

# Remedial Action Work Plan

June 29, 2011

Conducted at:

**60 West 177th Street & 92 West Tremont Avenue  
Bronx, New York  
New York City Tax Map Designation: *Block 2867; Lot 125 and 128***

Prepared for:

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300 East 175th Street  
Bronx, New York 10457**

Submitted to:

**Mayor's Office of Operations  
Office of Environmental Remediation  
253 Broadway-14th Floor**

**IE Project # 2166-03-03-3002**

**NYCBCP Project No. 12CBCP016X**



**IMPACT ENVIRONMENTAL**

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## **ATTACHMENTS**

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## LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AS/SVE	Air Sparging/Soil Vapor Extraction
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
C/D	Construction/Demolition
COC	Certificate of Completion
COAP	Construction Quality Assurance Plan
CSOP	Contractors Site Operation Plan
DCR	Declaration of Covenants and Restrictions
ECs/ICs	Engineering and Institutional Controls
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
BCA	Brownfield Cleanup Agreement
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYC BCP	New York City Brownfield Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
NYCRR	New York Codes Rules and Regulations
NYC OER	New York City Office of Environmental Remediation
NYS DEC	New York State Department of Environmental Conservation
NYS DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
ORC	Oxygen-Release Compound
OSHA	United States Occupational Health and Safety Administration
PE	Professional Engineer
PID	Photo Ionization Detector
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan or Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design
RI	Remedial Investigation

RMZ	Residual Management Zone
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVOC	Semi-Volatile Organic Compound
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

CERTIFICATION

I, Joel Rogers, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the 60 West 177th Street & 92 West Tremont Avenue, Bronx, New York Site BCP # 12CBCPO16X.

I, James Cressy am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the 60 West 177th Street & 92 West Tremont Avenue, Bronx, New York Site BCP # 12CBCPO16X.

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.

Joel Rogers, P.E. \_\_\_\_\_

Name

#083034 \_\_\_\_\_

NYS PE License Number

Signature

Date



James Cressy \_\_\_\_\_

QEP Name

QEP Signature

Date

# EXECUTIVE SUMMARY

## Site Description

The Site is located at 60 West 177<sup>th</sup> Street/92 West Tremont Avenue in the Bronx, New York and is identified as Block 2867 and Lots 125 & 128 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 25,475-square feet and is bounded to the north by West Tremont Avenue and beyond by residential apartments, to the south by residential apartments, to the east by West 177<sup>th</sup> Street and beyond by residential apartments, to the west by residential apartments. A map of the site boundary is shown in Figure 2. Currently, the Site is unimproved/vacant land. The Site exhibits high topographic relief, with the highest elevation on the southwestern boundary and the lowest elevation on the northeastern boundary.

## Redevelopment Plan

The proposed future use of the Site will consist of a five story senior citizens' residence. Layout of the proposed site development is presented in Figure 3. The current zoning designation is R7-1 Vacant Zoned Residential (V0). The proposed use is consistent with existing zoning for the property.

The Site is slated for redevelopment for one five-story residential apartment building with a cellar level. The proposed building consists of 61 apartment units from the first to the fifth floor. The cellar level will be utilized for utility, maintenance rooms, storage rooms, office space and one residential apartment. The excavation depth of the cellar will be 12'- 6". Groundwater is not expected to be encountered during these activities. The proposed building will not cover the entire footprint of the Site. Specifically, the south eastern portion of the Site will maintain a landscaped yard area with an approximate footprint of 3,600 ft<sup>2</sup>. Approximately 1,150 ft<sup>2</sup> of this landscaped area will be covered by a concrete patio.

## Summary of Past Uses of Site and Areas of Concern

A review of historic records revealed that Lot 125 has been utilized as a dry-cleaning facility since at least 1948 to approximately 1979. The building maintained on this Lot was listed as being serviced by a fuel oil fired heating system. The historic use of Lot 128 consisted of a parking lot.

1. The first AOC is a PCE and other organic carbon impacted soil area, located on the central portion of Lot 125. This area is where the former dry cleaning facility was maintained.
2. The second AOC is the marginally PCE impacted groundwater.

3. The third AOC is PCE impacted soil vapor
4. The fourth AOC is historical fill.

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

Impact Environmental performed the following scope of work:

Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);

Installed a total of twenty-three soil borings across the entire project Site, and collected a total of forty-three soil samples for chemical analysis from the soil borings to evaluate soil quality. Samples were collected in two phases with the second phase focused, in part, on the area of the dry cleaner;

Installed six groundwater monitoring wells throughout the Site to establish groundwater flow and collected five groundwater samples for chemical analysis to evaluate groundwater quality. One well was dry;

Installed a total of thirteen (and one ambient sample) soil vapor probes around Site perimeter and collected thirteen samples for chemical analysis. Samples were collected in two phases with the second phase focused, in part, on the area down-hydraulic gradient from the dry cleaner, offsite and ambient air.

### **Summary of the Environmental Findings**

1. Elevation of the property ranges from approximately 100 to 70 feet above sea level.
2. Depth to groundwater ranges from 13.64 to 15.00 feet at the Site.
3. Groundwater flow is generally from the northeast towards the south southwest, south and south southeast to beneath the Site.
4. Depth to bedrock is approximately 19 feet below existing grade (BEG) at the Site.
5. Soil/fill samples collected during the RI showed the presence of urban fill from grade to approximately 10' below existing grade (BEG). Forty-three shallow and deep soil samples were collected and analyzed for VOCs at 23 locations. Several compounds (1,4 dichlorobenzene, toluene, acetone) were found above Track 1 SCOs at depth in one sample location (SP-4). This sample was collected in the vicinity of the former dry cleaner in the west central portion of the property and also contained a variety of other parameters below Track 1 Unrestricted SCOs, including PCE. TCE was not detected in soil at this property. All VOCs in all soil samples were below Track 2 Restricted Residential SCOs. In the first round including 27 samples, acetone was not detected. In a second round including 16 samples, acetone was detected in all samples at

concentrations in a narrow range between about 25 and 60 ug/kg (including some above Track 1 Unrestricted SCOs), suggesting lab interference. A supplemental sampling round performed to delineate VOCs in the area of the dry cleaner showed that the area of predominant VOC impact was limited to the immediate area of SP-4. Overall, PCE was detected in 5 of 43 samples and all below the Track 1 Unrestricted SCOs. These findings correlate with the area of historic dry cleaning activities on Lot 125 and are probably associated with past dry cleaning operations. 1,4 dichlorobenzene was the only other VOC detected at multiple locations and all detections were at levels well below Track 1 SCOs (except in SP-4 noted above). The findings of soil, groundwater and soil vapor do not support a significant PCE or VOC source area onsite or significant disposal onsite. Removal of all soil/fill in this area (to bedrock) is expected in the area of the former dry cleaner during the remedial action. Only three SVOCs (PAH compounds) were detected in soils at low levels and included only one exceedence of Track 1 Unrestricted SCOs in one sample. No PCBs were detected in any soil sample. Eight pesticides were detected soils on this property, including four that were identified above Track 1 Unrestricted SCOs and Track 2 Restricted Residential SCOs, and four that exceeded Track 1 Unrestricted SCOs; However these compounds did not exceed Track 2 Restricted Residential SCOs. Generally, pesticides were detected at highest concentrations in shallow soils (0-2 feet). Metals were detected in soils at levels characteristic for historical fill. Lead was detected above Track 1 in a variety of samples but only exceeded Track 2 Restricted Residential SCOs in 4 samples, and all below 700 mg/kg. Mercury was detected in a variety of samples above Track 1 SCOs but only exceeded Track 2 Restricted Residential SCOs in 3 samples and all were below 2.5 mg/kg. Barium and cadmium were also detected in at least one sample above Track 2 Restricted Residential SCOs. Other metals exhibited marginal exceedence of Track 1 Unrestricted SCOs.

6. Groundwater samples collected during the RI from five wells showed no detectable concentrations of SVOCs, pesticides or PCBs. Five VOC were detected including chloroform above TOGS in three wells and PCE and TCE slightly above TOGS in two wells and one well, respectively. VOC concentrations are relatively low and similar to the soil results, do not support significant disposal of chlorinated hydrocarbons onsite. No clear pattern of VOC occurrence in groundwater was observed. For instance, a low concentration of PCE was found in the area of the former dry cleaner but was also identified in upgradient well MW-3 and was not identified in downgradient well MW-1. Lead exceeds TOGS in unfiltered groundwater samples and barium and chromium were identified at TOGS levels in one well. These groundwater metals samples are unfiltered and exhibit evidence of turbidity. With regards to mercury, analytical MDLs exceed TOGS limits.

Soil vapor samples collected at eight locations during the initial sampling round showed a common occurrence of BTEX and associated derivatives at relatively low levels (most detections were below 10 ug/m<sup>3</sup>) and suggest a local influence of automotive fuel. Sources may include onsite soils and releases along West Tremont Avenue, a major vehicular thoroughfare that is located immediately north of the property. TCE was identified in one location at trace concentrations (below 1 ug/m<sup>3</sup>) and PCE was found in 2 of eight locations, including one location hydraulic down-gradient from the former dry cleaner at a concentration of approximately 187ug/m<sup>3</sup>. These results, with other results reported for soil and groundwater, support an onsite origin of PCE, probably associated with dry cleaning operations, but does not support a significant source area onsite or significant disposal onsite. Supplemental onsite soil vapor samples collected during the second round of sampling supported this conclusion. However, several supplemental offsite background soil vapor samples, in areas where corresponding onsite soil vapor were non-detect for PCE, showed anomalously high PCE concentrations, orders of magnitude higher than found onsite, as did an ambient air sample, and suggest a possible sampling error. These offsite soil vapor samples will be repeated during the remedial action phase of this project using a different laboratory. Acetone was found in all soil vapor samples with maximum concentrations of approximately 800 ug/m<sup>3</sup>. Acetone was identified ubiquitously in the second round of onsite soil samples independent of past usage but was not identified in any sample from the initial round, and was only found in the upgradient groundwater well (MW-3).

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

An important portion of the cleanup investigation is the performance of a study to identify ways that people might come in contact with contaminants of 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 potential public exposures will be addressed under this cleanup plan.

### **Summary of the Remedy**

1. Preparation of a Community Protection Statement and performance of all required NYC BCP citizen participation activities according to an approved Citizen Participation Plan (CPP).
2. Establish Track 2 Restricted Residential Soil Cleanup Objectives (SCOs).

3. Excavation and removal of soil/fill exceeding Track 2 Restricted Residential SCOs. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with all Federal, State and City laws and regulations for handling, transport, and disposal.
4. Collection and analysis of end-point samples to evaluate the performance of the remedy with respect to attainment of SCOs.
5. Installation of a vapor/waterproof membrane system beneath entire building slab.
6. Installation and operation of an active sub slab depressurization system (SSDS).
7. Performance of Community Air Monitoring Program for particulates and volatile organic carbon compounds.
8. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
9. Implementation of storm-water pollution prevention measures.
10. Performance of all activities associated with the remedial action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and City laws and regulations.
11. Sampling and analysis of excavated media as required by disposal facilities.
12. Removal of all Underground Storage Tanks, if any, and closure of petroleum spills, if any, under authority of New York State Department of Environmental Conservation.
13. Screening for indications of contamination (by visual means, odor, and monitoring with a photo ionization detector (PID)) of excavated soil/fill during all intrusive work.
14. Recording of a Declaration of Covenants and Restrictions that includes a full listing of Engineering Controls and Institutional Controls and notice that these controls must be maintained within a Site Management Plan to prevent future exposure to any residual contamination remaining at the Site.
15. Establishment in a recorded Declaration of Covenants and Restrictions, a series of Institutional Controls on the Site, including: (1) compliance with the provisions of the recorded Declaration of Covenants and Restrictions; (2) compliance with provisions of the approved Site Management Plan; (3) operation and maintenance of Engineering Controls as specified in the Site Management Plan; (4) inspection and certification of all Engineering Controls at a frequency and in a manner defined in the Site Management Plan; (5) reporting at a frequency

and in a manner defined in the Site Management Plan; and (6) prohibition of discontinuation of Engineering Controls without an OER-approved amendment or extinguishment of the Declaration of Covenants and Restrictions.

16. Establishment in a recorded Declaration of Covenants and Restrictions, a series of site restriction Institutional Controls on the Site, including: (1) prohibition of vegetable gardening and farming; (2) prohibition of the use of groundwater without treatment rendering it safe for the intended use; (3) prohibition on all disturbance of residual contaminated material unless it is conducted in accordance with the provisions in the Site Management Plan; and (4) prohibition on higher level of land usage without an OER-approved amendment or extinguishment of this Declaration of Covenants and Restrictions.
17. Submission of a RAR which describes the remedial activities including any changes from this RAWP, certifies that the remedial requirements have or will be achieved, defines the Site boundaries, and describes any Engineering and Institutional Controls to be implemented at the Site.
18. Submission of an approved Site Management Plan in the Remedial Action Report for long-term management of residual contamination, including plans for Institutional and Engineering Controls for: (1) inspection and certification, (2) monitoring, (3) operation and maintenance, and (4) reporting.

# Community Protection Statement

The Office of Environmental Remediation created the New York City Brownfield Cleanup Program (NYC BCP) 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. This cleanup plan 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 BCP, 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 Health and Safety Plan 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. 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 Wen Qing Fang and can be reached at (631) 269-8800.

**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 James Cressy (631) 365-6118 or NYC Office of Environmental Remediation Project Manager Mr. Shaminder Chawla (212) 442-3007.

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

**Storm-Water Management.** To limit the potential for soil erosion and discharge, this cleanup plan has provisions for storm-water management. The main elements of the storm water management include physical barriers such as tarp covers and erosion fencing, and a program for frequent inspection.

**Hours of Operation.** The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. For this cleanup project, the hours of operation are 7am to 5pm 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 Brownfield Cleanup Program, provides project contact names and numbers, and locations of project documents can be viewed.

**Complaint Management.** The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager Mr. Thomas Brown at (347) 649-3134, the NYC Office of Environmental Remediation Project Manager Mr. Shaminder Chawla (212) 442-3007, or call 311 and mention 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. Stockpiles will be protected with silt fences. Hay bales will be used, as needed to protect storm water catch basins and other discharge points.

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

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

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

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

**Truck Routing.** Truck routes have been selected to: (a) limit transport through residential areas and past sensitive nearby properties; (b) maximize use of city-mapped truck routes; (c) limit total distance to major highways; (d) promote safety in entry to highways; (e) promote overall safety in trucking; and (f) minimize off-Site line-ups (queuing) of trucks entering the property. Operators of loaded trucks leaving the Site will be instructed not to stop or idle in the local neighborhood.

**Final Report.** The results of all cleanup work will be fully documented in a final report (called a Remedial Action Report) that will be available for you to review in the public document repositories located at The Mayor's Office of Environmental Remediation.

**Long-Term Site Management.** To provide long-term protection after the cleanup is complete, the property owner will be required to comply with an ongoing Site Management Plan that calls for continued inspection of protective controls, such as Site covers. The Site Management Plan is evaluated and approved by the NYC Office of Environmental Remediation. Requirements that the property owner must comply with are defined 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 cleanup is still effective.

# 1.0 SITE BACKGROUND

Promesa Housing Development Fund Corp. has enrolled in the New York City Brownfield Cleanup Program (NYC BCP) to investigate and remediate a property located at 60 West 177th Street & 92 West Tremont Avenue, Bronx, New York, the "Site". A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

## 1.1 SITE LOCATION AND CURRENT USAGE

The Site is located at 60 West 177<sup>th</sup> Street/92 West Tremont Avenue in the Bronx, New York and is identified as Block 2867 and Lots 125 & 128 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 25,475-square feet and is bounded to the north by West Tremont Avenue and beyond by residential apartments, to the south by residential apartments, to the east by West 177<sup>th</sup> Street and beyond by residential apartments, to the west by residential apartments. A map of the site boundary is shown in Figure 2. Currently, the Site is unimproved/vacant land. The Site exhibits high topographic relief, with the highest elevation on the southwestern boundary and the lowest elevation on the northeastern boundary.

## 1.2 PROPOSED REDEVELOPMENT PLAN

The proposed future use of the Site will consist of a five story senior citizens' residence. Layout of the proposed site development is presented in Figure 3. The current zoning designation is R7-1 Vacant Zoned Residential (V0). The proposed use is consistent with existing zoning for the property.

The Site is slated for redevelopment for one five-story residential apartment building with a cellar level. The proposed building consists of 61 apartment units from the first to the fifth floor. The cellar level will be utilized for utility, maintenance rooms, storage rooms, office space and one residential apartment. The excavation depth of the cellar will be 12'- 6". Groundwater is not expected to be encountered during these activities. The proposed building will not cover the entire footprint of the Site. Specifically, the

south eastern portion of the Site will maintain a landscaped yard area with an approximate footprint of 3,600 ft<sup>2</sup>. Approximately 1,150 ft<sup>2</sup> of this landscaped area will be covered by a concrete patio.

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

### **1.3 DESCRIPTION OF SURROUNDING PROPERTY**

The contiguous properties are utilized as residential apartments. The character of the neighborhood is primarily residential apartments with few stores maintained on the first floors. One daycare facility is located within 250' to the southeast of the Site and three public schools are located within a 500' radius of the Site. Figure 1 shows the surrounding land usage.

