

**RIVER BRIDGE TOWERS  
27-01 41<sup>ST</sup> AVENUE  
LONG ISLAND CITY,  
QUEENS, NEW YORK, 11101**

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## **Remedial Action Work Plan**

NYC VCP Number: 14CVCP158Q

**Prepared for:**

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# REMEDIAL ACTION WORK PLAN

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## LIST OF ACRONYMS

<b>Acronym</b>	<b>Definition</b>
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 VCP	New York City Voluntary 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, Albert Machlin, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the 29-12 LIC LLC1 Site, Site number 14CVCP158Q.

I, William J. Seevers am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the 29-12 LIC LLC Site, Site number 14CVCP158Q.

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.

\_\_\_\_\_  
Name

\_\_\_\_\_  
NYS PE License Number

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



\_\_\_\_\_  
QEP Name

\_\_\_\_\_  
QEP Signature

\_\_\_\_\_

## **EXECUTIVE SUMMARY**

River Bridge Tower, LLC has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to remediate a 10,000-square foot site located at 27-01 41st Avenue, Long Island City, Queens, 11101. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

### **Site Location and Current Usage**

The Site, which is presently a vacant lot, is located at 27-01 41st Avenue, Long Island City, Queens, NY 11101, and is identified as Block 405, Lot 5 former (Lots 5, 6 and 7) on the New York City Tax Map. Figure 1 shows the Site location. The Site is 10,000-square feet and is bounded by 41st Avenue on the south, 27th Street on the west, a two story inactive commercial property to the north, and two story inactive residential units to the east. A map of the Site boundary is shown in Figure 2.

### **Proposed Redevelopment Plan**

It is proposed to construct a 6 story condominium on the site, which would cover most of the area with little open space. Floors 2 through 6 of the building will each contain 4 living units]. The basement space of this building, which will be 12 feet below grade, will be occupied by an underground parking garage, as well as mechanical rooms and an elevator shaft. There will be 22 parking spaces. The first floor will contain a lobby and a commercial printing shop. Layout of the proposed site development is presented in Figure 3. The current zoning is M1-2/R6A and the proposed use is consistent with existing zoning for the property.

Excavation for the basement will extend to a depth of approximately 12 feet below the existing street level surface grade. The total volume of soil to be excavated for the construction and installation of the foundation and basement for the new building is approximately 4,500 cubic yards. Since groundwater is present at the Site at a depth of approximately 32 feet below the existing ground surface of the site, groundwater will not be encountered during site excavation.

The remedial action contemplated under this RAWP would be carried out as part of the excavation of the basement, as well as by its ventilation system.

### **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 for particulates and volatile organic carbon compounds
3. Establishment of Track 1 Unrestricted Use Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Excavation and removal of soil/fill exceeding Track 1 Unrestricted Use SCOs. Entire property will be excavated to a depth of approximately 12 feet below grade for construction of a new sub-grade parking garage for the new development
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.
7. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.
8. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities.

9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
10. Import of materials to be used for backfill in compliance with this plan and in accordance with applicable laws and regulations.
11. As part of development, installation of a vapor barrier/waterproofing system below the concrete slab underneath the garage, as well as behind foundation walls of the proposed building.
12. As part of development, construction and maintenance of an engineered composite cover consisting of a 16 inch thick concrete slab across the footprint of the new building.
13. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
15. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and, if Track 1 SCO's are not achieved, describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP.
16. If Track 1 Unrestricted Use SCOs are not achieved, 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.
17. If Track 1 Unrestricted Use SCOs are not achieved, the property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls; 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 William Seevers who can be reached at 631-232-1987.

**Worker Training.** Workers participating in cleanup of contaminated material on this project are required to be trained in a 40-hour hazardous waste operators training course and to take annual refresher training. This pertains to workers performing specific tasks including removing contaminated material and installing cleanup systems in contaminated areas.

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

**Odor, Dust and Noise Control.** This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and includes steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also required to comply with NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager William Seevers at 631-232-1987 or NYC Office of Environmental Remediation Project Manager Zachariah Schreiber (212) 788-3056.

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 7:00AM to 6:00PM 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 ETG Project Manager William Seevers at 631-232-1987, the NYC Office of Environmental Remediation Project Manager Zachariah Schreiber at (212-788-3056), or call 311 and mention that the Site is in the NYC Brownfield 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. If necessary, stockpiles will be protected with silt fences, and hay bales will be used, 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 repositories located at the Queens Library Long Island City Branch (37-44 21st Street, Long Island City, Queens, NY 11101).

**Long-Term Site Management.** To provide long-term protection after the cleanup is complete, the property owner will be required (If Track 1 cleanup is not achieved) to comply with an ongoing Site Management Plan that calls for continued inspection of protective controls. 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. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved remediation is still effective.

# REMEDIAL ACTION WORK PLAN

## 1.0 SITE BACKGROUND

29-12 LIC LLC River Bridge Tower, LLC has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 27-01 41st Avenue, Long Island City, Queens, NY 11101 (the Site). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

### 1.1 Site Location and Current usage

**The Site, which is presently a vacant lot, is located at 27-01 41st Avenue, Long Island City, Queens, NY 11101, and is identified as Block 405, Lot 5 on the New York City Tax Map.** Figure 1 shows the Site location. The Site is 10,000-square feet and is bounded by 41st avenue on the south, 27th street on the west, and two story inactive residential units to the east. A map of the Site boundary is shown in Figure 2.

### 1.2 Proposed Redevelopment Plan

It is proposed to construct a 6 story condominium on the site, which would cover most of the area with little open space. Floors 2 through 6 of the building will contain 4 living units. The basement space of this building, which will be 12 feet below grade, will be occupied by an underground parking garage, as well as mechanical rooms and an elevator shaft. There will be 22 parking spaces. The first floor will contain a lobby and a commercial printing shop. Layout of the proposed site development is presented in Figure 3. The proposed use is consistent with existing zoning for the property.

Excavation for the basement will extend to a depth of approximately 12 feet below the street level surface grade. The total volume of soil to be excavated for the construction and installation of the foundation and basement for the new building is approximately 4500 cubic yards. Since groundwater is present at the Site at a depth of approximately 32 feet below the proposed basement level, groundwater will not be encountered during site excavation.

The remedial action contemplated under this RAWP would be carried out as part of the excavation of the basement, as well as by its ventilation system.

### **1.3 Description of Surrounding Property**

The surrounding area is primarily commercial and industrial with some two story residential. The Site is bounded by 41st Avenue on the south, 27th Street on the west, a two story inactive commercial property to the north, and two story inactive residential units to the east, based on personal observation. A map of the Site boundary is shown in Figure 2. The Surrounding Land use is shown in Figure 4,

A school, the Academy of American Studies at 40-11 28th St, Queens, NY 11101, is located approximately 250 feet east of the site. Growing up Green Charter School (39-37 28th Street, Queens, NY 11101) is also located in the vicinity. SPEED web site was used to locate other nearby sensitive sites. Aside from the local schools no other sensitive sites were identified. There is a public school a half block south of the project and a taxi dispatch center across 27th street directly to the west.

### **1.4 Remedial Investigation**

A remedial investigation was performed and the results are documented in a companion document called "Remedial Investigation Report, 29-12 LIC LLC, dated June, 2013 (RIR).

On Lot 5 (former Lot 7) near the northwest corner, NYSDEC reported a spill of 500 gallons of liquid contents that led to the assignment of NYSDEC Spill number 00-03871 in the year 2000. The northwest corner of the lot is also where a suspect gasoline UST may be located. The chemistry of the liquid product was not determined and the spill number was closed in 2003.

Environmental Data Resources (EDR) of Milford, Connecticut, provided the following: a computerized database search of environmental compliance records of sites within a one mile radius of the property. The EDR report contains EDR Radius Maps with GeoCheck, EDR historical research reports, a scanned digital USGS 7.5 minute topographic map, and an aerial photograph search. The EDR report was submitted earlier under separate cover.

ETG reviewed the environmental database report compiled by EDR as a part of the assessment. The purpose of the review was to identify reported listings for the subject property or other properties in the site vicinity. Databases reviewed included federal and state lists of known or suspected contaminated sites, lists of known handlers or generators of hazardous waste, lists of known waste disposal facilities, and lists of aboveground and underground storage tanks (ASTs and USTs). The EDR report showed a number of spills to the SSE of the property that were closed out. Based on this information, one of the Areas of Concern was the possibility of petroleum contamination in groundwater on the site. The OER Areas of Concern were contamination of soil and groundwater, as well as the presence of soil vapor.

### **Summary of the Work Performed under the Remedial Investigation**

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Conducted a geophysical study across the project Site;
3. Installed 6 soil borings across the project Site, and collected 12 soil samples for chemical analysis from the soil borings to evaluate soil quality;
4. Installed 3 groundwater monitoring wells throughout the Site to establish groundwater flow and collected 3 groundwater samples for chemical analysis to evaluate groundwater quality;
5. Installed 4 soil vapor probes in a diagonal line (NW to SE) and collected 4 samples for chemical analysis.

### **Summary of Environmental Findings**

1. Elevation of the property is about 38 feet above msl .
2. Depth to groundwater from the existing surface of the site ranges from 32 to 34 feet below grade.

3. Groundwater flow is generally from east to west beneath the Site.
4. Bedrock, approximately 70 feet below existing ground surface at the Site, is overlain by upper glacial aquifer deposits.
5. The stratigraphy of the site, from the surface down, consists of approximately 0.5 to 2 feet of dark brown sandy soil with leaf and root debris. The next 2 to 5 feet of soil consists of fine yellow brown sand, which is dry and compact. Below 5 feet below grade consists of 70 feet of the Upper Glacial Aquifer geologic unit underlain by crystalline bedrock.
6. The results of the GPR survey revealed patches of small debris items of the sort that would be found on a demolition debris site. There were no large objects corresponding to the size and shape of underground storage tanks or drums. The site was free of large buried objects. However, an anomaly in the northwestern corner of the site was identified that may be a UST. The GPR study also appeared to indicate that appurtances from this anomaly may have extended to a fill port located on the adjacent sidewalk.
7. Soil/fill samples collected during the RI showed no detectable concentrations of VOCs or PCBs. Seven SVOCs including benzo(a)anthracene (max. of 3100 ug/Kg), benzo(a)pyrene (max. of 2500 ug/Kg), benzo(b)fluoranthene (max. of 3100 ug/Kg), benzo-(k)fluoranthene (max. of 960 ug/Kg), chrysene (max. of 3200 ug/Kg), dibenzo(a,h)anthracene (max. of 410 ug/Kg), and indeno(1,2,3-cd)pyrene (max. of 1400 ug/Kg) were detected above their respective Restricted Residential Use SCOs within shallow soil samples (0 – 5 feet). The SVOCs detected above Unrestricted/Restricted Residential SCOs are all PAH compounds and their concentrations and distribution indicate that they are associated with historic fill material. One pesticide, chlordane at a concentration of 490 ug/Kg was detected above Unrestricted Use SCOs in one shallow soil sample. This pesticide concentration is well below Restricted Residential SCOs. Four metals including chromium (max. of 799 ppm), copper (max. of 109 ppm), lead (max. of 457 ppm) and mercury (max. of 1.16 ppm) exceeded Unrestricted Use SCOs in one of more shallow soil sampling locations. Of these metals, chromium, lead, and mercury also exceeded Restricted Residential SCOs, in one shallow sample each. No VOCs, SVOCs, pesticides or metals were detected above Unrestricted Use SCOs in any

of the deep soil samples collected at the Site. Overall, the soil findings were unremarkable.

8. Groundwater samples collected during the RI showed the presence of one VOCs, tetrachloroethene at 2.3 ug/L which is below the New York State 6NYCRR Part 703.5 Groundwater Quality Standards (GQS). Four SVOCs were detected in groundwater at trace levels. The metals including iron, magnesium, manganese, and sodium were detected above their respective NYSDEC Groundwater Quality Standards (GQS) in all three groundwater samples. Pesticides were not detected in any groundwater sample.
9. Soil vapor samples collected during the RI showed chlorinated VOCs and petroleum related VOCs at moderate concentrations. Tetrachloroethylene (PCE) was identified in all four soil vapor samples and ranged in concentration of 9.9  $\mu\text{g}/\text{m}^3$  to 207  $\mu\text{g}/\text{m}^3$ , trichloroethylene (TCE) was detected within two of the soil vapor samples at a maximum concentration of 11.2  $\mu\text{g}/\text{m}^3$  and 1,1,1- TCA was detected at a maximum concentration of 12.8  $\mu\text{g}/\text{m}^3$ . Carbon tetrachloride was not detected in any soil vapor. The PCE and TCE concentrations are within the monitoring level ranges established within the State DOH soil vapor guidance matrix. Concentrations of petroleum-related VOCs including cyclohexane (max. concentration 912  $\mu\text{g}/\text{m}^3$ ), ethylbenzene (max. concentration 242  $\mu\text{g}/\text{m}^3$ ), hexane (max. concentration 75,000  $\mu\text{g}/\text{m}^3$ ), xylenes (max. concentration 273  $\mu\text{g}/\text{m}^3$ ) and toluene (max. concentration 177,000  $\mu\text{g}/\text{m}^3$ ) were detected at moderate to high levels.

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 the 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.
- Prevent exposure to contaminants volatilizing from 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 contamination.

### **Soil Vapor**

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

### **3.0 REMEDIAL Alternatives Analysis**

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

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

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 involves:**

- Establishment of Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
- Removal of all soil/fill exceeding Track 1 Unrestricted Use SCOs throughout the Site and confirmation that Track 1 Unrestricted Use SCOs have been achieved with post-excavation endpoint sampling. Based on the results of the Remedial Investigation, it is expected that this alternative would require excavation across the entire Site to a depth of approximately to 5 feet to remove all fill material and contaminated soils. Excavation for construction of the new building's cellar level would take place to a depth of

approximately 12 feet across the entire Site. If soil/fill containing analytes at concentrations above Unrestricted Use SCOs are still present at the base of the excavation after removal of all soil required for construction of the new building's cellar level is complete, additional excavation will be performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCOs;

- No Engineering or Institutional Controls are required for a Track 1 cleanup, but a vapor and waterproof barrier would be installed beneath the basement foundation and behind foundation sidewalls of the new building as a part of development to prevent any potential future exposures from off-Site soil vapor; and
- Placement of a final cover over the entire Site as part of new development.

#### **Alternative 2 involves**

- Establishment of Track 4 Site-Specific SCOs.
- Removal of all soil/fill exceeding Track 4 Site-Specific SCOs and confirmation that Track 4 Site-Specific SCOs have been achieved with post-excavation endpoint sampling. The remedial investigation identified soil contamination to a depth of 5 feet below grade. Excavation for construction of the new building's cellar level would take place to a depth of approximately 12 feet for the entire Site. Therefore, if soil/fill containing analytes at concentrations above Track 4 Site-Specific SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building is complete, additional excavation will be performed to meet Track 4 Site-Specific SCOs;
- Placement of a final cover over the entire Site to prevent exposure to remaining soil/fill;
- Installation of a soil vapor barrier/waterproofing system beneath the building (garage) slab and along foundation side walls to prevent any potential future exposures from off-Site soil vapor;
- Construction of a ventilated parking garage per NYC DOB codes and regulations;
- Establishment of use restrictions including prohibitions on the use of groundwater from the Site; prohibitions of sensitive Site uses, such as farming or vegetable

- gardening, to prevent future exposure pathways; and prohibition of a higher level of land use without OER approval;
- Establishment of an approved Site Management Plan (SMP) to ensure long-term management of these Engineering and Institutional Controls 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
  - The property will continue to be registered with an E-Designation at the NYC Buildings Department.

### **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 Engineering Controls or Institutional Controls. 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 contaminated soil/fill exceeding Track 1 Unrestricted Use SCOs and groundwater protection standards, thus eliminating potential for direct contact with contaminated soil/fill once construction is complete and eliminating the risk of contamination leaching into groundwater.

