

**335 GRAND CONCOURSE
BRONX, NEW YORK**

Remedial Action Work Plan

VCP Project Number:15CVCP020X

OER Project Number: 14EHAN453X

Prepared for:

GCH, LLC

335 Grand Concourse, Bronx,

New York 10451

Prepared by:

ESPL Environmental Consultants Corporation

2 West 32nd Street

212-330-7501

AUGUST 2014

REMEDIAL ACTION WORK PLAN

TABLE OF CONTENTS

TABLE OF CONTENTS.....	ii
FIGURES	iv
TABLES	v
APPENDICES	vi
LIST OF ACRONYMS	vii
CERTIFICATION	1
EXECUTIVE SUMMARY	2
REMEDIAL ACTION WORK PLAN.....	11
1.0 SITE BACKGROUND.....	11
1.1 Site Location and Current usage.....	11
1.2 proposed Redevelopment Plan.....	11
1.3 Description of Surrounding Property.....	12
1.4 remedial investigation.....	12
2.0 REMEDIAL ACTION OBJECTIVES.....	15
3.0 REMEDIAL Alternatives analysis	16
3.1 THRESHOLD CRITERIA	18
3.2. BALANCING CRITERIA	19
4.0 REMEDIAL ACTION	25
4.1 Summary of Preferred Remedial Action.....	25
4.2 Soil Cleanup Objectives and soil/Fill management	27
4.3 Engineering Controls	31
4.4 Institutional Controls	32
4.5 Site Management plan.....	33
4.6 Qualitative Human Health Exposure Assessment	34
5.0 REMEDIAL ACTION MANAGEMENT.....	38
5.1 Project Organization and Oversight.....	38
5.2 Site Security	38
5.3 Work Hours.....	38

5.4	Construction Health and Safety Plan	38
5.5	Community Air Monitoring Plan.....	39
5.6	Agency Approvals	41
5.7	Site Preparation.....	41
5.8	Traffic Control	45
5.9	Demobilization.....	45
5.10	Reporting and Record Keeping.....	46
5.11	Complaint Management.....	47
5.12	Deviations from the Remedial Action Work Plan	47
6.0	REMEDIAL ACTION REPORT	48
7.0	SCHEDULE	50

FIGURES

List of Typical Figures

- Figure 1- Site Location Map
- Figure 2- Redevelopment Plan
- Figure 3- Site excavation diagrams
- Figure 4- Map of end point sample locations
- Figure 5- Sub-slab depressurization design diagrams

TABLES

List of Tables

- Tables 1-4 Analytical results for soil
- Table 5 - Soil Cleanup Objectives and Soil/Fill Management

APPENDICES

List of Appendices

- Appendix 1 - Citizen Participation Plan
- Appendix 2 - Sustainability Statement
- Appendix 3 - Soil/Materials Management Plan
- Appendix 4 - Construction Health and Safety Plan
- Appendix 5 - Sample Hazardous or Non-Hazardous Soil Disposal Manifest
- Appendix 6 - Design Diagrams and Specifications for Vapor Barrier/Waterproofing Membrane and sub-slab depressurization system

LIST OF ACRONYMS

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

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

CERTIFICATION

I, Ray Kahn, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the 335 Grand Concourse OER Site No. 14EHAN453X and NYC VCP Number: 15CVCP020X.

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.

Ray Kahn

Name

75099

NYS P.E. License Number

Ray Kahn

Signature

8/6/2014

Date



EXECUTIVE SUMMARY

GCH LLC is enrolling in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 4,937-square foot site located at 335 Grand Concourse in Brooklyn, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

Site Location and Current Usage

The Site is located at 335 Grand Concourse in the Mott Haven section in Bronx, New York and is identified as Block 2345 and Lot 1 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 4,937-square feet and is bounded by East 144th Street to the north, 140th Street to the south, Grand Concourse to the east, and Walton Avenue to the west. A map of the site boundary is shown in Figure 3. Currently, the Site is used for an auto repair shop and contains a one- story building with no basement and four service bays.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of nine story hotel with 80 guest rooms and three parking spaces. The hotel will be built to the property lines with the exception of a 30' by 20' section which has been reserved for the parking of three cars. There is no basement or sub area proposed. Layout of the proposed site development is presented in Figure 2. The current zoning designation is C6-2A which is a commercial/residential district. The proposed use is consistent with existing zoning for the property.

Summary of the Remedy

The proposed remedial action achieves protection of public health and the environment for the intended use of the property. The proposed remedial action achieves all of the remedial action objectives established for the project and addresses applicable standards, criterion, and guidance; is effective in both the short-term and long-term and reduces mobility, toxicity and

volume of contaminants; is cost effective and implementable; and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Selection of NYSDEC 6NYCRR Part 375 Table 6.8; Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Excavation and removal of soil/fill exceeding Unrestricted Use Track 1 SCOs. Soil/fill at this property extends to depth of 3 feet below grade, and is underlain by bedrock. Entire property will be excavated to a depth of approximately 4 feet below grade for development purposes. A small area (elevator shaft) will be excavated deeper into bedrock. Approximately 820 tons of soil/bedrock will be excavated and removed from this property.
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
7. Management of excavated materials including temporarily stockpiling and segregating to prevent co-mingling of contaminated material and non-contaminated materials.
8. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.
9. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.

10. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.
11. End point samples are not necessary if bedrock is reached underneath the entire footprint of new development. Excavation for development is expected to go into bedrock. If any soils/fill remains behind, endpoint samples will be collected to determine the performance of the remedy with respect to attainment of Track 1 SCOs.
12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
13. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
14. Maintain records as described in this RAWP, including waste disposal manifests, clean fill/top soil sampling results, and appropriate health and safety forms and documentation.
15. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes any or all Engineering and Institutional Controls to be implemented at the Site.

If Track 1 SCOs are not achieved, the following construction elements will constitute Engineering and Institutional controls:

16. As part of development, construction and maintenance of an engineered composite cover consisting of concrete and building slab, to prevent human exposure to residual soil/fill remaining under the Site.
17. As part of development, installation and operation of a Passive Sub-Slab Depressurization System as part of the proposed development.
18. Installation of a vapor barrier system beneath the building slab and outside foundation sidewalls below grade.

19. If Track 1 SCOs are not achieved, submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
20. If Track 1 SCOs are not achieved, Recording of a Declaration of Covenants and Restrictions that includes a listing of Engineering Controls and Institutional Controls and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

COMMUNITY PROTECTION STATEMENT

The Office of Environmental Remediation created the New York City Voluntary Cleanup Program (NYC VCP) to provide governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action Work Plan (“cleanup plan”) describes the findings of prior environmental studies that show the location of contamination at the site, and describes the plans to clean up the site to protect public health and the environment.

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

Remedial Investigation and Cleanup Plan. Under the NYC VCP, a thorough cleanup study of this property (called a remedial investigation) has been performed to identify past property usage, to sample and test soils, groundwater and soil vapor, and identify contaminant sources present on the property. The cleanup plan has been designed to address all contaminant sources that have been identified during the study of this property.

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

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

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

Site Safety Coordinator. This project has a designated Site safety coordinator to implement the Health and Safety Plan. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is Bhupender Singh and can be reached at 917-731-8770.

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 Sanjay Patel at 516-351-2400 or NYC Office of Environmental Remediation Project Manager William Wong at 212341-0659.

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 7:00 AM to 6:00 PM Monday through Friday.

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

Complaint Management. The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager Sanjay Patel at 516-351-2400, the NYC Office of Environmental Remediation Project Manager William Wong at 212-341-0659, or call 311 and mention the Site is in the NYC Voluntary Cleanup Program.

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

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

Soil Chemical Testing and Screening. All excavations will be supervised by a trained and properly qualified environmental professional. In addition to extensive sampling and chemical testing of soils on the Site, excavated soil will be screened continuously using hand-held

instruments, by sight, and by smell to ensure proper material handling and management, and community protection.

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

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

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

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

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

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

Final Report. The results of all cleanup work will be fully documented in a final report (called a Remedial Action Report) that will be available for you to review in the public document repositories located at New York Public Library located at 321 E. 140th Street, Bronx, NY.

Long-Term Site Management. If long-term protection is needed after the cleanup is complete, the property owner will be required to comply with an ongoing Site Management Plan that calls for continued inspection of protective controls, such as Site covers. The Site Management Plan is evaluated and approved by the NYC Office of Environmental Remediation. Requirements that the property owner must comply with are established through a city environmental designation. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved cleanup is still effective.

REMEDIAL ACTION WORK PLAN

1.0 SITE BACKGROUND

GCH LLC is enrolling in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 335 Grand Concourse in the Mott Haven section of 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 335 Grand Concourse in the Mott Haven section in Bronx, New York and is identified as Block 2345 and Lot 1 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 4,937-square feet and is bounded by East 144th Street to the north, 140th Street to the south, Grand Concourse to the east, and Walton Avenue to the west. A map of the site boundary is shown in Figure 3. Currently, the Site is used for an auto repair shop and contains a one- story building with no basement and four service bays.

1.2 PROPOSED REDEVELOPMENT PLAN

The proposed future use of the Site will consist of nine story hotel with 80 guest rooms and three parking spaces. The hotel will be built to the property lines with the exception of a 30’ by 20’ section which has been reserved for the parking of three cars. There is no basement or sub area proposed. Layout of the proposed site development is presented in Figure 2. The current zoning designation is C6-2A which is a commercial/residential district. The proposed use is consistent with existing zoning for the property.

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

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The surrounding area is a mixed commercial and residential. The zoning for the surrounding area is C6-2A, M1-4/R6A, C4-4 and M1-2. To the north there is the All-City Corporate Transportation, which is mainly offices, the south is LMC Car Wash and Lube, the east is a mix of auto repair shops, medical care and rehabilitation, and NY Taxi Equipment and Upholstery and to the west are several multi-story commercial buildings.

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, 335 Grand Concourse*”, dated May, 2014 (RIR).

Summary of Past Uses of Site and Areas of Concern

Based on the available Sanborn Maps dated from 2005 to 1891, the Site was developed after to 1908 for use as a garage with 2-550 gallon USTs. From at least 1944 to 1981, the site was a filling station with 5 gas tanks and from 1984-2007 the site was listed as an auto repair without filling stations. Prior to October of 1980 the site was deeded to Texaco Inc. and in September of 2012 the site was deeded to GCH LLC, 335 Grand Concourse from Enrique Pita.

The AOCs identified for this site include:

1. Area A – the area of the fill ports and where the anomalies were detected by the GPR. (SB-1)
2. Area B – historical fill conditions. (SB-2)
3. Area C - the proposed area where the elevator pit is to be installed. (SB-5, MW-1, SVP-2)
4. Area D – the area of the AST (SB-4, SVP-3)

Summary of the Work Performed under the Remedial Investigation

ESPL performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed five soil borings across the entire project Site, and collected five soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed one groundwater monitoring wells throughout the Site to establish groundwater flow and collected one groundwater samples for chemical analysis to evaluate groundwater quality;
4. Installed three soil vapor probes around Site perimeter and collected three samples for chemical analysis.

Summary of Environmental Findings

1. Fairly flat with slight pitch from west to east
2. Depth to groundwater at the Site is 5 feet.
3. Since there was only one MW installed on site, the exact GW flow direction is unknown, however, following the surface grade, GW will most probably flows from north west to south east
4. Depth to bedrock is approximately 3 to 6 feet at the Site.
5. The stratigraphy of the site, from the surface down, consists of three feet of recycled concrete aggregate (RCA) and rock below it.
6. Soil samples collected during remedial investigation were compared to the 6NYCRR Part 375-6.8 Track 1 - Unrestricted Use Soil Cleanup Objectives (UUSCOs) and Track 2 - Restricted Residential Soil Cleanup Objectives (RRSCO). Soil/fill samples showed no VOC or PCBs detected above Unrestricted Use and Restricted Residential Use SCOs. One SVOC, benzo(b)fluoranthene at a concentration 1,100 ppb was detected above Unrestricted and Restricted Residential SCOs in one one sample. Metals including copper (max. of 491 ppm), mercury (max. of 0.19 ppm), zinc (max. of 457 ppm), nickel

(max. of 110 ppm) and lead (max. of 308 ppm) exceeded their respective Unrestricted Use SCOs. Of these metals, copper also exceeded Restricted Residential Use SCOs. Pesticides including 4,4' -DDT at a concentration of 29 ppb and 4,4' -DDE at a concentration of 11 ppb, exceeded Unrestricted Use SCOs in one sample, well below its Restricted Residential SCOs. Overall, soil chemistry is unremarkable and does not indicate any disposal condition.