### **1.4 REMEDIAL INVESTIGATION**

A remedial investigation was performed and the results are documented in a companion document called "*Remedial Investigation Report*" dated June 2011 (RIR).

A review of historic records revealed that Lot 125 has been utilized as a dry-cleaning facility since at least 1948 to approximately 1979. The building maintained on this Lot was listed as being services by a fuel oil fired heating system. The historic use of Lot 128 consisted of a parking lot.

Impact Environmental performed the following scope of work under the RIR:

Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);

1. Installed a total of twenty-three soil borings across the entire project Site, and collected a total of forty-three soil samples for chemical analysis from the soil borings to evaluate soil quality;
2. Installed six groundwater monitoring wells throughout the Site to establish groundwater flow and collected five groundwater samples for chemical analysis to evaluate groundwater quality. One well was dry;
3. Installed a total of thirteen (and one ambient sample) soil vapor probes around Site perimeter and collected thirteen samples for chemical analysis.

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

## **2.0 REMEDIAL ACTION OBJECTIVES**

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

### **Groundwater**

- Remove contaminant sources causing impact to 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 or surface water 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

For 60 West 177<sup>th</sup> Street/92 West Tremont Avenue, a Track 1 remedial action alternative and a Track 2 remedial action alternative are considered in this alternative analysis. The Track 1 alternative involves the removal of all soil above Track 1 SCOs. The Track 2 alternative involves establishment of Track 2 Restricted Residential SCOs, removal of soil/fill down to a depth of at least 12 feet throughout the property to the planned depth of the sub-grade development structure and removal of the VOC 'hot spot' area within lot 125 at SP-4, collection of end-point samples to verify attainment of Track 2 SCOs, and placement of ORC at the base of the open excavation in the hot spot area. The Track 2 remedial action alternative involves the excavation and removal of approximately 10,000 cubic yards of soil and fill and may also be capable of achieving Track 1 SCOs. Attainment of Track 1 would be assessed after the conclusion of the excavation activities through end point sampling. Other elements of the Track 2 remedial alternative include:

- Establishment of Track 2 Restricted Residential Soil Cleanup Objectives (SCOs).
- Placement of a composite final cover including a building slab and foundation side walls in the building area, and pavement or a 2 foot clean soil cover in all remaining open spaces to eliminate exposure to remaining soil/fill;
- Establishment of use restrictions including prohibitions on the use of groundwater from the site and prohibitions on other sensitive site uses, such as farming or vegetable gardening, to eliminate potential future exposure pathways;
- Establish a Site Management Plan to ensure long-term management of Institutional and Engineering Controls including the performance of periodic inspections and certification that the controls are performing as they were intended; and
- Placement of a deed restriction to memorialize the remedial action and the Engineering and Institutional Controls to ensure that future owners of the site continue to maintain these controls as required.

In addition, both alternatives would involve the installation of a vapor/water barrier membrane beneath the concrete foundation and outside the foundation wall surfaces, and operation of an active sub slab depressurization system (SSDS).

### 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.

The Track 1 alternative will result in excavation of all soil with contaminant concentration above Track 1 SCOs and would:

- Eliminate the risk of ingestion exposures or other direct contact with contaminated on-Site soils consistent with remedial action objectives;
- Eliminate the risk of leaching into groundwater and ingestion exposures or direct contact with groundwater with contamination derived from the Site consistent with remedial action objectives; and
- Eliminate potential sources for on-Site production of soil vapors, and prevent migration of on-Site derived vapors into occupied structures and eliminate associated inhalation exposures consistent with remedial action objectives.

The Track 2 alternative would:

- Establish Track 2 Restricted Residential SCOs;
- Remove soil/fill down to a depth of at least 12 feet throughout the property to the planned depth of the basement of the building. In addition, excavating activities will be conducted for the VOC hot spot area within Lot 125 in the area around SP-4 and delineated by SB-1 through SB-6;
- Place a composite final cover including a building slab and foundation side walls in the building area and concrete pavement and/or a 2 foot clean soil cover in all remaining open spaces to eliminate exposure to remaining soil/fill;
- Install a vapor/water barrier membrane beneath the concrete foundation and outside the foundation wall surfaces, and operation of an active sub slab depressurization system (SSDS)

- Establish use restrictions to ensure that future ingestion or other exposures to are eliminated, such as prohibition on use of groundwater for potable purposes;
- Establish a Site Management Plan to ensure long term management of Institutional and Engineering Controls to ensure that all Engineering and Institutional controls are inspected periodically and require certification that the remedy continues to perform as it was designed, thus ensuring that the protections achieved for public health and the environment remain in perpetuity;
- Place a deed restriction to memorialize these controls in order to decrease the risk of future exposures with contaminated media consistent with remedial action objectives to memorialize the remedial action and the existence of Engineering and Institutional Controls and will ensure that these controls will be appropriately managed by future owners of the Site.

## **3.2. BALANCING CRITERIA**

### **Compliance with Standards, Criteria and Guidance (SCGs)**

The Track 1 alternative would address the chemical-specific SCGs for soil by excavation and removal of all material above the Track 1 SCOs. 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.

The Track 2 alternative would address the chemical-specific SCGs for soil by establishment of Track 2 SCOs and attainment of these standards for onsite soil. Removal of possible source areas and placement of ORC at the base of the excavation in the hot spot area would address any residual groundwater impacts and associated impacted to soil vapor. Similar to the Track 1 alternative, 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. Soil vapor impacts within the building structure would be mitigated by the installation of a vapor barrier and operation of an active SSDS.

### **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.

The Track 1 alternative would result in some short-term impacts due to the quantity of excavation and transport required to remove all historic fill and other material necessary to achieve Track 1 SCOs throughout the Site. These impacts could include higher air quality impacts caused by greater soil excavation, handling and load out, and associated truck traffic. Focused attention to means and methods employed during the remedial action, including community air monitoring and appropriate truck routing, would minimize or negate the overall impact of this additional activity.

The Track 2 alternative would result in marginally fewer short-term impacts associated with excavation, handling, load out of materials, and truck traffic than a Track 1 remediation. However, focused attention to means and methods during the remedial action during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize or negate the overall impact of these activities under either alternative.

## **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.

The Track 1 alternative would be effective over the long-term by providing a permanent cleanup of on-Site contamination through removal of all soils in excess of the Track 1 SCOs and would eliminate any potential on-Site sources of soil vapors and groundwater contamination consistent with remedial action objectives.

The Track 2 alternative would also be effective over the long-term by attaining Track 2 SCOs, placement of a composite cover over the entire Site, establishment of a Site Management Plan to ensure long-term management of Institutional and Engineering Controls, and placement of a deed restriction to memorialize these controls after remedial construction is complete. Attainment of Track 2 SCOs would minimize the risk of leaching into groundwater and contact with or exposures to groundwater with contamination derived from on-Site consistent with remedial action objectives. Soil and fill removal would also minimize potential sources for on-Site production of soil vapors and migration of Site-derived vapors, and installation of a vapor barrier and active operation of a SSDS would prevent migration of on-Site and off-Site derived vapors into occupied structures and eliminate associated inhalation exposures consistent with remedial action objectives. Groundwater use restrictions will eliminate potential ingestion of groundwater, and establishment of a SMP and a deed restriction will ensure that these protections remain effective in perpetuity. The SMP will ensure long-term effectiveness of all Engineering and Institutional Controls by requiring periodic inspection and certification that these controls and use restrictions continue to be in place and functioning as they were intended.

## **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.

The Track 1 alternative will provide maximum reduction of toxicity, mobility and volume of contaminated material on-Site by excavation and removal of all soils that exceed the Track 1 unrestricted use SCOs.

The Track 2 alternative will provide:

- Reduction of toxicity, mobility and volume of contaminated material on-Site by establishing Track 2 SCOs and attainment of these SCOs for onsite soil;
- Placement of a composite cover over the entire Site that will lower toxicity by eliminating potential contact with remaining soil below the SCOs;
- Groundwater use restrictions will reduce toxicity by ensuring that there is no direct contact with on-Site groundwater in the future;
- Establishment of a Site Management Plan and placement of a deed restriction to memorialize these controls will ensure long-term management of these Engineering and Institutional Controls and provide assurance that protections will continue in perpetuity.

## **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 Track 1 alternative is both feasible and implementable. It uses standard materials and services and well established technology. The reliability of the remedy is high. There are no special difficulties associated with any of the activities proposed but will require a marginally longer period of time to accomplish due to the large quantity of soil and fill material that would require removal. Similarly, the Track 2 alternative is also both feasible and implementable. It uses standard materials and services and well established technology. The reliability of the remedy is also high. There are no special difficulties associated with any of the activities proposed, which utilize standard industry methods. The installation of

a vapor barrier and SSDS is a feasible and effective way to prevent vapors from entering the new building.

### **Cost effectiveness**

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

The capital costs associated with the Track 1 alternative are higher than the Track 2 alternative in that a higher volume of soil/fill will be excavated for off-site disposal to achieve a Track 1 status, and long term site management will involve continued site management activities.

Both alternatives satisfy the threshold balancing criterion and other criterion listed here, and each is fully protective of public health and the environment, will control migration of contaminants, will comply with SCGs, are effective for the short-term and long-term, are implementable, and reduce both mobility and toxicity.

### **Community Acceptance**

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

Based on the overall goals of the remedial program and initial observations by the project team, both of the alternatives would be acceptable to the community. This RAWP will be subject to and undergo public review under the NYC BCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedial action. This public comment will be considered by OER prior to approval of this plan.

### **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 Track 1 and Track 2 alternatives for remedial action at the site are comparable with respect to the proposed use and to land uses in the vicinity of the Site. The proposed use is consistent with the existing zoning designation for the property and is consistent with recent development patterns. The Site is surrounded by residential and commercial properties and the proposed alternative provides comprehensive protection of public health and the environment for these uses. Improvements in the current brownfield condition of the property achieved by the alternative is also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse. The alternatives are equally protective of natural resources and cultural resources. This RAWP will be subject to public review under the NYC BCP and will provide the opportunity for detailed public input on the land use factors described in this section. This public comment will be considered by OER prior to approval of this plan.

## **Sustainability of the Remedial Action**

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

Both alternatives have an equal potential to utilize sustainable means to achieve the cleanup goals. This program contemplates the utilization of several green remediation methods that are compatible with the alternative. The full list of green remediation activities considered in this program is included in the Sustainability Statement.

## 4.0 REMEDIAL ACTION

### 4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

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

The elements of this remedial action are:

1. Preparation of a Community Protection Statement and performance of all required NYC BCP citizen participation activities according to an approved Citizen Participation Plan (CPP).
2. Establish Track 2 Restricted Residential Soil Cleanup Objectives (SCOs).
3. Excavation and removal of soil/fill exceeding Track 2 Restricted Residential SCOs. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with all Federal, State and City laws and regulations for handling, transport, and disposal.
4. Collection and analysis of end-point samples to evaluate the performance of the remedy with respect to attainment of SCOs.
5. Installation of a vapor/waterproof membrane system beneath entire building slab and the side walls.
6. Installation and operation of an active sub slab depressurization system (SSDS).
7. Performance of Community Air Monitoring Program for particulates and volatile organic carbon compounds.
8. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
9. Implementation of storm-water pollution prevention measures.
10. Performance of all activities associated with the remedial action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and City laws and regulations.

11. Sampling and analysis of excavated media as required by disposal facilities.
12. Removal of all Underground Storage Tanks, if any, and closure of petroleum spills, if any, under authority of New York State Department of Environmental Conservation.
13. Screening for indications of contamination (by visual means, odor, and monitoring with a photo ionization detector (PID)) of excavated soil/fill during all intrusive work.
14. Recording of a Declaration of Covenants and Restrictions that includes a full listing of Engineering Controls and Institutional Controls and notice that these controls must be maintained within a Site Management Plan to prevent future exposure to any residual contamination remaining at the Site.
15. Establishment in a recorded Declaration of Covenants and Restrictions, a series of Institutional Controls on the Site, including: (1) compliance with the provisions of the recorded Declaration of Covenants and Restrictions; (2) compliance with provisions of the approved Site Management Plan; (3) operation and maintenance of Engineering Controls as specified in the Site Management Plan; (4) inspection and certification of all Engineering Controls at a frequency and in a manner defined in the Site Management Plan; (5) reporting at a frequency and in a manner defined in the Site Management Plan; and (6) prohibition of discontinuation of Engineering Controls without an OER-approved amendment or extinguishment of the Declaration of Covenants and Restrictions.
16. Establishment in a recorded Declaration of Covenants and Restrictions, a series of site restriction Institutional Controls on the Site, including: (1) prohibition of vegetable gardening and farming; (2) prohibition of the use of groundwater without treatment rendering it safe for the intended use; (3) prohibition on all disturbance of residual contaminated material unless it is conducted in accordance with the provisions in the Site Management Plan; and (4) prohibition on higher level of land usage without an OER-approved amendment or extinguishment of this Declaration of Covenants and Restrictions.
17. Submission of a RAR which describes the remedial activities including any changes from this RAWP, certifies that the remedial requirements have or will be achieved, defines the Site boundaries, and describes any Engineering and Institutional Controls to be implemented at the Site.
18. Submission of an approved Site Management Plan in the Remedial Action Report for long-term management of residual contamination, including plans for Institutional and Engineering Controls for: (1) inspection and certification, (2) monitoring, (3) operation and maintenance, and (4) reporting.

Remedial activities will be performed at the Site in accordance with this OER-approved RAWP. All deviations from the RAWP will be promptly reported to OER. Changes will be documented in the RAR.

## **4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT**

Track 2 Restricted Residential cleanup standards are proposed for this project. The Soil Cleanup Objectives (SCOs) for this Site are listed in Table 4 of the RIR.

Soil and materials management on-Site and off-Site will be conducted in accordance with the soil management plan as described below. All primary contaminant sources (such as hotspots) identified during the remedial action will be identified by GPS or surveyed by a surveyor licensed to practice in the State of New York. This information will be provided on maps 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 10,000 tons. Disposal facilities will be reported to OER when they are identified and prior to the start of remedial action.

### **End-Point Sampling**

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 300 feet in perimeter:
3. 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.
4. 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.

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.

## **Analytical Methodology**

All end-point samples will be analyzed utilizing the following methodology:

All soil samples will be analyzed for:

- volatile organic compounds (VOCs) by EPA Method 8260;
- semi-volatile organic compounds (SVOCs) by EPA Method 8270;
- Target Analyte List (TAL) metals; and
- pesticides/PCBs by EPA Method 8081/8082.

If required, groundwater samples will be analyzed for:

- VOCs by EPA Method 8260;
- SVOCs by EPA Method 8270;
- TAL metals, and
- Pesticides/PCBs by Method 8081/8082.

If required, soil gas samples will be analyzed for VOCs by EPA method TO-15.

If either LNAPL and/or DNAPL are detected a sample will be collected for characterization and “finger print analysis”.

In addition to end point sampling, several supplemental off-site soil vapor samples will be collected during the remedial action to repeat supplemental sampling performed during the remedial investigation.

## **Reporting of End-Point Data in Remedial Action Report**

Chemical labs used for all end-point sample analytical results will be ELAP certified and will be reported in the RAR. The RAR will provide a tabular and map summary of all end-point sample results.

## **Quality Assurance/Quality Control**

### **Decontamination Procedures**

Prior to arrival on the Site and between sample locations, all sampling tools/equipment will be decontaminated using the following methods: 1) remove all adherent soil material with stiff bristle brush; 2) wash with a laboratory grade glassware detergent or Alconox; 3) steam clean interior and exterior of the screened auger sampler and all associated augers; 4) allow to air dry.

## Laboratory

The laboratory will be an ELAP-certified laboratory by the New York State Department of Health. The laboratory will follow the QA/QC control procedures specific in the approved analytical methods. Standard reporting deliverables for the analytical results will be provided (not Category B Deliverables). Soil results will be reported on a dry weight basis.

## Sample Holding Times/Handling and Shipment

Samples will be submitted to the laboratory as soon as practicable subsequent to sample collection. Holding times will be met in accordance with the approved analytical methods for each analysis required. The soil samples will be placed in laboratory sample jars, transferred to storage/transportation coolers and preserved with ice, and shipped under proper chain-of-custody procedures to an NYSDOH-ELAP certified commercial laboratory for analysis.

## Field Blanks

A field blank is a sample of analyte-free water transferred, at the project site, into an appropriate container for the purpose of distinguishing ambient air contamination from in-situ sample contamination. Field blanks are used to indicate potential cross contamination from sampling equipment as quality control of decontamination procedures. One field blank will be collected for every work day that sampling is conducted at the site. The procedure for obtaining a field blank sample are as follows: collect two sets of sample vessels. One vessel shall contain analyte free water and the other is empty. Run the analyte free water through the decontaminated sampling equipment into the empty vessel. Analyze the water of this collecting vessel for target analytes.

