR PLAN - T.O.S.

1/4"=1'-0"



93-43 Sutphin Blvd.
JAMAICA, QUEENS 11435
BLOCK: 9998 LOTS: 42,43,47,48,52

PROJECT NO. 1649.00

DEVELOPER
STRUCTURAL ENGINEER
MECHANICAL ENGINEER
OWNER
ISSUE
SCALE
KEY PLAN

PROJECT
93-43 SUTPHIN BLVD.
JAMAICA, QUEENS 11435

DRAWING
GROUND FLOOR PLAN

SEAL AND SIGNATURE	DATE
PROJECT NO.	
DRAWING BY: JF, O.A.	
CHK BY: DAVID CROSS	
DWG NO.	
A-104.00	
CADD FILE NO.	OF XX

93-43 Sutphin Blvd.
JAMAICA, QUEENS 11435
BLOCK: 9998 LOTS: 42,43,47,48,52

PROJECT NO. 1649.00

DEVELOPER

STRUCTURAL ENGINEER

MECHANICAL ENGINEER

OWNER

ISSUE

SCALE

KEY PLAN

PROJECT

93-43 SUTPHIN BLVD.
JAMAICA, QUEENS 11435

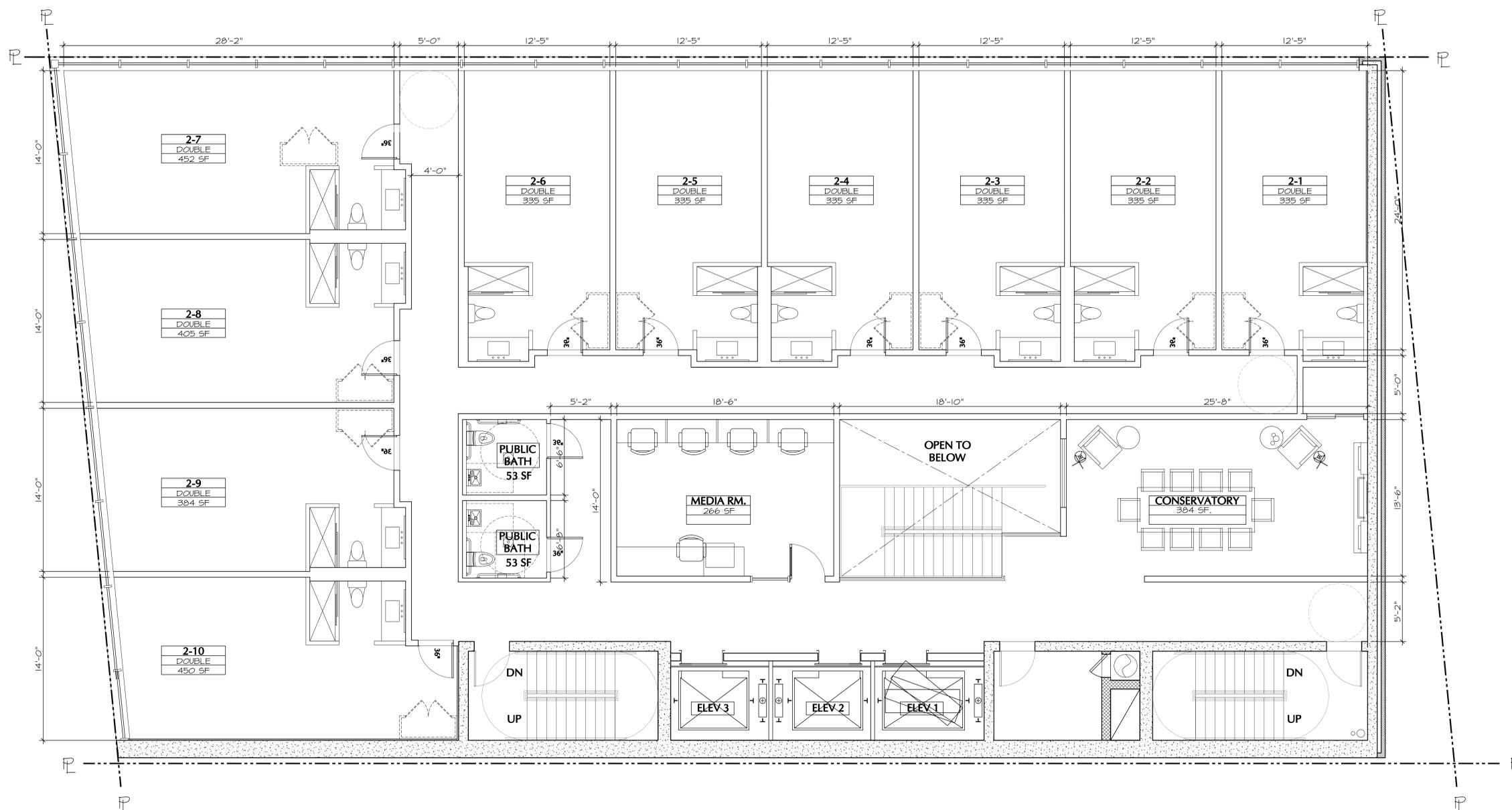
DRAWING

2ND FLOOR PLAN

SEAL AND SIGNATURE

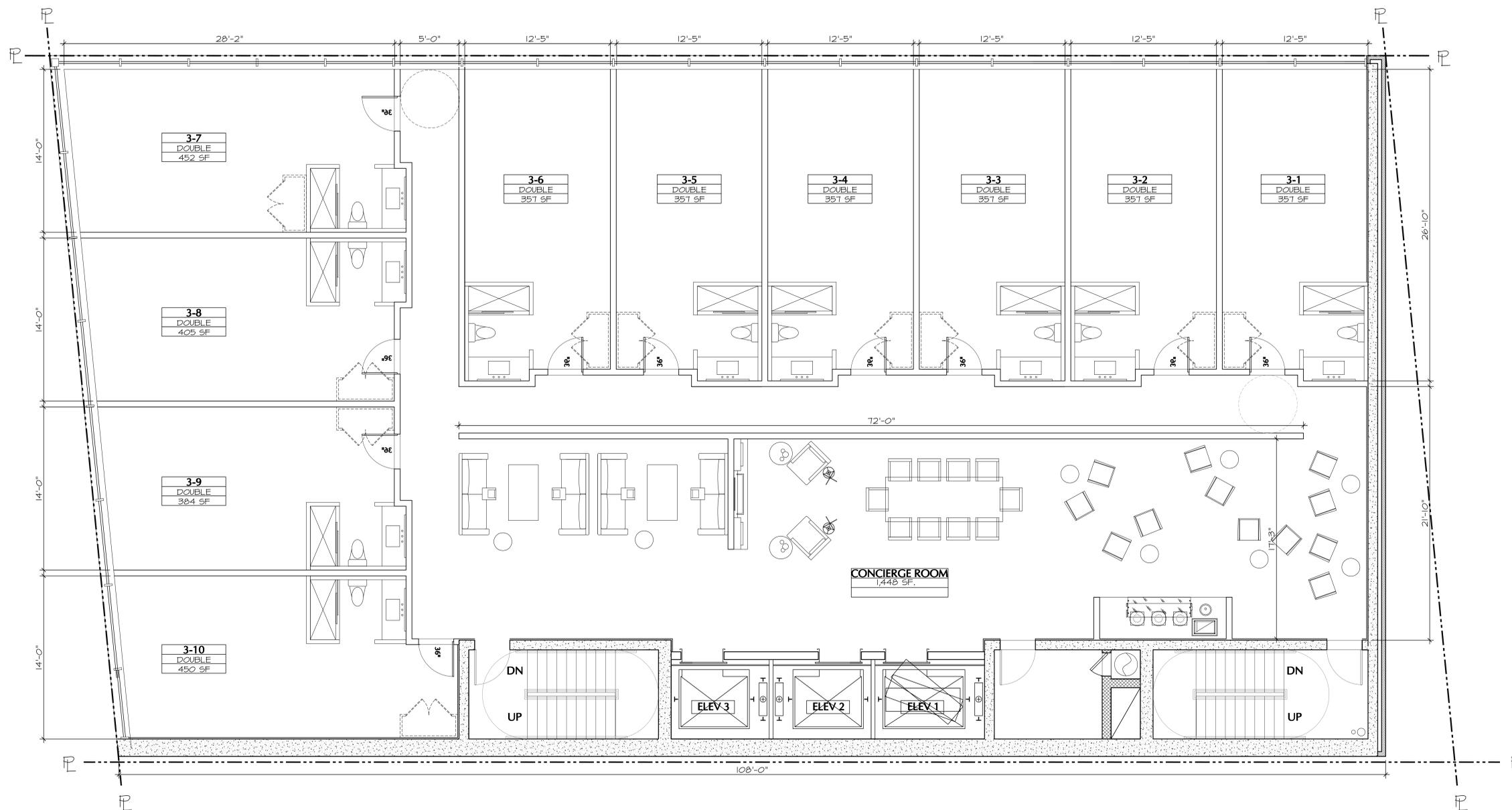
DATE: _____
PROJECT NO.: _____
DRAWING BY: J.F. O.A.
CHK BY: DAVID CROSS
DWG NO.: _____

A-105.00
CADD FILE NO.: _____ OF XX



A SECOND FLOOR PLAN - T.O.S.

1/4"=1'-0"



A THIRD FLOOR PLAN - T.O.S.