7. Groundwater sample collected during the RI was compared to NYSDEC Part 703.5 Groundwater Quality Standards (GQS). Groundwater results showed no VOC, SVOCs, PCBs or pesticides at detectable concentrations. Several dissolved metals were identified, but only iron exceeded its GQSs. The RI results indicate that groundwater has not been impacted by site conditions.
8. Soil vapor samples collected during the RI was compared to the compounds listed in Table 3.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion. Several petroleum related and chlorinated VOCs were detected in soil vapor samples collected during the RI. Soil vapor samples showed petroleum related and associated derivatives in all three soil vapor samples. Highest reported concentrations were for acetone ($1010 \mu\text{g}/\text{m}^3$), 1,3,5-Trimethylbenzene ($590 \mu\text{g}/\text{m}^3$), and p-&m- xylene ($1010 \mu\text{g}/\text{m}^3$). Petroleum related VOCs included BTEX compounds that were found throughout the Site, with the highest concentration at $1,160 \text{ ug}/\text{m}^3$. Chlorinated VOCs including tetrachloroethylene (PCE) was detected in all three of the soil vapor samples at a maximum concentration of $53 \text{ ug}/\text{m}^3$. Trichloroethylene was also detected in all three of the soil vapor samples at a maximum concentration of $39.1 \text{ ug}/\text{m}^3$. Carbon Tetrachloride was detected in all three of the soil vapor samples at a maximum concentration of $22.6 \text{ ug}/\text{m}^3$. TCA was not detected. TCE concentrations are above the monitoring level range established by NYSDOH guidance matrix.

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.

Soil

- Prevent direct contact with 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

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

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

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

Alternative 1 involves

- Selection of NYDEC 6NYCRR Part 375 Table 6.8 Unrestricted Use (Track 1) Soil Cleanup Objective (SCOs);
- Removal of all soil/ fill exceeding Track 1 Unrestricted Use SCOs throughout the Site and confirmation that Track 1 Unrestricted Use SCOs has been achieved with post-excavation endpoint sampling. Based on the results of the remedial investigation, it is

expected that this alternative would require excavation to a depth of approximately 3-4 feet to remove all historic fill at the Site. Excavation for development purposes would take place to a depth of approximately 4 feet. If soil/ fill containing analytes at concentrations above Track 1 Unrestricted Use SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building is complete, additional excavation will be performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCOs.

- No Engineering or Institutional Controls are required in a Track 1 cleanup, but a vapor barrier and a passive sub-slab depressurization system (SSDS) will be installed beneath the foundation of the new building as part of construction to prevent exposures from off-Site soil vapor.
- Placement of a final cover over the entire Site as part of new construction.

Alternative 2 involves

- Establishment of site-specific Track 4 SCOs.
- Removal of all soil/ fill exceeding Track 4 Site-Specific SCOs and confirmation that Track 4 has been achieved with post-excavation endpoint sampling. Excavation for development purposes would take place to a depth of approximately 4 feet. If soil/ fill containing SVOCs or metals at concentrations above Track 4 Site-Specific SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building is complete, additional excavation will be performed to ensure complete removal of soil that does not meet Track 4 Site-Specific SCOs.
- Placement of a final cover over the entire site to eliminate exposure to remaining soil/fill;
- Placement of a soil vapor barrier beneath the building slab and along foundation side walls and a passive sub-slab depressurization system beneath the foundation to the presence of off-site impacts to soil vapor;
- Establishment of use restrictions including prohibitions on the use of groundwater from the site and prohibitions on sensitive site uses, such as farming or vegetable gardening, to eliminate future exposure pathways.

- Establishment of an approved Site Management Plan to ensure long-term management of these engineering and institutional controls including the performance of periodic inspections and certification that the controls are performing as they were intended; and
- Continued registration as an E-designated property to memorialize the remedial action and the Engineering and Institutional Controls required by this RAWP.

3.1 THRESHOLD CRITERIA

Protection of Public Health and the Environment

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

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

Alternative 2 would achieve comparable protections of human health and the environment since soil to a depth of 4 feet will be removed for purposes of construction and by ensuring that remaining soil/ fill on-Site meets Track 4 Site-Specific SCOs as well as by placement of institutional and engineering controls, including a composite cover system. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Implementing institutional controls including a site management plan and continued "E" designation of property would ensure that the composite cover system remains intact and protective. Establishment of Track 4 Site-Specific SCOs would minimize the risk of contamination leaching into groundwater.

For both Alternatives, potential exposure to contaminated soils during construction would be minimized by implementing an approved Soil and Materials Management Plan and Community Air Monitoring Plan (CAMP). Potential contact with contaminated groundwater would be eliminated as it would be prohibited by the deed notice, and it is not anticipated to be

encountered during construction. Potential migration of soil vapors into the new building would be prevented by installing a vapor barrier and passive SSDS as part of new construction.

3.2. BALANCING CRITERIA

Compliance with Standards, Criteria and Guidance (SCGs)

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

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

Alternative 2 would address the chemical-specific SCGs for soil through removal of soil to meet Track 4 Site-Specific SCOs. Under both alternatives, SCGs for soil vapor would be achieved by installing a vapor barrier and passive sub-slab depressurization system under the proposed building as part of construction. A Site Management Plan would ensure that these controls remained protective for the long term. All potential sources for groundwater contamination will be removed as part of the remedial action.

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

Short-term effectiveness and impacts

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

impacts, time until remedial response objectives are achieved, and protection of workers during remedial actions.

Both Alternatives 1 and 2 have similar-short term effectiveness during their respective implementations, as each requires excavation of historic fill material. Short term impacts are likely to be higher for the Track 1 alternative due to excavation of greater amounts of historical fill material. 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 and any differences between these alternatives.

An additional short-term adverse impact and risks to the community associated with both remedial alternatives is increased truck traffic. Truck traffic will be routed on the most direct course using major thoroughfares where possible and flaggers will be used to protect pedestrians at Site entrances and exits.

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

Long-term effectiveness and permanence

This evaluation criterion addresses the results of a remedial action in terms of its permanence and quantity/nature of waste or residual contamination remaining at the Site after response objectives have been met, such as permanence of the remedial alternative, magnitude of remaining contamination, adequacy of controls including the adequacy and suitability of ECs/ICs that may be used to manage contaminant residuals that remain at the Site and assessment of

containment systems and ICs that are designed to eliminate exposures to contaminants, and long-term reliability of Engineering Controls.

Alternative 1 would achieve long-term effectiveness and permanence related to on-Site contamination by permanently removing all impacted soil/fill.

Alternative 2 would provide long-term effectiveness by removing most on-site contamination and attaining Track 4 Site-Specific SCOs, establishing a composite cover system across the Site, establishing use restrictions, establishing a Site Management Plan to ensure long-term management of Institutional Controls (ICs) and Engineering Controls (ECs), and placing a deed restriction to memorialize these controls for the long term. Establishment of an SMP and a deed restriction will ensure that this protection remains effective for the long-term. The SMP will ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and use restrictions continue to be in place and are functioning as they were intended assuring that protections designed into the remedy will provide continued high level of protection in perpetuity.

Reduction of toxicity, mobility, or volume of contaminated material

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

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

Alternative 2 would permanently eliminate the toxicity, mobility, and volume of contaminants from on-Site soil to a minimum depth of 4 feet bgs, and any remaining soil/fill would meet Track 4 Site-Specific SCOs. Alternative 1 would eliminate a greater total mass of contaminants on Site.

Implementability

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

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

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.

Initial costs associated with the Track 1 alternative may be higher than the Track 4 alternative based on soil volume. However, long-term costs higher for Alternative 2 than Alternative 1 based on implementation of a Site Management Plan and placement of a deed restriction as part of Alternative 2. In both cases, appropriate public health and environmental protections are achieved.

Community Acceptance

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

This 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 for the Site would be acceptable to the community. This RAWP will be subject to and undergo public review under the NYC VCP 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 proposed redevelopment of the Site is compatible with its current zoning. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 4 Site-Specific SCOs, both of which are appropriate for its planned residential use. Improvements in the current environmental condition of the property achieved by both alternatives are also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse. Both alternatives provide comprehensive protection of public health and the environment for reasonably foreseeable uses of the Site, including restricted residential uses.

Sustainability of the Remedial Action

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

While Alternative 2 would potentially result in lower energy usage based on reducing the volume of material transported off-Site, both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action.

4.0 REMEDIAL ACTION

4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

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

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Selection of NYSDEC 6NYCRR Part 375 Table 6.8; Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Excavation and removal of soil/fill exceeding Unrestricted Use Track 1 SCOs. Soil/fill at this property extends to depth of 3 feet below grade, and is underlain by bedrock. Entire property will be excavated to a depth of approximately 4 feet below grade for development purposes. A small area (elevator shaft) will be excavated deeper into bedrock. Approximately 820 tons of soil/bedrock will be excavated and removed from this property.
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.

7. Management of excavated materials including temporarily stockpiling and segregating to prevent co-mingling of contaminated material and non-contaminated materials.
8. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.
9. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
10. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.
11. End point samples are not necessary if bedrock is reached underneath the entire footprint of new development. Excavation for development is expected to go into bedrock. If any soils/fill remains behind, endpoint samples will be collected to determine the performance of the remedy with respect to attainment of Track 1 SCOs.
12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
13. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
14. Maintain records as described in this RAWP, including waste disposal manifests, clean fill/top soil sampling results, and appropriate health and safety forms and documentation.
15. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes any or all Engineering and Institutional Controls to be implemented at the Site.

If Track 1 SCOs are not achieved, the following construction elements will constitute Engineering and Institutional controls:

16. As part of development, construction and maintenance of an engineered composite cover consisting of concrete and building slab, to prevent human exposure to residual soil/fill remaining under the Site.
17. As part of development, installation and operation of a Passive Sub-Slab Depressurization System as part of the proposed development.
18. Installation of a vapor barrier system beneath the building slab and outside foundation sidewalls below grade.
19. If Track 1 SCOs are not achieved, submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
20. If Track 1 SCOs are not achieved, Recording of a Declaration of Covenants and Restrictions that includes a listing of Engineering Controls and Institutional Controls and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT

Track 1, Soil Cleanup Objectives (SCOs) are proposed for this project. If Track 1 is not achieved, the SCOs for this Site will include NYSDEC NYCRR Part 375.6(b) Track 2 Restricted Residential Use SCOs as amended by following Site-Specific (Track 4) SCOs:

<u>Contaminant</u>	<u>Track 4 SCOs</u>
Total SVOCs	100 ppm
Lead	800 ppm
Mercury	1.5 ppm

Soil and materials management on-Site and off-Site, including excavation, handling and disposal, will be conducted in accordance with the Soil/Materials Management Plan in Appendix 3. The location of planned excavations is shown in Figure 3.

Discrete contaminant sources (such as hotspots) identified during the remedial action will be identified by GPS or surveyed. This information will be provided in the Remedial Action Report.

Estimated Soil/Fill Removal Quantities

The total quantity of soil/fill expected to be excavated and disposed off-Site is 820 tons.

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

End-Point Sampling

Removal actions for development purposes under this plan will be performed in conjunction with confirmation soil sampling. Three confirmation samples will be collected from the base of the excavation at locations to be determined by OER. For comparison to Track 1 SCOs, analytes will include SVOC, and metals according to analytical methods described below. For comparison to Track 4 SCOs, analytes will only include trigger compounds and elements established on the Track 4 SCO list.

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

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.
2. For excavations 20 to 300 feet in perimeter:
 - For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.

- For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.

3. For sampling of volatile organics, bottom samples should be taken within 24 hours of excavation, and should be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours should be taken at six to twelve inches.

4. For contaminated soil removal, post remediation soil samples for laboratory analysis should be taken immediately after contaminated soil removal. If the excavation is enlarged horizontally, additional soil samples will be taken pursuant to bullets 1-3 above.

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

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

Soil analytical methods will include:

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

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

Quality Assurance/Quality Control

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

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

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

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

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

samples to be analyzed for metals, SVOCs or pesticides. One blind duplicate sample will be prepared and submitted for analysis every 20 samples.

Import and Reuse of Soils

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 0 tons. The estimated quantity of onsite soil/fill expected to be reused/relocated on Site is 0 tons.

4.3 ENGINEERING CONTROLS

Track 1 remedial actions do not require Engineering Controls. If Track 1 SCOs are not achieved, the following construction elements will constitute Engineering Controls:

- composite cover system consisting of asphalt covered roads, concrete covered sidewalks, and concrete building slabs;
- soil vapor barrier;
- sub-slab depressurization system.

Composite Cover System

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. This composite cover system is comprised of a 4 feet concrete building slab beneath the proposed building.

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

Vapor Barrier

Migration of soil vapor will be mitigated with a combination of building slab and vapor

barrier.

A high density polyethylene vapor barrier liner (HPDE) will be installed over the SSDS prior to pouring the building's concrete slab. The vapor barrier will consist of a 20 mil HDPE geomembrane liner. The vapor barrier will extend throughout the area occupied by the footprint of the new building which is to be constructed at the Site.

The Remedial Closure Report will include photographs (maximum of two photos per page) of the installation process, PE certified letter (on company letterhead) from primary contractor responsible for installation oversight and field inspections, and a copy of the manufacturers certificate of warranty.

Sub-Slab Depressurization System

Migration of soil vapor will be mitigated with the construction of a passive sub-slab depressurization system.

Sub-slab depressurization will be accomplished by installing strategically located, sub-slab collection points consisting of slotted Schedule 40 PVC pipe surrounded by a highly porous medium (i.e., gravel). Each collection point will be connected to solid Schedule 40 PVC which will be routed at a positive pitch through the sub-slab medium to vertical risers. Once the building slab is poured and building structure is in place, piping (material consistent with local building code) will be routed vertically through the interior of the building and terminating just above the building roof. Each rooftop pipe terminus will act as the system discharge points, and all discharge points will be properly located to prevent re-entrainment of vapors into roof-mounted air intakes or other building openings.