## Trip Blanks

A trip blank is used to identify the presence of volatile compound contamination attributable to transfer across a sample container septum during shipping and storage of samples. A trip blank is a sample of analyte-free matrix that is transported from the laboratory to the sampling site with the sample containers. The trip blank is stored on-site with the sample containers and field samples and then transported back to the laboratory with the samples for analysis. The trip blank is received and processed as a sample by the laboratory. One trip blank shall be submitted per cooler from laboratory personnel. The holding time for the trip blank in the field shall be 7 days.

## Duplicate Samples

Duplicate samples will be collected to verify QA/QC data accuracy at the selected laboratory. One duplicate sample will be analyzed for every twenty samples submitted to the laboratory.

## Sample Transfer

Samples shall be containerized and immediately transferred within a cooler with minimal disturbance. Chain-of-custody forms will be completed at the time of sample collection and will accompany the samples inside a cooler for transfer from sample team to mobile laboratory representatives.

#### Sample Containers and Analytical Requirements

All sample vessels will be "level A" certified decontaminated containers supplied by a New York State Certified Commercial Laboratory. Samples analyzed for hydrocarbons will be placed in containers with Teflon lined caps. All samples will be preserved by cooling them to a temperature of approximately four degrees Celsius. If glass bottles are used, extra glass bottles will be obtained from the laboratory to allow for accidental breakage that may occur. Necessary preservatives will be placed in the sample bottles by the laboratory. The sample bottles will be handled carefully so that preservatives and glassware are not inadvertently spilled. All liquid samples will be put into 40-ml glass vials with Teflon liners.

#### Chain-of-Custody Protocol

The primary objective of the sample custody procedures is to create an accurate written record that can be used to trace the possession and handling of all samples from the moment of their collection, through analysis, until their final disposition. Sample custody for samples collected during the investigation will be maintained by the field personnel collecting the samples. Field personnel are responsible for documenting each sample transfer and maintaining custody of all samples until they are transferred to the laboratory.

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

Import of soils onto the property and reuse of soils already onsite will be performed in conformance with the Soil/Materials Management Plan in Appendix 3. The estimated quantity of soil to be imported into the Site for backfill and cover soil is unknown at this time. The estimated quantity of onsite soil/fill expected to be reused/relocated on Site is unknown at this time.

### **4.3 ENGINEERING CONTROLS**

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

- composite cover system consisting of concrete building slabs, concrete covered open space, and open space with 2 feet of clean cover soil;
- soil vapor barrier beneath the concrete slab and outside foundation sidewalls;
- Active sub-slab depressurization system.

#### **Vapor Barrier System**

A high density polyethylene (HDPE) vapor barrier or retarder membrane (herein designated as “vapor barrier”) will be installed over the entire footprint of the building and foundation sidewalls during construction of the new building slab on grade. The vapor barrier membrane will be a conservative measure to prevent human exposure. The vapor barrier materials shall have a minimum thickness of 20 mils (0.5 mm). The vapor barrier will be ECC VIP Type 2 or equivalent. The membrane will be overlapped by a minimum of 6 inches and secured with mastic or asphaltic tape. Conduits penetrating the slab surface will be sealed with mastic or HDPE boots secured with the asphaltic tape. Inspections of the vapor barrier installation will be performed under the oversight of a Professional Engineer.

### **Sub-Slab Depressurization System**

The SSDS will provide a conduit for potential residual soil gas vapors to vent to the atmosphere. Said SSDS consists of vapor collecting screen/pipes within the building footprint.

Schedule 40 slotted PVC screens will be installed within the building footprint underneath the slab. PVC screens will be installed 1 foot below slab. The screens will be backfilled over and compacted with clean 3/4-inch pea gravel. Total depth of compacted gravel surrounding piping was a minimum of 10-inches thick. PVC screens were manifolded to 4-inch diameter solid PVC pipes and then to 4-inch diameter steel riser.

Upon completion of the building renovation, the riser will raise 3-feet above the roof. A rain cap will be installed at the end of the riser. The SSDS will be operated actively by installation of a fan on the riser.

### **Composite Cover System**

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. This composite cover system is comprised of:

- 2-feet of clean cover soil and concrete pavement in open spaces;
- asphalt covered roads;
- concrete covered sidewalks;
- concrete building slabs.

The composite cover system is a permanent engineering control for the Site. The system will be inspected and certified 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.

#### **4.4 INSTITUTIONAL CONTROLS**

Institutional Controls (IC) have been incorporated 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 established in a Declaration of Covenant and Restrictions (DCR) assigned to the property by the title holder and will be implemented under a site-specific Site Management Plan (SMP) that will be included in the RAR.

Institutional Controls for this remedial action are:

- Recording of an OER-approved Declaration of Covenant and Restrictions (DCR) with the City Register or county clerk, as appropriate. The DCR will include a description of all ECs and ICs, will summarize the requirements of the Site Management Plan, and will note that the property owner and property owner's successors and assigns must comply with the DCR and the approved SMP. The recorded DCR will be submitted in the Remedial Action Report. The DCR will be recorded prior to OER issuance of the Notice of Completion;
- Submittal of a Site Management Plan in the RAR for approval by OER that provides procedures for appropriate operation, maintenance, monitoring, inspection, reporting and certification of ECs. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification shall be submitted annually and will comply with RCNY §43-1407(l)(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 residential (residential senior care facility) 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 the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by the DCR and this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site Management responsibilities defined in the DCR and the Site Management Plan are implemented.

The SMP will provide a detailed description of the procedures required to manage residual soil/fill left in place following completion of the remedial action in accordance with the Brownfield Cleanup Agreement with OER. This includes a plan for: (1) implementation of EC's and ICs; (2) implementation of monitoring programs; (3) operation and maintenance of EC's; (4) inspection and certification of EC's; and (5) reporting.

Site management activities, reporting, and EC/IC certification will be scheduled on an periodic basis to be established in the SMP and will be subject to review and modification by OER. The Site Management Plan will be based on a calendar year and certification reports will be due for submission to OER by March 31 of the year following the reporting period.

#### **4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT**

Investigations reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA). As part of the BCP 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 EA 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.

## Potential Exposure Pathways

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.

## Nature, Extent, Fate and Transport of Contaminants

Based on the results of the RIR the contaminants of concern are as followed:

Soil:

- VOCs including: acetone toluene and 1,4 dichlorobenzene above Track 1 SCOs and a variety of VOCs below Track 1 SCOs including tetrachloroethylene. Eight pesticides were detected soils on this property above Track 1 SCOs. Inorganics including: lead, barium, cadmium, mercury and zinc.

Groundwater:

- VOCs including: chloroform, tetrachloroethylene and trichloroethene
- Inorganics including: barium, chromium, copper, lead and manganese

Soil Vapor:

- Significant levels of tetrachloroethylene and a variety of other VOCs including BTEX and associated derivatives were detected at low levels in the soil vapor point samples.

## Potential Routes of Exposure

An exposure route is the mechanism by which a receptor comes into contact with a chemical. Three potential primary routes exist by which chemicals can enter the body:

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

## Receptor Populations

### Land Use of the Site and Neighboring Properties - Current and Future

The Site is currently unimproved land. The area immediately surrounding the Site is residential with some small stores. The proposed future use of the Site is senior citizen residential five story building with a basement. The land use in the surrounding area is anticipated to remain residential since several new similar projects have recently been completed or are under construction in this neighborhood.

On-Site Receptors - The on-site potential sensitive receptors include adult and child visitors, commercial workers, pedestrians, and trespassers. The proposed redevelopment of the Site includes the construction of 5 story residential building with a single story basement. During redevelopment of the Site, the on-site potential sensitive receptors will include construction workers. Once the Site is redeveloped, the on-site potential sensitive receptors will include: adult and child residents, maintenance staff, building residents, and commercial workers.

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

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

## Existence of Human Health Exposure

### Existing

As the Site is not covered and has exposed soil there is a potential exposure pathways from the soil/fill. In addition, there is a potential exposure pathway from soil gas to enter into the two-story building as a result of any foundation slab/wall openings or cracks. The potential receptors from such a migration pathway into the building would be to commercial workers. The primary route of exposure would be inhalation.

There is an existing potential exposure pathway from soil gas if present offsite to enter into the adjoining buildings as a result of any sub-basement floor or lower wall openings/cracks. The indoor air quality at the adjoining properties may be susceptible to contamination from subsurface vapor intrusion. The potential receptors from such a migration pathway into the building would be to off-site commercial workers, and adult and child residents. The primary route of exposure would be inhalation.

## **Future**

Once redevelopment activities begin, there will be a potential exposure pathway from contaminated surface and subsurface soil/fill to construction workers as a result of on-site construction/excavation activities. On-site construction workers potentially could ingest, inhale or have dermal contact with any exposed impacted fill or soils. Similarly, off-site receptors could be exposed to dust from onsite activities. During construction, on-site off-site exposures to contaminated dust from on-site will be addressed through dust controls, and through the implementation of the community air monitoring program and a construction health and safety plan.

Once the remedial actions and redevelopment of the Site has been completed, there will be no potential on-site or off-site exposure pathways to adult and child residents, maintenance staff, community residents, and commercial workers. Removal of more than 12 feet of soil/fill on-site and the VOC hotspot in the vicinity of SP-4 will remove possible onsite sources of soil vapor and inhalation of any potential off-gassing of VOC vapors from off-site sources. Any on-site exposures to residual vapors and vapors from off-site sources will be eliminated by implementation of the vapor barrier and operation of an active SSDS. Direct exposures to residual soils and production of dust that might impact on-site or off-site receptors will be prevented by the construction of the composite site cover. Long term assurance of these protections will be achieved by site inspections and periodic certifications under an approved Site Management Plan and Declaration of Covenant and Restrictions.

## **Overall Human Health Exposure Assessment**

Based upon this analysis, currently, there are two potential exposure pathways: 1) from soil gas to enter structures as a result of any foundation slab/wall openings or cracks; and, 2) direct exposure to on-site soils and dust from on-site soils. The on-site potential sensitive receptors include adult and child visitors, commercial workers, pedestrians, trespassers and commercial workers. The potential off-site receptors

are construction and commercial workers, and adult and child residents. The primary route of exposure would be inhalation and dermal contact onsite and inhalation off site.

During remedial construction, on-site and off-site exposures to contaminated dust from contaminated soils will be addressed through dust controls, and through the implementation of the community air monitoring program and a construction health and safety plan.

After the remedial action is complete, there will be no remaining exposure pathways. More than 12 feet of soil/fill onsite and the VOC hotspot in the vicinity of SP-4 will be removed and will greatly reduce possible onsite sources of contamination in groundwater and soil vapor and will mitigate any potential on-site and off-site impacts. The vapor barrier, SSDS and the composite cover and long-term site management will interrupt any remaining exposure pathways. Continued protection after the remedial action is complete will be achieved by the implementation of site management including periodic inspection and certification of the performance of remedial controls.

## **5.0 REMEDIAL ACTION MANAGEMENT**

### **5.1 PROJECT ORGANIZATION AND OVERSIGHT**

Principal personnel who will participate in the remedial action include James Cressy and Kevin Kleaka. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Joel Rogers and Kevin Kleaka.

### **5.2 SITE SECURITY**

Site access will be controlled by having a fence around the entire property with gated entrances for workers.

### **5.3 WORK HOURS**

The hours for operation of remedial construction will be from 7am to 5pm. These hours conform to the New York City Department of Buildings construction code requirements.

### **5.4 CONSTRUCTION HEALTH AND SAFETY PLAN**

The Health and Safety Plan is included in Appendix 4. The Site Safety Coordinator will be Wen Qing Fang from Impact Environmental. 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.

## **5.6 AGENCY APPROVALS**

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

## **5.7 SITE PREPARATION**

### **Pre-Construction Meeting**

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

### **Mobilization**

Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation, equipment mobilization (including securing all sampling equipment needed for the field investigation), marking/staking sampling locations and utility mark-outs. Each field team member will attend an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

### **Utility Marker Layouts, Easement Layouts**

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

Proper safety and protective measures pertaining to utilities and easements, and compliance with all laws and regulations will be employed during invasive and other work contemplated under this RAWP. The

integrity and safety of on-Site and off-Site structures will be maintained during all invasive, excavation or other remedial activity performed under the RAWP.

### **Dewatering**

Dewatering is not expected for this project.

### **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.

## **5.8 TRAFFIC CONTROL**

Drivers of trucks leaving the NYC BCP 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 from West Tremont Avenue. The trucks will then proceed to Highway 87 (the Major Deegan Expressway). A map of this route is included in **Figure 6**.

## 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.

### **5.13 DATA USABILITY SUMMARY REPORT**

The primary objective of a Data Usability Summary Report (DUSR) is to determine whether or not data meets the site specific criteria for data quality and data use. The DUSR provides an evaluation of analytical data without third party data validation. The DUSR for post-remedial samples collected during implementation of this RAWP will be included in the Remedial Action Report (RAR).

## 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.
- Recorded Declaration of Covenants and Restrictions.
- 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, Joel Rogers, 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 92 West Tremont Avenue, BCP # 12CBCPO16X.*

*I, James Cressy, am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the 92 West Tremont Avenue, BCP # 12CBCPO16X Site.*

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

<b>Schedule Milestone</b>	<b>Weeks from Remedial Action Start</b>	<b>Duration (weeks)</b>
OER Approval of RAWP	September, 2011	-
Fact Sheet 2 announcing start of remedy	December, 2011	-
Mobilization	January 2012	-
Remedial Excavation	January 2012	-
Demobilization	May 2012	-
Record Declaration of Covenants and Restrictions	August 2012	-
Submit Remedial Action Report	October 2012	-

## APPENDIX 1

### CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Promesa Systems have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Brownfield Cleanup Program. This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYC BCP, Promesa Systems 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, Shaminder Chawla, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 788-8841

**Project Contact List.** OER has established a Site Contact List for this project to provide public notices in the form of fact sheets to interested members of the Community. Communications will include updates on important information relating to the progress of the cleanup program at the Site as well as to request public comments on the cleanup plan. The Project Contact List includes owners and occupants of adjacent buildings and homes, principal administrators of nearby schools, hospitals and day care centers, the public water supplier that serves the area, established document repositories, the representative Community Board, City Council members, other elected representatives and any local Brownfield Opportunity Area (BOA) grantee organizations. Any member of the public or organization will be added to the Site Contact List on request. A copy of the Site Contact List is maintained by OER's project manager. If you would like to be added to the Project Contact List, contact NYC OER at (212) 788-8841 or by email at [brownfields@cityhall.nyc.gov](mailto:brownfields@cityhall.nyc.gov).

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

Sedwick Library  
1701 Dr. Martin L King Jr Boulevard  
Bronx, NY 10453-6961  
Phone: (718) 731-2074  
Hours of Operation:  
Mon. 10am to 6pm  
Tues. 10am to 6pm  
Wed. 10am to 6pm  
Thurs. 11 am to 7pm  
Fri. 10 am to 5pm  
Sat. 10am to 5pm  
Sun. Closed

Copies of the documents are also available on OER's website: <http://www.nyc.gov/oer>

**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.

**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 Promesa Systems, reviewed and approved by OER prior to distribution and mailed by Promesa Systems. Public comment is solicited in public notices for all work plans developed under the NYC Brownfield 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 BCP project. See flow chart on the following page, which identifies when during the NYC BCP 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 2**

### **SUSTAINABILITY STATEMENT**

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

**Reuse of Clean, Recyclable Materials.** Reuse of clean, locally-derived recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction.

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

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

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

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

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

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

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

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

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

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

**Low-Energy Project Management Program.** Impact Environmental is participating in OER's low-energy project management program. Under this program, whenever possible, meetings are held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation.

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

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

## **APPENDIX 3**

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

#### **1.1 SOIL SCREENING METHODS**

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

#### **1.2 STOCKPILE METHODS**

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

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

#### **1.3 CHARACTERIZATION OF EXCAVATED MATERIALS**

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

#### **1.4 MATERIALS EXCAVATION, LOAD-OUT AND DEPARTURE**

The PE/QEP overseeing the remedial action will:

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

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

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

## 1.5 OFF-SITE MATERIALS TRANSPORT

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

Outbound truck transport routes are show in **Figure 6**. This routing takes into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c) minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

## 1.6 MATERIALS DISPOSAL OFF-SITE

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

## 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 may be reused on-Site. The soil cleanup objectives for on-Site reuse are listed in **Table 1**. '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. The expected location for placement of reused material is shown in **Figure 7**.

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

## **1.8 DEMARCATION**

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

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

## **1.9 IMPORT OF BACKFILL SOIL FROM OFF-SITE SOURCES**

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives are listed in **Table 2**.

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

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

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with applicable laws and regulations;
- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYS DEC.

All materials received for import to the Site will be approved by a PE/QEP and will be in compliance with provisions in this RAWP. The RAR will report the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where backfill or soil cover was placed.

### **Source Screening and Testing**

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

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

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

Recycled concrete aggregate (RCA) will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the RAR. A PE/QEP is responsible to ensure that the facility is compliant with 6NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require additional testing, unless required by NYSDEC under its terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete. RCA material is not acceptable for, and will not be used as cover material.