1/4"=1'-0"



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JAMAICA, QUEENS 11435
BLOCK: 9998 LOTS: 42,43,47,48,52

PROJECT NO. 1649.00

DEVELOPER

STRUCTURAL ENGINEER

MECHANICAL ENGINEER

OWNER

ISSUE

SCALE

KEY PLAN

PROJECT

93-43 SUTPHIN BLVD.
JAMAICA, QUEENS 11435

DRAWING

3RD FLOOR PLAN

SEAL AND SIGNATURE

DATE

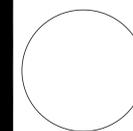
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DRAWING BY: J.F. O.A.

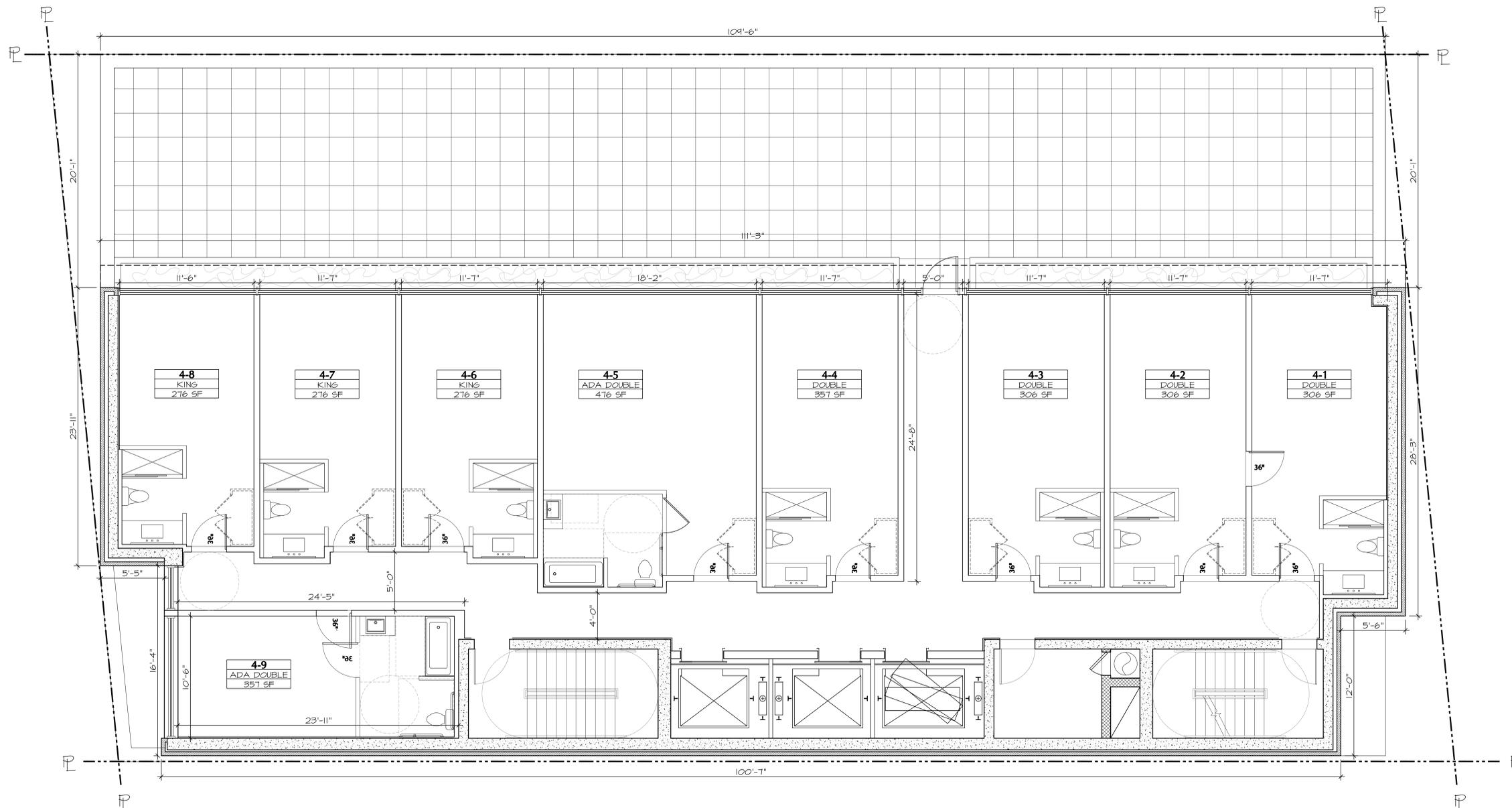
CHK BY: DAVID CROSS

DWG NO.

CADD FILE NO. OF XX



A-106.00



A FOURTH FLOOR PLAN - T.O.S.