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 implemented under a site-specific Site Management Plan (SMP) that will be included in the RAR. The property will continue to be registered with an E-Designation by the NYC Buildings Department.

Institutional Controls for this remedial action are:

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

4.5 SITE MANAGEMENT PLAN

Site Management is not required for Track 1 remedial actions. However, if Track 1 SCOs are not achieved, Site Management will be the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and

procedures to ensure implementation of all ECs and ICs that are required by the DCR and this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site Management responsibilities defined in the Site Management Plan are implemented.

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

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

4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

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

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

Known and Potential Sources

Historic fill material is present at the Site from grade to approximately 4 feet below grade. Based on the results of the RIR, the contaminants of concern found are:

Soil:

- Metals including copper, lead, mercury, nickel and zinc were identified, but only copper exceeded Restricted Residential Use SCOs;
- Pesticides including 4,4-DDE and 4,4-DDT exceeded Unrestricted Use SCOs and;
- PAH, benzo(f)fluoranthene exceeded Restricted Residential SCOs.

Groundwater

- Several metals were identified but only iron exceeded GQS.

Soil Vapor

- Chlorinated VOCs detected at low concentrations.
- Petroleum related VOCs identified at moderate concentrations.

Nature, Extent, Fate and Transport of Contaminants

The metals, pesticides and SVOC are present in the historical fill materials throughout the Site. The metal contaminants that were found in on-Site filtered groundwater are linked with regional impacts, rather than onsite source. The petroleum related VOCs that were identified in soil gas at the Site were not found in any on-Site soil or groundwater sample.

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, or soil.

Existence of Human Health Exposure

Existing – The Site is developed as a 1-story commercial building. Therefore, exposure to surficial soil/fill material does not exist under current conditions. Groundwater is marginally contaminated but is not exposed at the Site, and because the Site is served by the public water supply and groundwater use for potable supply is prohibited and there is no potential for exposure.

Construction/ Remediation Activities– Once redevelopment activities begin, construction workers will come into direct contact with surface and subsurface soils and groundwater as a result of on-Site construction/excavation activities. Similarly, off-Site receptors could be exposed to dust from onsite activities. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through dust controls, and through the implementation of the Community Air Monitoring Plan and a Construction Health and Safety Plan. Construction excavation is anticipated to be below groundwater table, thus dewatering will be required.

Proposed Future Conditions – Under future remediated conditions, all soils in excess of Track 1 SCOs will be removed. The Site soils/RCA will be excavated and the Site will be fully capped with concrete building slab, which will prevent contact with any residual soils. A vapor barrier system will prevent any exposure to potential off site soil vapors in the future. The Site is served by a public water supply, and groundwater is not used at the Site for potable supply. There are no plausible off-Site pathways for ingestion, inhalation, or dermal exposure to contaminants derived from the Site under future conditions.

Receptor Populations

The immediate area is mixed use residential, commercial, institutional and public recreational neighborhood and is anticipated to remain as such. The new building at the site will be utilized as a mixed use commercial and residential facility. Potential receptor populations are as follows:

On-Site Receptors - The Site is currently a 1-story commercial building. Therefore, the only potential on-Site receptors are Site representatives, trespassers and visitors granted access to the

property. During redevelopment of the Site, the on-Site potential receptors will include construction workers, site representatives, and visitors. Once the Site is redeveloped, the on-Site potential sensitive receptors will include adult and child residents.

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

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

Overall Human Health Exposure Assessment

There are potential complete exposure pathways for the current site condition. There is a potential complete exposure pathway that requires mitigation during implementation of the remedy. There is no complete exposure pathway under future conditions after the site is developed. This assessment takes into consideration the reasonably anticipated use of the site, which includes a commercial hotel, site-wide impervious surface cover cap, and a subsurface vapor barrier. Under current conditions, on-Site exposure pathways are minimized by preventing access to the Site. During the remedial action, on-site exposure pathways will be eliminated by preventing access to the Site, through implementation of soil/materials management, stormwater pollution prevention, dust controls, employment of a community air monitoring plan, and implementation of a Construction Health and Safety Plan. After the remedial action is complete, there will be no remaining exposure pathways. The Site cap and vapor barrier will interrupt any remaining exposure pathways.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 PROJECT ORGANIZATION AND OVERSIGHT

Principal personnel who will participate in the remedial action include Sanjay Patel, administrator. The Professional Engineer (PE) for this project is Ray Kahn.

5.2 SITE SECURITY

Site access will be controlled by a fence, which will surround the property.

5.3 WORK HOURS

The hours for operation of remedial construction will be from 7:00 AM to 6 PM. 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 Bhupender Singh. Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations. The HASP pertains to remedial and invasive work performed at the Site until the issuance of the Notice of Completion.

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

Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign an HASP acknowledgment. Site-specific training will be provided to field personnel. Additional safety training may be added depending on the tasks performed.

Emergency telephone numbers will be posted at the site location before any remedial work begins. A safety meeting will be conducted before each shift begins. Topics to be discussed include task hazards and protective measures (physical, chemical, environmental); emergency procedures; PPE levels and other relevant safety topics. Meetings will be documented in a log book or specific form.

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

5.5 COMMUNITY AIR MONITORING PLAN

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

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

VOC Monitoring, Response Levels, and Actions

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

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

5.6 AGENCY APPROVALS

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

5.7 SITE PREPARATION

Pre-Construction Meeting

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

Mobilization

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

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

Utility Marker Layouts, Easement Layouts

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

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

Equipment and Material Staging

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

Stabilized Construction Entrance

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

Measures will be taken to ensure that adjacent roadways will be kept clean of project related soils, fill and debris.

Truck Inspection Station

An outbound-truck inspection station will be set up close to the Site exit. Before exiting the NYC VCP Site, trucks will be required to stop at the truck inspection station and will be examined for evidence of contaminated soil on the undercarriage, body, and wheels. Soil and debris will be removed. Brooms, shovels and potable water will be utilized for the removal of soil from vehicles and equipment, as necessary.

Extreme Storm Preparedness and Response Contingency Plan

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

Storm Preparedness

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

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to OER at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911. Petroleum spills will be reported to NYS DEC within 2 hours of identification and consistent with State regulations. Emergency and spill conditions will also be reported to OER. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed. Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Storm-water control systems and structures will be inspected and maintained as necessary. If soil or fill materials are discharged off site to adjacent properties, property owners and OER will be notified and corrective measure plan designed to remove and clean dislocated material will be submitted to OER and implemented following approval by OER and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of OER. If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYS DEC's spill hotline at DEC 800-457-7362. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYS DEC.

Storm Response Reporting

A site inspection report will be submitted to OER at the completion of site inspection. An inspection report established by OER is available on OER's website (www.nyc.gov/oer) and will

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

5.8 TRAFFIC CONTROL

Drivers of trucks leaving the NYC VCP Site with soil/fill will be instructed to proceed without stopping in the vicinity of the site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site is head south on Grand Concourse to Interstate 87N to Interstate 95.

5.9 DEMOBILIZATION

Demobilization will include:

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

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

5.10 REPORTING AND RECORD KEEPING

Daily Reports

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

- Project number and statement of the activities and an update of progress made and locations of work performed;
- Quantities of material imported and exported from the Site;
- Status of on-Site soil/fill stockpiles;
- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP excursions, if any;
- Photograph of notable Site conditions and activities.

The frequency of the reporting period may be revised in consultation with OER project manager based on planned project tasks. Daily email reports are not intended to be the primary mode of communication for notification to OER of emergencies (accidents, spills), requests for changes to the RAWP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RAWP will be communicated directly to the OER project manager by personal communication. Daily reports will be included as an Appendix in the Remedial Action Report.

Record Keeping and Photo-Documentation

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

5.11 COMPLAINT MANAGEMENT

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

5.12 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

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

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

6.0 REMEDIAL ACTION REPORT

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

- Information required by this RAWP;
- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan (if Track 1 is not achieved);
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;
- Tabular summary of all end point sampling results and all material characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action and DUSR;
- Test results or other evidence demonstrating that remedial systems are functioning properly;
- Account of the source area locations and characteristics of all contaminated material removed from the Site including a map showing source areas;
- Account of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material.
- Account of the origin and required chemical quality testing for material imported onto the Site.
- Continue registration of the property with an E-Designation by the NYC Department of Buildings.
- Reports and supporting material will be submitted in digital form.

Remedial Action Report Certification

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

I, Ray Kahn, 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 GCH LLC Site, 335 Grand Concourse, Bronx (NYC OER Project Number 14EHAN453X and NYC VCP Project Number 15CVCP020X).

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.

Name

NYS PE License Number

Signature

Date



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, an 11 month remediation period is anticipated.

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAWP	0	-
Fact Sheet 2 announcing start of remedy	0	-
Mobilization	2	1
Remedial Excavation	8	5
Demobilization	10	1
Record Declaration of Covenants and Restrictions	12	2
Submit Remedial Action Report	16	2

APPENDIX 1

CITIZEN PARTICIPATION PLAN

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

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

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

Repository Name: New York Public Library/Mott Haven Library

Repository Address: 321 East 140th Street, Bronx, NY 10454

Repository Telephone Number: 718-665-4878

Repository Hours of Operation: Monday and Thursday: 10am-6pm

Tuesday and Wednesday: 10am-7pm

Friday-Saturday: 10am-5pm

Sunday: Closed

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

Identify Issues of Public Concern.

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

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

- On-Site air monitoring for worker protection,
- Perimeter air monitoring for community protection.

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

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

Citizen Participation Milestones. Public notice and public comment activities occur at several steps during a typical NYC VCP project. See flow chart on the following page, which identifies when during the NYC VCP public notices are issued: These steps include:

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

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

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

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

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

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

APPENDIX 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.

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

Reduce Consumption of Virgin and Non-Renewable Resources. Reduced consumption of virgin and non-renewable resources lowers the overall environmental impact of the project on the region by conserving these resources.

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

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

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

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

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

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

The propose development will be connecting to the natural gas lines as their source of fuel for heating and general use.

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.

The development of the site will include passive sub slab depressurization system to vent any potential vapors that may accumulate in the soil as well as a vapor barrier system beneath the foundation slab.

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

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

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

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 head south on Grand Concourse to Interstate 87N to Interstate 95. 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 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.

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

1.7 MATERIALS REUSE ON-SITE

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site. The soil cleanup objectives for on-Site reuse are listed in Table 5. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to the NYC VCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed..

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

1.8 DEMARCATION

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

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

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

1.9 IMPORT OF BACKFILL SOIL FROM OFF-SITE SOURCES

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

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

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

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

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

Source Screening and Testing

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

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

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

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

1.10 FLUIDS MANAGEMENT

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

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

1.11 STORM-WATER POLLUTION PREVENTION

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

1.12 CONTINGENCY PLAN

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

1.13 ODOR, DUST AND NUISANCE CONTROL

Odor Control

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

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

Dust Control

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

- Use of a dedicated water spray methodology for roads, excavation areas and stockpiles.

- Use of properly anchored tarps to cover stockpiles.
- Exercise extra care during dry and high-wind periods.
- Use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface.

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

Other Nuisances

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

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

APPENDIX 4

HEALTH AND SAFETY PLAN

GCH, LLC

HEALTH & SAFETY PLAN

For

335 Grand Concourse

Bronx, NY

August 2014

Volume 1 of 1

Prepared By

ESPL *ENVIRONMENTAL CONSULTANTS CORPORATION*

2 West 32nd Street, 5th Floor – Suite 504

New York, NY 10001

(212) 330-7501

Table of Contents

1.0	INTRODUCTION	A-1
	1.1 Brief Description of Project	A-1
	1.2 Site History	A-1
	1.3 Synopsis of Remedial Actions	A-2
	1.4 Site Operations to be Performed	A-2
2.0	ORGANIZATIONAL STRUCTURE	A-2
	2.1 Roles and Responsibilities.....	A-2
3.0	HAZARD ASSESSMENT	A-4
	3.1 Activity-Specific Hazards and Standard Operating Procedures.....	A-4
	3.2 General Site Hazards	A-5
	3.3 Biological Hazards.....	A-6
4.0	TRAINING REQUIREMENTS	A-6
5.0	PERSONAL PROTECTIVE EQUIPMENT	A-8
	5.1 Level A.....	A-10
	5.2 Level B.....	A-13
	5.3 Level C	A-14
	5.4 Level D	A-17
6.0	TEMPERATURE EXTREMES	A-18
	6.1 Heat Stress.....	A-18
	6.2 Cold Stress.....	A-19
7.0	MEDICAL MONITORING REQUIREMENTS	A-20
	7.1 Fit-Testing Requirements	A-20
8.0	AIR MONITORING	A-21
	8.1 Routine Air Monitoring Requirements	A-21
9.0	SITE CONTROL AND STANDARD OPERATING PROCEDURES	A-23
	9.1 Work Zones	A-23
	9.2 General Field Safety and Standard Operating Procedures	A-23
10.0	DECONTAMINATION PROCEDURES	A-25

11.0	CONTINGENCY PLAN / EMERGENCY RESPONSE PLAN	A-26
11.1	Emergency Equipment On-Site/Site Communications	A-26
11.2	Emergency Telephone Numbers and Hospital Information	A-27
11.3	Personnel Responsibilities During an Emergency	A-27
11.4	Medical Emergencies	A-28
11.5	Fire or Explosion	A-28
11.6	Evacuation Routes	A-28
11.7	Spill Control Procedures	A-29
11.8	Vapor Release Plan	A-29
11.9	Communication Procedures	A-29
12.0	CONFINED SPACE	A-31
12.1	Confined Space Entry Procedure	A-32
13.0	DAILY SAFETY MEETINGS	A-32
14.0	WORK PLAN	A-33
14.1	Work Tasks, Objectives and Methods for Implementation	A-33
14.2	Clean up/Decontamination Activities and Procedures	A-33
14.3	Informational Programs	A-34
14.4	Medical Surveillance Program	A-34
14.5	Personnel Requirements	A-34
14.6	Training Implementation	A-34

1.0 INTRODUCTION

This health and safety plan (HASP) describes the health and safety (HAS) guidelines developed for this site to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes. In accordance with the Occupational Safety and Health Administration (OSHA) at 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response Final Rule, this HASP addresses the potential and actual safety and health hazards relating to of each phase of site operations.