## **1.10 FLUIDS MANAGEMENT**

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

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

## **1.11 STORM-WATER POLLUTION PREVENTION**

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

## **1.12 CONTINGENCY PLAN**

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

surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

## **1.13 ODOR, DUST AND NUISANCE CONTROL**

### **Odor Control**

All necessary means will be employed to prevent on- and off-Site odor nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) use of foams to cover exposed odorous soils. If odors develop and cannot otherwise be controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; and (e) use of chemical odorants in spray or misting systems.

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

### **Dust Control**

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

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

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

## **Other Nuisances**

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

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

## **APPENDIX 4**

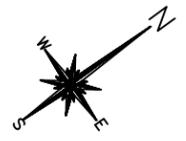
### **CONSTRUCTION HEALTH AND SAFETY PLAN**

**Impact Environmental**  
Remedial Action Work Plan  
BCP # 12CBCPO16X

Figures

**Impact Environmental**  
Remedial Action Work Plan  
BCP # 12CBCPO16X

Figure 1: Surrounding Land Use



**IMPACT ENVIRONMENTAL**

170 KEYLAND COURT  
 BOHEMA, NEW YORK 11716  
 TEL (631) 269-8800 FAX (631) 269-1599  
 1560 BROADWAY, SUITE 1024  
 NEW YORK, NEW YORK 10036  
 TEL (212) 201-7905 FAX (212) 201-7906

**TITLE:**

**Surrounding Land Use**

60 W 177th St &  
 92 W Tremont Ave.  
 Bronx, New York

DRAWN BY: JC  
 CHECKED BY: KK  
 DATE: 06/29/2011  
 SCALE: 1" = 90'

PROJECT # 2166-03-03-3002

Figure # 01

BCP # 12CBP016X



**Impact Environmental**  
Remedial Action Work Plan  
BCP # 12CBCPO16X

Figure 2  
Site Tax Map



**Impact Environmental**  
Remedial Action Work Plan  
BCP # 12CBCPO16X

Figure 3  
Proposed Site Development Plan

WEST TREMONT AVENUE

WEST 177TH STREET

PROPOSED 5 STORY BUILDING

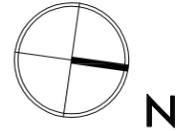
REAR YARD

EXISTING 6 STORY BUILDING

EXISTING 3 STORY BUILDING

EXISTING 6 STORY BUILDING

EXISTING 6 STORY BUILDING



SK-01

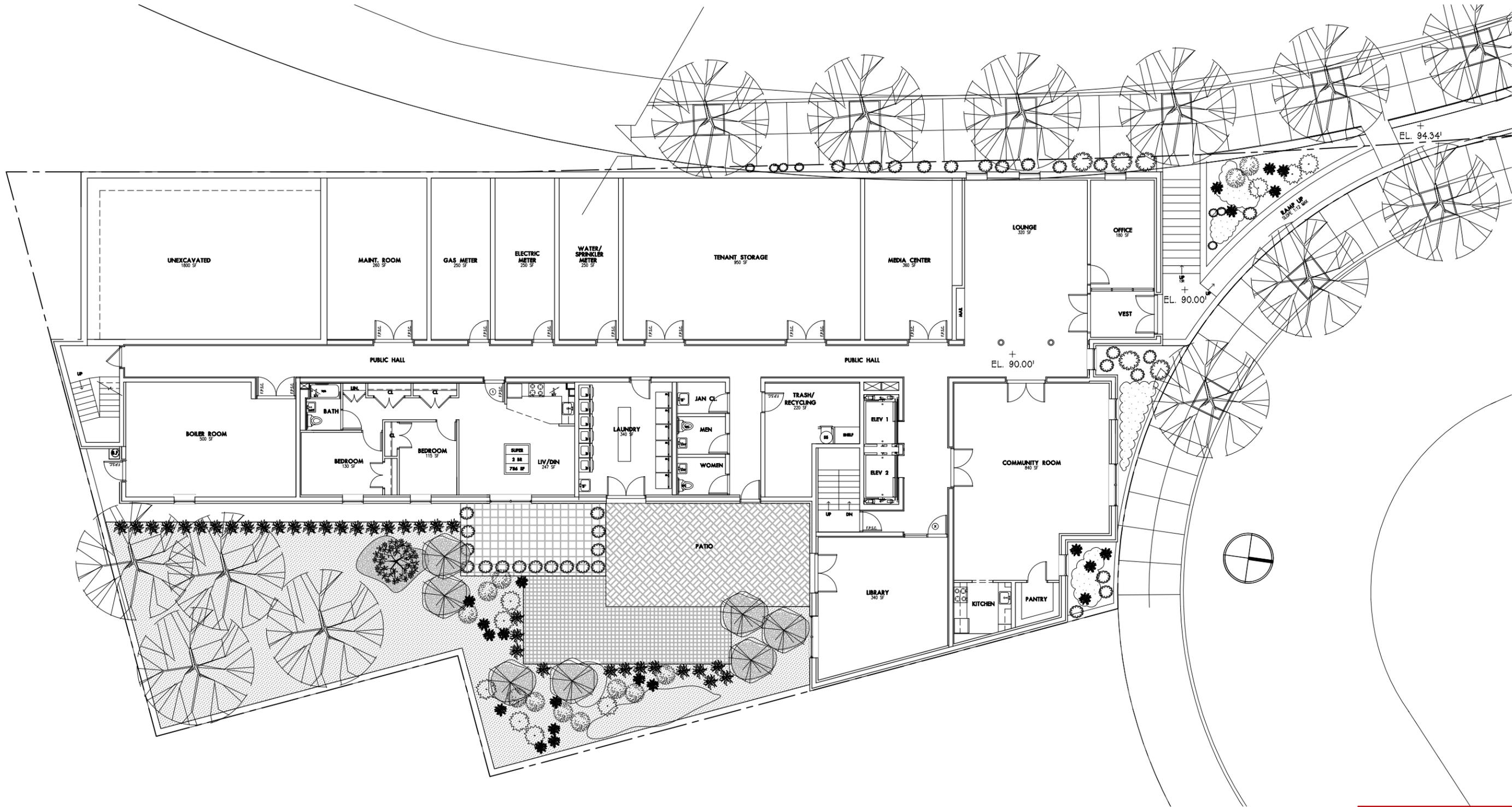
SCHEMATIC SITE PLAN

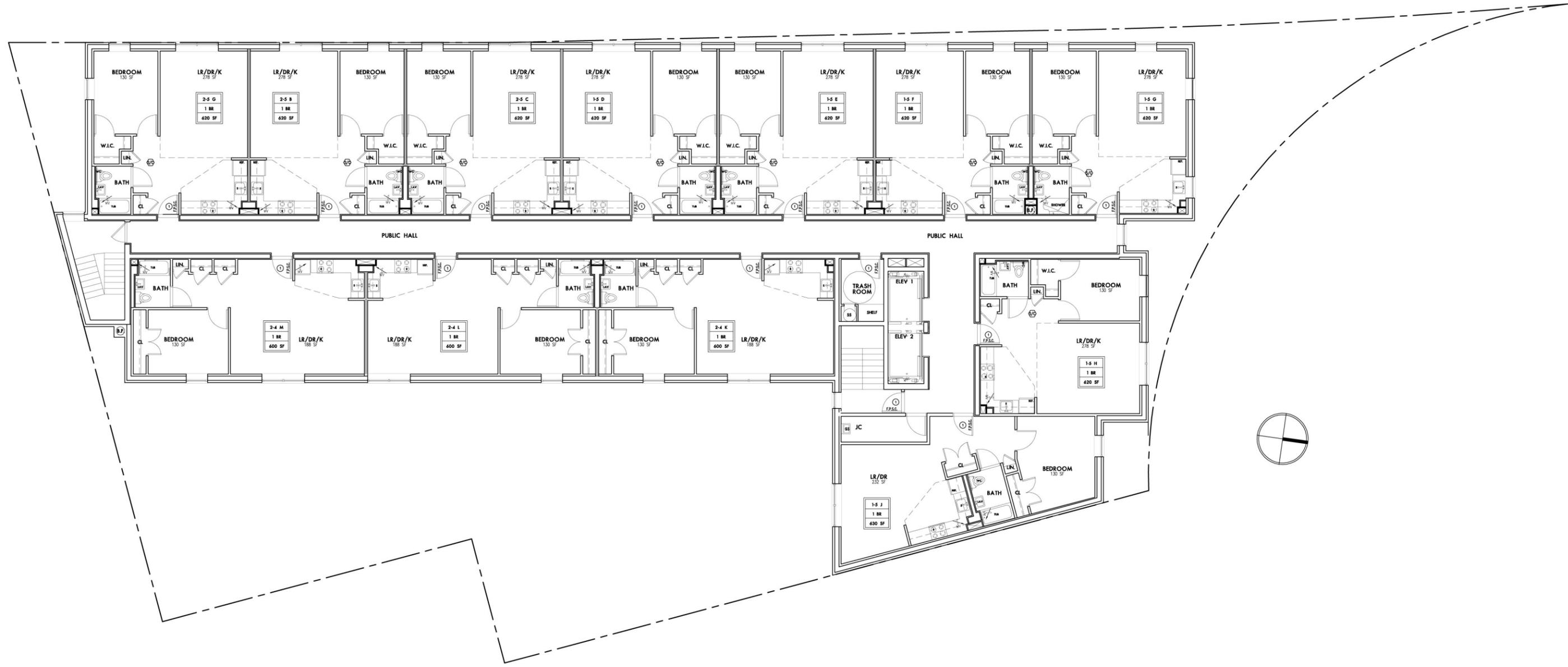
SENIOR CITIZENS' RESIDENCE  
92 WEST TREMONT AVENUE

1/16"=1'-0"  
2/3/10



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T 212 675 6470 F 212 675 6728





SK-03

SCHEMATIC PLAN - FLOORS 1-5

SENIOR CITIZENS' RESIDENCE  
 92 WEST TREMONT AVENUE  
 1/16"=1'-0"  
 2/3/10



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**SK-04**

**WEST TREMONT ELEVATION**

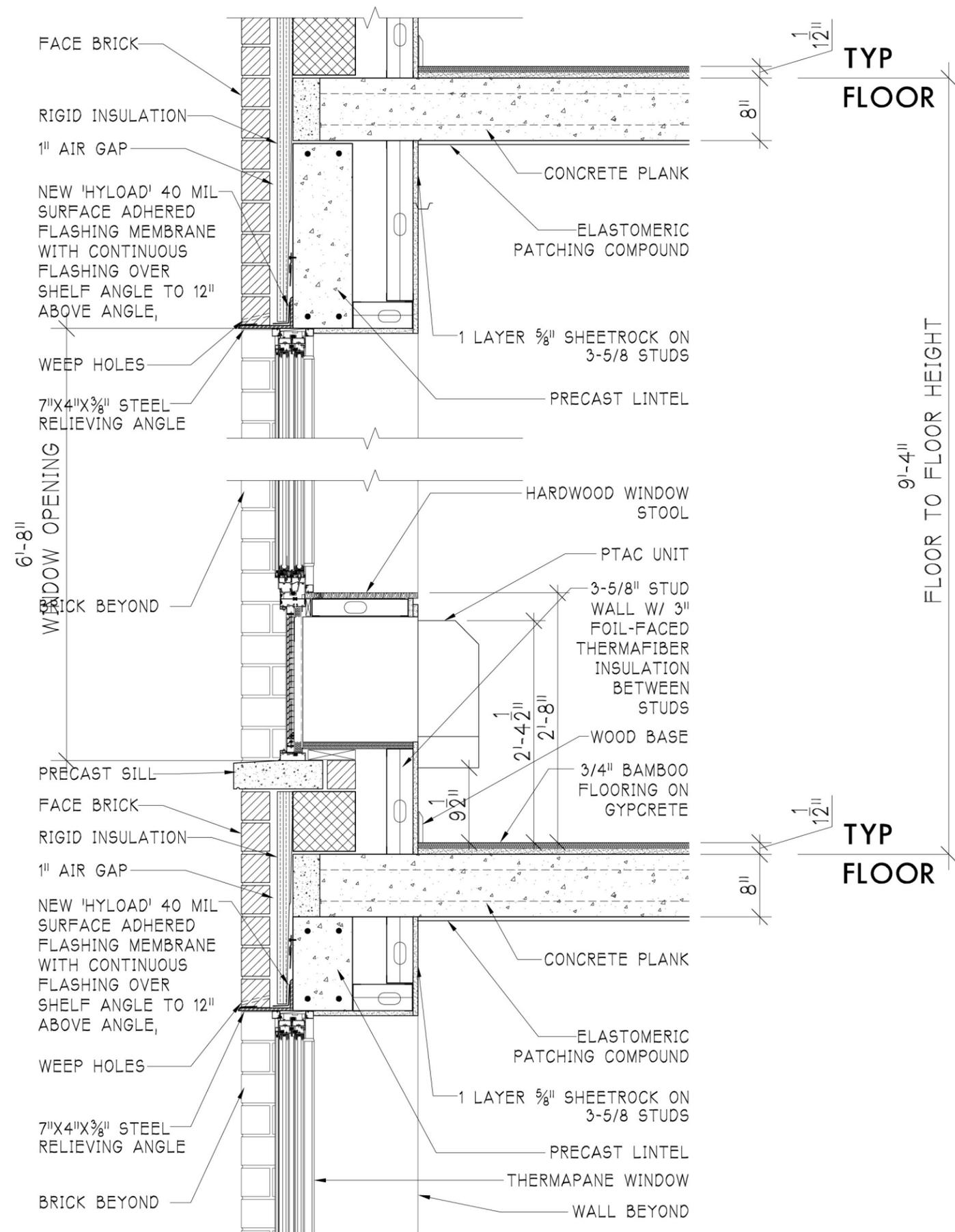
**SENIOR CITIZENS' RESIDENCE**  
**92 WEST TREMONT AVENUE**

1/16"=1'-0"  
 2/03/10



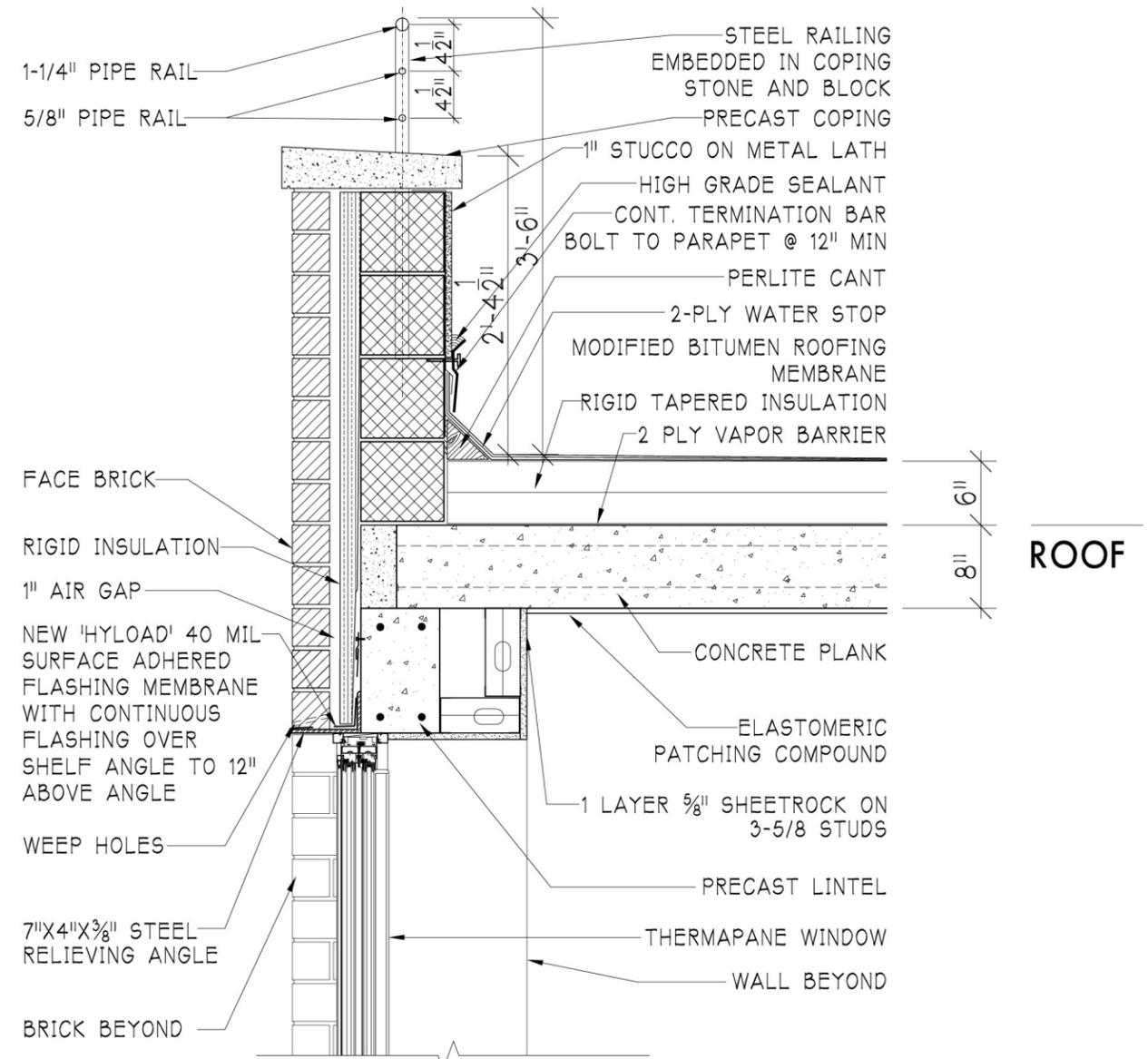
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**TYPICAL WALL SECTION**