**Alternative 2** would achieve comparable protections of human health and the environment by excavating the historic fill at the Site and by ensuring that remaining soil/fill on-Site meets Track 4 Site-Specific SCOs, as well as by placement of Institutional and Engineering controls, including a composite cover system. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Implementing Institutional Controls 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 or groundwater during construction would be minimized by implementing a Construction Health and Safety Plan, an approved Soil/Materials Management Plan and Community Air Monitoring Plan (CAMP). Potential contact with contaminated groundwater would be prevented as its use is prohibited by city laws and regulations. Potential future migration of off-Site soil vapors into the new building would be prevented by installing a vapor barrier below the 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 to Track 1 Unrestricted Use SCOs and Groundwater Protection Standards. Compliance with SCGs for soil vapor would also be achieved by installing a vapor barrier/waterproofing system below 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 meet Track 4 Site specific SCOs. Compliance with SCGs for soil vapor would also be achieved by installing a vapor barrier below 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.

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

## **Short-term effectiveness and impacts**

This evaluation criterion assesses the effects of the alternative during the construction and implementation phase until remedial action objectives are met. Under this criterion, alternatives are evaluated with respect to their 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 1 and 2 have similar short-term effectiveness during their respective implementations, as each requires excavation of historic fill material to depths of five feet. Both alternatives would result in short-term dust generation impacts associated with excavation, handling, load out of materials, and truck traffic. Short term impacts could potentially be higher for Alternative 1 if excavation of greater amounts of historical fill material is encountered below the excavation depth of 12 feet for the proposed building. However, focused attention to means and methods during the removal action, including community air monitoring and appropriate truck routing, would minimize or negate the overall impact of these activities.

An additional short-term adverse impact and risks to the community associated with both remedial alternatives is increased truck traffic. Approximately 270, 25-ton capacity truck trips would be necessary to transport fill and soil excavated during Site development. 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.

Both alternatives would employ appropriate measures to prevent short term impacts, including a Construction Health and Safety Plan, a Community Air Monitoring Plan (CAMP) 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 Construction Health and Safety Plan (CHASP) will be protected from on-Site contaminants (personal protective equipment would be worn consistent with the documented risks within the respective work zones).

### **Long-term effectiveness and permanence**

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

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

Alternative 2 would provide long-term effectiveness by removing most on-Site contamination and attaining Track 4 Site-Specific SCOs; a composite cover system across the Site, maintaining use restrictions, establishing an SMP to ensure long-term management of Institutional Controls (ICs), Engineering Controls (ECs), and maintaining continued registration as an E-designated property to memorialize these controls for the long term. The SMP would ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and restrictions continue to be in place and are functioning as they were intended assuring that protections designed into the remedy will provide continued high level of protection in perpetuity. Both alternatives would result in removal of soil contamination exceeding the SCOs providing the highest level, most effective and permanent remedy over the long-term with respect to a remedy for contaminated soil, which will eliminate any migration to groundwater. Potential sources of soil vapor and groundwater contamination will also be eliminated as part of the remedy.

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

Alternative 2 would remove most of the historic fill at the Site, and any remaining on-Site soil beneath the new building will meet Track 4 - Site-Specific SCOs. Alternative 1 would eliminate a greater total mass of contaminants on Site.

The removal of soil to 12 feet for the new development in both scenarios would probably result in relatively minor differences between these two alternatives.

### **Implementability**

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

The techniques, materials and equipment to implement Alternatives 1 and 2 are readily available and have been proven effective in remediating the contaminants associated with the Site. They use standard materials and services that are well established technology. The reliability of each remedy is also high. There are no special difficulties associated with any of the activities proposed.

### **Community Acceptance**

This evaluation criterion addresses community opinion and support for the remedial action.

Based on the overall goals of the remedial program and initial permitting associated with the proposed site development, no adverse community opinion is anticipated for either alternative. This RAWP will be subject to a public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedy. This public comment will be considered by OER prior to approval of this plan. The Citizen Participation Plan for the project is provided in Attachment B. Observations here will be supplemented by public comment received on the RAWP.

### **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 proposed redevelopment of the Site is compatible with its current zoning and is consistent with recent development patterns. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 4 Site-Specific SCOs, both of which are appropriate for its planned residential use. Improvements in the current environmental condition of the property achieved by both alternatives are also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse. 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 PlanNYC: 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 remedial alternatives would excavate property to 12 feet below grade and are comparable with respect to the opportunity to achieve sustainable remedial action. The remedial plan would take into consideration the shortest trucking routes during off-Site disposal of historic fill and other soils, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. The New York City Clean Soil Bank program may be utilized for reuse of native soils. To the extent practicable, energy efficient building materials, appliances, and equipment will be utilized to complete the development. Alternatives 1 and 2 would also seek to utilize recycled materials such as recycled concrete aggregate (RCA) for backfilling where feasible. A complete list of green remedial activities considered as part of the NYC VCP is included in the Sustainability Statement, included as Appendix 3.

## **4.0 REMEDIAL ACTION**

### **4.1 Summary of Preferred Remedial Action**

The preferred remedial action alternative is the 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 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 for particulates and volatile organic carbon compounds
3. Establishment of Track 1 Unrestricted Use Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Excavation and removal of soil/fill exceeding Track 1 Unrestricted Use SCOs. Entire property will be excavated to a depth of approximately 12 feet below grade for construction of a new sub-grade parking garage for the new development
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.
7. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.
8. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities.

9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
10. Import of materials to be used for backfill in compliance with this plan and in accordance with applicable laws and regulations.
11. As part of development, installation of a vapor barrier/waterproofing system below the concrete slab underneath the garage, as well as behind foundation walls of the proposed building.
12. As part of development, construction and maintenance of an engineered composite cover consisting of 16" thick concrete slab across the footprint of the new building.
13. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
15. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and, if Track 1 SCO's are not achieved, describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP.
16. If Track 1 Unrestricted Use SCOs are not achieved, 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.
17. If Track 1 Unrestricted Use SCOs are not achieved, the property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls; 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 1. If Track 1 is not achieved, the following Track 4 Site-Specific SCOs will be used:

<u>Contaminant</u>	<u>Track 4 SCOs</u>
Total SVOCs	200 ppm
Lead	800 ppm
Mercury	2.0 ppm

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 4. The entire site will be excavated to a depth of approximately 12 feet for new development and is expected to achieve Track 1 cleanup.

Soil and fill management at the Site will include impacted soil removal and disposal within the development cut. No over-excavation beyond the development cut is anticipated. If any hot-spot areas are identified during development and remediation at the site, they will be removed to the extent practical. 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 6600 tons. The Site-derived contaminated materials will be disposed of at permitted locations. Disposal location(s) will be reported promptly to the OER Project Manager prior to the start of the remedial action.

#### **End-Point Sampling**

Removal actions under this plan will be performed in conjunction with remedial end-point sampling. Post-excavation end-point sampling and testing will be performed promptly following materials removal and completed prior to Site development activities. To evaluate attainment of Track 1 - Unrestricted Use SCOs, samples will be collected and analyzed for SVOCs and TAL Metals (chromium, lead and mercury) that exceeded Track 1 SCOs. For comparison to Track 4 Site-Specific SCOs, analytes will only include trigger compounds and elements established on

the Track 4 Site-Specific SCO list. The approximate collection location of the six endpoint soil samples is shown on Figure 6. The end-point sampling and testing will be performed promptly following excavation and be completed prior to any site development activities.

In addition, if hotspots are encountered, hotspot removal end-point sampling frequency will consist of the following:

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 100 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.

Hot-Spot post-remediation 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.

Restricted Residential Use SCOs for metals were not met in all of the 6 sampling locations taken 0 to 5 feet bgs. Therefore, endpoint soil samples to be collected from all 6 boring locations below the top 0 to 5 feet bgs.

New York State ELAP certified labs will be used for all end-point sample analyses. Labs for end-point sample analyses will be reported in the RAR. The RAR will provide a tabular and map summary of all end-point sample results and will include all data including non-detects and applicable standards and/or guidance values. End-point samples will be analyzed for trigger analytes (those for which SCO exceedance is identified) 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 required regulatory reporting (i.e. spills hotline) will be performed. Also, see Appendix 4 for end point sampling criteria.

### **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.

One duplicate sample for every 20 samples collected will be submitted to the approved laboratory for analysis of the same parameters. One trip blank will be submitted to the laboratory with each shipment of soil samples.

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 4oC.

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 1 for every eight 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

Prepare field blanks 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.

### **Import and Reuse of Soils**

There will not be any imported soil used on the site. The estimated quantity of onsite soil/fill expected to be reused/relocated on Site is 0 tons.

### **4.3 Engineering Controls**

The excavation required for the proposed Site development will achieve Track 1 Unrestricted Use SCOs. No Engineering Controls are required to address residual contamination at the Site. However, the following elements will be incorporated into the foundation design as part of the development: composite cover system, soil vapor barrier and ventilated sub-grade garage. If Track 1 is not achieved, these elements will constitute Engineering Controls that will be employed in the remedial action to address residual contamination remaining at the Site.

## **Composite Cover System**

As part of new development, the entire property will be covered by an engineered permanent cover system. This cover system will be comprised of a 6 inch thick concrete-building slab beneath the area of the proposed building.

If Track 1 SCO's are not achieved at the Site, the composite cover system will be a permanent engineering control. 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.

## **Vapor Barrier**

As part of development, mitigation of potential soil vapor from offsite in the future will be achieved with a combination of building slab and vapor barrier. The vapor barrier will consist of **Raven Industries' VaporBlock 20 Plus**. The vapor barrier will be installed prior to pouring the building's concrete slab and sub-grade foundation walls. The vapor barrier will extend throughout the area occupied by the footprint of the new building and up the foundation sidewalls in accordance with manufacturer specifications. The specifications for installation will be provided to the construction management company and the foundation contractor or installer of the liner. The specifications state that all vapor barrier seams, penetrations, and repairs will be sealed either by the tape method or weld method, according to the manufacturer's recommendations and instructions.

The project's Professional Engineer licensed by the State of New York will have primary direct responsibility for overseeing the implementation of the vapor barrier. The extent of the proposed vapor barrier membrane is provided in Figure 7. Installation details (penetrations, joints, etc.) with respect to the proposed building foundation, footings, slab, and sidewalls are provided in Figure 6. Product specification sheets are provided in Attachment 6. 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.

### **Parking Ventilation System**

As part of the development plan, a parking garage will be constructed in the cellar level and will be ventilated in accordance with NYC DOB codes and regulations. 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.

#### **4.4 Institutional Controls**

Institutional Controls are not required on sites that achieve Track 1 Remedial Action. 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. The property will continue to be registered with an E-Designation at the NYC Buildings Department.

Institutional Controls for a contingent (Alternative 2) remedial action are:

- Continued registration of the E-Designation for the property. This RAWP includes a description of all EC's and IC's 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 maintenance, inspection and certification of ECs and ICs. 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 annually and will comply with RCNY §43-1407(1)(3).

- Vegetable gardens and farming on the Site are prohibited;
- 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 restricted residential 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 on sites that achieve Track 1 Remedial Action. However, if Track 1 Unrestricted Use SCOs are not achieved, site management will be performed and 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 SMP describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by 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 SMP are implemented.

The SMP will provide a detailed description of the procedures required to manage residual soil/fill left in place following completion of the remedial action in accordance with the Voluntary Cleanup Agreement with OER. This includes a plan for: (1) implementation of EC's and IC's; (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 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 5 year calendar and certification reports will be due for submission to OER by July 30 of the year following the reporting period.

#### **4.6 Qualitative Human Health Exposure Assessment**

The objective of the qualitative exposure assessment is to identify potential receptors 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**

Historic fill is present in the top 0 to 2 feet of soil at the site. Based on the results of the Remedial Investigation Report, the contaminants including SVOCs and metals were detected in 0 to 5 feet depths. The contaminants of concern found are:

##### Soil

- Metals, including chromium, lead and mercury exceeding Track 2 Restricted Residential SCOs;
- One pesticide, chlordane was identified but did not exceed Restricted Residential SCOs; and
- SVOCs (PAH compounds) including benzo(a)anthracene, benzo(a)pyrene, benzo(b)-fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene exceeding Track 2 Restricted Residential SCOs.

##### Groundwater

- SVOCs were detected at trace levels, below their respective GQS;

- Metals including iron, magnesium, sodium and manganese exceeding GQS;

### **Soil Vapor**

- Chlorinated VOCs including PCE and TCE were detected within the NYSDOH monitoring level ranges established within the State DOH soil vapor guidance matrix; and
- Petroleum VOCs detected at moderate to high concentrations and included cyclohexane, ethylbenzene, hexane, xylenes and toluene.

### **Nature, Extent, Fate and Transport of Contaminants**

SVOCs and metals are present in the historic fill materials throughout the Site from surface to five feet depths. Pesticides were detected in one shallow sample. Metals including iron, magnesium, manganese, and sodium were detected above GQS. The chlorinated VOCs in soil vapor were detected above guidance issued by New York State DOH and were not found in any of the on-Site soil or groundwater samples collected. Petroleum related VOCs were detected at high concentrations in soil vapor.

### **Potential Routes of Exposure**

The five elements of an exposure pathway are: (1) a contaminant source; (2) contaminant release and transport mechanisms; (3) a point of exposure; (4) a route of exposure; and (5) a receptor population. An exposure pathway is considered complete when all five elements of an exposure pathway are documented. A potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway cannot be 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 fill/soil;
- Inhalation of vapors and particulates; and
- Dermal contact fill/soil or building materials.

**Land Use of the Site and Neighboring Properties** - Current and Future -Currently, the Site comprises one vacant lot totaling 10,000 square feet in size. The immediate area surrounding the Site is mixed commercial/residential, and is anticipated to remain as such. The proposed future use of the Site consists of one 6 story building, which will cover the entire footprint of the Site. The basement will be a basement level parking garage.

### **Receptor Populations**

**On-Site Receptors** - The Site is currently vacant and unpaved. Access to the Site is restricted. Onsite receptors are limited to trespassers and site representatives and visitors granted access to the property. The proposed redevelopment of the Site includes the construction of a six-story condominium with a basement level garage. During redevelopment of the Site, the on-site potential receptors will include construction workers and adult visitors. Once the Site is redeveloped, the on-site potential 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, 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

### **Existence of Human Health Exposure**

#### **Existing**

**Current Conditions:** The potential for exposure to surficial historic fill exists under current conditions but is limited due to site access restrictions. Groundwater is not contaminated and is not exposed at the Site (32 feet deep), and because the Site is served by the public water supply,

groundwater use for potable supply is prohibited and there is no potential for exposure. As there is currently no structure onsite, accumulation of soil vapor cannot pose an exposure threat.

**Construction/ Remediation Activities:** Once redevelopment activities begin, construction workers will come into direct contact with surface and subsurface soils, as a result of on-Site construction and excavation activities. On-Site construction workers potentially could ingest, inhale or have dermal contact with any exposed impacted soil, and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through the Soil/Materials Management Plan, dust controls, and through the implementation of the Community Air-Monitoring Program and a Construction Health and Safety Plan.

**Proposed Future Conditions:** Under future remediated conditions, all soils in excess of Track 1 SCOs will be removed. The Site will be fully capped with building, limiting potential direct exposure to soil remaining in place, and a vapor barrier system and the ventilated garage will prevent any exposure to potential off site soil vapors in the future. The Site is served by a public water supply, and groundwater is not used at the Site for potable supply. There are no plausible off-Site pathways for ingestion, inhalation, or dermal exposure to contaminants derived from the Site under future conditions.

### **Overall Human Health Exposure Assessment**

There are potential complete exposure pathways for the current site condition. 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 a residential structure with a cellar level ventilated garage, site-wide impervious concrete cover cap, and a subsurface vapor barrier system for the building. Potential post-construction use of groundwater is not considered an option because groundwater is 32 feet deep and is not used as a potable water source in this area of the City. There are no surface waters in close proximity to the Site that could be impacted or threatened.

Based upon this analysis, complete on-Site exposure pathways appear to be present only during the current unremediated phase and the remedial action phase. Under current conditions, on-Site exposure pathways exist for those given access to the Site or trespassers. During remedial construction, on-Site and off-Site exposures to contaminated dust from historic fill material will be addressed through dust controls, and through the implementation of the 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 William Seevers, Project Manager, and Albert Machlin, P.E. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Albert Machlin, P.E. and William Seevers, PIH.