1/4"=1'-0"



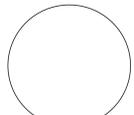
93-43 Sutphin Blvd.
 JAMAICA, QUEENS 11435
 BLOCK: 9998 LOTS: 42,43,47,48,52

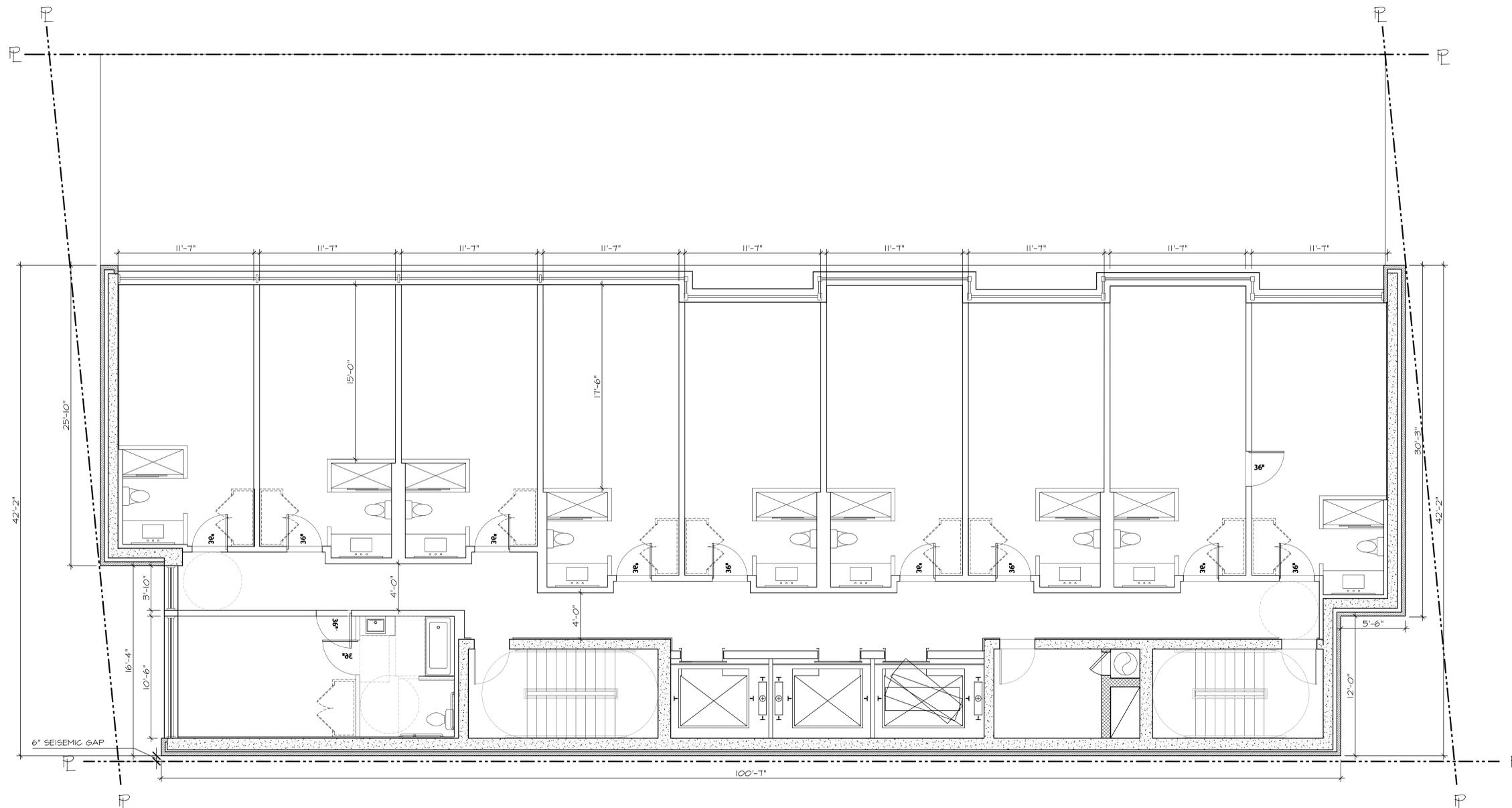
PROJECT NO. 1649.00

DEVELOPER
STRUCTURAL ENGINEER
MECHANICAL ENGINEER
OWNER
ISSUE
SCALE
KEY PLAN

PROJECT
 93-43 SUTPHIN BLVD.
 JAMAICA, QUEENS 11435

DRAWING
 4TH FLOOR PLAN

SEAL AND SIGNATURE	DATE
	PROJECT NO.
	DRAWING BY: J.E. O.A.
	CHK BY: DAVID CROSS
	DWG NO.
A-107.00	
CADD FILE NO. OF XX	



A 5TH TO 18TH FLOOR PLAN - T.O.S. 88'-0" (109.76)