SCALE: 3/4" = 1'-0"



**SK-06**  
TYPICAL WALL SECTION

SENIOR CITIZENS' RESIDENCE  
92 WEST TREMONT AVENUE

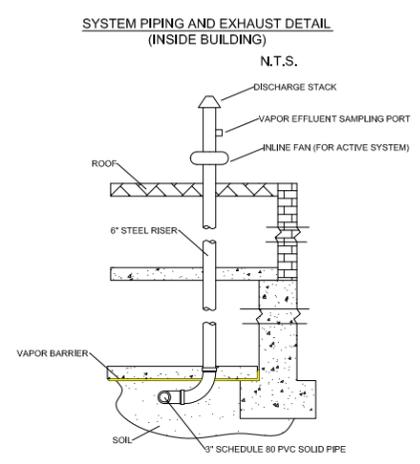
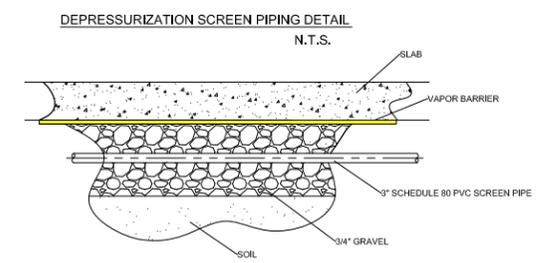
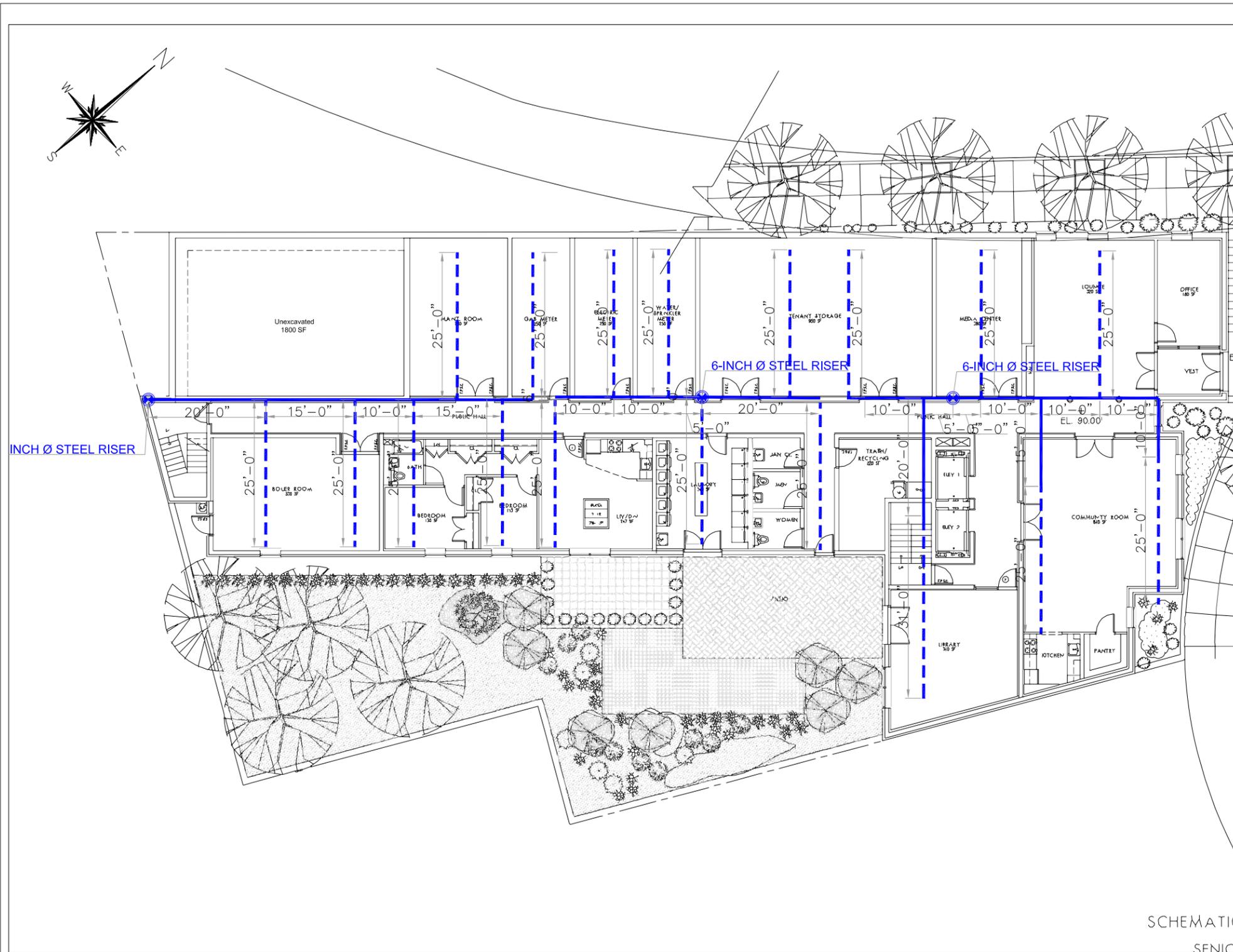
3/4"=1'-0"  
2/03/10



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BCP # 12CBCPO16X

Figure 4  
Sub-Slab Depressurization System Layout



- SUB-MEMBRANE DEPRESSURIZATION SYSTEM CONSTRUCTION NOTES:**
- PROPOSED LOCATIONS OF DEPRESSURIZATION SYSTEM RISER PIPES TO BE VERIFIED BY ARCHITECT.
  - PREPARE SUBSOIL AS SPECIFIED BY PROJECT GEOTECHNICAL OR STRUCTURAL ENGINEER, OR IN ACCORDANCE WITH ACI 302.1R-04 SECTION 4.1. PLACE, LEVEL, AND COMPACT GRAVEL BED CONSISTING OF CLEAN 3/4-INCH PEA GRAVEL, OR AN EQUIVALENT APPROVED BY THE DESIGN ENGINEER. GRAVEL TO BE NO MORE THAN 1-INCH IN DIAMETER, WITH NO SHARP AGGREGATE. LEVEL GRAVEL BED TO ELEVATION OF BOTTOM OF PVC PIPING TO BE INSTALLED.
  - 3-INCH DIAMETER SCHEDULE 80 SLOTTED PVC SCREEN SHALL BE INSTALLED 1 FOOT BENEATH THE BUILDING SLAB. BACKFILL AND COMPACT OVER SUPPORTED SCREEN WITH CLEAN 3/4-INCH PEA GRAVEL. TOTAL DEPTH OF COMPACTED GRAVEL SURROUNDING PIPING SHALL BE MINIMUM 24-INCHES THICK. PVC SCREENS SHALL BE CONNECTED TO 4-INCH DIAMETER SCHEDULE 80 PVC SOILD PIPE AND STEEL RISERS. VAPOR EFFLUENT SAMPLING PORTS SHALL BE INSTALLED ON THE RISERS. THE RISERS SHALL RAISE AT LEAST 3- FEET ABOVE THE ROOF. RAIN CAPS SHALL BE INSTALLED ON THE ROOF AT THE END OF THE RISERS.
  - PVC PIPING TO BE NEW, CLEAN SLOTTED SCREEN AND SOLID PIPE. 20-FOOT LENGTHS OF PIPE SHALL BE USED TO THE EXTENT PRACTICABLE. SCREEN TO BE 40-SLOT (0.040 INCH WIDE SLOTS). STEEL RISER PIPE AND FITTINGS FOR THE VERTICAL STACK TO BE PRIMED AND PAINTED WITH WEATHER RESISTENT PAINT. A MINIMUM OF TWO UNIONS SHALL BE INSTALLED ON THE STACK PIPE TO PROVIDE FOR FUTURE MODIFICATION.
  - PLUMBING, PRIMING, GLUING, PAINTING, FASTENING, AND SUPPORTING PVC AND STEEL PIPES, SCREENS, RISERS, AND FITTINGS TO BE CONDUCTED IN ACCORDANCE WITH EXISTING PROJECT PLANS AND SPECIFICATIONS, INDUSTRY STANDARDS, AND MANUFACTURERS INSTRUCTIONS, UNLESS OTHERWISE APPROVED BY THE PROJECT ENGINEER. THE INSTALLATION SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL CODES.
  - CONTRACTOR SHALL STORE MATERIALS IN A CLEAN AND DRY AREA, AND SHALL PROTECT MATERIALS FROM DAMAGE DURING HANDLING AND INSTALLATION.

Legend	
	SCH. 80 Ø 3-INCH PVC SCREEN
	SCH. 80 Ø 4-INCH PVC SOLID PIPE
	STEEL RISER

**TITLE:** Sub-Slab Depressurization System (Bsement)

60 W. 177th St. & 92 Tremont Ave.  
Bronx, New York

DRAWN BY:	JC
CHECKED BY:	KK
DATE:	07-25-2011
SCALE:	1/32" = 1'

**PROJECT #** 2166-03-03-3002

**PLATE #** 04

**Note:** Base map provided by OCV Architects

**IMPACT ENVIRONMENTAL**

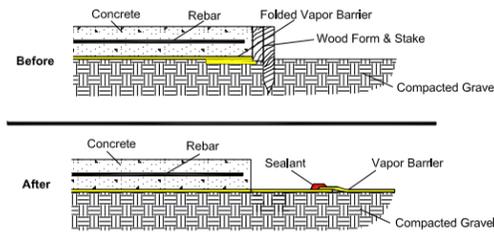
170 KEYLAND COURT  
BOHEMIA, NEW YORK 11716  
TEL (631) 269-8800 FAX (631) 269-1599

1560 BROADWAY, SUITE 1024  
NEW YORK, NEW YORK 10036  
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**Impact Environmental**  
Remedial Action Work Plan  
BCP # 12CBCPO16X

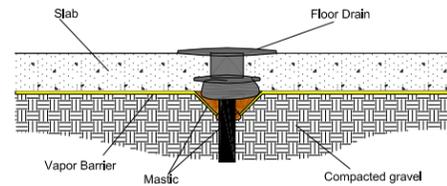
Figure 5  
Vapor Barrier Detail Drawing and Construction Notes

**Construction Joint Application for Large Slabs Placed in Stages**



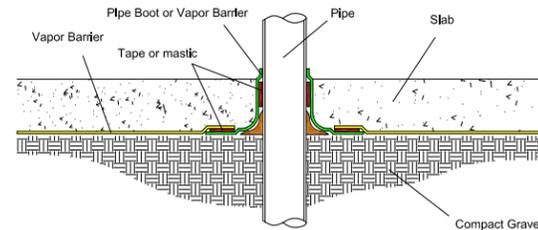
NOT TO SCALE

**Membrane Interaction with Floor Drain**



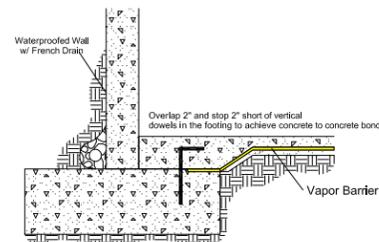
NOT TO SCALE

**Membrane Interaction with Pipe Penetration**



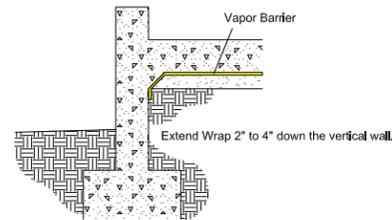
NOT TO SCALE

**Membrane Termination Onto Footing just Short of Rebar Dowels**



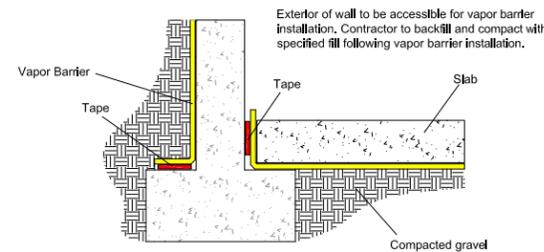
NOT TO SCALE

**Membrane Termination Onto Below Slab Wall Footing**



NOT TO SCALE

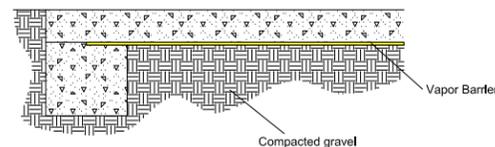
**Membrane Termination Onto Outside Cellar Wall Footing**



NOT TO SCALE

**Membrane Termination Between Footer and Slab Needing Concrete Bond**

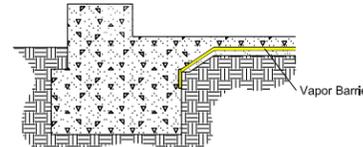
\*Overlap the vapor barrier as far as necessary to ensure that it remains sandwiched between the slab and footer during construction, but not so far that it prohibits adequate bonding of concrete to concrete.



NOT TO SCALE

**Membrane Termination Onto Exterior Wall Footing**

Lap membrane down the vertical face of the footing 2" to 4"



NOT TO SCALE

**VAPOR BARRIER CONSTRUCTION NOTES:**

1. Vapor barrier membrane to be approved by the project design engineer. Membrane shall at a minimum be a Class A Vapor Barrier (ASTM E 1745) and with a minimum thickness of 20 mills. The slab-side of the membrane shall have qualities to allow bonding with the poured concrete. In no case shall membrane contain recycled plastic product or have a permeance of greater than 0.04 perms. Manufacturers samples and cut sheets shall be submitted to the design engineer for approval prior to delivery to site.
2. Vapor barrier materials to be stored in a clean, dry area or per manufacturer's instructions. Materials to be protected during handling and installation to prevent damage.
3. Prepare subsoil as specified by project architect, geotechnical engineer or structural engineer, or in accordance with ACI 302.1R-04 Section 4.1 Install vapor retarder membrane over leveled and compacted 3/4" 2B pea gravel, or an equivalent approved by design engineer. Gravel to be no more than 1-inch in diameter, with no sharp aggregate or projections. Do not begin installation until unacceptable conditions have been corrected.
4. Installation shall be in accordance with manufacturer's instructions, ASTM E 1643-98 (2005), best industry practices, and all applicable federal, state, and local codes. Membrane to be unrolled with the longest dimension parallel to the direction of the pour. Membrane to be installed with smooth side facing down and concrete-bonding side facing up. Succeeding sheets should be accurately positioned to overlap the adjacent sheet by a minimum of 6 inches. Lap membrane over footings and seal to foundation wall. Ensure there are no discontinuities in vapor retarder at seams and penetrations. Laps to be sealed with double-sided asphaltic tape, mastic or equivalent sealant with permeance of 0.3 perms or less approved by the design engineer. Ensure membrane surfaces to receive sealant are clean and dry.
5. Protect membrane from damage during installation of reinforcing steel and utilities, and during placement of concrete slab.
6. No penetrations shall be made except for reinforcing steel, foundations/pile caps, and permanent utilities. Vapor barrier to be inspected for holes or other damage. Small holes to be patched with mastic or approved equivalent, or per manufacturer's instructions. Larger holes to be patched with additional cut-out sections of membrane and sealed on all four sides, or per manufacturer's instructions. All allowed penetrations shall be sealed per manufacturer's instructions. Design engineer must be allowed to inspect final installation prior to pouring slab with sufficient lead-time for the contractor to implement required changes.
7. Place concrete within 30 days of vapor barrier installation.

**Legend**

TITLE: Vapor Barrier Details Drawings and Construction Notes

PROJECT # 2166-03-03-3002

FIGURE # 05

DRAWN BY: WF  
 CHECKED BY: JR  
 DATE: 7-25-2011  
 SCALE: N.T.S.