### **5.2 Site Security**

Site access will be controlled by a chain link or wooden construction fence, which fronts the property.

### **5.3 Work Hours**

The hours for operation of remedial construction will be from 7:00AM to 6:00PM. These hours conform to the New York City Department of Buildings construction code requirements.

### **5.4 Construction Health and Safety Plan**

The Site Safety Coordinator will be William Seevers. 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 ( $\text{mcg}/\text{m}^3$ ) 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 (see Appendix 5).

## **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.

## **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 BCP 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, 62 Box Street LLC 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](http://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 to proceed east on 40th Avenue and travel to Northern Boulevard.

## **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.

## **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:

- Information required by this RAWP;
- 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;
- 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.
- The property will continue to be registered with an E-Designation at 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, Albert Machlin, 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 Site name Site Site number.*

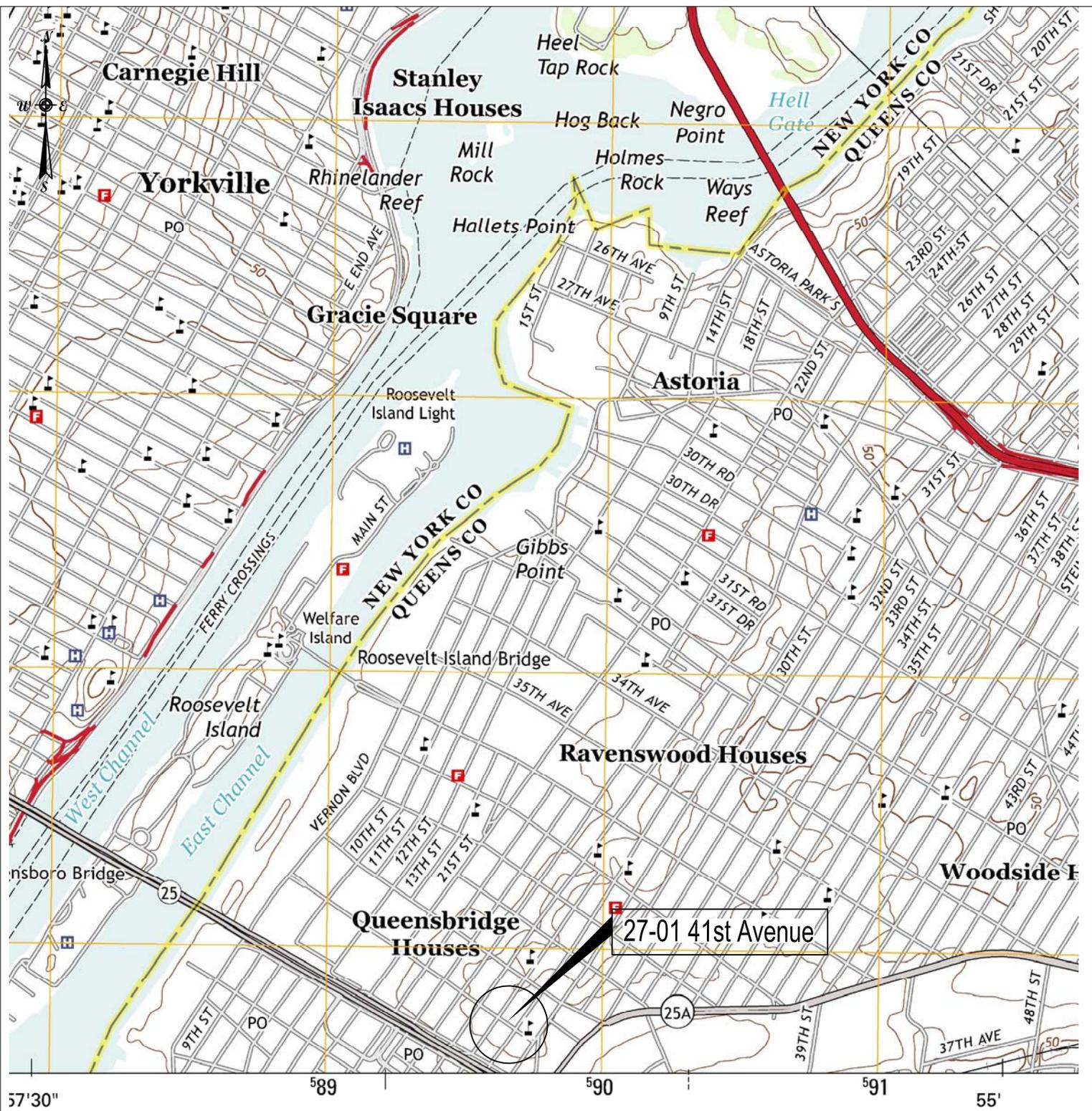
*I, William J. Seevers, am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the Site name Site Site number . (Optional)*

*I certify that the OER-approved Remedial Action Work Plan dated month day year 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.*

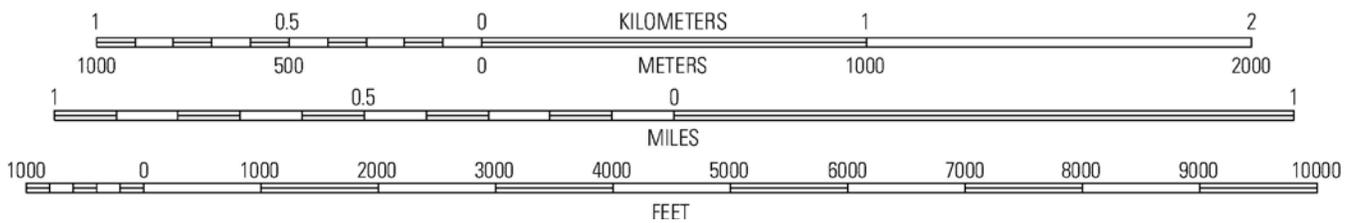
## **7.0 SCHEDULE**

The schedule for remediation and development activities will be submitted to OER at a later date.

## Figures



SCALE 1:24 000



Environmental  
Technology  
Group, Inc.

300 WHEELER ROAD, SUITE 307, HAUPPAUGE, NEW YORK 11788

Project Name

27-01 41st Avenue  
Long Island City, NY  
Remedial Action Work Plan

Figure Title

Site Location Map  
for Long Island City, NY

Figure 1

DWN BY: AJZ  
CHK BY: JB  
SCALE: AS SHOWN  
DATE: 07/11/13



Site Location and Surrounding Buildings



Site Location with Parcel No. & Tax Lot Lines



Site Location with 2010 Aerial Photo



Environmental  
Technology  
Group, Inc.

300 WHEELER ROAD, SUITE 307, HAUPPAUGE, NEW YORK 11788

Project Name

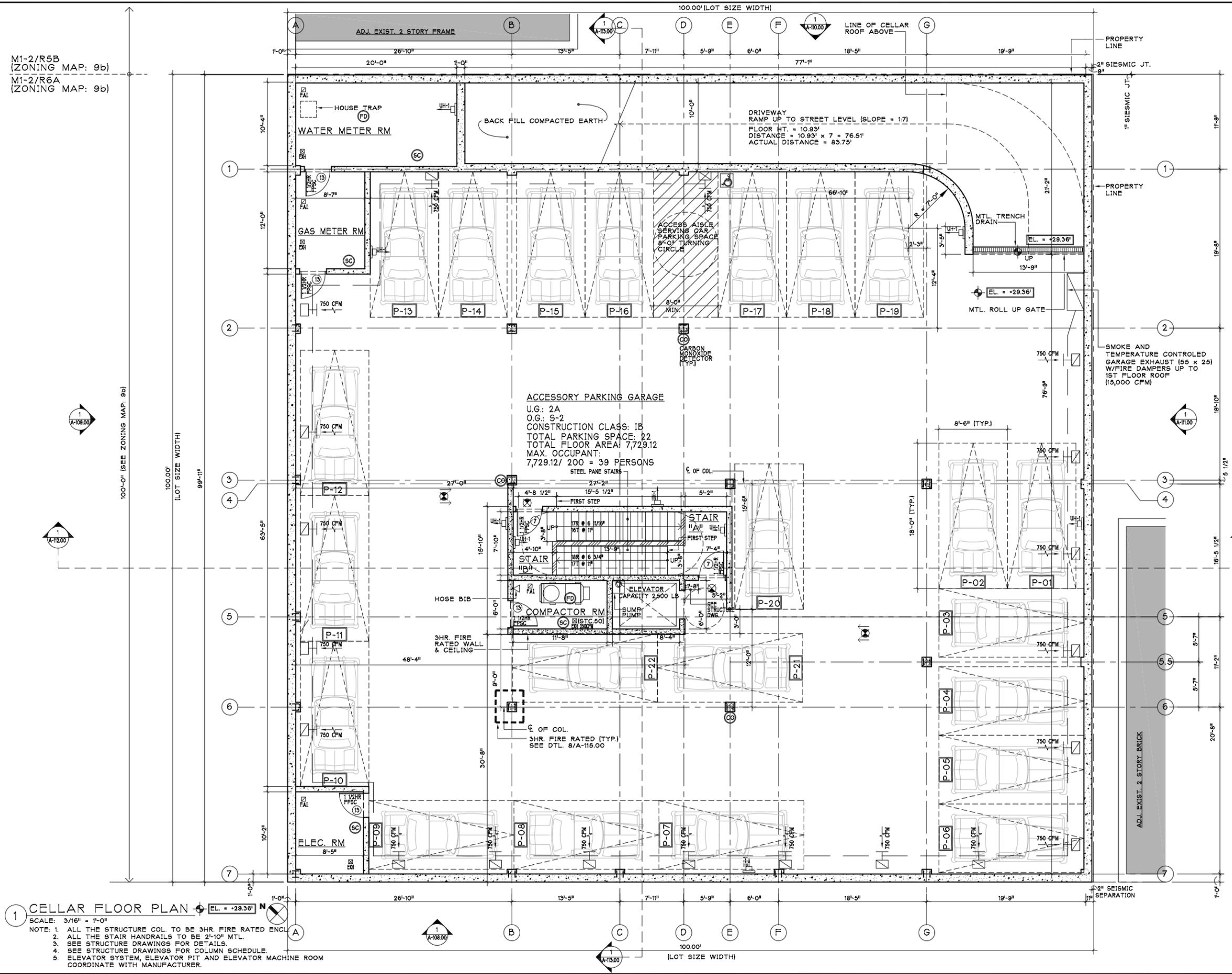
27-01 41st Avenue  
Long Island City, NY  
Remedial Action Work Plan

Figure Title

Site Map  
for Long Island City, NY

Figure 2

DWN BY: AJZ  
CHK BY: JB  
SCALE: 1" = 100'  
DATE: 07/22/13

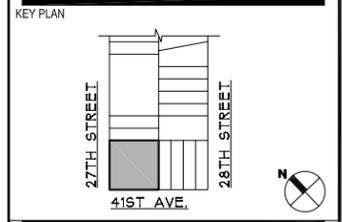


**1 CELLAR FLOOR PLAN** EL. = +29.36'

SCALE: 3/16" = 1'-0"

NOTE: 1. ALL THE STRUCTURE COL. TO BE 3HR. FIRE RATED ENCL.  
2. ALL THE STAIR HANDRAILS TO BE 2'-10" MTL.  
3. SEE STRUCTURE DRAWINGS FOR DETAILS.  
4. SEE STRUCTURE DRAWINGS FOR COLUMN SCHEDULE.  
5. ELEVATOR SYSTEM, ELEVATOR PIT AND ELEVATOR MACHINE ROOM COORDINATE WITH MANUFACTURER.

**DOB # 420780355**

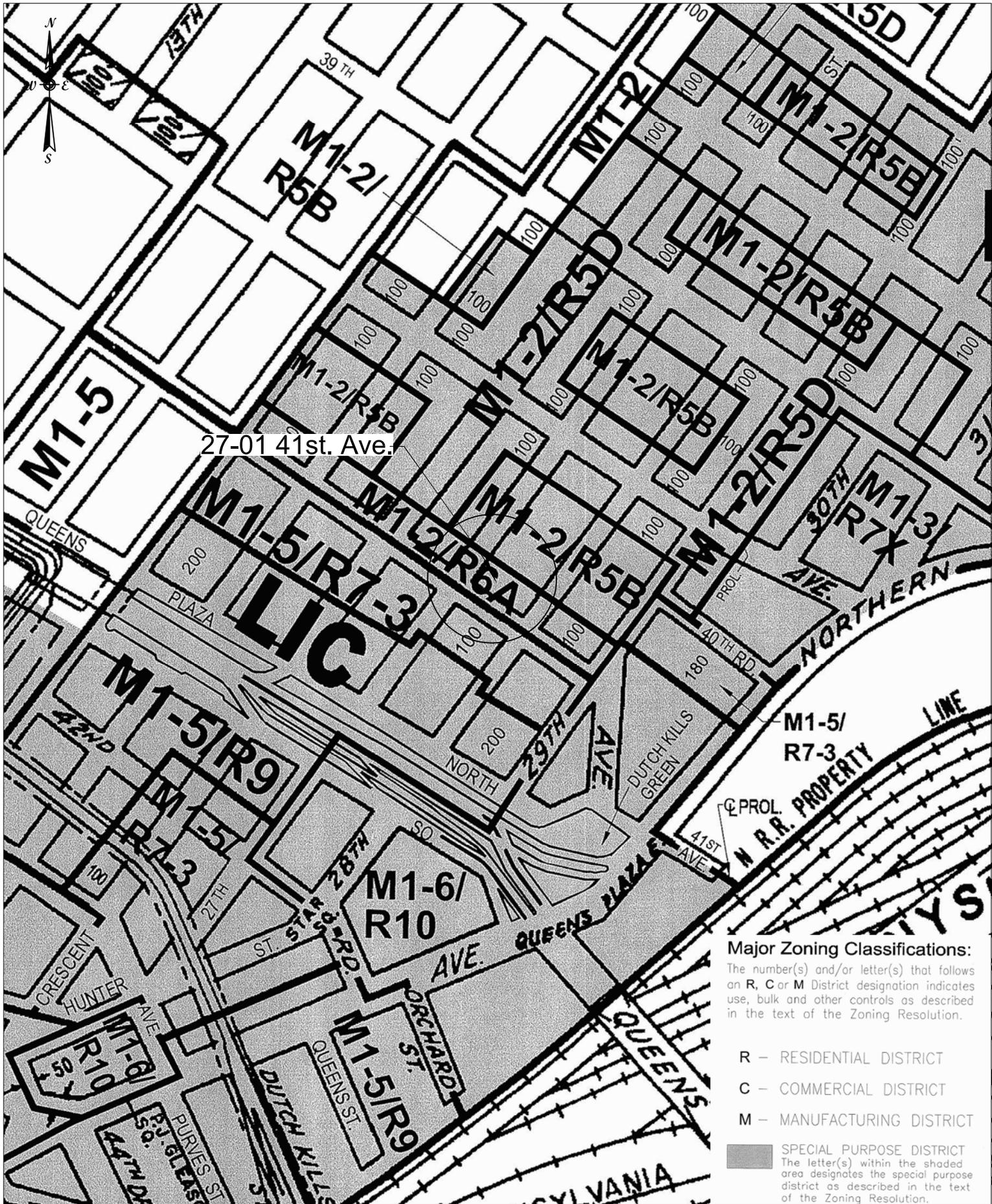


REV.#	DATE	DESCRIPTION

PROJECT  
**27-05 41ST AVE.**  
LONG ISLAND CITY, NEW YORK

**FLOOR PLAN**  
**CELLAR**

SEAL & SIGNATURE	DATE: 08/02/12
	PROJECT No:
	DRAWING BY: SY
	CHK BY: MK
DWG No: <b>A-101.00</b>	
CADD FILE No: 6 OF 37	



27-01 41st Ave.

**Major Zoning Classifications:**

The number(s) and/or letter(s) that follows an R, C or M District designation indicates use, bulk and other controls as described in the text of the Zoning Resolution.