This site-specific HASP is based on the best available information to date. The HASP may be revised when new information on site conditions is received or identified.

GCH, LLC and contractor employees may be exposed to risks from hazardous conditions related to activities at this site. GCH, LLC's policy is to minimize the possibility of work-related injury through aware and qualified supervision, health and safety training, medical monitoring, and the use of appropriate personal protective equipment.

This site-specific Health and Safety Plan (HASP) applies to GCH, LLC and contractor personnel where operations involve actual or potential exposure to safety or health hazards. This HASP describes emergency response procedures for actual and potential physical and chemical hazards that have been identified by GCH, LLC. This HASP is also intended to inform and guide all personnel entering an exclusion zone. GCH, LLC's sub-contractors are retained as independent contractors and, are responsible for ensuring the health and safety of their own employees.

GCH, LLC may require that its personnel take certain precautions in accordance with this HASP, and GCH, LLC requests that others protect their personnel in a manner that they deem necessary or sufficient.

1.1 Brief Description of Project

Remedial action at the site is proposed to consist of advancement of three (3) boreholes as identified in the Remedial Action Work Plan dated August 2014.

1.2 Site History

The Site is located at 335 Grand Concourse in the Mott Haven section in Bronx, New York and is identified as Block 2345 and Lot 1 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 4,937-square feet and is bounded by East 144th Street to the north, 140th Street to the south, Grand Concourse to the east, and Walton Avenue to the west. A map of the site boundary is shown in Figure 3. Currently, the Site is used for an

auto repair shop and contains a one- story building with no basement and four service bays.

1.3 Synopsis of Remedial Actions

A contractor shall be retained to perform advancement of three (3) boreholes to obtaining soil samples by this technique.

1.4 Site Operations to be performed

Geoprobe boring installation for soil sampling.

2.0 ORGANIZATIONAL STRUCTURE

Principal in Charge: Sanjay Patel (516-351-2400)

Project Supervisor / Overall Project Manager: Sanjay Patel (516-351-2400)

Site Safety and Health Officer: Bhupender Singh , (917-731-8770)

<u>Title</u>	<u>Name</u>
Project Manager	Sanjay Patel
Field Supervisor	Bhupender Singh
Health and Safety Officer	Bhupender Singh
Chemical Analysis	By a New York State Department of Health Environmental Laboratory Approval Program (NYSDOH ELAP) certified laboratory

2.1 Roles and Responsibilities

The Project Supervisor is responsible for overall project administration and for supervising implementation of the HASP by GCH, LLC personnel on site. All applicable OSHA health and safety (HAS) standards shall be applied. Each subcontractor (defined as an OSHA employer) is also responsible for the health and safety of its employees. If there is any dispute with regard to HAS or project activities, on-site personnel shall attempt to resolve the issue. If the issue cannot be resolved, in the work zone, then the project superintendent shall be consulted.

The GCH, LLC Site Safety Officer is also responsible for coordinating HAS standards on-site. The Site Safety Officer will have met the emergency response and hazardous materials handling training requirements of OSHA 29 CFR Part 1910.120, completed supervisors training, and have appropriate experience pertinent to the on-site work. The Site Safety Officer is authorized to suspend site work based on safety concerns, and is responsible for:

1. Indoctrinating personnel with regard to all of the information in this HASP and any other safety requirements to be observed during site operations, including, but not limited to, decontamination procedures, designation of work zones and levels of protection, air monitoring, fit testing, and emergency procedures dealing with fire and medical situations;
2. Coordinating site safety decisions with the Project Supervisor and the Principal in Charge;
3. Maintaining the designation of exclusion, decontamination, and support zones on a daily basis;
4. Monitoring the condition and status of known on-site hazards, and maintenance and implementation of the air quality-monitoring program specified in this HASP;
5. Maintaining the Site Personnel log;
6. Maintaining records of safety problems encountered, corrective actions taken, and documentation of any chemical exposures or physical injuries. The Site Safety Officer will document these conditions in a bound notebook and maintain a copy of this log on-site; and
7. Periodic inspections of the site to determine the effectiveness of the HASP.

Any person who observes safety concerns or potential hazards that have not

been addressed in the daily safety meetings should immediately report observations/concerns to the GCH, LLC Site Safety Officer or other appropriate key personnel.

3.0 HAZARD ASSESSMENT

This section identifies the activity-specific hazards associated with site operations and standard operating procedures (SOPs) that should be implemented to reduce the hazards; identifies general physical hazards that can be expected at most sites; and presents a summary of documented or potential chemical hazards at the site. Every effort must be made to reduce or eliminate these hazards. Those that cannot be eliminated must be guarded against by using engineering controls and/or personal protective equipment.

3.1 Activity-Specific Hazards and Standard Operating Procedures In-situ Remediation:

Geoprobe borings.

Identification of the Hazards associated with each task:

Geoprobe Borings

Drilling operations may expose workers to rotating equipment, heavy moving objects and overhead hazards. Booms and derricks shall not be raised unless the area is clear of overhead hazards such as tree limbs and electrical power lines. Underground utilities may pose a hazard if encountered during drilling.

Mechanical System Construction:

Mechanical system construction will include piping and electrical construction that involves the use of standard tools and electrical equipment such as hammers, saws, power cutting tools, drills and other equipment. These types of tools shall be used in accordance with manufactures recommendations for specific hazards posed by each.

System Operation:

The operation of a system in a petroleum-contaminated site may require field visits and well monitoring operations such as depth to water measurements, depth to product measurements, air, soil and groundwater sample collection. The hazard associated with this task is the possible worker exposure to gasoline in liquid and vapor forms.

Required Hazard Controls or SOP:

1. Use tools in accordance with manufactures specifications.
2. Use ground fault circuit interrupters for all electrical work.
3. Avoid wearing loose clothing around rotating machinery associated with well drilling equipment.

4. Use OSHA compliant personal protective equipment.
5. Hand digging and site mark outs shall be performed prior to commencement of drilling operations to avoid underground utilities. Overhead inspections shall be performed prior to raising drill rig derricks and booms.

3.2 General Site Hazards

Applicable OSHA 29 CFR 1910.120(m) standards for illumination shall apply. Generally, all work at this site will be conducted during daylight hours. All electrical power must be connected to a ground fault circuit interrupter. All equipment that will enter excavations must be suitable and approved (i.e. intrinsically safe) for use in potentially explosive environments. Applicable OSHA 29 CFR 1926 Subpart K standards for use of electricity shall apply.

Work in which a worker could fall will be performed using appropriate ladders and/or protection (e.g. body harness and lifeline). All work at this site is expected to be conducted at the ground surface.

When the temperature is above 70°F and personnel are wearing protective clothing, a heat stress-monitoring program shall be implemented. Employees shall be allowed break periods and beverages as necessary. All personnel routinely working on site (including the support zone) shall be familiar with the symptoms, signs, and emergency care associated with heat stress, heat exhaustion, and heat stroke as discussed in Section 6 of this HASP.

Cold stress is a result of cold, wetness, and wind. A worker's susceptibility to cold stress can vary according to his/her physical fitness, degree of acclimatization to cold weather, age, and diet. A cold stress-monitoring program shall be implemented as appropriate. Employees shall have access to break periods, shelter, and beverages as necessary. All personnel routinely working on-site (including the support zone) shall be familiar with the symptoms, signs, and emergency care associated with cold stress, hypothermia, and frostbite as discussed in Section 6 of this HASP.

In accordance with 29 CFR 1910.151(c), all site related operations involving possible eye injury, (chemical splash, etc.), must have approved eye wash units readily available (in the Site Safety Officer's vehicle and in the job trailer). Protective eyewear shall be donned in Level D, when directed by the site safety officer. (The full-face APR required by Level C and the pressure demand self-contained breathing apparatus mask required by Level B serve as eye protection.)

Operations creating the potential for fire hazards shall be conducted in a manner that minimizes risk. Non-sparking tools and fire extinguishers shall be used or available as directed by the site safety officer when potentially

explosive atmospheres may be encountered. Ignition sources shall be removed from work areas. When necessary, explosion-proof instruments and/or bonding and grounding will be used to prevent fire or explosion.

Overhead and underground utilities shall be identified and/or inspected and appropriate safety precautions taken before conducting operations involving potential contact or interference.

3.3 Biological Hazards

Biological hazards can cause infection or disease in people, plants, animals, or microorganisms. These hazards are divided into five categories: viral, rickettsial/chlamydia, bacterial, fungal, and parasitic.

Biological agents may be dispersed by wind or water. Many biological agents require a carrier (e.g. bees, ticks, snakes) to infect a host; therefore, controlling the agent may require controlling or avoiding the carrier. Contact with some biological agents may be avoided by using personal protective equipment similar to that used for chemical hazards.

4.0 TRAINING REQUIREMENTS

All personnel entering an exclusion zone or decontamination zone must have met training requirements for hazardous waste site operations and emergency response operations in accordance with OSHA 29 CFR 1910.120(e).

Documentation of personnel training is maintained on file, and each employee will have copies of his/her applicable 40-Hour OSHA Training, 8-Hour Refresher Training, and Supervisor Training certificates on-site (located in job trailer files). A summary of personnel training status and HAS training records is shown in Table 1-1. Each subcontractor working on the job must provide the site safety officer with training documentation for its personnel.

Notes:

- (1) Physicals will be completed before site work begins.
- (2) An 8-hour refresher course including respirator fit testing will be conducted before site work begins.
- (3) Union employees working in the exclusion zone will have 40-hours training. Additional workers, who meet all requirements specified in this plan, will be supplied by the local unions as needed.

5.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) shall be selected in accordance with the site air monitoring program and hazard assessment, OSHA 29 CFR 1910.120(.c) and (g), and 1910.132. Protective equipment shall be NIOSH-approved and respiratory protection shall conform to OSHA 29 CFR Part 1910.133 and 1910.134 specifications; head protection shall conform to 1910.135; eye and face protection shall conform to 1910.133; and foot protection shall conform to 1910.136.

The level of personnel protection for site activities described in the hazard assessment is as follows:

<u>Location</u>	<u>Job Function</u>	<u>Level of Protection</u>			
Exclusion Zone	D	A	B	C	D
		A	B	C	D
		A	B	C	D
		A	B	C	D
Decontamination Zone	D	A	B	C	D
		A	B	C	D
		A	B	C	D
		A	B	C	D

Specific protective equipment for each level of protection is as follows:

Level A	_____	Level B	_____
	_____		_____
	_____		_____
Level C	_____	Level D	Hardhat and safety boots
	_____		_____
	_____		_____
	_____		_____

List type of air-purifying canister to be used if required. _____

Other PPE not listed above:

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

A description of typical PPE for each protection level is as follows:

5.1 Level A Protection

1. PPE:

Supplied-air respirator approved by the Mine Safety and health Administration (MSHA) and NIOSH. Respirators may be:

- Positive-pressure SCBA; or
 - Positive-pressure airline respirator (with escape bottle for immediately Dangerous to Life and Health (IDLH) or potential for IDLH atmosphere).
- b. Fully encapsulating chemical-resistant suit.
- c. Coveralls.
- d. Cotton long underwear*.

- e. Gloves (inner), chemical-resistant.
- f. Boots, chemical-resistant, steel toe and shank. (Depending on suit construction, worn over or under suit boot).
- g. Hard hat (under suit)*.
- h. Disposable gloves and boot covers (worn over fully encapsulating suit).
- i. Cooling unit*.
- j. Two-way radio communications (inherently safe)*.

*Optional

2. Criteria for Selection:

Meeting any of these criteria warrants use of Level A protection:

- a. The chemical substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on:
 - Measures (or potential for) high concentration or atmospheric vapors, gases, or particulate, or
 - Site operations and work functions involve high potential for splash, immersion, or exposure to unexpected vapors, gases, or particles of materials highly toxic to the skin.
- b. Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible.
- c. Operations must be conducted in confined, poorly ventilated areas until the absence of substances requiring Level A protection is determined.
- d. Direct readings on field Flame Ionization Detectors (FID) or photoionization Detectors (PID) and similar instruments indicate high levels of unidentified vapors and gases in the air.