1/4"=1'-0"



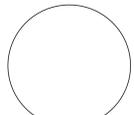
93-43 Sutphin Blvd.
 JAMAICA, QUEENS 11435
 BLOCK: 9998 LOTS: 42,43,47,48,52

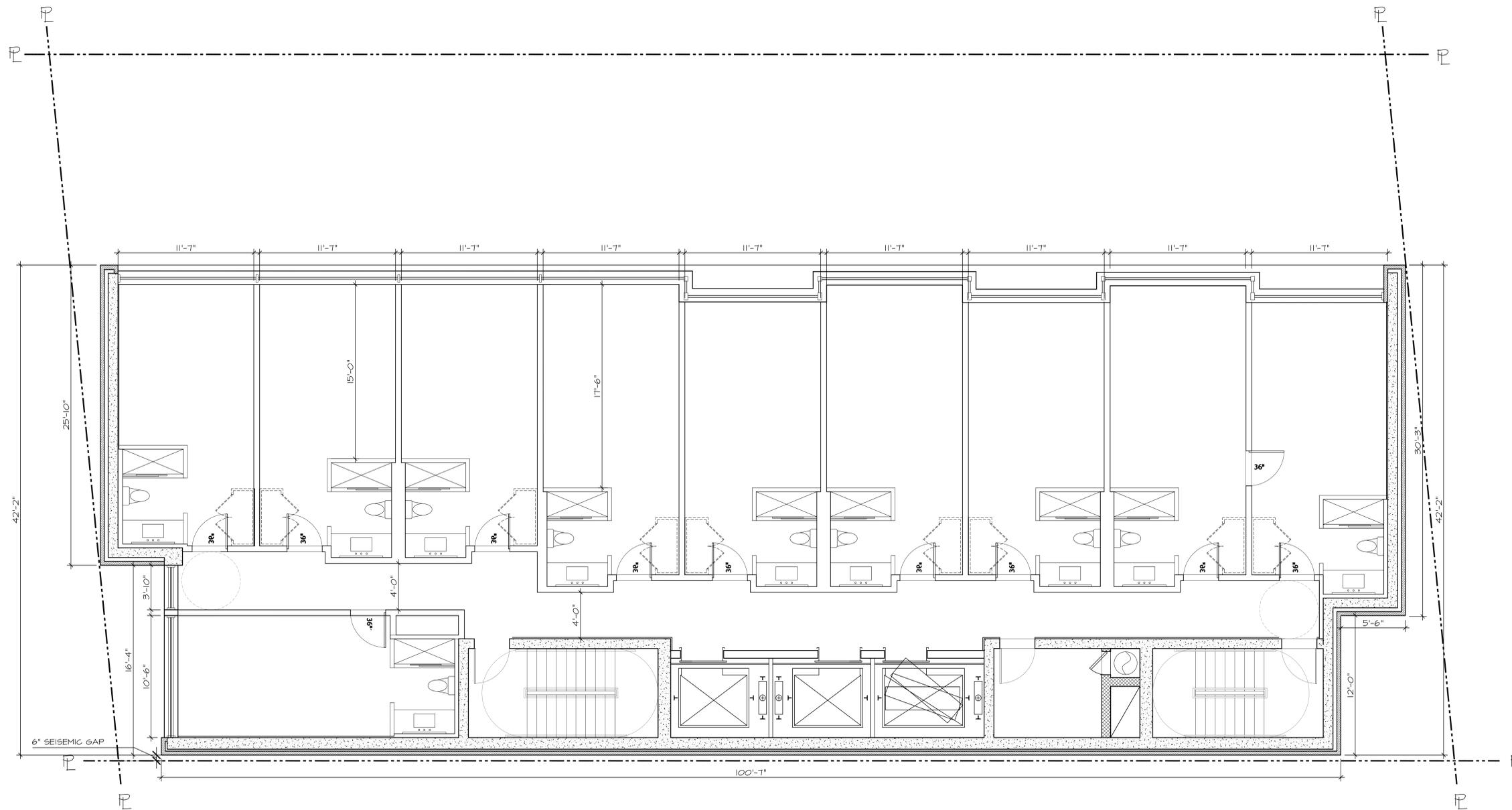
PROJECT NO. 1649.00

DEVELOPER
STRUCTURAL ENGINEER
MECHANICAL ENGINEER
OWNER
ISSUE
SCALE
KEY PLAN

PROJECT
93-43 SUTPHIN BLVD.
 JAMAICA, QUEENS 11435

DRAWING
5TH-18TH FLOOR PLAN

SEAL AND SIGNATURE	DATE
	PROJECT NO.
	DRAWING BY: J.E. O.A.
	CHK BY: DAVID CROSS
	DWG NO.
A-108.00	
CADD FILE NO. _____ OF XX	



A 19TH TO 26TH FLOOR PLAN - T.O.S.