- R – RESIDENTIAL DISTRICT
- C – COMMERCIAL DISTRICT
- M – MANUFACTURING DISTRICT

**SPECIAL PURPOSE DISTRICT**  
 The letter(s) within the shaded area designates the special purpose district as described in the text of the Zoning Resolution.

# VaporBlock® Plus™

UNDERSLAB VAPOR RETARDER / GAS BARRIER

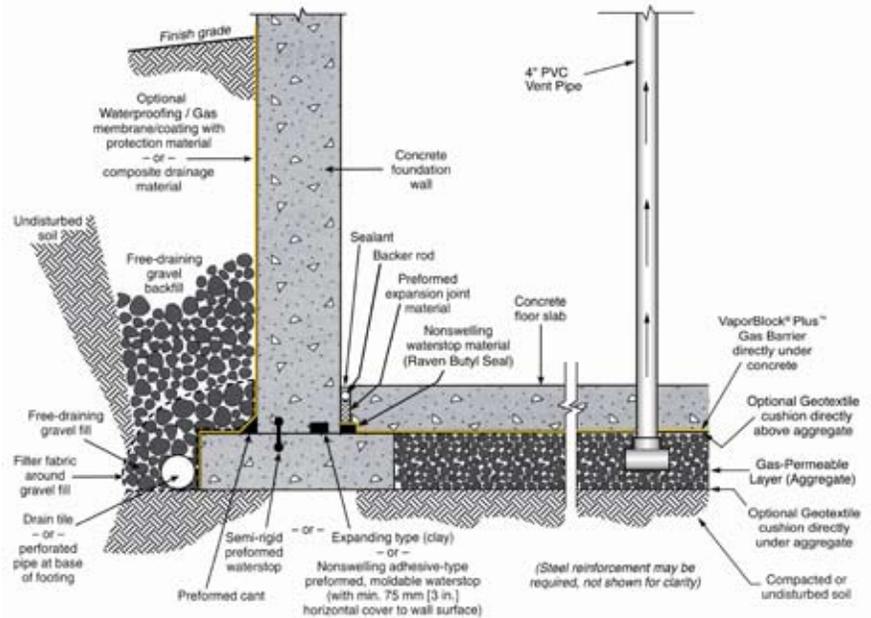
## INSTALLATION GUIDELINES

**Please Note:** Read these instructions thoroughly before installation to ensure proper use of VaporBlock® Plus™. ASTM E 1465, ASTM E 2121 and, ASTM E 1643 also provide valuable information regarding the installation of vapor / gas barriers. When installing this product, contractors shall conform to all applicable local, state and federal regulations and laws pertaining to residential and commercial building construction.

- When VaporBlock Plus gas barrier is used as part of an active control system for radon or other gas, a ventilation system will be required.
- If designed as a passive system, it is recommended to install a ventilation system that could be converted to an active system if needed.

**Materials List:**

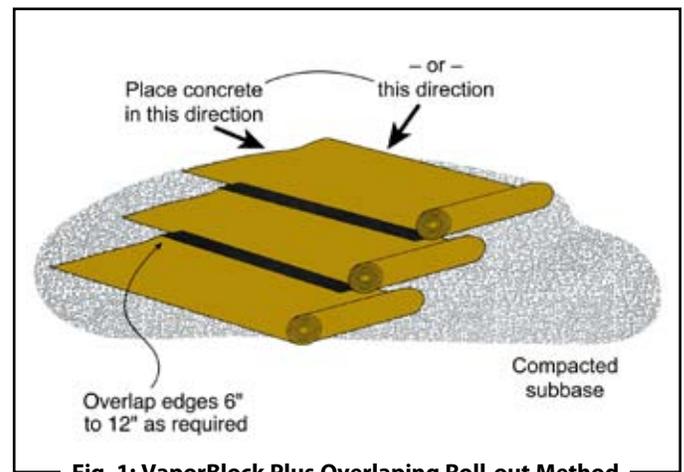
- VaporBlock® Plus™ Vapor / Gas Barrier
- VaporBond Plus 4" Foil Seaming Tape
- Butyl Seal 2-Sided Tape
- VaporBoot Plus Pipe Boots 12/Box (recommended)
- VaporBoot Tape (optional)



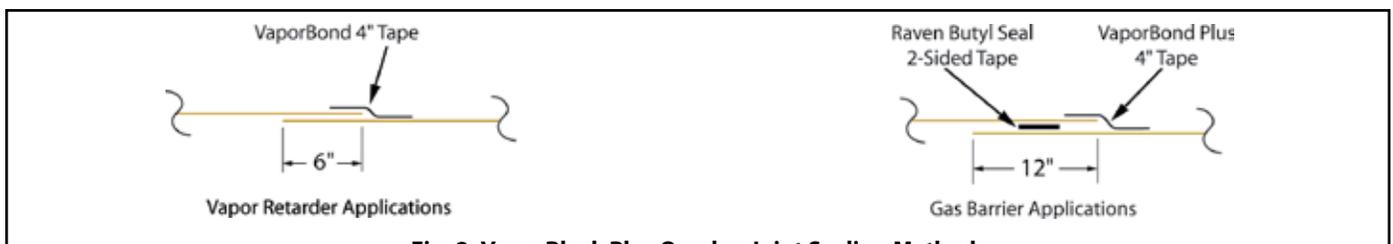
**Elements of a moisture/gas-resistant floor system. General illustration only.**  
(Note: This example shows multiple options for waterstop placement.)

### VAPORBLOCK® PLUS™ PLACEMENT

- 1.1. Level and tamp or roll granular base as specified. A base for a gas-reduction system may require a 4" to 6" gas permeable layer of clean coarse aggregate as specified by your architectural or structural drawings after installation of the recommended gas collection system. In this situation, a cushion layer consisting of a non-woven geotextile fabric placed directly under VaporBlock® Plus™ will help protect the barrier from damage due to possible sharp coarse aggregate.
- 1.2. Unroll VaporBlock Plus running the longest dimension parallel with the direction of the pour and pull open all folds to full width. (Fig. 1)
- 1.3. Lap VaporBlock Plus over the footings and seal with Raven Butyl Seal tape at the footing-wall connection. Prime concrete surfaces and assure they are dry and clean prior to applying Raven Butyl Seal Tape. Apply even and firm pressure with a rubber roller. Overlap joints a minimum of 6" and seal overlap with Raven VaporBond Tape. When used as a gas



**Fig. 1: VaporBlock Plus Overlapping Roll-out Method**



**Fig. 2: VaporBlock Plus Overlap Joint Sealing Methods**

# SINGLE PENETRATION PIPE BOOT INSTALLATION

barrier, overlap joints a minimum of 12" and seal in-between overlap with 2-sided Raven Butyl Seal Tape. Then seal with VaporBond Plus Tape centered on the overlap seam. (Fig. 2)

- 1.4. Seal around all plumbing, conduit, support columns or other penetrations that come through the **VaporBlock Plus** membrane. Pipes four inches or smaller can be sealed with Raven VaporBoot Plus preformed pipe boots. VaporBoot Plus preformed pipe boots are formed in steps for 1", 2", 3" and 4" PVC pipe or IPS size and are sold in units of 12 per box (Fig. 3 & 5).

Pipe boots may also be fabricated from excess **VaporBlock Plus** membrane (Fig. 4 & 6) and sealed with VaporBoot Tape or VaporBond Plus Tape (sold separately).

*Reminder Note: All holes or penetrations through the membrane will need a patch cut to a minimum of 12" from the opening in all directions.*

To fabricate pipe boots from **VaporBlock Plus** excess material (see Fig. 4 & 6 for A-F):

- A) Cut a square large enough to overlap 12" in all directions.
- B) Mark where to cut opening on the center of the square and cut four to eight slices about 3/8" less than the diameter of the pipe.
- C) Force the square over the pipe leaving the tightly stretched cut area around the bottom of the pipe with approximately a 1/2" of the boot material running vertically up the pipe. *(no more than a 1/2" of stretched boot material is recommended)*
- D) Once boot is positioned, seal the perimeter to the membrane by applying 2-sided Raven Butyl Seal Tape in between the two layers. Secure boot down firmly over the membrane taking care not to have any large folds or creases.
- E) Use VaporBoot Tape or VaporBond Plus Tape to secure the boot to the pipe.
 

VaporBoot Tape (option) – fold tape in half lengthwise, remove half of the release liner and wrap around the pipe allowing 1" extra for overlap sealing. Peel off the second half of the release liner and work the tape outward gradually forming a complete seal.

VaporBond Plus Tape (option) - Tape completely around pipe overlapping the to get a tight seal against the pipe.
- F) Complete the process by taping over the boot perimeter edge with VaporBond Plus Tape to create a monolithic membrane between the surface of the slab and gas/moisture sources below and at the slab perimeter. (Fig. 4 & 6)

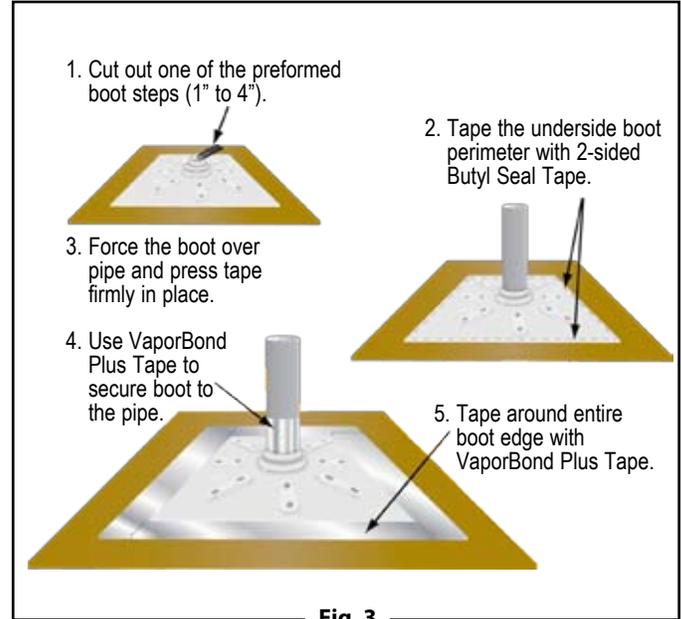


Fig. 3

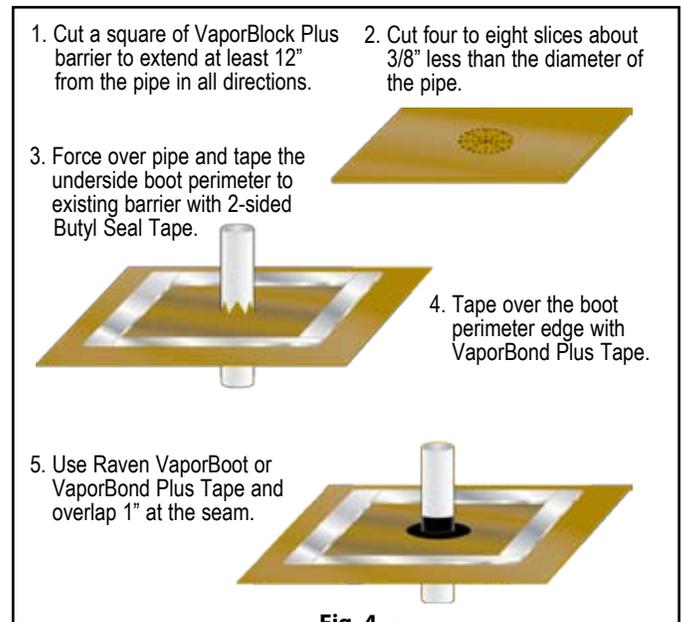


Fig. 4

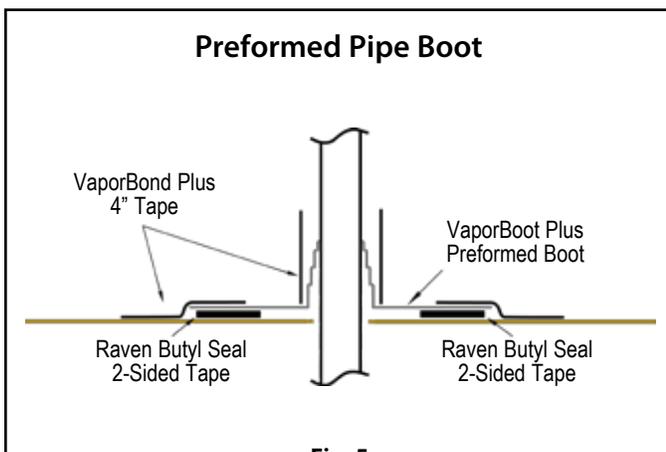


Fig. 5

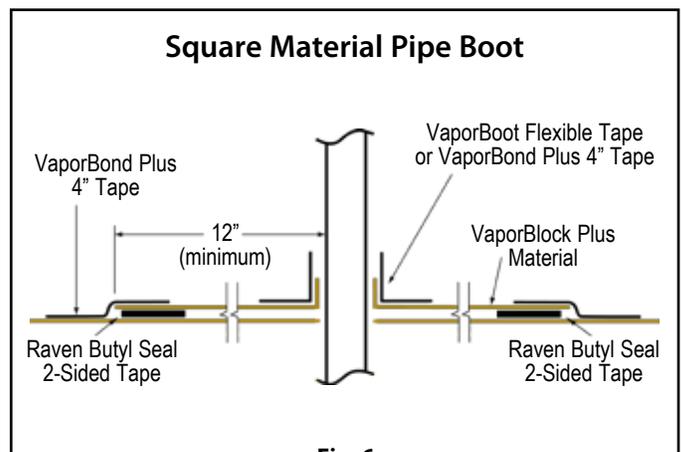


Fig. 6

# MULTIPLE PENETRATION PIPE BOOT INSTALLATION

1.5. For side-by-side multiple penetrations;

- A) Cut a patch large enough to overlap 12" in all directions (Fig. 7) of penetrations.
- B) Mark where to cut openings and cut four to eight slices about 3/8" less than the diameter of the penetration for each.
- C) Slide patch material over penetration to achieve a tight fit.
- D) Once patch is positioned, seal the perimeter to the membrane by applying 2-sided Raven Butyl Seal Tape in-between the two layers. (Fig. 8)
- E) After applying Raven Butyl Seal Tape between the patch and membrane, tape around each of the penetrations and the patch with VaporBond Plus 4" foil tape. (Fig. 9) For additional protection apply an acceptable polyurethane elastomeric sealant around the penetrations. (Fig. 10)

1.6. Holes or openings through **VaporBlock Plus** are to be repaired by cutting a piece of **VaporBlock Plus** 12" larger in all directions from the opening. Seal the patch to the barrier with 2-sided Raven Butyl Seal Tape and seal the edges of the patch with VaporBond Plus Tape.