3. Guidance on Selection

- a. Fully encapsulating suits are primarily designed to provide gas or vapor-tight barrier between the wearer and atmospheric conditions.

Therefore Level A is generally worn when high concentrations of airborne substances could severely affect the skin. Since Level A required the use of SCBA, the eyes and respiratory system are also more protected.

Until air surveillance data become available to assist in the selection of the appropriate level of protection, the use of Level A may have to be based on indirect evidence of the potential for atmospheric contamination or other means of skin contact with severe skin affecting substances.

Conditions that may require Level A protection include:

- Confined spaces: Enclosed, confined, or poorly ventilated areas are conducive to the build up of toxic vapors, gases, or particles. (Explosive or oxygen-deficient atmospheres are also more probable in confined spaces). Confined-space entry does not automatically warrant wearing Level A protection, but should serve as a cue to carefully consider and to justify a lower level of protection.
- Suspected / known highly toxic substances: Various substances that are highly toxic, especially skin absorption, for example, fuming corrosives, cyanide compounds, concentrated pesticides, Department of Transportation Poison "A" materials suspected carcinogens, and infectious may be known or suspected to be involved. Field instruments may not be available to detect or quantify air concentrations of these materials. Until these substances are identified and concentrations measured maximum protection may be necessary.
- Visible emissions: Visible air emissions from leaking containers or railroad / vehicular tank cars, as well smoke from chemical fires and others indicate high potential for concentrations or substances that could be extreme respiratory or skin hazards.
- Job functions: Initial site entries are generally walk-through, in which instruments and visual observations are used to make a preliminary evaluation of the hazards.

In initial site entries, Level A should be worn when:

- There is a probability for exposure to high concentrations of vapors, gases, or particulates; and
- Substances are known or suspected of being extremely toxic directly to the skin or by being absorbed.

Subsequent entries are to conduct the many activities needed to reduce the environmental impact of the incident. Levels of protection for later operations are based not only on data obtained from the initial and subsequent environmental monitoring, but also on the probability of contamination and ease of decontamination.

Examples of situations where Level A has been worn are:

- Excavating of soil to sample buried drums suspected of containing high concentrations of dioxin;
- Entering a cloud of chlorine to repair a valve broken in a railroad accident;
- Handling and removing drums known to contain petroleum; and
- Responding to accidents involving cyanide, arsenic, and undiluted pesticides.

The fully encapsulating suit provides the highest degree of protection to skin, eyes, and respiratory system if the suit material resists chemicals during the time the suit is worn. While Level A provides maximum protection, all suit material may be rapidly permeated and degraded by certain chemicals from extremely high air concentrations, splashes, or an immersion of boots or gloves in concentrated liquids or sludges. These limitations should be recognized when specifying the type of fully encapsulating suit. Whenever possible, the suit material should be matched with the substance it is used to protect against.

5.2 Level B Protection

1. PPE:

- a. Positive-pressure SCBA (MSHA\NIOSH approved); or
- b. Positive-pressure air line respirator (with escape bottle for IDLH potential for IDLH atmosphere) MSHA/NIOSH approved;
- c. Chemical resistant clothing (overalls and long-sleeved jacket; coveralls or hooded one-or two-piece chemical splash suit; disposable chemical-resistant, one-piece suits);
- d. Cotton long underwear*;
- e. Coveralls;
- f. Gloves (outer), chemical-resistant;
- g. Gloves (inner), chemical-resistant;
- h. Boots (inner), leather work shoe with steel toe and shank;
- i. Boots (outer), chemical-resistant, (disposable);

- j. Hard hat (face shield*);
- k. 2-way radio communication*; and
- l. Taping between suit and gloves; and suit and boots.

* Optional

2. Criteria for Selection

Any one of the following conditions warrants use of Level B Protection:

- a. The type and atmospheric concentration of toxic substances have been identified and require a high level of respiratory protection, but less skin protection than Level A. These atmospheres would be:
 - Have IDLH concentrations; or
 - Exceed limits of protection afforded by an air-purifying mask; or
 - Contain substances requiring air-supplied equipment, but substances and/or concentrations do not represent a serious skin hazard.
- b. The atmosphere contains less than 19.5% oxygen.
- c. Site operations make it highly unlikely that the work being done will generate high concentrations of vapors, gases or particulates, or splashes of material that will affect the skin of personnel wearing Level B protection.
- d. Working in confined spaces.
- e. Total atmospheric concentrations, sustained in the breathing zone, of unidentified vapors or gases range from 5 ppm above background to 500 ppm above background as measured by direct reading instruments such as the ID or PID or similar instruments, but vapors and gases are not suspected of containing high levels of chemicals toxic to skin

3. Guidance on Selection Criteria:

Level B equipment provides a reasonable degree of protection against splashes and to lower air concentrations, but a somewhat lower level of protection to skin than Level A. The chemical-resistant clothing required in Level B is available in a wide variety of styles, materials, construction detail,

permeability, etc. Taping joints between the gloves, boot and suit, and between the hood and respirator reduces the possibility for splash and vapor or gas penetration. These factors all affect the degree of protection afforded. Therefore the Safety Officer should select the most effective chemical-resistant clothing based on the known or anticipated hazards and/or job function.

Level B does provide a high level of protection to the respiratory tract. Generally, if SCBA is required, Level B clothing rather than a fully encapsulating suit (Level A) is selected based on needing less protection against known or anticipated substances affecting the skin. Level B skin protection is selected by:

- a. Comparing the concentrations of known or identified substances in air with skin toxicity data.
- b. Determining the presence of substances that are destructive to or readily absorbed through the skin by liquid splashes, unexpected high levels of gases, vapor or particulates, or other means of direct contact; and
- c. Assessing the effect of the substance (at its measure air concentrations or splash potential) on the small area of the head and neck left unprotected by chemical-resistant clothing.

For initial site entry at an open site, Level B protection should protect site personnel, providing the conditions described in selecting Level A are known or judged to be absent.

5.3 Level C Protection

1. PPE

- a. Full-face, air purifying, cartridge- or canister-equipped respirator (MSHA/NIOSH approved) with cartridges appropriate for the respiratory hazards;
- b. Chemical-resistant clothing (coveralls, hooded, one-or two-piece chemical splash suit; chemical-resistant hood and apron; disposable chemical-resistant coveralls;
- c. Coveralls;
- d. Cotton long underwear*;
- e. Gloves (outer), chemical resistant;

- f. Gloves (inner), chemical-resistant
- g. Boots (inner), leather work shoes with steel toes and shank;
- h. Boots (outer), chemical-resistant (disposable)*;
- i. Hard hat (face shield)*;
- j. Escape SCBA of at least 5 minute duration;
- k. 2-way radio communications (inherently safe)*; and
- l. Taping between suit and boots, and suit and gloves.

* Optional

2. Criteria for Selection

Meeting all of these criteria permits use of Level C protection:

- a. Measured air concentrations of Identified substances will be reduced by the respirator to, at, or below the substance's Threshold Limit Value (TLV) or appropriate occupational exposure limit and the concentration is within the service limit of the canister.
- b. Atmospheric contaminate concentrations do not exceed IDLH levels.
- c. Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect the small area of the skin left unprotected by chemical-resistant clothing.
- d. Job functions do not require SCBA;
- e. Total readings register between background and 5 ppm above background as measured by instruments such as the FID or PID.
- f. Oxygen concentration is not less than 19.5% by volume.
- g. Air will be monitored continuously.

3. Guidance on Selection Criteria

Level C protection is distinguished from Level B by the equipment used to protect the respiratory system, assuming the same type of chemical-resistant clothing is used. The main selection criterion for Level C is that conditions

permit wearing air-purifying devices. The air-purifying device must be a full-face mask (MSHA/NIOSH approved) equipped with a cartridge suspended from the chin or on a harness. Cartridges must be able to remove the substances encountered.

A full-face air purifying mask can be used only if:

- a. Oxygen content of the atmosphere is at least 19.5% by volume;
- b. Substance(s) is identified and its concentration(s) measured;
- c. Substance(s) has adequate warning properties;
- d. Individual passes a qualitative fit-test for the mask; and
- e. Appropriate cartridge is used, and its service limits concentration is not exceeded.

An air-monitoring program is part of all response operations when atmospheric contamination is known or suspected. It is particularly important that the air be monitored thoroughly when personnel are wearing air-purifying respirators (Level C). Continual surveillance using direct reading instruments and air sampling is needed to detect any changes in air quality necessitating a higher level of respiratory protection. Total unidentified vapor/gas concentrations exceeding 5 ppm above background required Level B.

5.4 Level D Protection

1. PPE

- a. Coveralls, chemical-resistant;
- b. Gloves (outer), chemical resistant;
- c. Gloves (inner), chemical-resistant*;
- d. Boots (inner), leather work shoes with steel toes and shank;
- e. Boots (outer), chemical-resistant (disposable)*;

- f. Hard hat;
- g. Face shield*;
- h. Safety glasses with side shields or chemical splash goggles*; and
- i. Taping between suit and boots, and suit and gloves.

* Optional

2. Criteria for Selection

- a. No atmospheric contamination is present.
- b. Direct reading instruments do not indicate any readings above background.
- c. Job functions have been determined not to require respirator protection.

3. Guidance on Selection Criteria

Level C protection is distinguished from Level D protection in the requirement for respiratory protection. Level D is used for non-intrusive activities or intrusive activities with continuous air monitoring. It can be worn only in areas where there is no possibility of contact with contamination.

6.0 TEMPERATURE EXTREMES

6.1 Heat Stress

Site personnel who wear protective clothing allow body heat to be accumulated with an elevation of the body temperature. Heat cramps, heat exhaustion, and heat stroke can be experienced, which, if not remedied, can threaten life or health. Therefore an American Red Cross Standard First Aid book or equivalent will be maintained on site at all time so that the SO and site personnel will be able to recognize symptoms of heat emergencies and be capable of controlling the problem. When protective clothing is worn, especially Levels A and B, the suggested guidelines for ambient temperature and maximum wearing time per excursion are:

Ambient Temperature (F)	Max. Wearing Time per Excursion (min)
Above 90	15
85 to 90	30
80 to 85	60
70 to 80	90
60 to 70	120
50 to 60	180

One method of measuring the effectiveness of employees' rest-recovery regime is by monitoring the heart rate. The Brouha guideline is one such method.

- During a three minute period, count the pulse rate for at least 30 seconds of the first minute, the last 30 seconds of the second minute, and the last 30 seconds of the third minute.
- Double the count.

If the recover pulse rate during the last thirty seconds of the first minute is at 110 beats/minute or less and the deceleration between the first, second, and third minutes is at least 10 beats/minute, the work-recovery regime is acceptable. If the employee's rate is above that specified, a longer rest period is required, accompanied by an increased intake of fluids.

In the case of heat cramps or heat exhaustion, "pediolite" or its equivalent is suggested as part of the treatment regime. The reason for this type of liquid refreshment is that such beverages will return much needed electrolytes to the system. Without these electrolytes, body systems cannot function properly, thereby increasing the represented health hazard. Also in the more extreme instances, inundation with cool water is recommended to lower the

body temperature as rapidly as possible.

This liquid refreshment will be stored in a cooler at the edge of the decontamination zone in plastic squeeze bottles. The plastic bottle will be marked with the individual's names. Disposable cups with lids and straws may be used in place of the squeeze bottles. Prior to drinking within the decontamination zone, the project personnel shall follow the following decontamination procedures:

- A. Personnel shall wash and rinse their outer gloves and remove them.
- B. Personnel shall remove their hard hats and respirators and place on table.
- C. Personnel shall remove their inner gloves and place them on table.
- D. Personnel shall wash and rinse their face and hands.
- E. Personnel shall carefully remove their personal bottle or cup from the cooler to ensure that their outer clothes do not touch any bottle, cups, etc.
- F. The used bottle or cups will not be returned to the cooler, but will be placed in a receptacle or container to be cleaned or disposed of.
- G. Personnel shall replace their respirators, hard hats gloves and tape gloves prior to re-entering the hazardous zone.

When personnel are working in situations where the ambient temperatures and humidity are high--and especially in situations where protection Levels A, B, and C are required the must:

- Assure that all employees drink plenty of fluids ("Pediolite or its equivalent);
- Assure that frequent breaks are scheduled so overheating does not occur; and,
- Revise work schedules, when necessary, to take advantage of the cooler parts of the day (i.e., 5:00 a.m. to 1:00 p.m., and 6:00 p.m. to nightfall).

6.2 Cold Stress

Whole-body protection shall be provided to all site personnel that have prolonged exposure to cold air. The right kind of protective clothing shall be provided to site personnel to prevent cold stress. The following dry clothing

shall be provided by the Contractor as deemed necessary by the SO:

- Appropriate underclothing (wool or other);
- Outer coats that repel wind and moisture;
- Face, head, and ear coverings;
- Extra pair of socks;
- Insulated safety boots; and
- Glove liners (wool) or wind-and water repellent gloves.

The SO will use the equivalent chill temperature when determining the combined cooling effect of wind and low temperatures on exposed skin or when determining clothing insulation requirements.