1/4"=1'-0"



93-43 Sutphin Blvd.
 JAMAICA, QUEENS 11435
 BLOCK: 9998 LOTS: 42,43,47,48,52

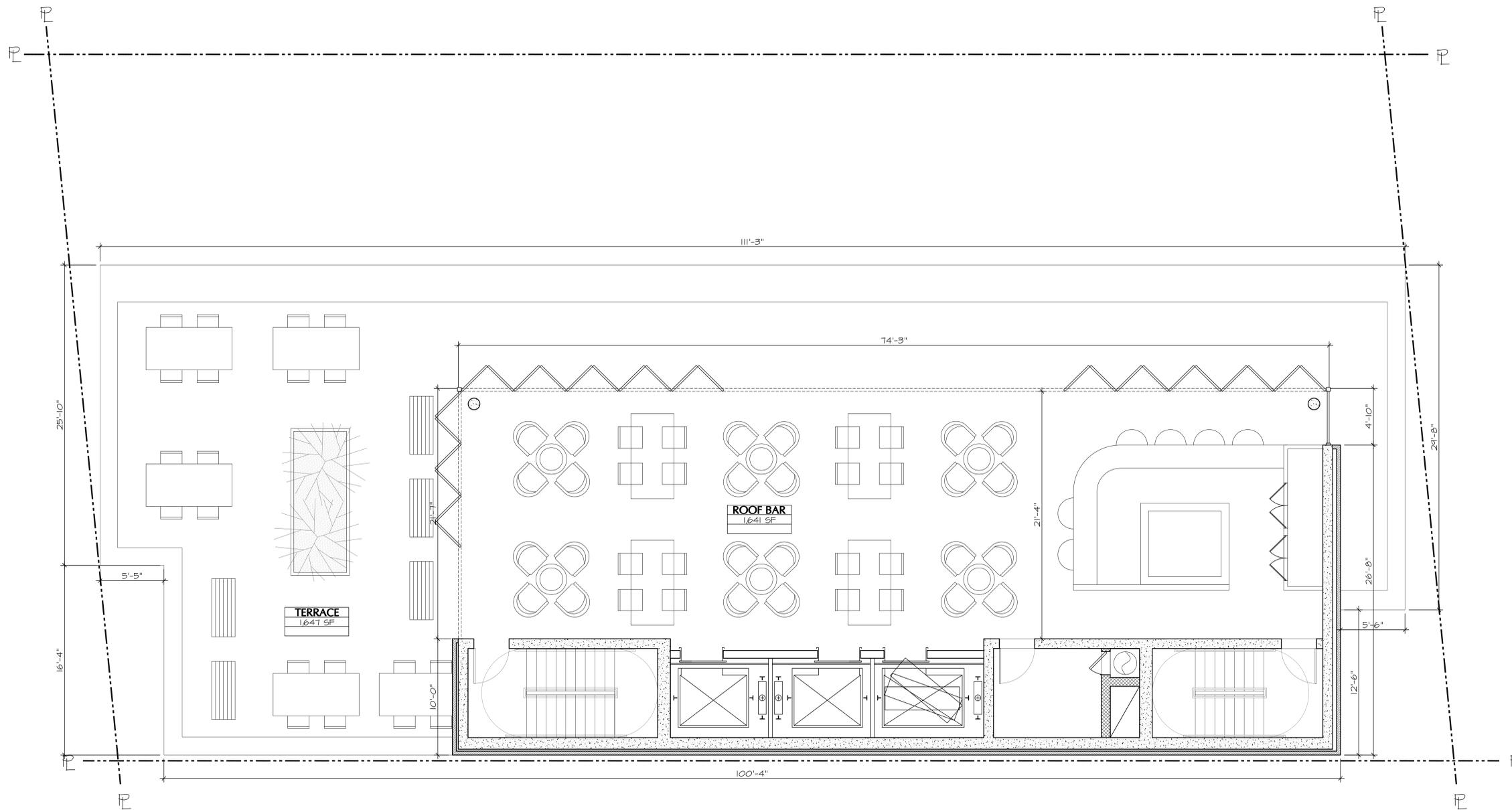
PROJECT NO. 1649.00

DEVELOPER
STRUCTURAL ENGINEER
MECHANICAL ENGINEER
OWNER
ISSUE
SCALE
KEY PLAN

PROJECT
 93-43 SUTPHIN BLVD.
 JAMAICA, QUEENS 11435

DRAWING
 19TH-26TH FLOOR PLAN

SEAL AND SIGNATURE	DATE
	PROJECT NO.
	DRAWING BY: J.E. O.A.
	CHK BY: DAVID CROSS
	DWG NO.
A-109.00	
CADD FILE NO. _____ OF XX	



A 27TH FLOOR PLAN - ROOF RECREATION AND BAR - T.O.S.