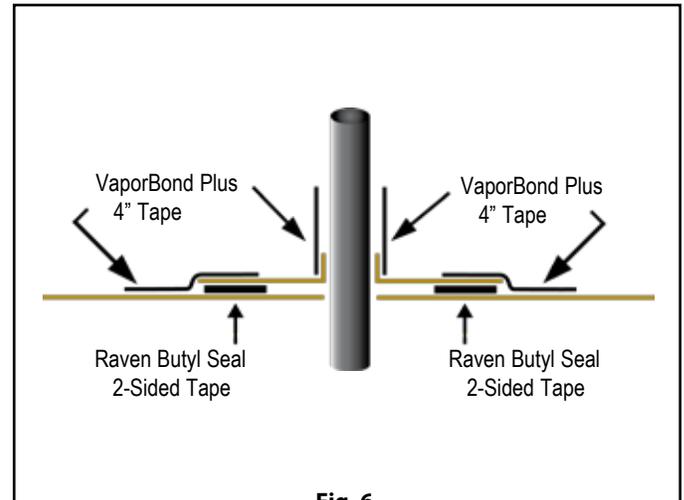


Fig. 6

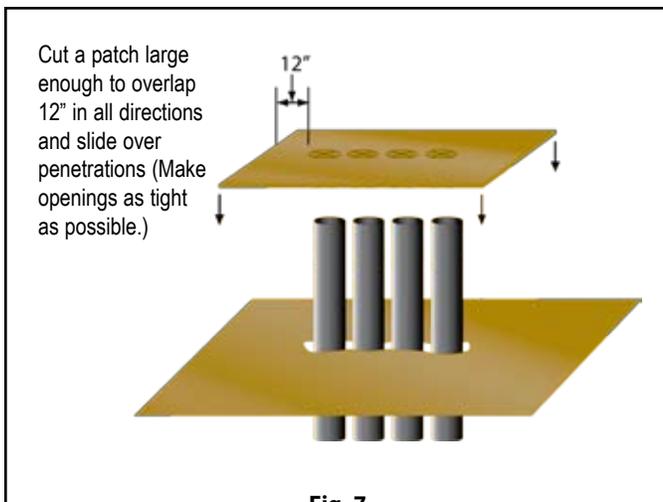


Fig. 7

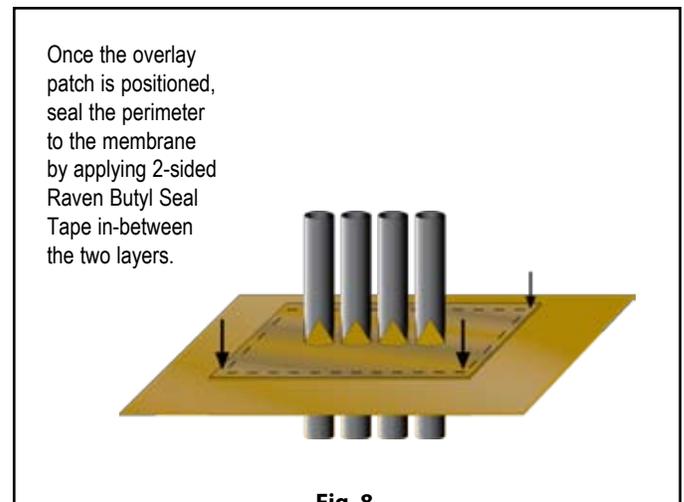


Fig. 8

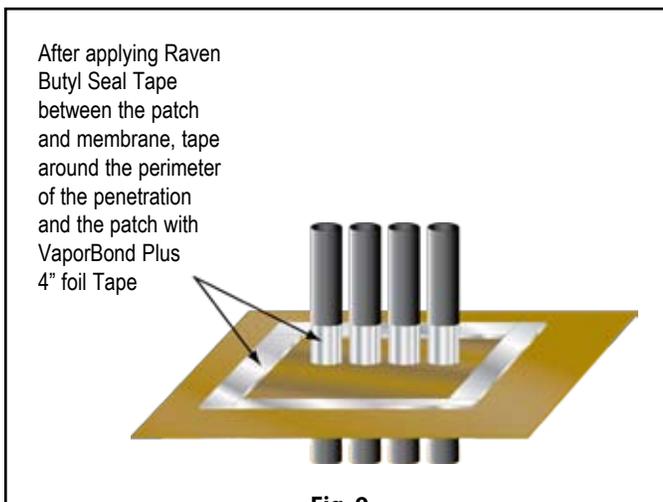


Fig. 9

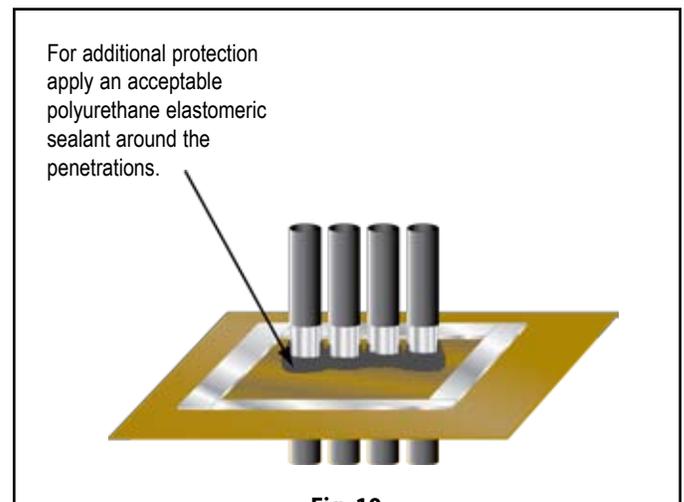


Fig. 10

## VAPORBLOCK® PLUS™ PROTECTION

- 2.1. When installing reinforcing steel and utilities, in addition to the placement of concrete, take precaution to protect **VaporBlock Plus**. Carelessness during installation can damage the most puncture-resistant membrane. Sheets of plywood cushioned with geotextile fabric temporarily placed on **VaporBlock Plus** provide for additional protection in high traffic areas including concrete buggies.
- 2.2. Use only brick-type or chair-type reinforcing bar supports to protect **VaporBlock Plus** from puncture.
- 2.3. Avoid driving stakes through **VaporBlock Plus**. If this cannot be avoided, each individual hole must be repaired per section 1.6.
- 2.4. If a cushion or blotter layer is required in the design between **VaporBlock Plus** and the slab, additional care should be given if sharp crushed rock is used. Washed rock will provide less chance of damage during placement. Care must be taken to protect blotter layer from precipitation before concrete is placed.



Note: To the best of our knowledge, these are typical installation procedures and are intended as guidelines only. Architectural or structural drawings must be reviewed and followed as well on a project basis. NO WARRANTIES ARE MADE AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS OR GUIDELINES REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and we disclaim all liability for resulting loss or damage.

**RAVEN**  
INDUSTRIES

RAVEN INDUSTRIES, INC. / Engineered Films Division  
P.O. Box 5107 • Sioux Falls, SD 57117-5107  
Ph: (605) 335-0174 • Fx: (605) 331-0333  
**Toll Free: 800-635-3456**

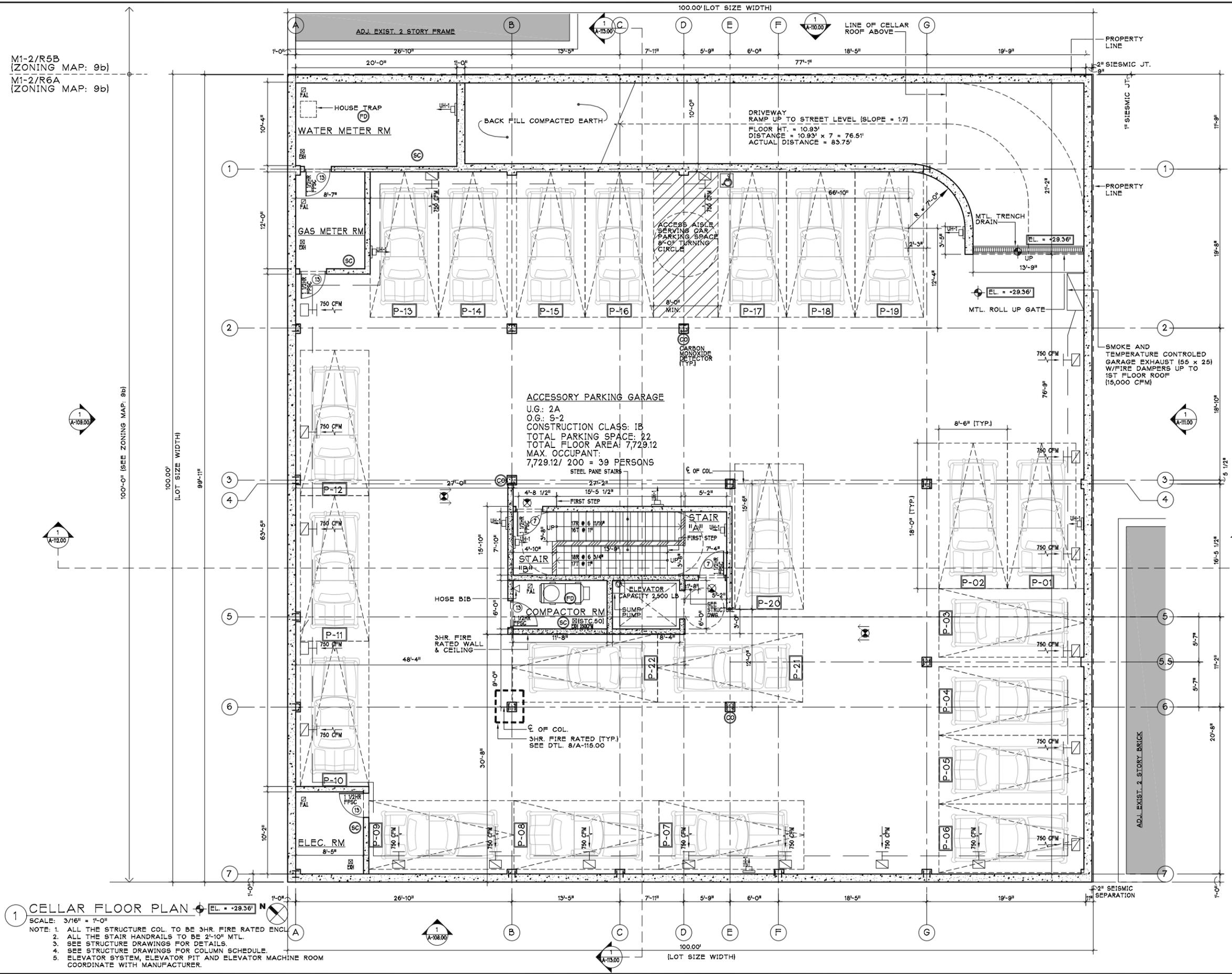


**ISO 9001:2000**  
CERTIFIED MANAGEMENT SYSTEM

[www.vaporblockplus.com](http://www.vaporblockplus.com)

6/09 EFD 1127

Appendix 1  
DEVELOPMENT PLANS

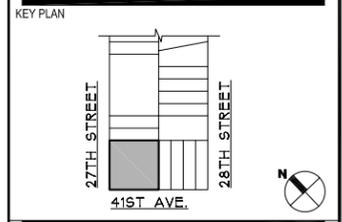


**1 CELLAR FLOOR PLAN** EL. = +29.36'

SCALE: 3/16" = 1'-0"

NOTE: 1. ALL THE STRUCTURE COL. TO BE 3HR. FIRE RATED ENCL.  
2. ALL THE STAIR HANDRAILS TO BE 2'-10" MTL.  
3. SEE STRUCTURE DRAWINGS FOR DETAILS.  
4. SEE STRUCTURE DRAWINGS FOR COLUMN SCHEDULE.  
5. ELEVATOR SYSTEM, ELEVATOR PIT AND ELEVATOR MACHINE ROOM COORDINATE WITH MANUFACTURER.

**DOB # 420780355**



REV.#	DATE	DESCRIPTION

PROJECT  
**27-05 41ST AVE.**  
LONG ISLAND CITY, NEW YORK

**FLOOR PLAN**  
**CELLAR**

SEAL & SIGNATURE	DATE: 08/02/12
	PROJECT No:
	DRAWING BY: SY
	CHK BY: MK
A-101.00	DWG No:
	CADD FILE No: 6 OF 37

DOB # 420780355

KEY PLAN



REV.#	DATE	DESCRIPTION

PROJECT

27-05 41ST AVE.  
LONG ISLAND CITY, NEW YORK

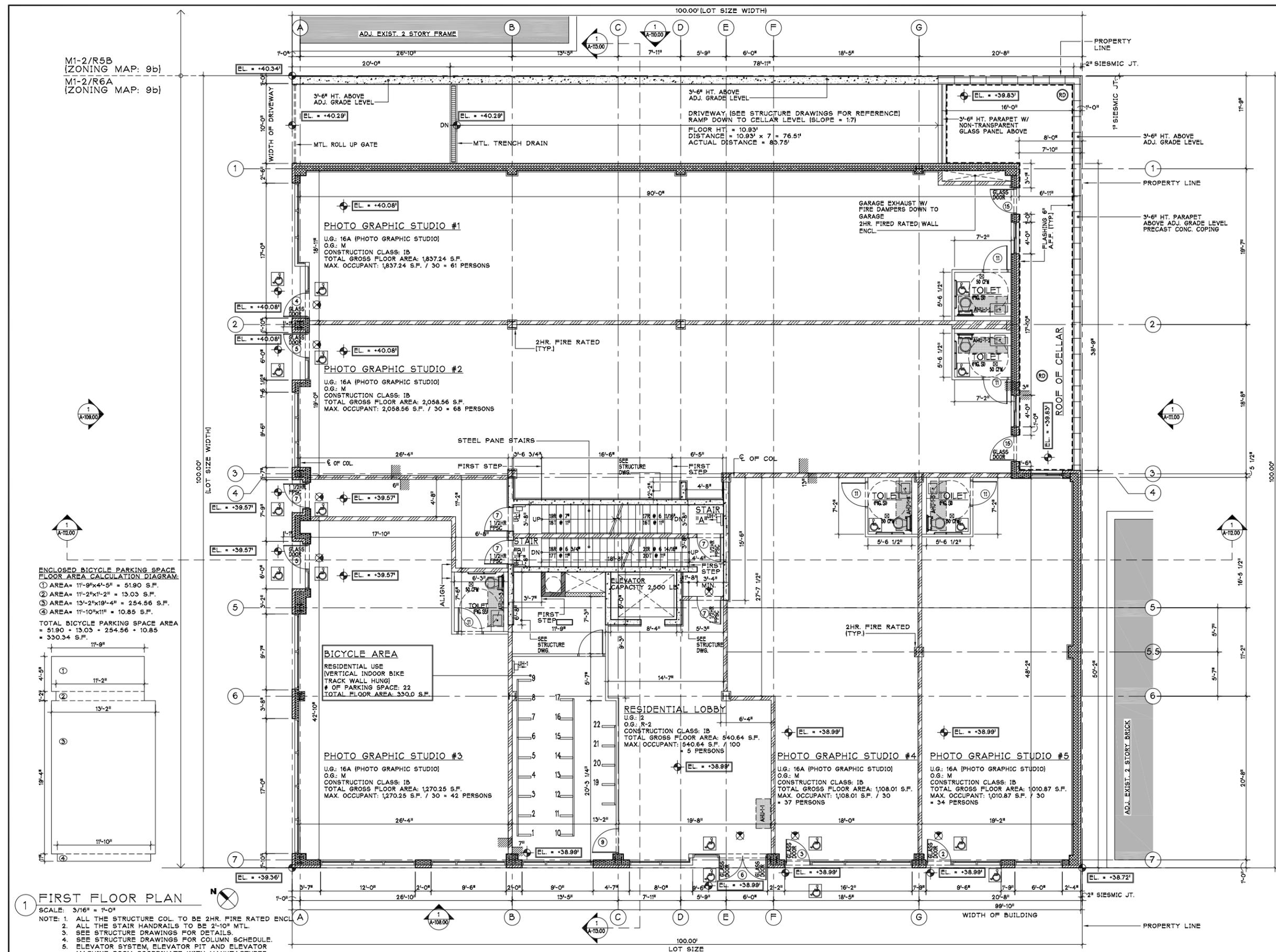
FLOOR PLAN  
FIRST FLOOR

SEAL & SIGNATURE

DATE: 08/02/12
PROJECT No:
DRAWING BY: SY
CHK BY: MK
DWG No:

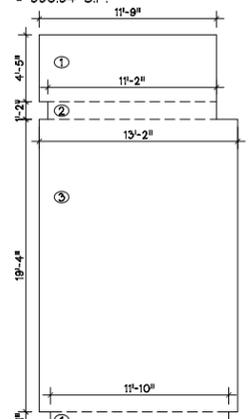
A-102.00

CADD FILE No: 07 OF 37



M1-2/R5B  
[ZONING MAP: 9b]  
M1-2/R6A  
[ZONING MAP: 9b]

ENCLOSED BICYCLE PARKING SPACE  
FLOOR AREA CALCULATION DIAGRAM:  
① AREA = 11'-9" x 4'-5" = 51.90 S.F.  
② AREA = 11'-2" x 1'-2" = 13.03 S.F.  
③ AREA = 13'-2" x 19'-4" = 254.56 S.F.  
④ AREA = 11'-10" x 11" = 10.85 S.F.  
TOTAL BICYCLE PARKING SPACE AREA  
= 51.90 + 13.03 + 254.56 + 10.85  
= 330.34 S.F.