Site personnel working continuously in the cold are required to warm themselves on a regular basis. Warm, sweet drinks will also be provided to site personnel to prevent dehydration. The SO will follow the work practices and recommendations for cold stress threshold limit values as stated by the 1991-1992 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices by the American Conference of Governmental Industrial Hygienists or equivalent cold stress prevention methods.

7.0 MEDICAL MONITORING REQUIREMENTS

All personnel and visitors entering an exclusion zone or decontamination zone must have completed appropriate medical monitoring requirements required under OSHA 29 CFR 1910.120(f). Medical monitoring enables a physician to monitor each employee's health and physical condition, fitness to wear respiratory protective equipment, and fitness to carry out on-site tasks.

If there are additional medical monitoring requirements for a site, evidence of compliance must be included. Documentation of GCH, LLC personnel medical monitoring is maintained on file and summarized in Table 1-1. Subcontractors working on the job must provide the site safety officer with documentation on their medical monitoring programs.

7.1 Fit-Testing Requirements

All personnel and visitors entering an exclusion zone or decontamination zone using a negative pressure air purifying respirator (APR) must have successfully passed a qualitative respirator fit-test in accordance with OSHA 29 CFR 1910.134 or the American National Standards Institute.

Documenting fit-testing is the responsibility of each subcontractor. Documentation of GCH, LLC personnel fit-testing is maintained on file and summarized in Table 1-1.

8.0 AIR MONITORING

According to 29 CFR 1910.120(h) air shall be monitored to identify and quantify levels of airborne hazardous substances and health hazards, and to determine the appropriate level of worker protection.

Air may be monitored for oxygen content, explosive levels (LEL), quantitative and qualitative toxic gas levels. Portable gas monitors will be used based on the hazard assessment. This section describes the type, purpose and method of air monitoring to be used on site.

8.1 Routine Air Monitoring Requirements

Type of Air Monitor to be used
MSA Four GAS Meter

Purpose
To monitor oxygen content, explosive levels (LEL), quantitative and qualitative toxic gas levels.

Method (continuous or periodic)
Continuous

Method of Maintenance and Calibration
Annual Calibration by Manufacture

Maintenance and Calibration Log
Date of Last Maintenance

Date of Last Calibration

Air will be monitored when any of the following conditions apply within the exclusion zone:

- Initial site entry;
- A potential IDLH condition or flammable atmosphere has developed;
- Work begins on another portion of the site;
- Contaminants, other than those previously identified, have been discovered;
- Each time a different task or activity is initiated; or
- During trenching and/or excavation work.

All air monitoring data will be documented in a site log book by the Site Safety Officer. Air monitoring instruments will be calibrated and maintained in accordance with the manufacturer's specifications.

Below are guidelines for actions to be taken based on routine air monitoring within the exclusion zone if the hazard assessment warrants. These are:

Oxygen readings between 19.5% and 25%: continue.

Oxygen readings <19.5%: SCBA required, CGI not reliable.

Oxygen readings >25%: exit.

CGI readings of <10% LEL: continue

CGI readings of 10 to 20% LEL: proceed with caution

CGI readings >20% LEL: exit.

OVA/Microtip readings for VOCs sustained between background and 5 ppm over site specific background in breathing zone:

Continue OVA/Microtip readings for VOCs sustained between 5 and 10 ppm over site-specific background in breathing zone: Level C PPE. (See Note)

OVA/Microtip readings for VOCs >10 ppm over site-specific background in breathing zone: Level B PPE.

Note: To ensure readings are not generated by methane, screen vapors with a PID. If the PID reading is less than 5 ppm continue work (assume vapors are methane). If PID readings are over 5 ppm allow the work zone to vent. If PID and OVA reading continue to persist over 5 ppm screen the area with compound specific detector tubes for vinyl chloride and benzene. If these compounds are not present then level C can be worn.

9.0 SITE CONTROL AND STANDARD OPERATING PROCEDURES

9.1 Work Zones

The primary purpose for site controls is to establish the perimeter of a hazardous area, to reduce migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons. The Project Superintendent shall designate an exclusion zone, a decontamination zone, and a support zone. These zones will float (move around the site) depending on the tasks being performed on any given day. The Site Safety Officer will outline these locations during the daily site safety meetings. This information shall be recorded by the Site Safety Officer in the site log.

Tasks requiring the OSHA 40-hour Hazardous Waste Operations and Emergency Response Operations training are carried out in the exclusion zone. The exclusion zone will be defined by the Site Safety Officer but will typically be a 50-foot area around work activities.

Protective equipment shall be removed within the decontamination zone. Disposable protective equipment shall be stored in receptacles staged in the decontamination zone, and non-disposable equipment will be decontaminated according to the procedures outlined in Section 10.0. All personnel and equipment will exit the exclusion zone through the decontamination zone. If, during certain steps of the work, a decontamination trailer is provided, first aid equipment, an eye wash unit, and drinking water shall be kept in the decontamination trailer.

The support zone will be used for the office trailers, for vehicle parking, daily safety meetings, and supply storage. Eating, drinking, and smoking are permitted only in the support zone. When a decontamination trailer is not provided, the eye wash unit, first aid equipment, and drinking water shall be kept at the command post. Gross decontamination (as determined by the site Health and Safety Officer) will be conducted in the exclusion zone, all other decontamination will be performed in the decontamination trailer. This HASP, HASP attachments, a site map indicating the three work zones, and a telephone will be kept in a designated office trailer. An eyewash and fire extinguisher shall be kept in the decontamination trailer or the command post.

9.2 General Field Safety and Standard Operating Procedures

GCH, LLC 's policy is to control hazards for all site areas by limiting entrance to exclusion zones to essential personnel, and by implementing the following:

- Non-essential (as judged by the Site Safety Officer) personnel and unauthorized persons will not enter the exclusion or decontamination zone.

- Before entering the exclusion or decontamination zones, all personnel must be familiar with emergency response procedures (Section 11.0), site safety locations, first aid and communication equipment, and the locations of the map to the hospital and the list of emergency telephone numbers.
- Before entering the exclusion or decontamination zones, all personnel must be familiar with emergency response procedures (Section 11.0), site safety locations, first aid and communication equipment, and the locations of the map to the hospital and the list of emergency telephone numbers.
- The buddy system will be used at all times by field personnel in the exclusion zone; no one is to perform work within the exclusion zone alone. When in Level D or C, visual contact or radio contact shall be maintained at all times. In Level A or B, visual contact shall be maintained at all times, and radio contact shall be maintained with the decontamination and/or support zone.
- Contact with contaminated and potentially contaminated surfaces should be avoided. Walk around (not through) puddles and discolored surfaces. Do not kneel on the ground or set equipment on the ground. Protect equipment from contamination.
- All personnel exiting the exclusion zone must exercise the decontamination procedures described in Section 11.0 of this HASP.
- Beards or other facial hair that interferes with respirator fit will preclude admission to the exclusion zone. Contact lenses shall not be worn in the exclusion or decontamination zones, or if the worker may be expected to enter these zones under routine or emergency situations.
- Eating, drinking, or smoking is permitted only in designated areas in the support zone.
- Each worker must be supplied with and maintain his/her own personal protective equipment.

Note: These policies will be enforced by the GCH, LLC Site Safety Officer with the delegated power of the Principal in Charge.

10.0 DECONTAMINATION PROCEDURES

The standard level D decontamination protocol shall be used in the decontamination zone.

All equipment and PPE exiting the exclusion zone must be decontaminated or properly discarded upon exit. All personnel must enter and exit the exclusion zone through the decontamination area. Due to the nature of the site work, the exclusion and decontamination zones may change. Plastic bags containing personal protective clothing and equipment will be placed in designated receptacles.

All boots and other potentially contaminated garments that have come in contact with the MSW will be cleaned in wash tubs with detergent/water solution and rinsed with water and must remain on site at all times. The wash water, rinse water, and residues will be collected and properly stored until sampling results are received and the final method of disposal can be determined. Disposable PPE, including spent respirator cartridges and canisters, will be properly bagged and disposed of. All contaminated boots, clothing, and equipment (e.g. leather boots, equipment carrying straps) that cannot be decontaminated will be disposed of with the disposable garments or left on site in the decontamination trailer.

Heavy equipment will be decontaminated on a pad constructed of concrete or plastic sheeting that will allow water and residues to be collected in a trench. The decontamination water and residues will be drummed, sealed, and properly stored on-site to await proper disposal. The pad will serve a dual purpose, for decontamination, and to stop equipment leaving the site from tracking materials off site.

The **minimum** measures for Level B doffing and decontamination are:

- Deposit equipment used on site on plastic drop cloths;
- Scrub outer boots and gloves with a water and detergent solution and rinse off;
- Remove outer boots and outer gloves. Discard disposable outer garments in receptacle provided;
- Remove SCBA and face piece and place on rack provided;
- Remove tyvek/outer garment and place in receptacle provided;
- Remove inner gloves and deposit in receptacle provided; and
- Shower/wash face and hands.

The **minimum** measures for Level C doffing and decontamination are:

- Deposit equipment used on site on plastic drop cloths;
- Scrub outer boots and gloves (if worn) with a water and detergent solution and rinse off;
- Remove outer boots and outer gloves. Discard disposable outer garments in receptacle provided;
- Remove tyvek/outer garment and place in receptacle provided;
- Remove first pair of inner gloves;
- Remove respirator (using "clean" inner gloves) and place on rack provided;
- Remove last pair of inner gloves and deposit in receptacle provided; and,
- Shower/wash face and hands

The second to last item to be removed should be the APR, and the last item to be removed should be the last of several pairs of surgical gloves. Wearing several pairs of inner gloves permits layers to be removed as needed during various stages of the doffing procedure, and if the APR inadvertently becomes contaminated, inner gloves guard against bare hands contacting the APR.

11.0 CONTINGENCY PLAN/EMERGENCY RESPONSE PLAN

Site personnel must be prepared in the event of an emergency. Emergencies can take many forms: illnesses, injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather.

Emergency telephone numbers and a map to the hospital will be posted in the command post. Site personnel should be familiar with the emergency procedures, and the locations of site safety, first aid, and communication equipment.

11.1 Emergency Equipment On-Site / Site Communications

Type	Location
Private Telephones:	Site personnel
Two-Way Radios:	Site personnel, if required
Emergency Alarms	On-site vehicle horns*
First Aid Kits:	On-site
Fire Extinguisher:	On-site

* Horns: Air horns will be supplied to personnel at the discretion of the Project Superintendent or Site Safety Officer.

11.2 Emergency Telephone Numbers and Hospital Information

Police	911
Fire and Ambulance	911
National Response Center	(800) 424-8802
Poison Control	(800) 282-3171
Chemical Emergency Advice	(800) 424-9300
ESPL Environmental	(212) 330-7501

11.3 Personnel Responsibilities During an Emergency

The **Project Superintendent** is primarily responsible for responding to and correcting emergency situations. However, in the absence of the Project Superintendent, the **Safety Officer** shall act as the Project Superintendent's on-site designee, and perform the following tasks:

- Take appropriate measures to protect personnel including: withdrawal from the exclusion zone, total evacuation and securing of the site, or upgrading or downgrading the level of protective clothing and respiratory protection;
- Ensure that appropriate federal, state, and local agencies are informed, and emergency response plans are coordinated; In the event of fire or explosion, the local fire department should be summoned immediately. If toxic materials are released to the air, the local authorities should be informed in order to assess the need for evacuation;
- Ensure appropriate decontamination, treatment, or testing for exposed or injured personnel;
- Determine the cause of the incident and make recommendations to prevent recurrence; and,
- Ensure that all required reports have been prepared.

The emergency coordinators for this work are:

Project Superintendent	-	Sanjay Patel (516351-2400)
Site Safety Officer	-	Bhupender Singh (917-731-8770)

11.4 Medical Emergencies

Any person who becomes ill or injured in the exclusion zone must be

decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. First aid should be administered while awaiting an ambulance or paramedics.

11.5 Fire or Explosion

In the event of a fire or explosion, the local fire department should be summoned immediately. The Project Superintendent or his designated alternate will advise the fire commander of the location, nature and identification of the hazardous materials on-site. If it is safe to do so, site personnel may:

- Use fire fighting equipment available on site; or,
- Remove or isolate flammable or other hazardous materials that may contribute to the fire.

11.6 Evacuation Routes

Evacuation routes established by work area locations for this site will be highlighted on a site map and periodically reviewed during the daily safety meetings. As the work areas change, the evacuation route and map will be altered accordingly, and the new route will be reviewed during the daily safety meetings.

Under extreme emergency conditions, evacuation should be conducted immediately, without regard for equipment. The evacuation signal will be a continuous blast of a vehicle horn, if possible, and/or by verbal/radio communication. When evacuating the site, personnel shall follow these instructions:

- Keep upwind of smoke, vapors, or spill location.
- Exit through the decontamination corridor if possible.
- If evacuation through the decontamination corridor is not possible, site personnel should remove contaminated clothing once they are in a safe location and leave it near the exclusion zone or in a safe place.
- The Project Superintendent or Site Safety Officer will conduct a head count to ensure that all personnel have been evacuated safely. The head count will be correlated to the site and/or exclusion zone entry/exit log.
- If emergency site evacuation is necessary, all personnel are to escape the emergency situation and decontaminate to the maximum extent

practical.