1/4"=1'-0"



93-43 Sutphin Blvd.
 JAMAICA, QUEENS 11435
 BLOCK: 9998 LOTS: 42,43,47,48,52

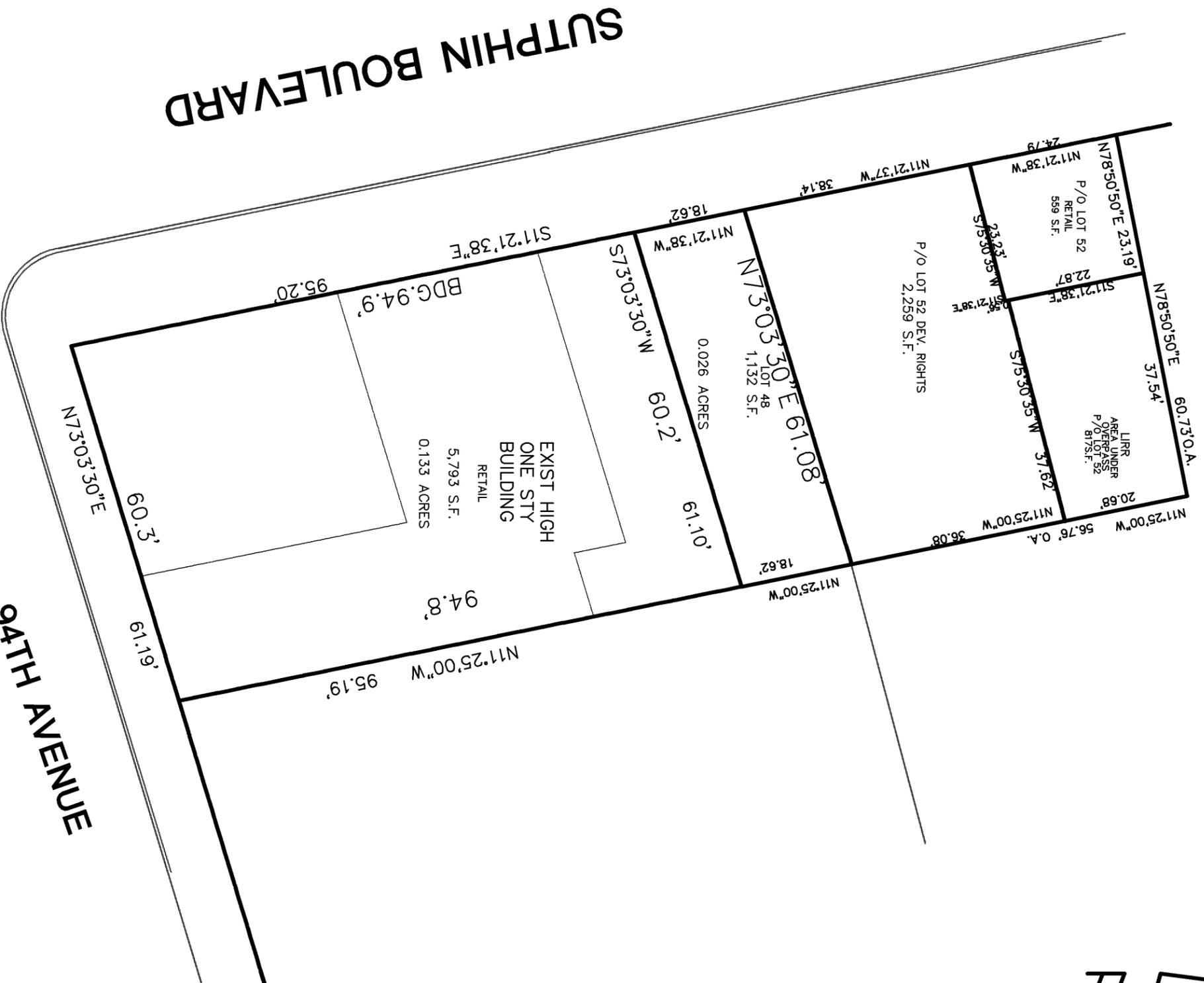
PROJECT NO. 1649.00

DEVELOPER
STRUCTURAL ENGINEER
MECHANICAL ENGINEER
OWNER
ISSUE
SCALE
KEY PLAN

PROJECT
 93-43 SUTPHIN BLVD.
 JAMAICA, QUEENS 11435

DRAWING
ROOF FLOOR PLAN

SEAL AND SIGNATURE	DATE
	PROJECT NO.
	DRAWING BY: J.F. O.A.
	CHK BY: DAVID CROSS
	DWG NO.
A-110.00	
CADD FILE NO. OF XX	



NOTE:
SURVEYOR IS NOT RESPONSIBLE FOR ANY EASEMENT OR ENCROACHMENTS NOT SHOWN ON THIS SURVEY

**SECTION 128 OF THE FINAL SECTION MAPS OF THE BOROUGH OF QUEENS
 QUEENS COUNTY TAX MAP: BLOCK 9998 , LOTS 42, 43, 47, 48 & P/O 52**