**IMPACT ENVIRONMENTAL**

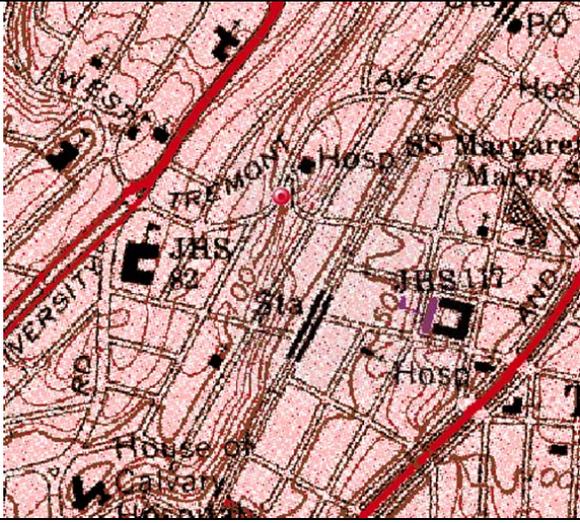
170 KEYLAND COURT  
 BOHEMIA, NEW YORK 11716  
 TEL (631) 269-8800 FAX (631) 269-1599

1560 BROADWAY, SUITE 1024  
 NEW YORK, NEW YORK 10036  
 TEL (212) 201-7905 FAX (212) 201-7906



**Impact Environmental**  
Remedial Action Work Plan  
BCP # 12CBCPO16X

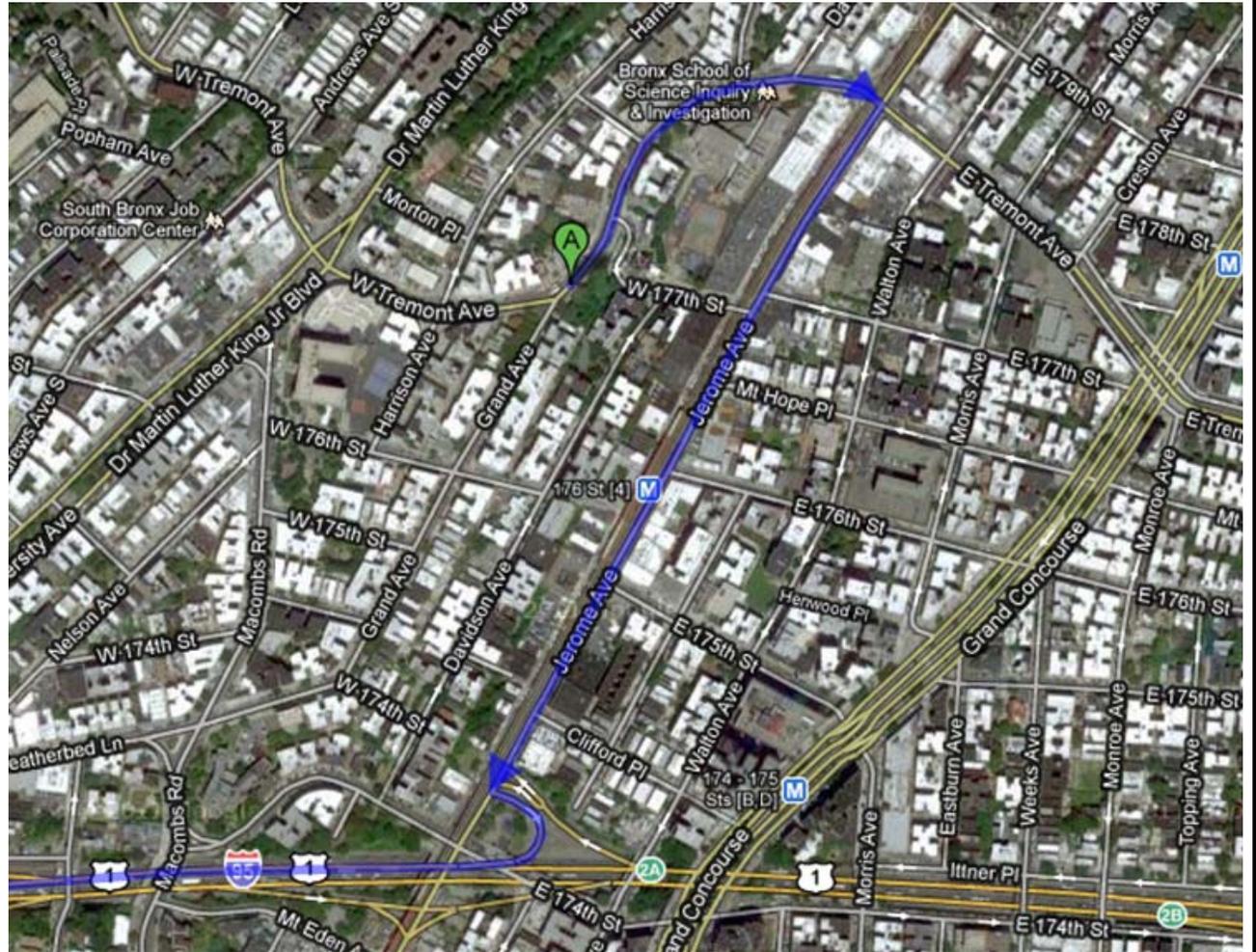
Figure 6  
Truck Route Map



**Figure 6: Truck Route Map**

Tax Map Designation:  
Block 2867; Lots 125 & 128

60 West 177<sup>th</sup> Street/  
92 West Tremont Avenue, Bronx  
New York



**IMPACT ENVIRONMENTAL**



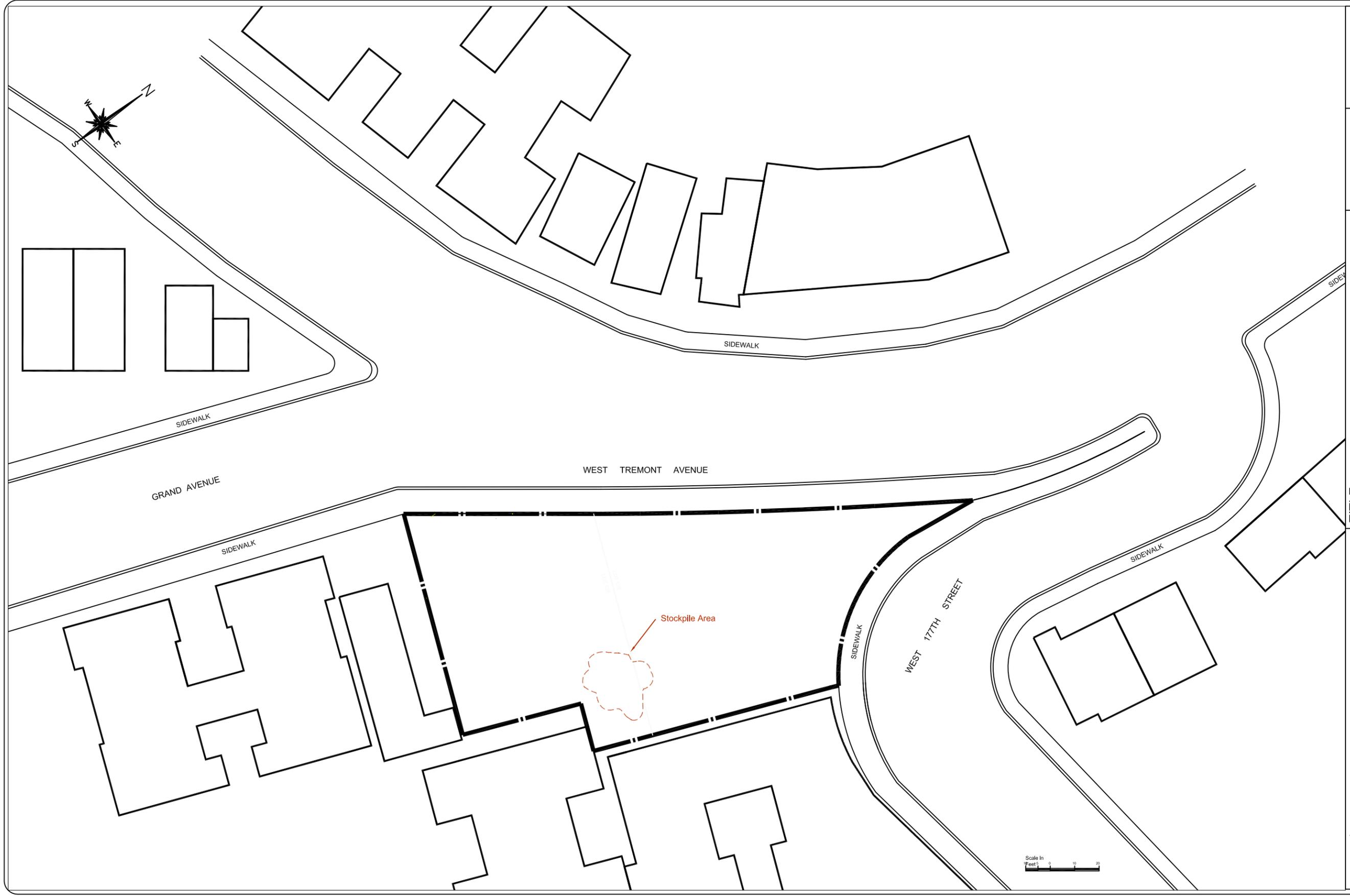
170 KEYLAND COURT  
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1560 BROADWAY, SUITE 1024  
NEW YORK, NEW YORK 10036  
TEL (212) 201-7905 FAX (212) 201-7906

Map Acquired from Google  
**New York State Geographic Information System**  
2001 Half Foot Natural Color Long Island Zone

**Impact Environmental**  
Remedial Action Work Plan  
BCP # 12CBCPO16X

Figure 7  
Reuse Soil Stockpile Area



 <p><b>IMPACT ENVIRONMENTAL</b>          170 KEYLAND COURT          BOHEMA, NEW YORK 11716          TEL (631) 269-8800 FAX (631) 269-1599</p> <p>1580 BROADWAY, SUITE 1024          NEW YORK, NEW YORK 10036          TEL (212) 201-7905 FAX (212) 201-7906</p>	<b>TITLE:</b> Reuse Soil Stockpile Area 60 W 177th St & 92 W Tremont Ave. Bronx, New York		PROJECT # 2166-03-03-3002 Figure # 07 BCP# 12CBCPO16X
	DRAWN BY: JC CHECKED BY: KK DATE: 06/25/2011 SCALE: 1" = 50'		

**Impact Environmental**  
Remedial Action Work Plan  
BCP # 12CBCPO16X

Tables

**Table 1:**  
Soil Cleanup Objectives for on-Site Reuse

Parameter Name	Parameter ID	NYCRR 375 Unrestricted Use
Sample ID		
Unit		<i>ug/kg</i>
1,1,1,2-Tetrachloroethane	VOC	NA
1,1,1-Trichloroethane	VOC	680
1,1,2,2-Tetrachloroethane	VOC	NA
1,1,2-Trichloroethane	VOC	NA
1,1,2 Trichloro-1,2,2 Trifluoroethane	VOC	NA
1-1- Biphenyl	VOC	NA
1,1-Dichloroethane	VOC	270
1,1-Dichloroethene	VOC	330
1,1-Dichloropropene	VOC	NA
1,2,3-Trichlorobenzene	VOC	NA
1,2,3-Trichloropropane	VOC	NA
1,2,4,5-Tetramethylbenzene	VOC	NA
1,2,4-Trimethylbenzene	VOC	3,600
1,2-Dibromo-3-Chloropropane	VOC	NA
1,2-Dibromoethane	VOC	NA
1,2-Dichlorobenzene	VOC	1,100
1,2-Dichloroethane	VOC	20c
1,2-Dichloropropane	VOC	NA
1,3,5-Trimethylbenzene	VOC	8,400
1,3-Dichlorobenzene	VOC	2,400
1,3-Dichloropropane	VOC	NA
1,3-Dichloropropene(cis and trans)	VOC	NA
1,4-Dichlorobenzene	VOC	1,800
1,4-Dioxane	VOC	100b
2,2-Dichloropropane	VOC	NA
2-Butanone	VOC	NA
2-Chlorotoluene	VOC	NA
2-Hexanone	VOC	NA
2-Chloroethyl vinyl ether	VOC	NA
4-Chlorotoluene	VOC	NA
4-Methyl-2-Pentanone	VOC	NA
Acetone	VOC	50
Acrolein	VOC	NA
Acrylonitrile	VOC	NA
Benzene	VOC	60
Benzidine	VOC	NA
Bromobenzene	VOC	NA
Bromochloromethane	VOC	NA
Bromodichloromethane	VOC	NA
Bromoform	VOC	NA
Bromomethane	VOC	NA
Carbon Disulfide	VOC	NA
Carbon Tetrachloride	VOC	760
Chlorobenzene	VOC	1,100
Chlorodibromomethane	VOC	NA
Chloroethane	VOC	NA
Chloroform	VOC	370
Chloromethane	VOC	NA

**Table 1:**  
Soil Cleanup Objectives for on-Site Reuse

Parameter Name	Parameter ID	NYCRR 375 Unrestricted Use
Sample ID		
Unit		<i>ug/kg</i>
cis-1,2-Dichloroethene	VOC	250
cis-1,3-Dichloropropene	VOC	NA
Dibromomethane	VOC	NA
Dichlorodifluoromethane	VOC	NA
Ethylbenzene	VOC	1,000
Isopropylbenzene	VOC	NA
Methyl Acetate	VOC	NA
Methylene Chloride	VOC	50
Methyl Tert-Butyl Ether	VOC	930
Naphthalene	VOC	12,000
n-Butylbenzene	VOC	12,000
n-Propylbenzene	VOC	3,900
p-Diethylbenzene	VOC	NA
p-Ethyltoluene	VOC	NA
p-Isopropyltoluene	VOC	NA
sec-Butylbenzene	VOC	11,000
Styrene	VOC	NA
tert-Butylbenzene	VOC	5,900
Tertiary Butyl Alcohol	VOC	NA
Tetrachloroethene	VOC	1,300
Toluene	VOC	700
Total Xylenes	VOC	260
trans-1,2-Dichloroethene	VOC	190
trans-1,3-Dichloropropene	VOC	NA
Trichloroethene	VOC	470
Trichlorofluoromethane	VOC	NA
Vinyl Acetate	VOC	NA
Vinyl Chloride	VOC	20
Hexachlorobutadiene	SVOC	NA
1,2- Diphenylhydrazine	SVOC	NA
1,2,4-Trichlorobenzene	SVOC	NA
2,4,5-Trichlorophenol	SVOC	NA
2,4,6-Trichlorophenol	SVOC	NA
2,4-Dichlorophenol	SVOC	NA
2,4-Dimethylphenol	SVOC	NA
2,4-Dinitrophenol	SVOC	NA
2,4-Dinitrotoluene	SVOC	NA
2,6-Dinitrotoluene	SVOC	NA
2-Chloronaphthalene	SVOC	NA
2-Chlorophenol	SVOC	NA
2-Methylnaphthalene	SVOC	NA
2-Methylphenol	SVOC	330b
2-Nitroaniline	SVOC	NA
2-Nitrophenol	SVOC	NA
3+4 Methylphenol	SVOC	NA
3,3-Dichlorobenzidine	SVOC	NA
m-Cresol(s)	SVOC	330b
3-Nitroaniline	SVOC	NA

**Table 1:**  
Soil Cleanup Objectives for on-Site Reuse

Parameter Name	Parameter ID	NYCRR 375 Unrestricted Use
Sample ID		
Unit		<i>ug/kg</i>
4,6-Dinitro-2-methylphenol	SVOC	NA
4-Bromophenyl-phenyl ether	SVOC	NA
4-Chloro-3-methylphenol	SVOC	NA
4-Chloroaniline	SVOC	NA
4-Chlorophenyl phenyl ether	SVOC	NA
4-Methylphenol	SVOC	330b
4-Nitroaniline	SVOC	NA
4-Nitrophenol	SVOC	NA
Acenaphthene	SVOC	20,000
Acenaphthylene	SVOC	100,000a
Acetophenone	SVOC	NA
Aniline	SVOC	NA
Anthracene	SVOC	100,000a
Atrazine	SVOC	NA
Azobenzene	SVOC	NA
Benzaldehyde	SVOC	NA
Benzo-a-Anthracene	SVOC	1,000c
Benzo-a-Pyrene	SVOC	1,000c
Benzo-b-Fluoranthene	SVOC	1,000c
Benzo-k-Fluoranthene	SVOC	800c
Total SVOC's Backfill/Landfill	SVOC	NA
Total SVOCs	SVOC	NA
Benzo-g,h,i-Perylene	SVOC	100,000
Benzoic Acid	SVOC	NA
Benzyl Alcohol	SVOC	NA
Bis(2-Chloroethoxy)methane	SVOC	NA
Bis(2-Chloroethyl)ether	SVOC	NA
Bis(2-Chloroisopropyl)ether	SVOC	NA
Bis(2-Ethylhexyl)Phthalate	SVOC	NA
Butylbenzylphthalate	SVOC	NA
Caprolactam	SVOC	NA
Carbazole	SVOC	NA
Chrysene	SVOC	1,000c
Dibenzofuran	SVOC	7,000
Dibenzo-a,h-Anthracene	SVOC	330b
Diethyl Phthalate	SVOC	NA
Dimethyl Phthalate	SVOC	NA
Di-n-Butyl Phthalate	SVOC	NA
Dinitrotoluene(2,4-/2,6-)	SVOC	NA
Di-n-Octyl Phthalate	SVOC	NA
Fluoranthene	SVOC	100,000
Fluorene	SVOC	30,000
Hexachlorobenzene	SVOC	330
Hexachlorocyclopentadiene	SVOC	NA
Hexachloroethane	SVOC	NA
Indeno(1,2,3-cd)Pyrene	SVOC	500c
Isophorone	SVOC	NA
Nitrobenzene	SVOC	NA