**1 FIRST FLOOR PLAN**  
SCALE: 3/16" = 1'-0"  
NOTE: 1. ALL THE STRUCTURE COL. TO BE 2HR. FIRE RATED ENCL.  
2. ALL THE STAIR HANDRAILS TO BE 2'-10" MTL.  
3. SEE STRUCTURE DRAWINGS FOR DETAILS.  
4. SEE STRUCTURE DRAWINGS FOR COLUMN SCHEDULE.  
5. ELEVATOR SYSTEM, ELEVATOR PIT AND ELEVATOR MACHINE ROOM COORDINATE WITH MANUFACTURER.

M1-2/R5B  
[ZONING MAP: 9b]  
M1-2/R6A  
[ZONING MAP: 9b]

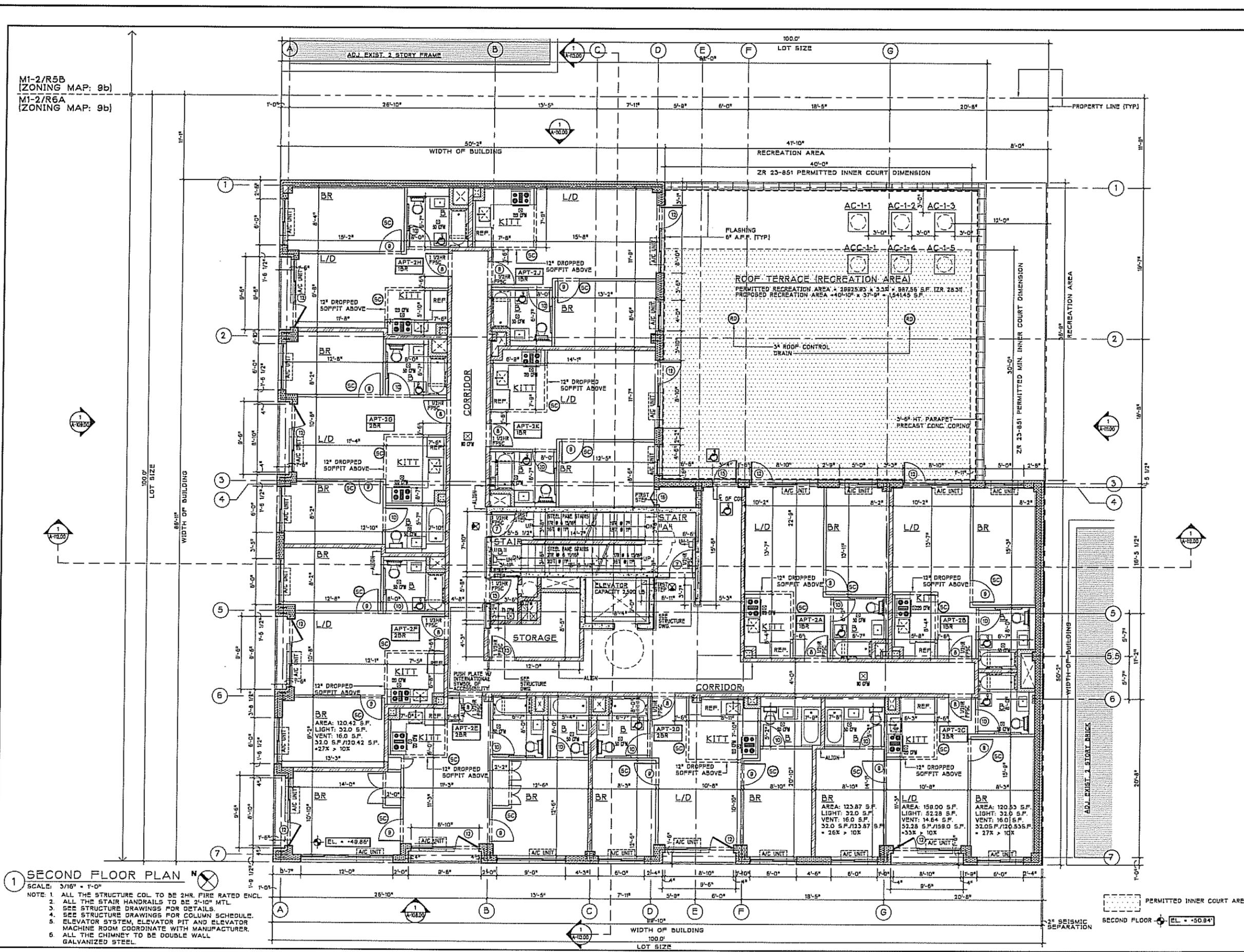


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ARCHITECT, PLLC.

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37-01 Main Street, Suite #10A, Flushing, NY 11354  
michaelkang@nyu.edu

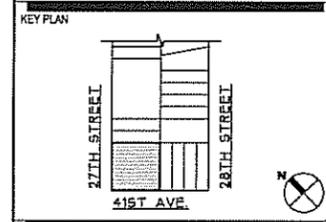
Tel: (718) 353-2329  
Fax: (718) 661-1619

MICHAEL KANG, RA



**1 SECOND FLOOR PLAN**  
SCALE: 3/16" = 1'-0"  
NOTE: 1. ALL THE STRUCTURE COL. TO BE 2HR. FIRE RATED ENCL.  
2. ALL THE STAIR HANDRAILS TO BE 2'-10" MTL.  
3. SEE STRUCTURE DRAWINGS FOR DETAILS.  
4. SEE STRUCTURE DRAWINGS FOR COLUMN SCHEDULE.  
5. ELEVATOR SYSTEM, ELEVATOR PIT AND ELEVATOR MACHINE ROOM COORDINATE WITH MANUFACTURER.  
6. ALL THE CHIMNEY TO BE DOUBLE WALL GALVANIZED STEEL.

DOB #420780355



REV#	DATE	DESCRIPTION

PROJECT  
**27-05 41ST AVE.**  
LONG ISLAND CITY, NEW YORK

**FLOOR PLAN**  
**SECOND FLOOR**

SEAL & SIGNATURE  
DATE: 06/02/12  
PROJECT No  
DRAWING BY: MK  
CHK BY: MK  
DWG No  
**A-103.00**  
CADD FILE No: 08DF 37

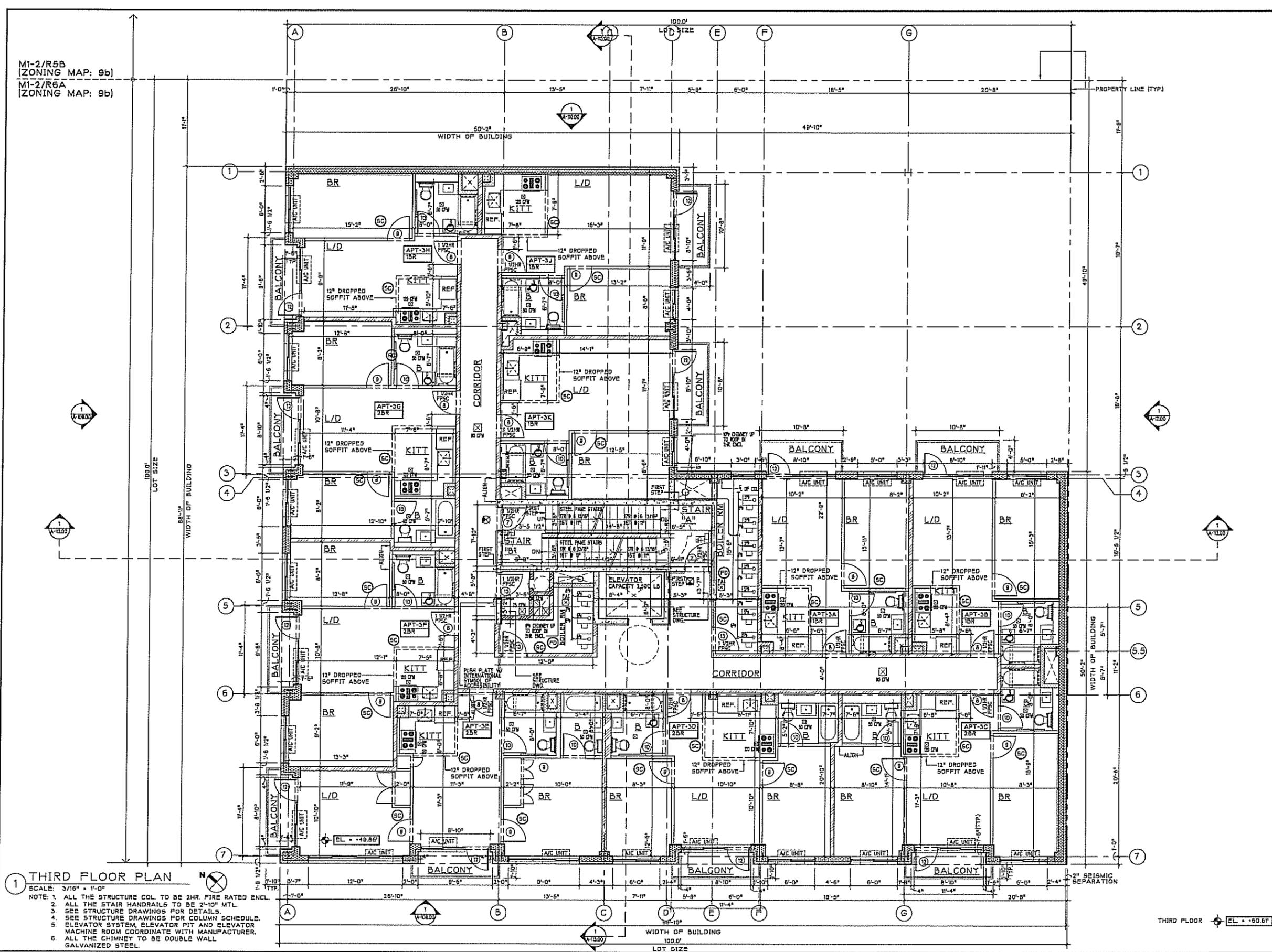
M1-2/R5B  
[ZONING MAP: 9b]  
M1-2/R6A  
[ZONING MAP: 9b]



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37-01 Main Street, Suite #10K, Flushing, NY 11354  
michaelkang@yohoo.com

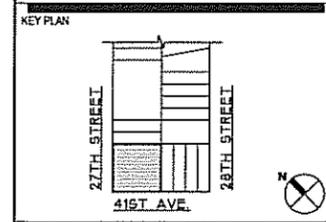
Tel: (718) 353-2929  
Fax: (718) 661-1619

MICHAEL KANG, RA



**1 THIRD FLOOR PLAN**  
SCALE: 3/16" = 1'-0"  
NOTE: 1. ALL THE STRUCTURE COL TO BE 2HR. FIRE RATED ENCL.  
2. ALL THE STAIR HANDRAILS TO BE 2'-10" MTL.  
3. SEE STRUCTURE DRAWINGS FOR DETAILS.  
4. SEE STRUCTURE DRAWINGS FOR COLUMN SCHEDULE.  
5. ELEVATOR SYSTEM, ELEVATOR PIT AND ELEVATOR MACHINE ROOM COORDINATE WITH MANUFACTURER.  
6. ALL THE CHIMNEY TO BE DOUBLE WALL GALVANIZED STEEL.

DOB #420780355



REV #	DATE	DESCRIPTION

PROJECT  
**27-05 41ST AVE.**  
LONG ISLAND CITY, NEW YORK

FLOOR PLAN  
THIRD FLOOR

SEAL & SIGNATURE	DATE: 06/02/12
	PROJECT No
	DRAWING BY: SY
	CHK BY: MK DWG No

**A-104.00**

CADD FILE No 08 OF 37

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M1-2/R6A  
[ZONING MAP: 9b]

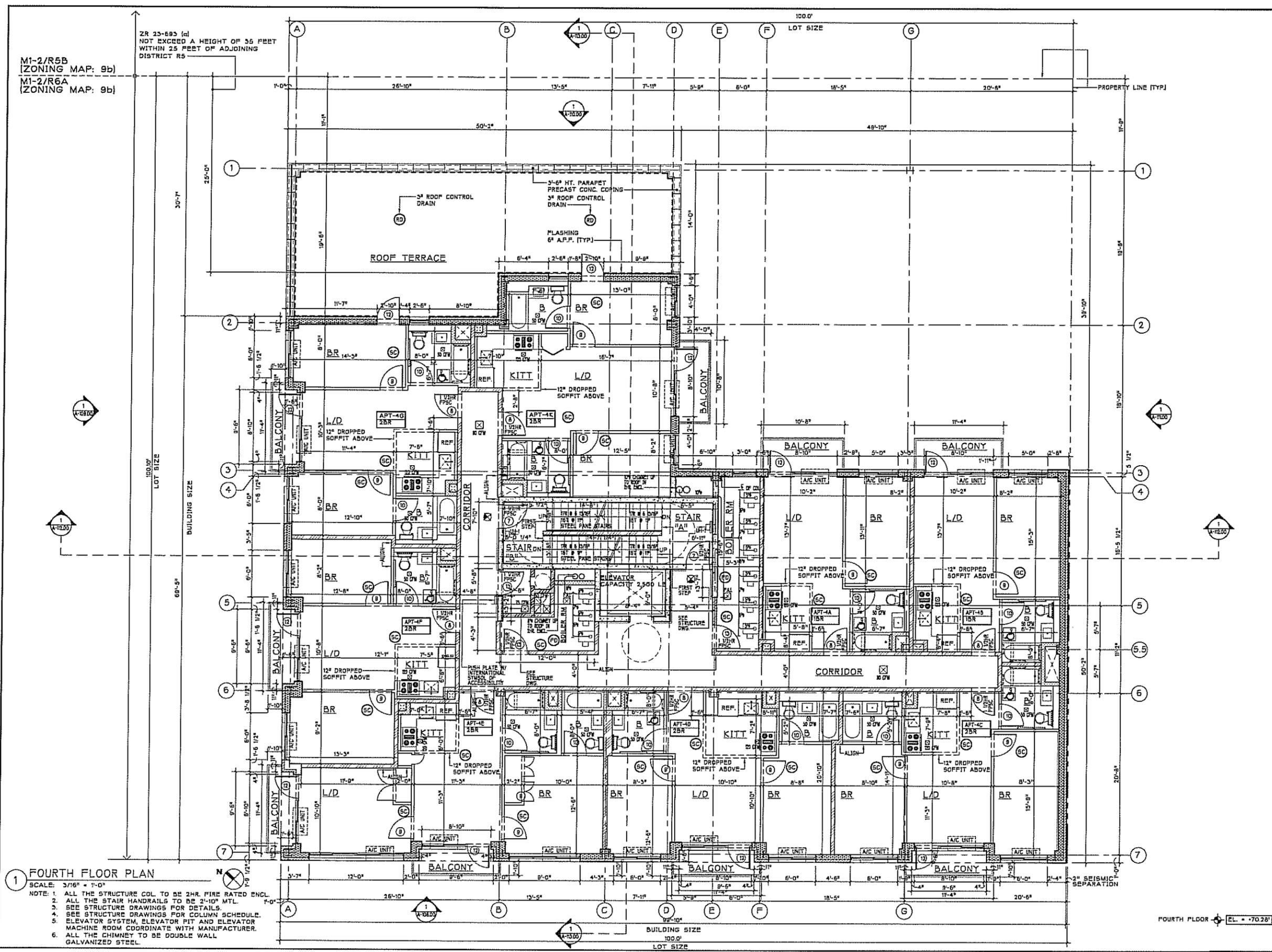
ZR 25-693 (a)  
NOT EXCEED A HEIGHT OF 35 FEET  
WITHIN 25 FEET OF ADJOINING  
DISTRICT R5

**MA**  
MICHAEL KANG  
ARCHITECT, PLLC.

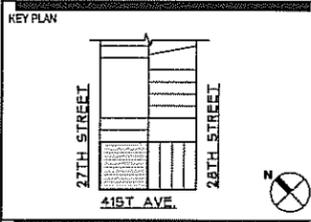
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MICHAEL KANG, RA



DOB # 420780355



REV #	DATE	DESCRIPTION

PROJECT  
**27-05 41ST AVE.**  
LONG ISLAND CITY, NEW YORK

FLOOR PLAN  
FOURTH FLOOR

SEAL & SIGNATURE  
DATE: 08/02/12  
PROJECT No:  
DRAWING BY:  
CHK BY: MK  
DWG No:

**A-105.00**  
CADD FILE No. 10 OF 37

- 1 FOURTH FLOOR PLAN**  
SCALE: 3/16" = 1'-0"  
NOTE: 1. ALL THE STRUCTURE COL. TO BE 3HR. FIRE RATED ENCL.  
2. ALL THE STAIR HANDRAILS TO BE 2"-10" MTL.  
3. SEE STRUCTURE DRAWINGS FOR DETAILS.  
4. SEE STRUCTURE DRAWINGS FOR COLUMN SCHEDULE.  
5. ELEVATOR SYSTEM, ELEVATOR PIT AND ELEVATOR MACHINE ROOM COORDINATE WITH MANUFACTURER.  
6. ALL THE CHIMNEY TO BE DOUBLE WALL GALVANIZED STEEL.