11.7 Spill Control Procedures

In the event of a leak or a release, site personnel will:

- Inform their supervisor immediately;
- Locate the source of the spillage and stop the flow if it can be done safely; and,
- Begin containment and recovery of the spilled materials.

Equipment on-site shall be sufficient to handle any spills. Equipment shall be diked and containerized appropriately. Field monitoring equipment and spill control equipment are shown in Table 11-1.

11.8 Vapor Release Plan

The site work will be suspended if air monitoring at the site perimeter shows air contaminants above acceptable concentrations. Off-site readings will be taken within 20 feet of the nearest residential or commercial property. If efforts to mitigate the emission source are unsuccessful for 30 minutes then the GCH, LLC Site Safety Officer will:

- contact the local police,
- continue to monitor air every 30 minutes, 20 feet from the closest off-site property. If two successive readings are within acceptable levels, off-site air monitoring, would be halted.

All property line and off-site air monitoring locations and results associated with vapor releases shall be recorded in the site safety log book.

11.9 Communication Procedures

Type of communication to be used:
(i.e. cellular phone, Two-way radio, etc.)

Cell phones

The following standard hand signals will be used in case of failure of communication equipment:

date of April 15, 1993. The rule specifically excludes agriculture, construction, or shipyard employment, but prudence requires that this HASP cover confined space entry and the OSHA rule will be followed. OSHA defines confined space as:

1. is large enough and so configured that an employee can bodily enter and perform assigned work;
2. has limited or restricted areas for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited entry); and
3. is not designed for continuous employee occupancy.

OSHA further requires that an "entry supervisor" (the site safety officer) decides at the time of entry whether the space is permit required or non-permit required space. Once designated the site safety officer will monitor the space two hours prior to entry and continuously during work to ensure that the atmosphere is not hazardous. OSHA defines as hazardous atmosphere as:

1. Flammable gas, vapor, or mist in excess of 10 percent of its lower explosive limit (LEL);
2. Airborne combustible dust at a concentration that meets or exceeds its LEL;
NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.
3. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent
4. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z. Toxic and Hazardous Substances, of this part and which could result in employee exposure in excess of its dose or permissible exposure limit;
5. Any other atmospheric condition that is immediately dangerous to life or health.

The space is non-permit required if none of the above defined hazardous conditions are present. OSHA requires an attendant (e.g., an individual stationed outside one or more spaces who monitors the entrants and who performs air monitoring of the space(s) be assigned for each space. The attendant is not allowed to perform any rescue duties but simply must communicate with the entrant and call for coordinates rescue procedures if required.

12.1 Confined Space Entry Procedure

Confined space entry that will require a permit may be required during construction at the site. If the Site Safety Officer determines that an excavation meets the definition of a confined space then natural or mechanical ventilation will be employed to ensure that the space meets the requirements of non-permit required confined space. The Site Safety Officer will perform continuous air monitoring one hour before and during entry work to ensure that the space remains non-permit required.

A confined space entry permit must be filled out and signed by the Site Safety Officer. By signing this, the supervisor certifies that the space does not contain a hazardous atmosphere, and that the atmosphere will be monitored.

A confined space entry permit form is located in New York State Department of Labor, Employer Guide and Model (Permit Required Confined Space Entry Plan (29 CFR Part 1910.146) located at the end of this section or at the GCH, LLC office. This permit will be modified by the Site Safety Officer for different confined spaces.

Blowers will be utilized to ventilate the space.

When workers are in the excavation, the space must be continuously monitored for the hazardous atmosphere parameters using appropriate instrumentation. The Site Safety Officer or delegee must log the meter readings every 30 minutes while the confined space is occupied.

If a hazardous atmosphere is detected, employees must leave confined space until monitoring shows that there is no atmosphere hazard. Engineering controls will be used to dissipate the atmosphere if it does not dissipate naturally.

13.0 DAILY SAFETY MEETINGS

Safety or pre-entry meetings will be held each day before work begins, to ensure that all on-site personnel understand site conditions and operating procedures, and to address safety questions and concerns. The Site Safety Officer or the Project Superintendent will lead the meetings. All personnel trained and prepared to enter exclusion and decontamination zones will attend the meetings.

The site safety officer shall maintain a log of each meeting.

14.0 WORK PLAN

14.1 Work Tasks, Objectives and Methods for Implementation

(Describe specifically who will be working on tasks to be performed and their functions)

Margaret Tavares, overall site supervisor to coordinate all field activities related to environmental investigations.

Margaret Tavares, site health and safety officer to coordinate and ensure compliance to all site-specific safety plans.

Location of Exclusion, Decontamination and Support Zones. (Include a location drawing if necessary)

14.2 Clean Up / Decontamination Activities and Procedures

(Describe specifically who will be working on tasks to be performed and their functions)

FieldSupervisor_____

14.3 Informational Programs

To ensure that employees, contractors, and subcontractors (or their representatives) are aware of this plan all persons engaged in operations at this site must sign the Site Personnel Form indicating that they are familiar with this Site Health and Safety Plan prior to commencing operations.

Site Personnel Log

I have reviewed and am familiar with the Site Health and Safety Plan for the following site:

GCH, LLC
335 Grand Concourse
Bronx , New York

Name	Company or Affiliation	Date	Remarks

14.4 Medical Surveillance Program

Refer to Section 7.0

14.5 Personnel Requirements

Refer to Section 2.0

14.6 - Training Implementation

Refer to Section 4.0

APPENDIX 5

**SAMPLE HAZARDOUS AND NON-HAZARDOUS SOIL
DISPOSAL MANIFESTS**

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number		2. Page 1 of		3. Emergency Response Phone		4. Manifest Tracking Number			
		5. Generator's Name and Mailing Address						Generator's Site Address (if different than mailing address)			
Generator's Phone:											
6. Transporter 1 Company Name						U.S. EPA ID Number					
7. Transporter 2 Company Name						U.S. EPA ID Number					
8. Designated Facility Name and Site Address						U.S. EPA ID Number					
Facility's Phone:											
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))					10. Containers		11. Total	12. Unit	13. Waste Codes	
						No.	Type	Quantity	Wt./Vol.		
	1.										
	2.										
	3.										
	4.										
14. Special Handling Instructions and Additional Information											
<p>15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.</p> <p>I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.</p>											
Generator's/Offeror's Printed/Typed Name						Signature			Month	Day	Year
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: _____ Date leaving U.S.: _____											
17. Transporter Acknowledgment of Receipt of Materials											
Transporter 1 Printed/Typed Name						Signature			Month	Day	Year
Transporter 2 Printed/Typed Name						Signature			Month	Day	Year
18. Discrepancy											
18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection											
						Manifest Reference Number:					
18b. Alternate Facility (or Generator)						U.S. EPA ID Number					
Facility's Phone:											
18c. Signature of Alternate Facility (or Generator)						Signature			Month	Day	Year
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)											
1.			2.			3.			4.		
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a											
Printed/Typed Name						Signature			Month	Day	Year

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No.		Manifest Document No.	2. Page 1 of
3. Generator's Name and Mailing Address					
4. Generator's Phone ()					
5. Transporter 1 Company Name		6. US EPA ID Number		A. State Transporter's ID	
				B. Transporter 1 Phone	
7. Transporter 2 Company Name		8. US EPA ID Number		C. State Transporter's ID	
				D. Transporter 2 Phone	
9. Designated Facility Name and Site Address		10. US EPA ID Number		E. State Facility's ID	
				F. Facility's Phone	
11. WASTE DESCRIPTION			12. Containers		13. Total Quantity
			No.	Type	14. Unit Wt./Vol.
a.					
b.					
c.					
d.					
G. Additional Descriptions for Materials Listed Above				H. Handling Codes for Wastes Listed Above	
15. Special Handling Instructions and Additional Information					
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.					
Printed/Typed Name				Signature	
				Date	
				Month	Day Year
17. Transporter 1 Acknowledgement of Receipt of Materials				Date	
Printed/Typed Name				Signature	
				Date	
				Month	Day Year
18. Transporter 2 Acknowledgement of Receipt of Materials				Date	
Printed/Typed Name				Signature	
				Date	
				Month	Day Year
19. Discrepancy Indication Space					
20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.					
Printed/Typed Name				Signature	
				Date	
				Month	Day Year

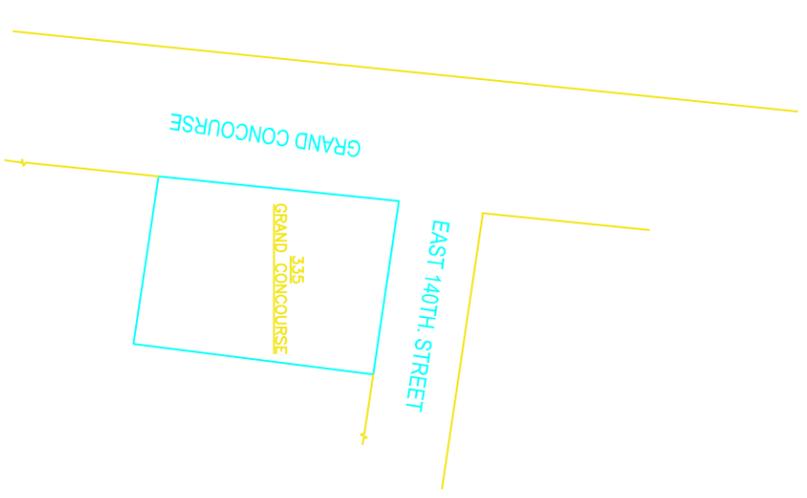
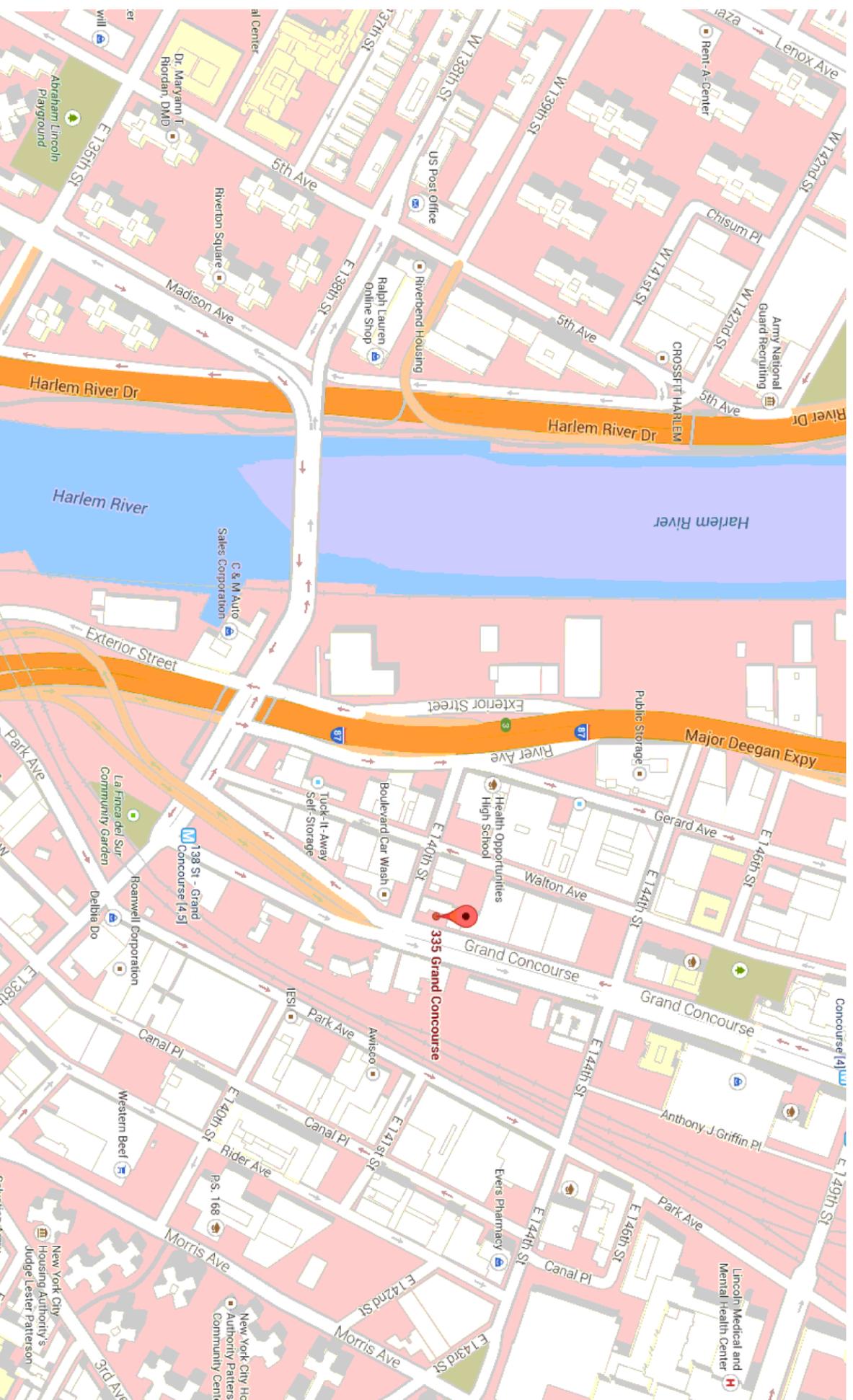
NON-HAZARDOUS WASTE

GENERATOR

TRANSPORTER

FACILITY

FIGURES



SITE LOCATION MAP

ESPL Environmental Consultants Corp.
 Address: 2 West 32nd Street
 NY 10001 Tel: 212-363-ESPL
 Email: mail@espl.com www.espl.com

Sheet Title: Site Location Map
 Client & Location: GCH, LLC
 335 Grand Concourse, Bronx NY

Project #: 131-4
 Date: August 1, 2014

Scale: As Shown
 Drawn By: T.H.