METES AND BOUNDS EXHIBIT
 FOR
GREATER JAMAICA DEVELOPMENT CORPORATION
 SUTPHIN BOULEVARD @ 94TH AVENUE
 JAMAICA
 QUEENS COUNTY, NEW YORK

RUSSELL H. LEWIS CO.
 LAND SURVEYORS
 57 CONKLIN AVE., WHEATLEY HEIGHTS NY 11798
 TEL. No. (516) 474-3665

RUSSELL H. LEWIS, N.Y. L.S. #50265
 NOVEMBER 11, 2014

*Unauthorized alteration or addition to a survey map bearing a licensed land surveyor's seal is a violation of the provisions of § 21 of the New York State Education Law.
 *Copies from the original of this survey map, not marked with an original of the land surveyor's seal, or a printed or electronic copy, shall not be considered to be a valid true copy.
 *Certifications indicated hereon signify that this survey was prepared in accordance with the standards of the New York State Association of Professional Land Surveyors.
 *Certifications shall run only to the person for whom the survey was prepared and shall be the title company, governmental agency and lending institution listed hereon, and to the assignees of the lending institution. Certifications shall not be construed to additional institutions or subsequent owners.

SCALE: 1" = 20'

APPENDIX 6

Sample Hazardous or Non-Hazardous Soil Disposal Manifest



Manifest # _____

GLOBAL JOB NUMBER: _____ **FACILITY APPROVAL NUMBER:** _____

Please Check One:

- | | | | |
|---|---|--|---|
| <input type="checkbox"/> Clean Earth of Carteret
24 Middlesex Avenue
Carteret, NJ 07008
Ph: 732-541-8909 | <input type="checkbox"/> Clean Earth of Maryland
1469 Oak Ridge Place
Hagerstown, MD 21740
Ph: 301-791-6220 | <input type="checkbox"/> Clean Earth of New Castle
94 Pyles Lane
New Castle, DE 19720
Ph: 302-427-6633 | <input type="checkbox"/> Other
_____ |
| <input type="checkbox"/> Clean Earth of Philadelphia
3201 S. 61st Street
Philadelphia, PA 19153
Ph: 215-724-5520 | <input type="checkbox"/> Clean Earth of West Virginia
3815 South State Route 2
Friendly, WV 26146
Ph: 304-652-8580 | <input type="checkbox"/> Clean Earth of Southeast Pennsylvania
7 Steel Road East
Morrisville, PA 19067
Ph: 215-428-1700 | _____ |

Non-Hazardous Material Manifest

(Type or Print Clearly)

GENERATOR'S NAME & SITE ADDRESS:	GROSS WEIGHT: <input checked="" type="checkbox"/> Tons <input type="checkbox"/> Yards
	TARE WEIGHT: <input checked="" type="checkbox"/> Tons <input type="checkbox"/> Yards
GENERATOR'S PHONE: _____	NET WEIGHT: <input checked="" type="checkbox"/> Tons <input type="checkbox"/> Yards

DESCRIPTION OF MATERIAL/SAMPLE ID AND LOCATION

GENERATOR'S CERTIFICATION – Incomplete and/or unsigned manifests will cause the load to be delayed and/or rejected.

I hereby certify that the above named material does not contain free liquid as defined by 40 CFR Part 260.10 or any applicable state law, is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, is not a DOT hazardous substance as defined by 49 CFR Part 172 or any applicable state law, has been fully and accurately described above, classified, packaged and is in proper condition for transportation according to all applicable state and federal regulations.

Name: _____ Title: _____
Signature: _____ Date and Time: _____

TRANSPORTER

Company: _____ Phone Number: _____
Address: _____ Truck # and License Plate: _____
Driver: _____ SW Haulers Permit #: _____
(Type or Print Clearly) (applicable state permit #)

I hereby certify that the above named material was picked up at the site listed above.

Driver Signature: _____ Date and Time: _____

DESTINATION

I hereby certify that the above named material was delivered without incident to the facility noted above.

Driver Signature: _____ Date and Time: _____

I hereby certify that the above named material has been accepted at the above referenced facility.

Authorized Signature: _____ Date and Time: _____