FOURTH FLOOR EL. = +70.28'

M1-2/R5B  
[ZONING MAP: 9b]  
M1-2/R6A  
[ZONING MAP: 9b]

ZR 23-693 (a)  
NOT EXCEED A HEIGHT OF 35 FEET  
WITHIN 25 FEET OF ADJOINING  
DISTRICT R5

**MKA**  
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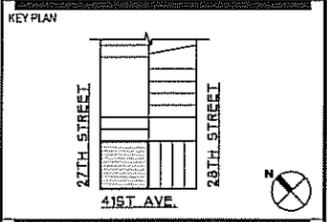
MICHAEL KANG, RA

**FIFTH & SIXTH FLOOR PLAN**

- SCALE: 3/16" = 1'-0"
1. ALL THE STRUCTURE COL TO BE 2HR. FIRE RATED ENCL.
  2. ALL THE STAIR HANDRAILS TO BE 2'-10" MTL.
  3. SEE STRUCTURE DRAWINGS FOR DETAILS.
  4. SEE STRUCTURE DRAWINGS FOR COLUMN SCHEDULE.
  5. ELEVATOR SYSTEM, ELEVATOR PIT AND ELEVATOR MACHINE ROOM COORDINATE WITH MANUFACTURER.
  6. ALL THE CHIMNEY TO BE DOUBLE WALL GALVANIZED STEEL.

SIXTH FLOOR [EL. +88.62']  
FIFTH FLOOR [EL. +79.85']

DOB # 420780355



REV #	DATE	DESCRIPTION

PROJECT  
**27-05 41ST AVE.**  
LONG ISLAND CITY, NEW YORK

FLOOR PLAN  
FIFTH & SIXTH FLOOR

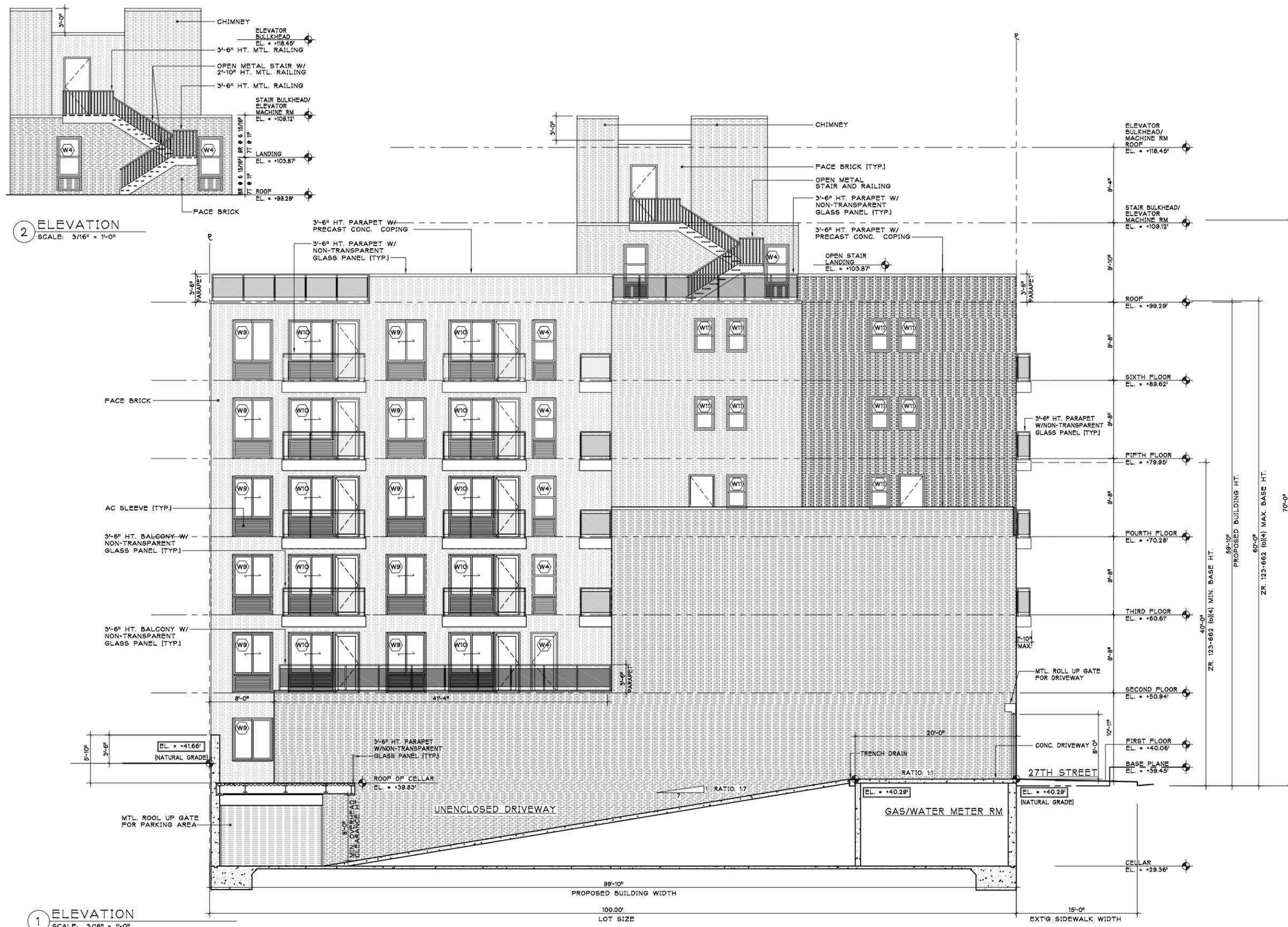
SEAL & SIGNATURE

DATE: 06/02/12  
PROJECT No.  
DRAWING BY: SY  
CHK BY: MK  
DWG No.

**A-106.00**

CAD FILE NO. 11 OF 37





**2** ELEVATION  
SCALE: 3/16" = 1'-0"

**1** ELEVATION  
SCALE: 3/16" = 1'-0"

**DOB # 420780355**



REV.#	DATE	DESCRIPTION

PROJECT  
**27-05 41ST AVE.**  
LONG ISLAND CITY, NEW YORK

**ELEVATION**

SEAL & SIGNATURE	DATE: 08/02/12
	PROJECT No:
	DRAWING BY: SY
	CHK BY: MK
	DWG No:
<b>A-110.00</b>	
CADO FILE No: 15 OF 37	

23-62(d) PERMITTED OBSTRUCTIONS  
STAIR BULKHEAD OR ELEVATOR BULKHEAD, EACH SHALL HAVE AN AGGREGATE WIDTH OF STREET WALLS EQUAL TO NOT MORE THAN 30'

ACTUAL STAIR, ELEVATOR BULKHEAD AND ELEVATOR MACHINE ROOM WIDTH = 27'-1 1/2" < 30'-0" O.K.

23-62(d) STAIR BULKHEAD OR ELEVATOR BULKHEAD AGGREGATE AREA EACH SHALL NOT EXCEED A FIGURE EQUAL TO FOUR TIMES THE WIDTH, IN FEET, OF THE STREET WALL OF THE BLDG. FACING SUCH FRONTAGE

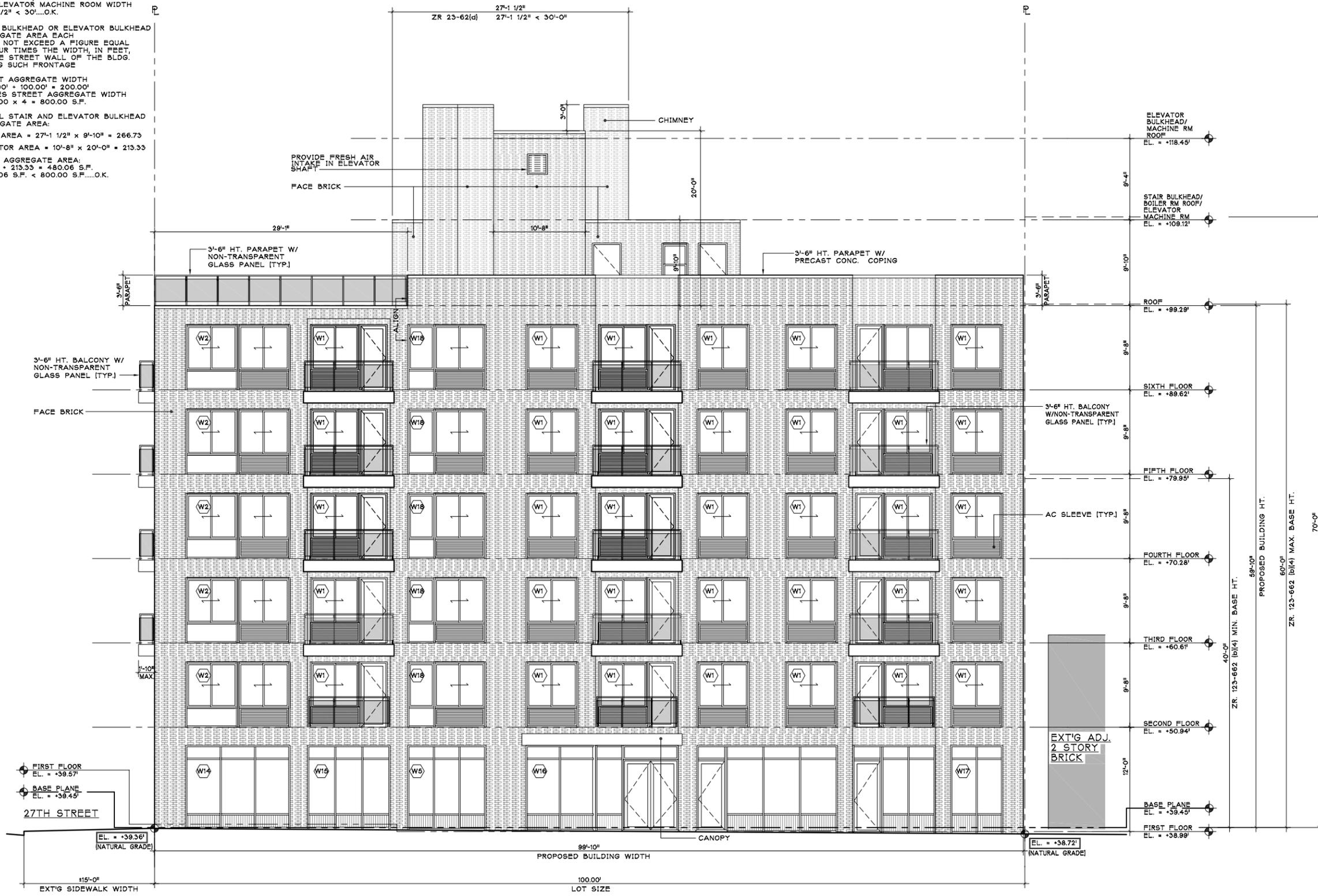
STREET AGGREGATE WIDTH = 100.00' + 100.00' = 200.00'  
4 TIMES STREET AGGREGATE WIDTH = 200.00 x 4 = 800.00 S.F.

ACTUAL STAIR AND ELEVATOR BULKHEAD AGGREGATE AREA:

STAIR AREA = 27'-1 1/2" x 9'-10" = 266.73

ELEVATOR AREA = 10'-8" x 20'-0" = 213.33

TOTAL AGGREGATE AREA: 266.73 + 213.33 = 480.06 S.F.  
= 480.06 S.F. < 800.00 S.F. O.K.



**DOB # 420780355**



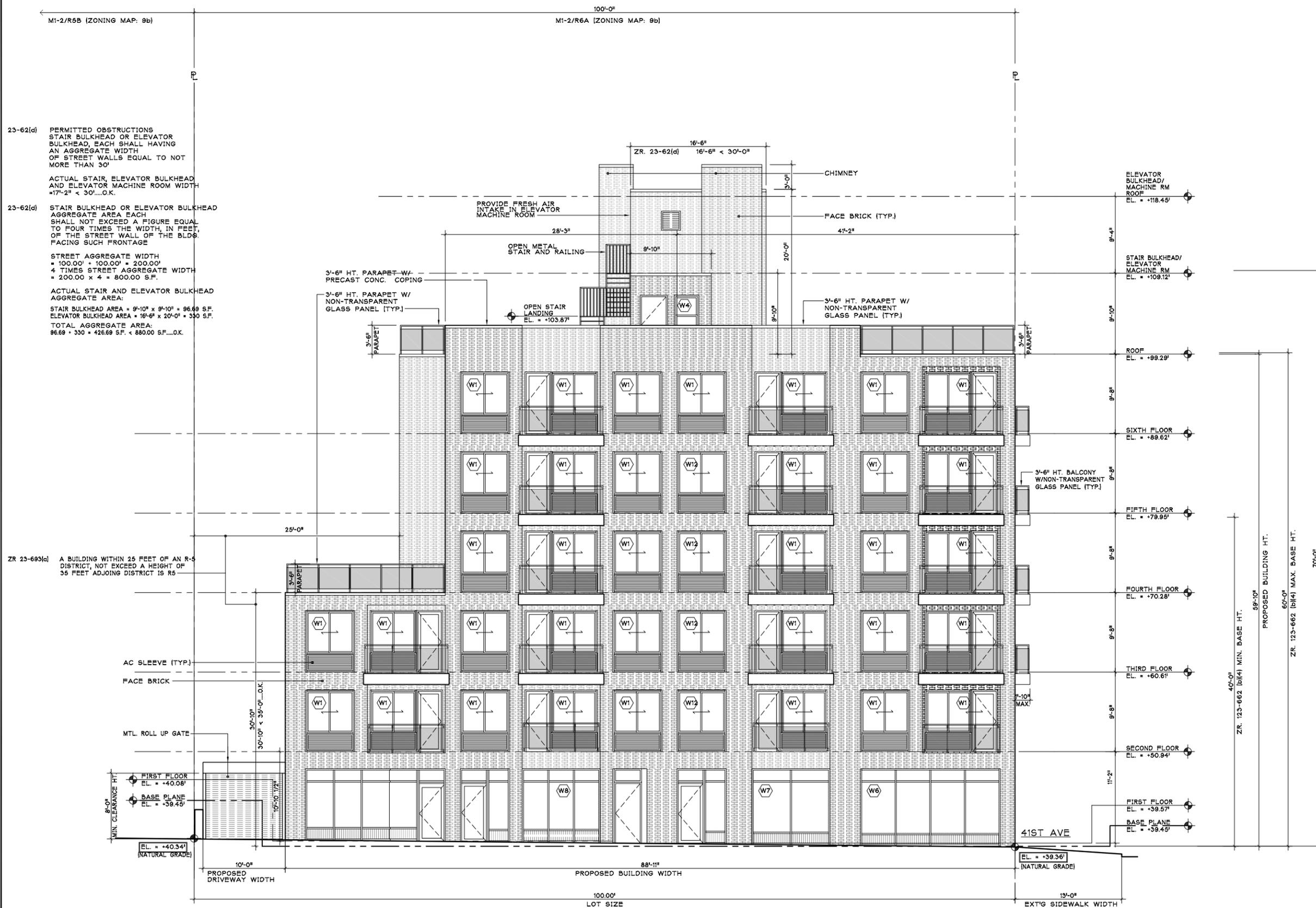
REV.#	DATE	DESCRIPTION

PROJECT  
**27-05 41ST AVE.**  
LONG ISLAND CITY, NEW YORK

**ELEVATION - 41ST AVE.**

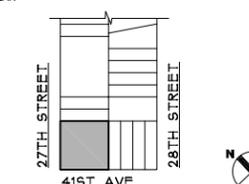
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	PROJECT No:
	DRAWING BY: SY
	CHK BY: MK
	DWG No:
	<b>A-108.00</b>
	CADD FILE No: 13 OF 37