**Table 1:**  
Soil Cleanup Objectives for on-Site Reuse

Parameter Name	Parameter ID	NYCRR 375 Unrestricted Use
Sample ID		
Unit		<i>ug/kg</i>
N-Nitrosodimethylamine	SVOC	NA
N-Nitroso-di-n-Propylamine	SVOC	NA
N-Nitrosodiphenylamine	SVOC	NA
Pentachlorophenol	SVOC	800b
Phenanthrene	SVOC	100,000
Phenol	SVOC	330b
Pyrene	SVOC	100,000
2,4,5-T	HERBICIDE	NA
2,4,5-TP Acid	PESTICIDE	3,800
2,4-D	HERBICIDE	NA
2,4-DB	HERBICIDE	NA
4,4-DDD	PESTICIDE	3.3b
4,4-DDE	PESTICIDE	3.3b
4,4-DDT	PESTICIDE	3.3b
Aldrin	PESTICIDE	5c
alpha-BHC	PESTICIDE	20
Aroclor 1016	PCB	NA
Aroclor 1221	PCB	NA
Aroclor 1232	PCB	NA
Aroclor 1242	PCB	NA
Aroclor 1248	PCB	NA
Aroclor 1254	PCB	NA
Aroclor 1260	PCB	NA
beta-BHC	PESTICIDE	36
Chlordane	PESTICIDE	94
delta-BHC	PESTICIDE	40
Dicamba	HERBICIDE	NA
Dieldrin	PESTICIDE	5
Endosulfan	PESTICIDE	NA
Endosulfan I	PESTICIDE	2,400
Endosulfan II	PESTICIDE	2,400
Endosulfan Sulfate	PESTICIDE	2,400
Endrin	PESTICIDE	14
Endrin Aldehyde	PESTICIDE	NA
Endrin Ketone	PESTICIDE	NA
gamma-BHC	PESTICIDE	100
Heptachlor	PESTICIDE	42
Heptachlor Epoxide	PESTICIDE	NA
Methoxychlor	PESTICIDE	NA
Mitotane	PESTICIDE	NA
Parathion	PESTICIDE	NA
Polychlorinated Biphenyls	PESTICIDE	100
Toxaphene	PESTICIDE	NA
Unit		<i>mg/kg</i>
Aluminum, Al	METAL	NA
Antimony, Sb	METAL	NA
Arsenic, As	METAL	13c
Barium, Ba	METAL	350c

**Table 1:**  
Soil Cleanup Objectives for on-Site Reuse

Parameter Name	Parameter ID	NYCRR 375 Unrestricted Use
Sample ID		
Unit		<i>ug/kg</i>
Beryllium, Be	METAL	7.2
Cadmium, Cd	METAL	2.5c
Calcium, Ca	METAL	NA
Chromium, Cr	METAL	NA
Chromium, hexavalent	METAL	1b
Chromium, trivalent	METAL	30c
Cobalt, Co	METAL	NA
Copper, Cu	METAL	50
Cyanide	METAL	27
Iron, Fe	METAL	NA
Lead, Pb	METAL	63c
Magnesium, Mg	METAL	NA
Manganese, Mn	METAL	1,600c
Mercury (inorganic salts)	METAL	1.2
Mercury, Hg	METAL	.18c
Nickel, Ni	METAL	30
Potassium, K	METAL	NA
Selenium, Se	METAL	3.9c
Silver, Ag	METAL	2
Sodium, Na	METAL	NA
Thallium, Tl	METAL	NA
Vanadium, V	METAL	NA
Zinc, Zn	METAL	109c

**Table 2:**  
Backfill/Cover Soil Quality Objectives

		<b>Soil Cleanup objectives NYCRR 375 Residential</b>
<b>Parameter Name</b>	<b>Parameter ID</b>	
Sample ID		
Unit		<i>ug/kg</i>
1,1,1,2-Tetrachloroethane	VOC	NA
1,1,1-Trichloroethane	VOC	100,000a
1,1,2,2-Tetrachloroethane	VOC	35000
1,1,2-Trichloroethane	VOC	NA
1,1,2 Trichloro-1,2,2 Trifluoroethane	VOC	NA
1-1- Biphenyl	VOC	NA
1,1-Dichloroethane	VOC	19,000
1,1-Dichloroethene	VOC	100,000a
1,1-Dichloropropene	VOC	NA
1,2,3-Trichlorobenzene	VOC	NA
1,2,3-Trichloropropane	VOC	80000
1,2,4,5-Tetramethylbenzene	VOC	NA
1,2,4-Trimethylbenzene	VOC	47,000
1,2-Dibromo-3-Chloropropane	VOC	NA
1,2-Dibromoethane	VOC	NA
1,2-Dichlorobenzene	VOC	100,000a
1,2-Dichloroethane	VOC	2,300
1,2-Dichloropropane	VOC	NA
1,3,5-Trimethylbenzene	VOC	47,000
1,3-Dichlorobenzene	VOC	17,000
1,3-Dichloropropane	VOC	NA
1,3-Dichloropropene(cis and trans)	VOC	NA
1,4-Dichlorobenzene	VOC	9,800
1,4-Dioxane	VOC	9,800
2,2-Dichloropropane	VOC	NA
2-Butanone	VOC	100,000a
2-Chlorotoluene	VOC	NA
2-Hexanone	VOC	NA
2-Chloroethyl vinyl ether	VOC	NA
4-Chlorotoluene	VOC	NA
4-Methyl-2-Pentanone	VOC	NA
Acetone	VOC	100,000a
Acrolein	VOC	NA
Acrylonitrile	VOC	NA
Benzene	VOC	2,900
Benzidine	VOC	NA
Bromobenzene	VOC	NA
Bromochloromethane	VOC	NA
Bromodichloromethane	VOC	NA
Bromoform	VOC	NA
Bromomethane	VOC	NA
Carbon Disulfide	VOC	100000
Carbon Tetrachloride	VOC	1,400
Chlorobenzene	VOC	100,000a
Chlorodibromomethane	VOC	NA
Chloroethane	VOC	NA
Chloroform	VOC	10,000

**Table 2:**  
Backfill/Cover Soil Quality Objectives

		<b>Soil Cleanup objectives NYCRR 375 Residential</b>
<b>Parameter Name</b>	<b>Parameter ID</b>	
Sample ID		
Chloromethane	VOC	NA
cis-1,2-Dichloroethene	VOC	59,000
cis-1,3-Dichloropropene	VOC	NA
Dibromomethane	VOC	NA
Dichlorodifluoromethane	VOC	NA
Ethylbenzene	VOC	30,000
Isopropylbenzene	VOC	100000
Methyl Acetate	VOC	NA
Methylene Chloride	VOC	51,000
Methyl Tert-Butyl Ether	VOC	62,000
Naphthalene	VOC	100,000a
n-Butylbenzene	VOC	100,000a
n-Propylbenzene	VOC	100,000a
p-Diethylbenzene	VOC	NA
p-Ethyltoluene	VOC	NA
p-Isopropyltoluene	VOC	NA
sec-Butylbenzene	VOC	100,000a
Styrene	VOC	NA
tert-Butylbenzene	VOC	100,000a
Tertiary Butyl Alcohol	VOC	NA
Tetrachloroethene	VOC	5,500
Toluene	VOC	100,000a
Total Xylenes	VOC	100,000a
trans-1,2-Dichloroethene	VOC	100,000a
trans-1,3-Dichloropropene	VOC	NA
Trichloroethene	VOC	10,000
Trichlorofluoromethane	VOC	NA
Vinyl Acetate	VOC	NA
Vinyl Chloride	VOC	210
Hexachlorobutadiene	SVOC	NA
1,2- Diphenylhydrazine	SVOC	NA
1,2,4- Trichlorobenzene	SVOC	NA
2,4,5- Trichlorophenol	SVOC	100000
2,4,6- Trichlorophenol	SVOC	NA
2,4-Dichlorophenol	SVOC	100000
2,4-Dimethylphenol	SVOC	NA
2,4-Dinitrophenol	SVOC	100000
2,4-Dinitrotoluene	SVOC	NA
2,6-Dinitrotoluene	SVOC	1030
2-Chloronaphthalene	SVOC	NA
2-Chlorophenol	SVOC	100000
2-Methylnaphthalene	SVOC	NA
2-Methylphenol	SVOC	100,000a
2-Nitroaniline	SVOC	NA
2-Nitrophenol	SVOC	NA
3+4 Methylphenol	SVOC	NA
3,3-Dichlorobenzidine	SVOC	NA
m-Cresol(s)	SVOC	100,000a

**Table 2:**  
Backfill/Cover Soil Quality Objectives

		<b>Soil Cleanup objectives NYCRR 375 Residential</b>
<b>Parameter Name</b>	<b>Parameter ID</b>	
Sample ID		
3-Nitroaniline	SVOC	NA
4,6-Dinitro-2-methylphenol	SVOC	NA
4-Bromophenyl-phenyl ether	SVOC	NA
4-Chloro-3-methylphenol	SVOC	NA
4-Chloroaniline	SVOC	100000
4-Chlorophenyl phenyl ether	SVOC	NA
4-Methylphenol	SVOC	34,000
4-Nitroaniline	SVOC	NA
4-Nitrophenol	SVOC	NA
Acenaphthene	SVOC	100,000a
Acenaphthylene	SVOC	100,000a
Acetophenone	SVOC	NA
Aniline	SVOC	48000
Anthracene	SVOC	100,000a
Atrazine	SVOC	NA
Azobenzene	SVOC	NA
Benzaldehyde	SVOC	NA
Benzo-a-Anthracene	SVOC	1,000f
Benzo-a-Pyrene	SVOC	1,000f
Benzo-b-Fluoranthene	SVOC	1,000f
Benzo-k-Fluoranthene	SVOC	1,000
Total SVOC's Backfill/Landfill	SVOC	NA
Total SVOCs	SVOC	NA
Benzo-g,h,i-Perylene	SVOC	100,000a
Benzoic Acid	SVOC	100000
Benzyl Alcohol	SVOC	NA
Bis(2-Chloroethoxy)methane	SVOC	NA
Bis(2-Chloroethyl)ether	SVOC	NA
Bis(2-Chloroisopropyl)ether	SVOC	NA
Bis(2-Ethylhexyl)Phthalate	SVOC	50000
Butylbenzylphthalate	SVOC	100000
Caprolactam	SVOC	NA
Carbazole	SVOC	NA
Chrysene	SVOC	1,000f
Dibenzofuran	SVOC	14,000
Dibenzo-a,h-Anthracene	SVOC	330e
Diethyl Phthalate	SVOC	100000
Dimethyl Phthalate	SVOC	100000
Di-n-Butyl Phthalate	SVOC	100000
Dinitrotoluene(2,4-/2,6-)	SVOC	NA
Di-n-Octyl Phthalate	SVOC	100000
Fluoranthene	SVOC	100,000a
Fluorene	SVOC	100,000a
Hexachlorobenzene	SVOC	330e
Hexachlorocyclopentadiene	SVOC	NA
Hexachloroethane	SVOC	NA
Indeno(1,2,3-cd)Pyrene	SVOC	500f
Isophorone	SVOC	100000

**Table 2:**  
Backfill/Cover Soil Quality Objectives

		<b>Soil Cleanup objectives NYCRR 375 Residential</b>
<b>Parameter Name</b>	<b>Parameter ID</b>	
Sample ID		
Nitrobenzene	SVOC	3700
N-Nitrosodimethylamine	SVOC	NA
N-Nitroso-di-n-Propylamine	SVOC	NA
N-Nitrosodiphenylamine	SVOC	NA
Pentachlorophenol	SVOC	2,400
Phenanthrene	SVOC	100,000a
Phenol	SVOC	100,000a
Pyrene	SVOC	100,000a
2,4,5-T	HERBICIDE	100000
2,4,5-TP Acid	PESTICIDE	58,000
2,4-D	HERBICIDE	100000
2,4-DB	HERBICIDE	NA
4,4-DDD	PESTICIDE	2,600
4,4-DDE	PESTICIDE	1,800
4,4-DDT	PESTICIDE	1,700
Aldrin	PESTICIDE	19
alpha-BHC	PESTICIDE	97
Aroclor 1016	PCB	NA
Aroclor 1221	PCB	NA
Aroclor 1232	PCB	NA
Aroclor 1242	PCB	NA
Aroclor 1248	PCB	NA
Aroclor 1254	PCB	NA
Aroclor 1260	PCB	NA
beta-BHC	PESTICIDE	72
Chlordane	PESTICIDE	910
delta-BHC	PESTICIDE	100,000a
Dicamba	HERBICIDE	NA
Dieldrin	PESTICIDE	39
Endosulfan	PESTICIDE	NA
Endosulfan I	PESTICIDE	4,800i
Endosulfan II	PESTICIDE	4,800i
Endosulfan Sulfate	PESTICIDE	4,800i
Endrin	PESTICIDE	2,200
Endrin Aldehyde	PESTICIDE	NA
Endrin Ketone	PESTICIDE	NA
gamma-BHC	PESTICIDE	280
Heptachlor	PESTICIDE	420
Heptachlor Epoxide	PESTICIDE	77
Methoxychlor	PESTICIDE	100000
Mitotane	PESTICIDE	NA
Parathion	PESTICIDE	100000
Polychlorinated Biphenyls	PESTICIDE	1,000
Unit		<i>mg/kg</i>
Aluminum, Al	METAL	NA
Antimony, Sb	METAL	NA
Arsenic, As	METAL	16f

**Table 2:**  
Backfill/Cover Soil Quality Objectives

		<b>Soil Cleanup objectives NYCRR 375 Residential</b>
<b>Parameter Name</b>	<b>Parameter ID</b>	
Sample ID		
Barium, Ba	METAL	350f
Beryllium, Be	METAL	14
Cadmium, Cd	METAL	2.5f
Calcium, Ca	METAL	NA
Chromium, Cr	METAL	NA
Chromium, hexavalent	METAL	22
Chromium, trivalent	METAL	36
Cobalt, Co	METAL	30000
Copper, Cu	METAL	270
Cyanide	METAL	27
Iron, Fe	METAL	2000000
Lead, Pb	METAL	400
Magnesium, Mg	METAL	NA
Manganese, Mn	METAL	2,000f
Mercury (inorganic salts)	METAL	NA
Mercury, Hg	METAL	0.81j
Nickel, Ni	METAL	140
Potassium, K	METAL	NA
Selenium, Se	METAL	36
Silver, Ag	METAL	36
Sodium, Na	METAL	NA
Thallium, Tl	METAL	NA
Vanadium, V	METAL	100000
Zinc, Zn	METAL	2,200

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Appendices

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Appendix A:  
Proposed Building Plan