**1 ELEVATION - 41ST AVE**  
SCALE: 3/16" = 1'-0"



DOB # 420780355

KEY PLAN



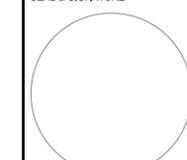
REV.#	DATE	DESCRIPTION

PROJECT

27-05 41ST AVE.  
LONG ISLAND CITY, NEW YORK

ELEVATION - 27TH STREET

SEAL & SIGNATURE

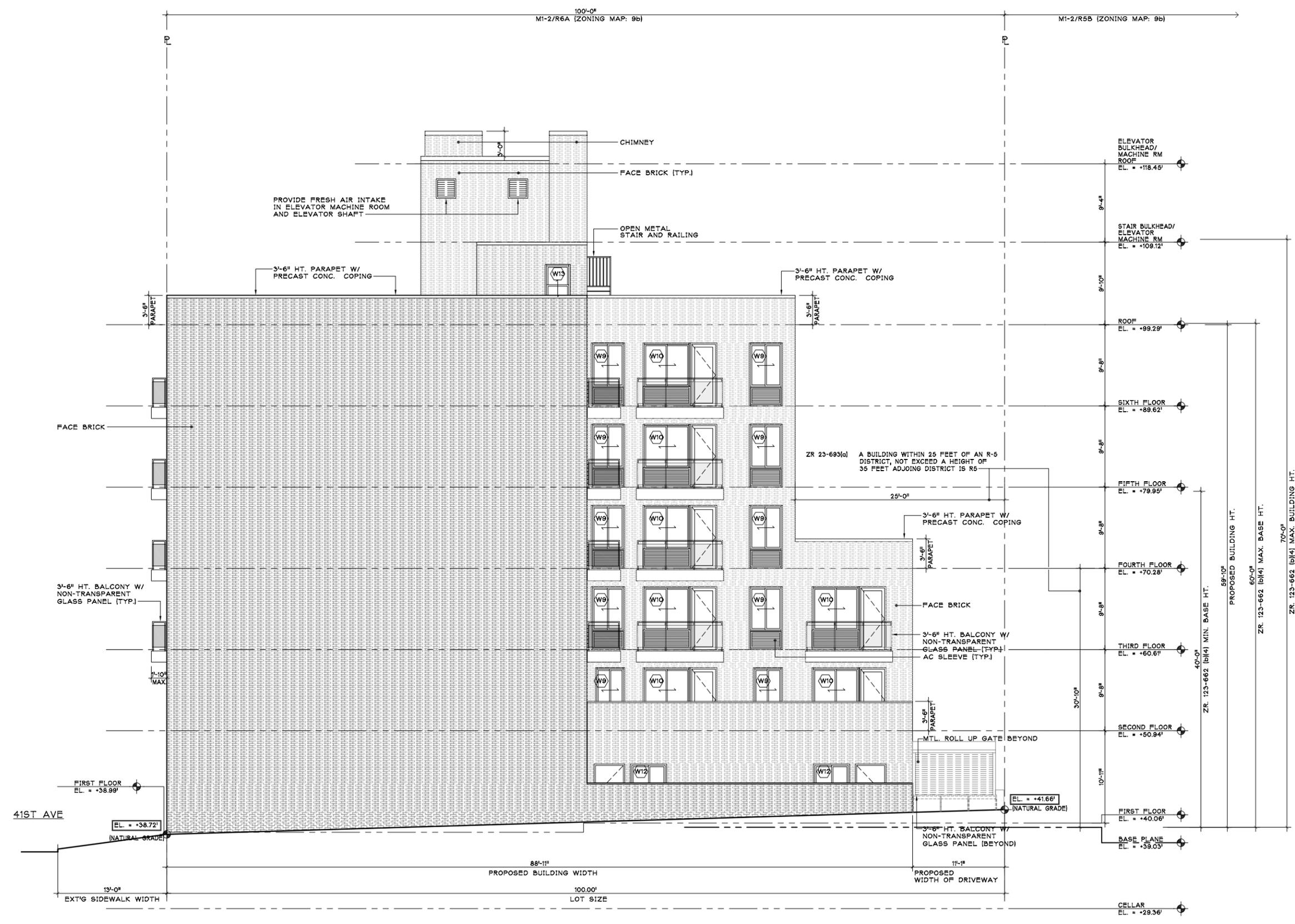


DATE: 08/02/12  
PROJECT No:  
DRAWING BY: SY  
CHK BY: MK  
DWG No:

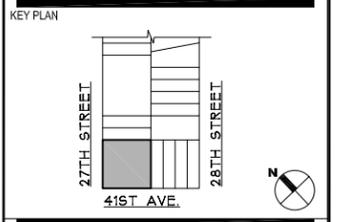
A-109.00

CADD FILE No: 14 OF 37

1 ELEVATION - 27TH STREET  
SCALE: 3/16" = 1'-0"



**DOB # 420780355**



REV.#	DATE	DESCRIPTION

PROJECT  
**27-05 41ST AVE.**  
LONG ISLAND CITY, NEW YORK

**ELEVATION**

SEAL & SIGNATURE	DATE: 08/02/12
	PROJECT No:
	DRAWING BY: SY
	CHK BY: MK
	DWG No:
	<b>A-111.00</b>
	CADD FILE No: 16 OF 37

**1 ELEVATION**  
SCALE: 3/16" = 1'-0"

## **Appendix 2**

### **CITIZEN PARTICIPATION PLAN**

The NYC Office of Environmental Remediation and ETG have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Voluntary Cleanup Program (VCP). 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, ETG 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, Zachariah Schreiber, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 788-3056.

**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, 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](mailto:brownfields@cityhall.nyc.gov).

**Repository.** 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. ETG will inspect the repository to ensure that it is fully populated with project information. The repository for this project is:

REPOSITORY NAME: Long Island City Branch

ADDRESS: 37-44 21<sup>st</sup> Street, Long Island City, NY 11101

REPOSITORY TELEPHONE NUMBER: 718-752-3700

**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.

The major issues of concern to the public will be potential impacts of nuisance odors and dust during the disturbance of historic fill soils at the Site. This work will be performed in accordance with procedures which will be specified under a detailed Remedial Program which considers and takes preventive measures for exposures to future residents of the property and those on adjacent properties during construction. Detailed plans to monitor the potential for exposure including a Construction Health and Safety Plan and a Community Air Monitoring Plan are required components of the remedial program. Implementation of these plans will be under the direct oversight of the New York City Department of Environmental Remediation (OER).

These plans will specify the following worker and community health and safety activities during remedial activity at the Site:

- On-site air monitoring for worker protection,

- Perimeter air monitoring for community protection.

The Health and Safety Plan and the Community Air Monitoring Plan prepared as part of the Remedial Action Work Plan will be available for public review at the document repository.

**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 the Environmental Technology, Inc. (ETG), reviewed and approved by OER prior to distribution and mailed by ETG. 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. See flow chart on the following page, which identifies when during the NYC VCP public notices are issued: 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 3 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.

This project intends to use recycled concrete aggregate wherever possible in grading and backfilling the site. 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.

The project will reduce the consumption of virgin materials by substituting recycled concrete aggregate for mined gravel and/or sand backfill whenever possible. 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.

Recycled concrete materials and other backfill materials will be locally sourced reducing the energy consumption associated with transporting these materials to the Site. 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.

## **Appendix 4**

### **SOIL/MATERIALS MANAGEMENT PLAN**

#### **1.1 Soil Screening Methods**

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional and will be reported in the 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.

#### **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. The site will be completely covered with the proposed building. Therefore, no capping of soil will be required.

#### 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.

If necessary, outbound truck transport routes are to proceed west on 40<sup>th</sup> Avenue towards Northern Boulevard. 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. 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 Brooklyn, 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

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan will not be reused on-Site. '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 BCP 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.

It is common to reuse clean soil at the site for use as backfill around footings and other foundation structures. If on-Site material is to be reused for these purposes at the Site, soil piles no greater than 500 cubic yards are to be staged on and under 5-mil polyethylene sheeting while awaiting sampling. Each soil pile will undergo a testing program to confirm the soil meets Track 1 Unrestricted Use Soil Cleanup Objectives prior to reuse on-site. Confirmation testing of clean soils will be as follows:

<b>Analysis</b>	<b>Frequency</b>	<b>Sample Type</b>
SVOCs (PAHs)	1 per 500 yd <sup>3</sup>	Composite of 5-point grab
Metals (Cu, Cr, Pb, Zn)	1 per 500 yd <sup>3</sup>	Composite of 5-point grab

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 Import of Backfill Soil from Off-Site Sources

Soil from off-site sources will not be used on the site.

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.

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.

#### Endpoint Sampling

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.

### 1.9 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.

#### 1.10 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.

#### 1.11 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.

#### 1.12 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 5**

### **COMMUNITY AIR MONITORING PLAN**

#### **1.0 Introduction**

This Community Air Monitoring Plan (CAMP) requires real-time continuous monitoring for volatile organic compounds (VOCs) and particulates at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The intent of the CAMP is to provide a measure of protection for the downwind community. The community is defined as off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities. The protection is from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increase monitoring, corrective actions to abate or prevent emissions, and/or work shutdown. Additionally, the CAMP helps confirm that work activities did not spread contamination off-site through the air.

#### **2.0 Monitoring Requirements**

Known or potential contaminants at the site include VOCs, SVOCs, Metals, and PCBs. These are contained in the soils on the site in some areas as elevated levels.

##### **2.1 Emissions Prevention**

Remediation will include the excavation of contaminated soils.

The excavations will be away from residential areas. When excavation is being performed during dry conditions, dust will be controlled by using a water spray or other dust suppression techniques.

##### **2.1 Continuous Monitoring**

Continuous monitoring will be for VOCs and Particulates downwind of the site when excavation work is being performed.

## **2.2 Periodic Monitoring**

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil or groundwater samples. Periodic sampling would consist of taking a PID reading upon arrival at a sample location and prior to leaving a sample location.

## **3.0 VOC Monitoring, Response Levels, and Actions**

VOCs must be monitored with a PID at the downwind perimeter of the site at periodic levels depending on the excavation emissions (if any) and the work activity (actively digging vs. resting). Monitoring should occur during those periods of most activity and/or emissions and at periods of approximately once every 15 minutes during active and/or emissions periods. Upwind concentrations should be measured at the start and end of each work day and at periodic intervals during the day. Equipment should be calibrated at least daily for the contaminants of concern. The equipment should 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 site exceeds 5 ppm above the background level for the 15 minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, then work activities can resume with continuous monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or the site persists at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the sources of vapor identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can continue provided that the total organic vapor level 10 feet down wind of the site is below 5 ppm over background level for the fifteen minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities are to be shut down.
- All 15-minute readings must be recorded and available for OERS personnel to review. Instantaneous readings, if any, used for decision purposes shall also be recorded.

#### **4.0 Particulate Monitoring, Response Levels, and Actions**

Particulate concentrations shall be monitored continuously at the upwind and downwind perimeters of the site at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particular matter of less than 10 microns in size (10 ppm) and capable of integrating over a 15 minutes period (or less) for comparison to the airborne particulate action level. In addition, fugitive dust migration should be visually assessed during related work activities.

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

#### **5.0 Record Keeping**

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

## Appendix 6

### VAPOR BARRIER SPECIFICATIONS AND MANUFACTURER COMPATABILITY LETTER UNDER-SLAB GAS BARRIER / VAPOR RETARDER (Class A)

#### *PART 1 – GENERAL*

##### 1.1 SUMMARY

###### **Products Supplied Under This Section**

1. Gas Barrier / Vapor Retarder, Seam Tape, and Pipe Boots

##### 1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM)
  1. ASTM E 1745 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil Or Granular Fill Under Concrete Slabs
  2. ASTM E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs
  3. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials
  4. ASTM E 1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs
  5. ASTM D 1434 Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting
- B. Radon Diffusion Coefficient K124/02/95
- C. American Concrete Institute (ACI)
  1. ACI 302.1R-6 & 7 Section 3.2.3 Vapor Retarder

##### 1.3 SUBMITTALS

- A. Testing/Specifications
  1. Laboratory test results showing compliance with ASTM & ACI Standards.
  2. Manufacturer's samples, literature.
  3. Manufacturer's installation instructions for placement and seaming.

#### PART 2 – PRODUCTS

##### 2.1 MATERIALS

- A. Provide a Gas Barrier / Vapor Retarder that meets the following:

1. ASTM E-1745 Standard for Plastic Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs
  - a) Must meet all Class "A" criteria.
  
2. ASTM D 1434 Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting
  - a) Methane Permeance:  
 $1.7 \times 10^{-10} \text{ m}^2/\text{d}\cdot\text{atm}$  or  $0.32 \text{ GTR ml}/\text{m}^2\cdot\text{D}\cdot\text{ATM}$
  
3. K124/02/95 Radon Diffusion Coefficient:  $< 1.1 \times 10^{-13} \text{ m}^2/\text{s}$ 
  - **VaporBlock® Plus™ 20 by Raven Industries – 800-635-3456**

*Other Manufacturer accepted meeting the above specification:*

- CETCO Liquid Boot Company - 714-384-0111

## 2.2 ACCESSORIES

### A. Seam Tape

1. VaporBond Plus Tape by Raven Industries, 800-635-3456 or other 4" wide gas barrier tape approved by the gas barrier / vapor retarder manufacturer.
2. VaporBoot Tape by Raven Industries, 800-635-3456 or other 2" wide stretchable butyl rubber tape.
3. Butyl Seal Tape by Raven Industries, 800-635-3456 or other 2" wide double-sided reinforced butyl rubber seaming tape.

### B. Pipe Boots

1. Raven VaporBoot Plus pipe boots or other manufacturer's supplied pipe boot system.

## PART 3 – EXECUTION

### 3.1 PREPARATION

1. A. Ensure that subsoil is approved by architect  
Level and tamp or roll aggregate, sand or tamped earth base.

### 3.2 INSTALLATION

#### A. Install Gas Barrier / Vapor Retarder:

1. Installation shall be in accordance with manufacturer's instructions and ASTM E 1643.

(Instructions on architectural or structural drawings should be reviewed and followed.)

- A. Unroll VaporBlock Plus with the longest dimension parallel with the direction of the pour and pull open all folds to full width.
- B. Lap VaporBlock Plus over footings and seal to the vertical foundation walls with 2-Sided Raven Butyl Seal tape.
- C. Overlap joints a minimum of 12 inches and seal in-between overlap with 2-Sided Raven Butyl Seal tape then center the Raven VaporBond Plus Tape or other 4" wide gas barrier tape approved by gas barrier / vapor retarder manufacturer over the seal overlap.
- D. Seal around sewer pipes, support columns or any other penetration with Raven VaporBoot Plus pipe boots or at minimum a combination of VaporBlock Plus and VaporBond Plus Tape or VaporBoot Tape, creating a monolithic membrane between the surface of the slab and moisture sources below as well as at the slab perimeter.
- E. When VaporBlock Plus gas barrier is used as a part of an active control system for radon gas and other VOCs, a ventilation system will be required. When installed as a passive system it is still recommended to

include a ventilation system that could be converted to an active system later.

- F. Repair damaged areas by cutting patches of VaporBlock Plus, overlapping damaged area 12 inches and taping all four sides with VaporBond Plus Tape or other 4" wide gas barrier tape approved by vapor retarder / gas barrier manufacturer.

NOTE: See manufacturers full-length VaporBlock Plus Installation Guidelines located at [www.ravenefd.com](http://www.ravenefd.com) for complete details.