WEST TREMONT AVENUE

WEST 177TH STREET

PROPOSED 5 STORY BUILDING

REAR YARD

EXISTING 6 STORY BUILDING

EXISTING 3 STORY BUILDING

EXISTING 6 STORY BUILDING

EXISTING 6 STORY BUILDING



SK-01

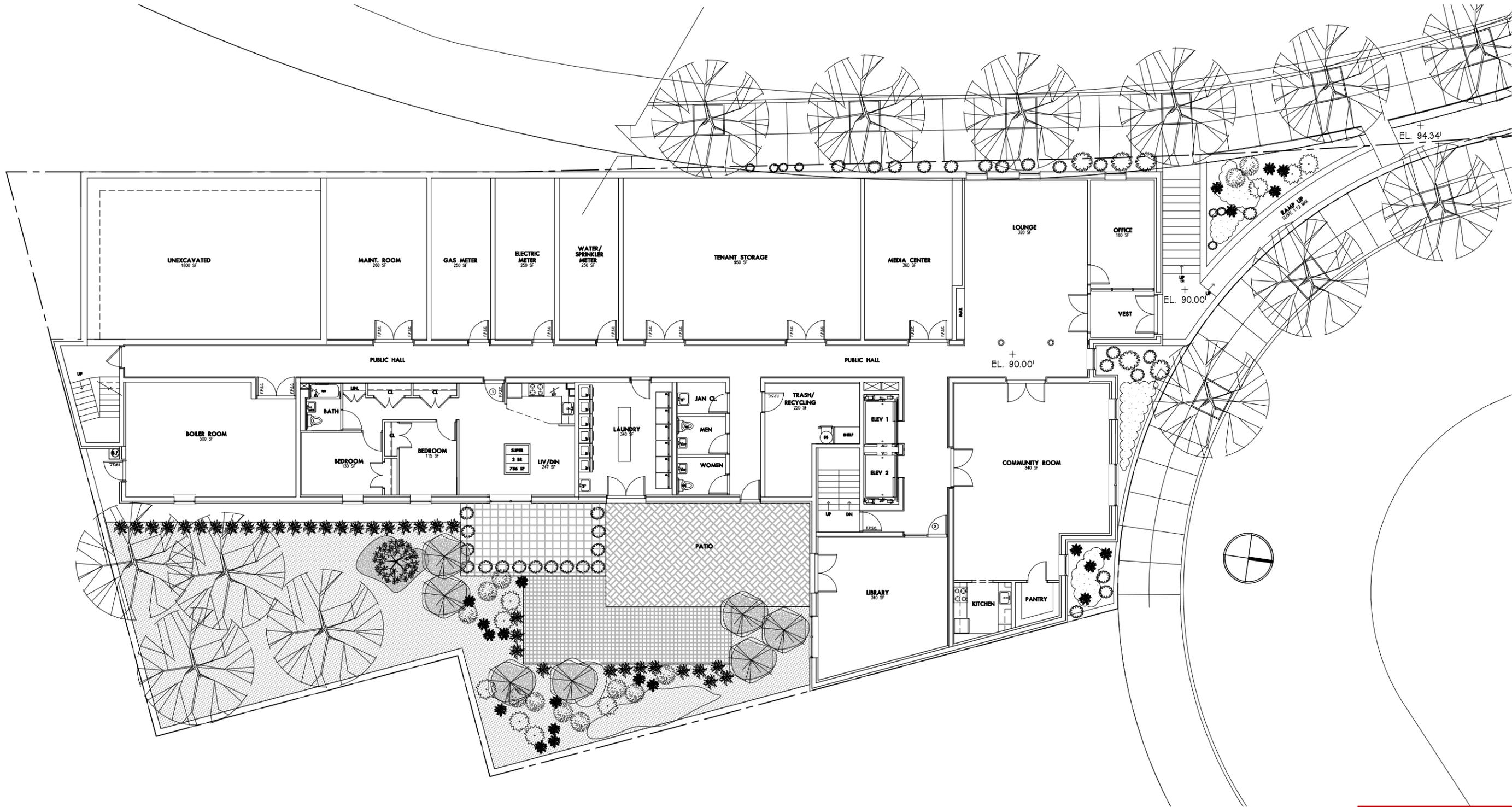
SCHEMATIC SITE PLAN

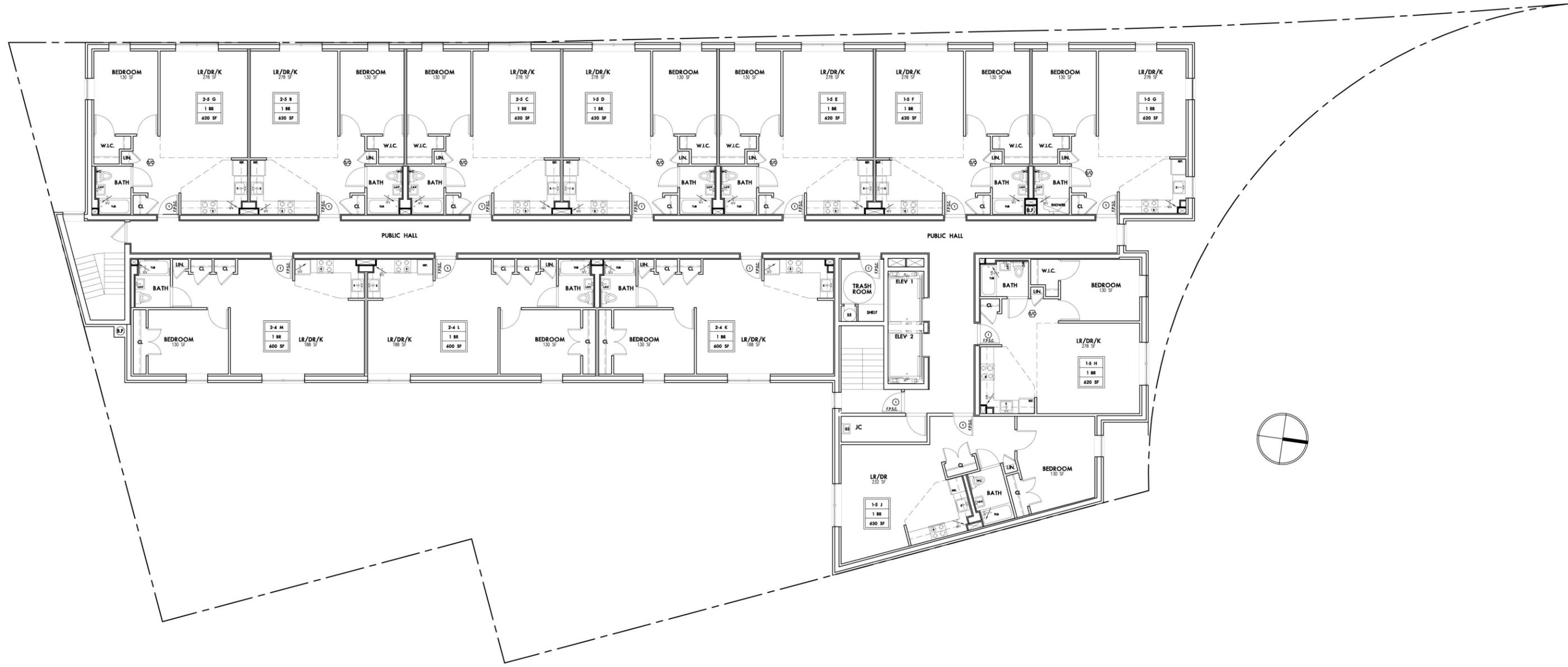
SENIOR CITIZENS' RESIDENCE  
92 WEST TREMONT AVENUE

1/16"=1'-0"  
2/3/10



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SK-03

SCHEMATIC PLAN - FLOORS 1-5

SENIOR CITIZENS' RESIDENCE  
 92 WEST TREMONT AVENUE  
 1/16"=1'-0"  
 2/3/10



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SK-04

WEST TREMONT ELEVATION

SENIOR CITIZENS' RESIDENCE  
92 WEST TREMONT AVENUE

1/16"=1'-0"  
2/03/10



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**SK-05**

**WEST 177th STREET ELEVATION**

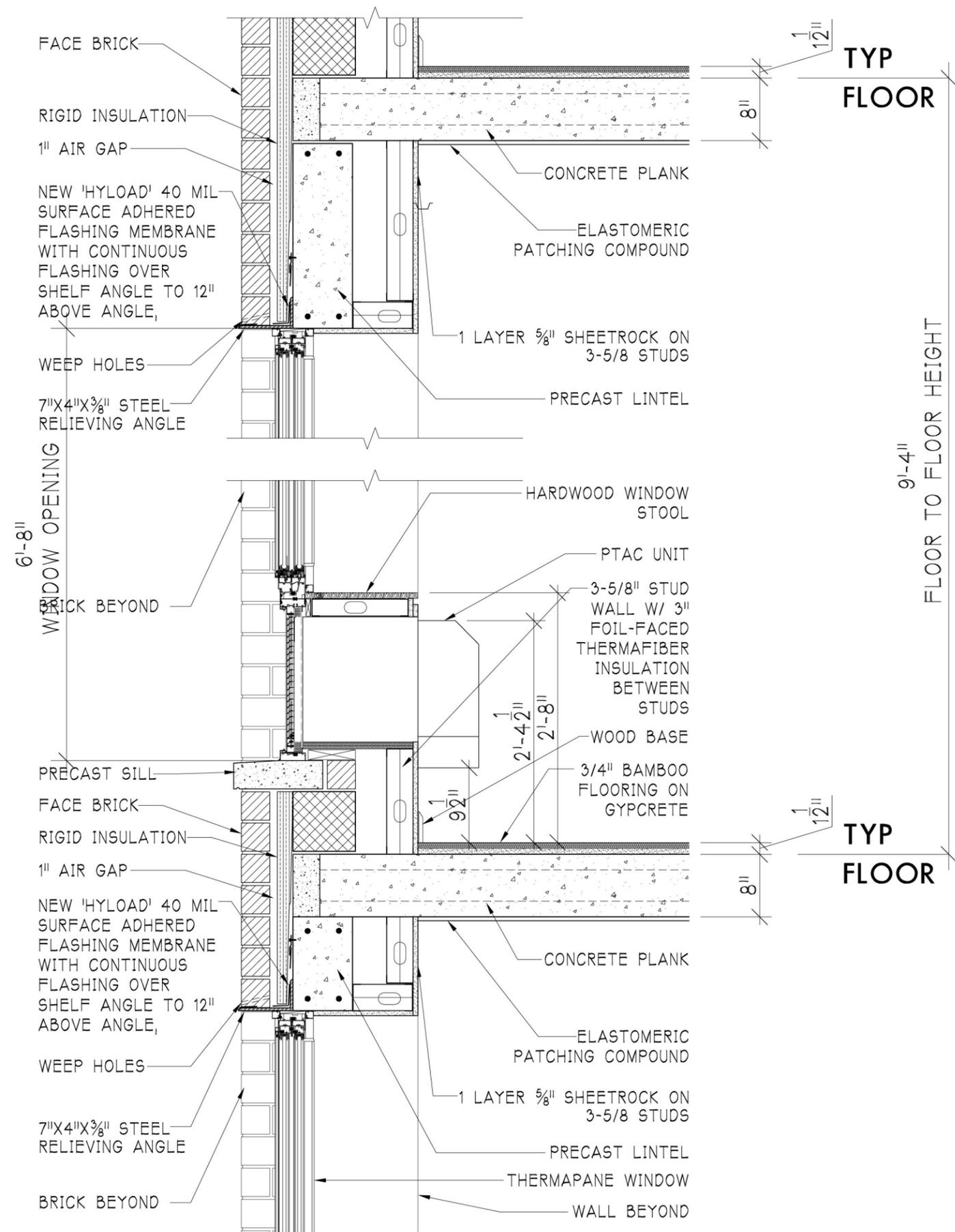
**SENIOR CITIZENS' RESIDENCE  
92 WEST TREMONT AVENUE**

1/16"=1'-0"

2/3/10

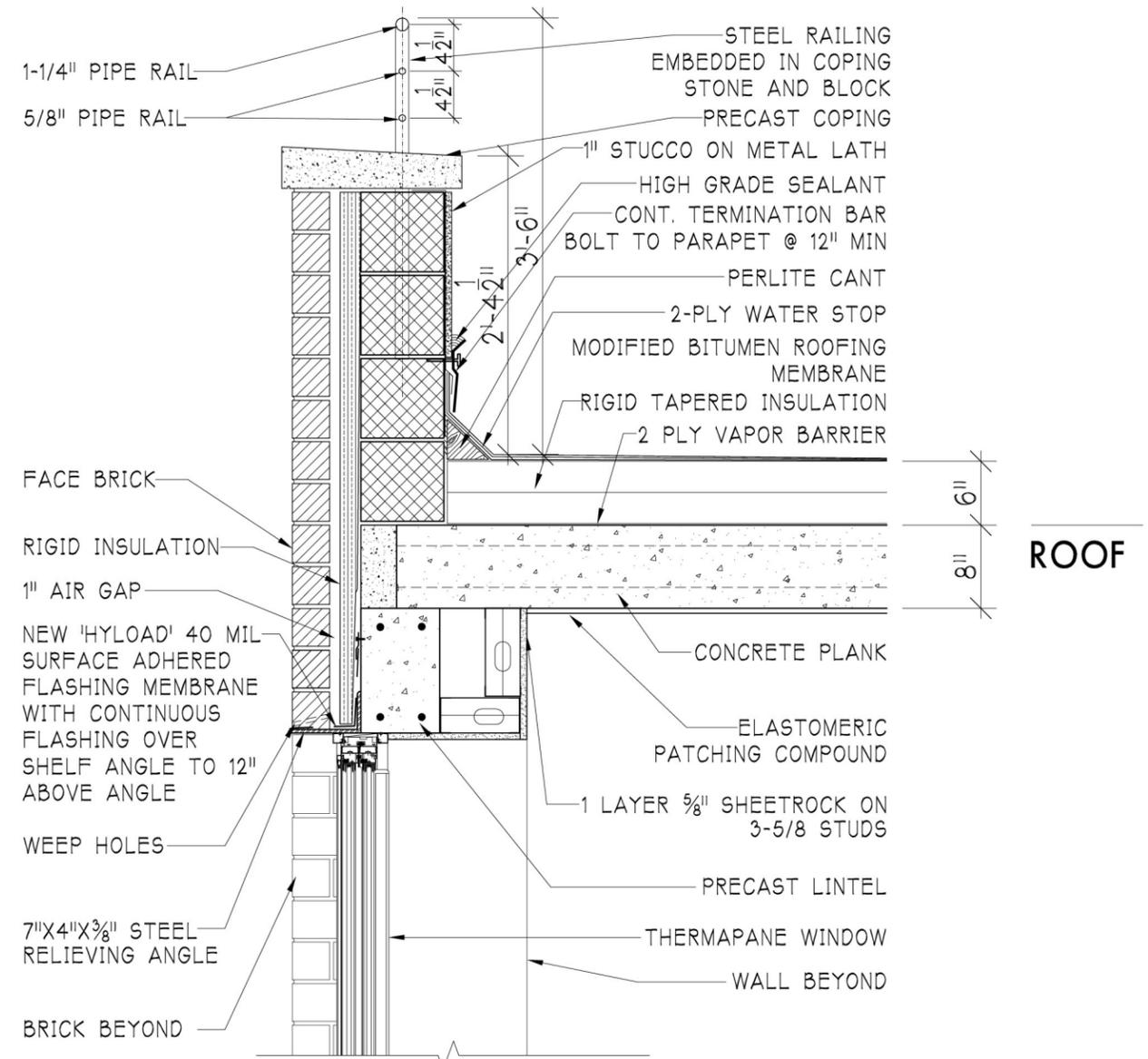


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TYPICAL WALL SECTION

SCALE: 3/4" = 1'-0"



SK-06  
TYPICAL WALL SECTION

SENIOR CITIZENS' RESIDENCE  
92 WEST TREMONT AVENUE

3/4"=1'-0"  
2/03/10

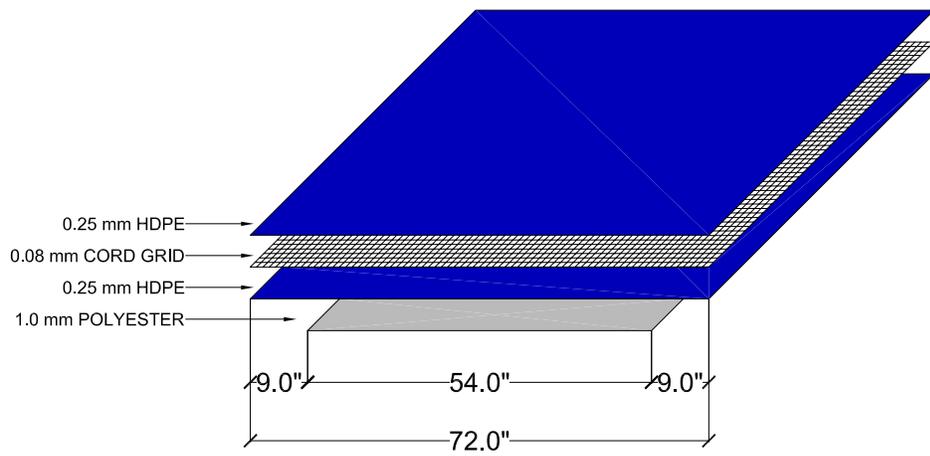
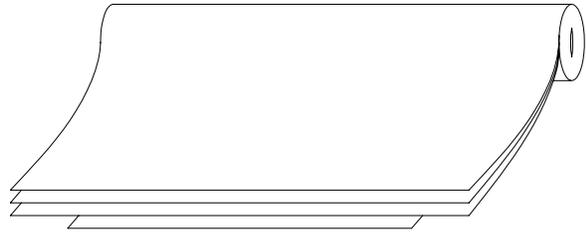


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Appendix B:  
ECC Type II Vapor Barrier Specifications

## TYPE II VAPOR BARRIER LAYOUT



Engineering Control Corp (ECC) is a full service company providing environmental construction support services and engineering controls, with a focus on the construction and development industries. ECC specializes in four major areas of environmental engineering controls: dewatering, groundwater treatment, vapor barriers, and earthen caps. ECC also provides site-specific solutions such as contaminant cut-off walls, sub-slab depressurization systems, hydrogeological pilot testing, and permitting assistance.



Recent reforms in the regulatory world have changed the rules for construction and development projects. Environmental policy has shifted towards limiting contaminant exposure in all stages of the building process, including measures such as treatment of dewatering fluids during excavation, installation of a vapor barrier before pouring a floor slab, or provision of a clean fill earthen cap before landscaping outdoor areas. ECC has the expertise to help navigate these challenges, from the pre-bid planning phase through the final phases of construction.

ECC provides services and products for the Metro New York area, the greater northeast, and nationwide. Contact us to discuss the best strategy for your project.

## VAPOR BARRIERS

Perhaps the hottest topic in the environmental regulatory world right now is that of 'soil vapor intrusion', or the migration of volatile organic vapors into building interiors. These often dangerous vapors originate from contaminated subsurface soil or groundwater, and are pulled through the floor slab by the naturally occurring negative pressures created inside of most buildings. Long-term exposure to these vapors can cause serious illness or death, and build-up of some vapors may cause an explosion hazard.



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The fundamental defense to vapor intrusion is placement of a vapor barrier/retarder membrane on top of compacted aggregate, directly below a newly poured floor slab. Many environmental regulatory agencies, health departments, and building departments nationwide have developed new rules requiring vapor barriers/retarders at contaminated sites, and in some cases, uncontaminated sites. Choosing the proper membrane is a function of the type of expected subsurface contaminants, construction conditions, and expected soil settlement. Recent case studies have demonstrated that standard 6-mil polyethylene (Visqueen) sheeting purchased at contractor supply shops is NOT an effective or long-term barrier against contaminants, as high recycled plastic content may contribute to quicker degradation.