Figure 1

83.15'

ZONE : C6-2A, FAR : C :6.0

MAX: 4,945 SF. X 6 =29,670 SF.

MIN. BASE HT.:60'

MAX. BASE HT.:85'

LOT : 4,945 SF.

HEIGHT : MAX. BLDG. HT.:120'

60.48'

SETBACK: 10' ON WIDE ST., 15' ON NARROW ST.

58.49'

EAST 140TH. STREET

TOTAL : 80 GUEST ROOMS, 3 PARKING SPACES

1F: 3 RMS (2 H.C. SUITE)

2F~6F: 10X5=50 RMS

7F~9F: 9X3=27 RMS (3 H.C. SUITE)

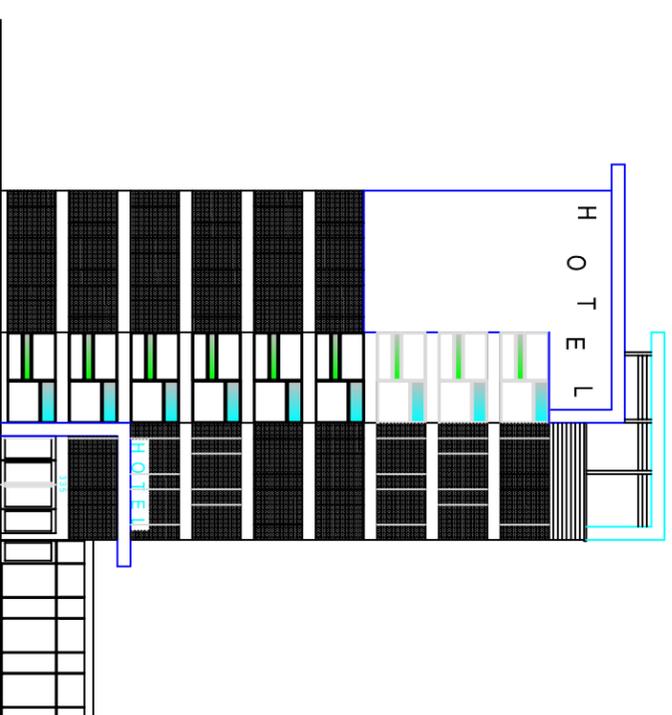
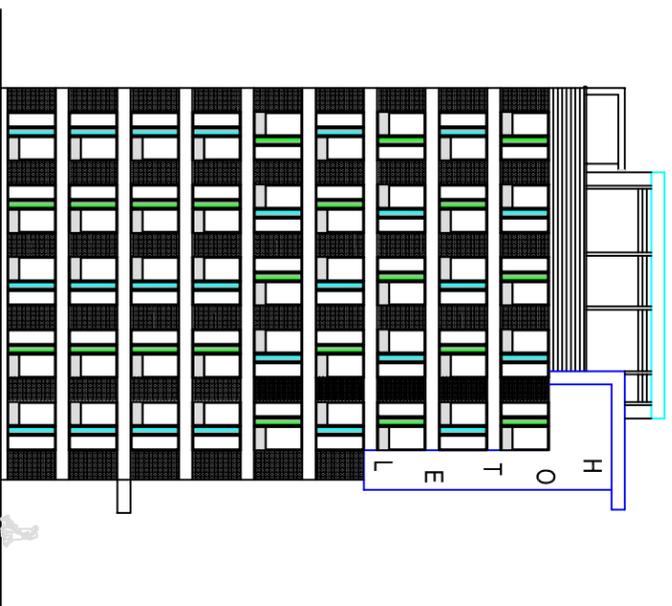
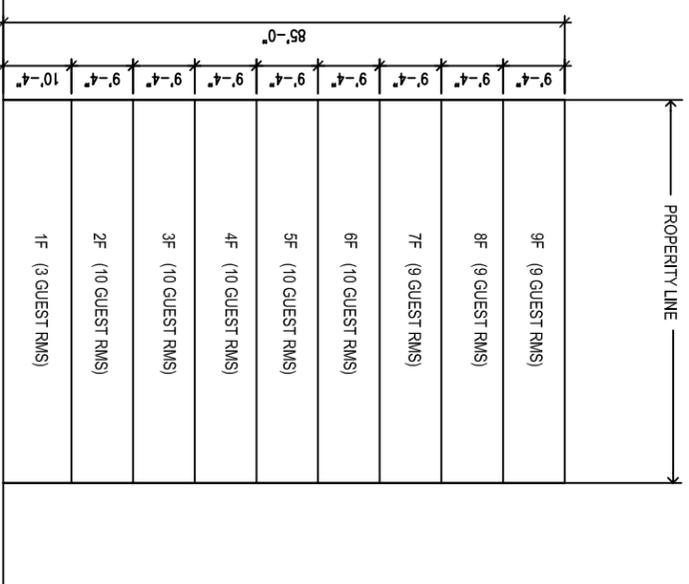
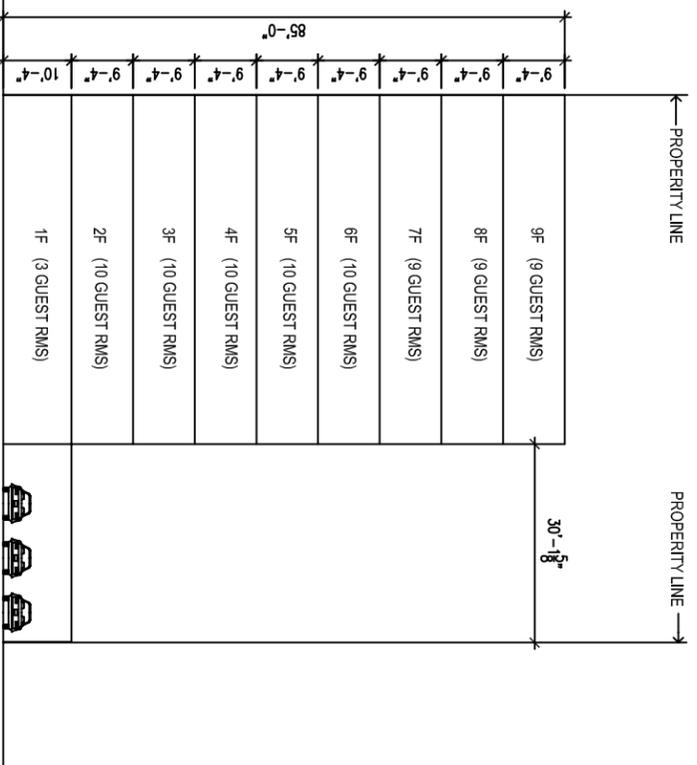
83.22'

GRAND CONCOURSE

ESPL Environmental
Consultants
Corp.
Address: 2 West 32nd Street
NY 10001 Tel: 212-363-ESPL
Email: mail@espl.com www.espl.com

Sheet Title:	Site Re-Development Plan Map	Project #:	131-4	Scale:	As Shown
Client & Location:	GCH, LLC 335 Grand Concourse, Bronx, NY	Date:	August 1, 2014	Drawn By:	T.H.

Figure 2.0



ESPL Environmental
Consultants Corp.

Address: 2 West 32nd Street
NY 10001 Tel: 212-363-ESPL
Email: mail@espl.com www.espl.com

Sheet Title: Site Re-Development Plan Map

Client & Location: GCH, LLC
335 Grand Concourse, Bronx, NY

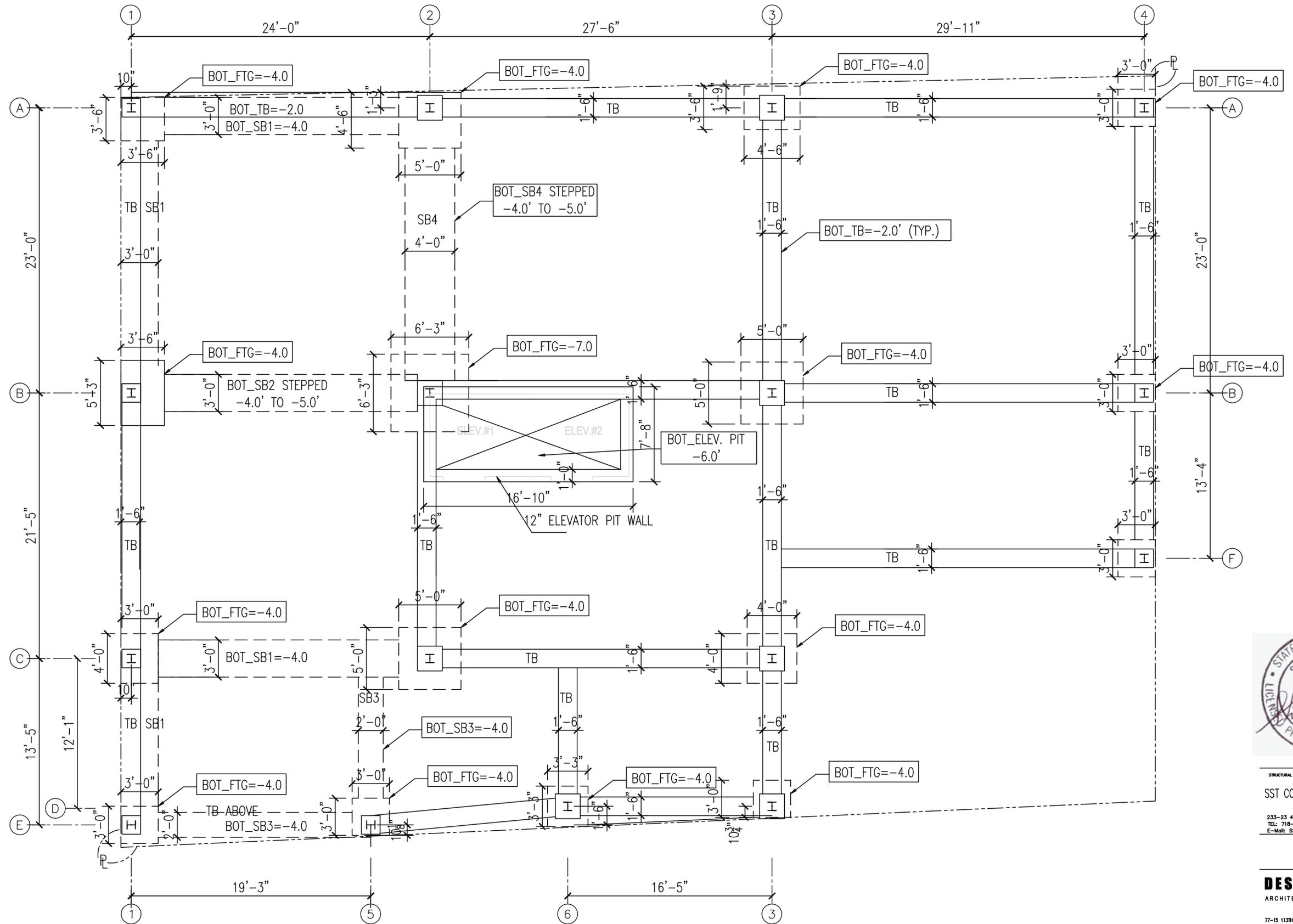
Project #: 131-4

Date: August 1, 2014

Scale: As Shown

Drawn By: T.H.

Figure 2.2



1 FOUNDATION PLAN
S101 SCALE : 3/16"=1'-0"

- NOTE: 1. DATUM TOP 1ST FLOOR SLAB (TOS) EL. 32.25' = EL. 0.0'.
 2. FOUNDATION SHALL BE BEARING ON SOILD ROCK WITH THE BEARING CAPACITY =10 TON SF.
 3. ALL FOOTING SHOW DOTTED TO BE 2'-0" DEEP AND 4'-0" BELOW 1ST FLOOR TOS.
 4. COLUMN 2B FOOTING =7'-0" AND ELEVATOR PIT TO BE 6'-0" BELOW 1ST FLOOR TOS.
 5. ALL TIE BEAM (TB) TO BE 18"Wx18"D AND BOT_TB TO BE 2'-0" BELOW TOS.
 6. ALL STRAP BEAM (SB) SHOW DOTTED TO BE 2'-0" DEEP AND FLUSHING WITH THE SPREAD FOOTING.
 7. ADDITIONAL TB ABOVE THE PERIMETER STRAP BEAM AS CLOSURE BEAM.
 8. ALL PEDESTAL TO BE 2'-0"x2'-0" OR 1'-6"x1'-6" FOR PERIMETER COLUMN.

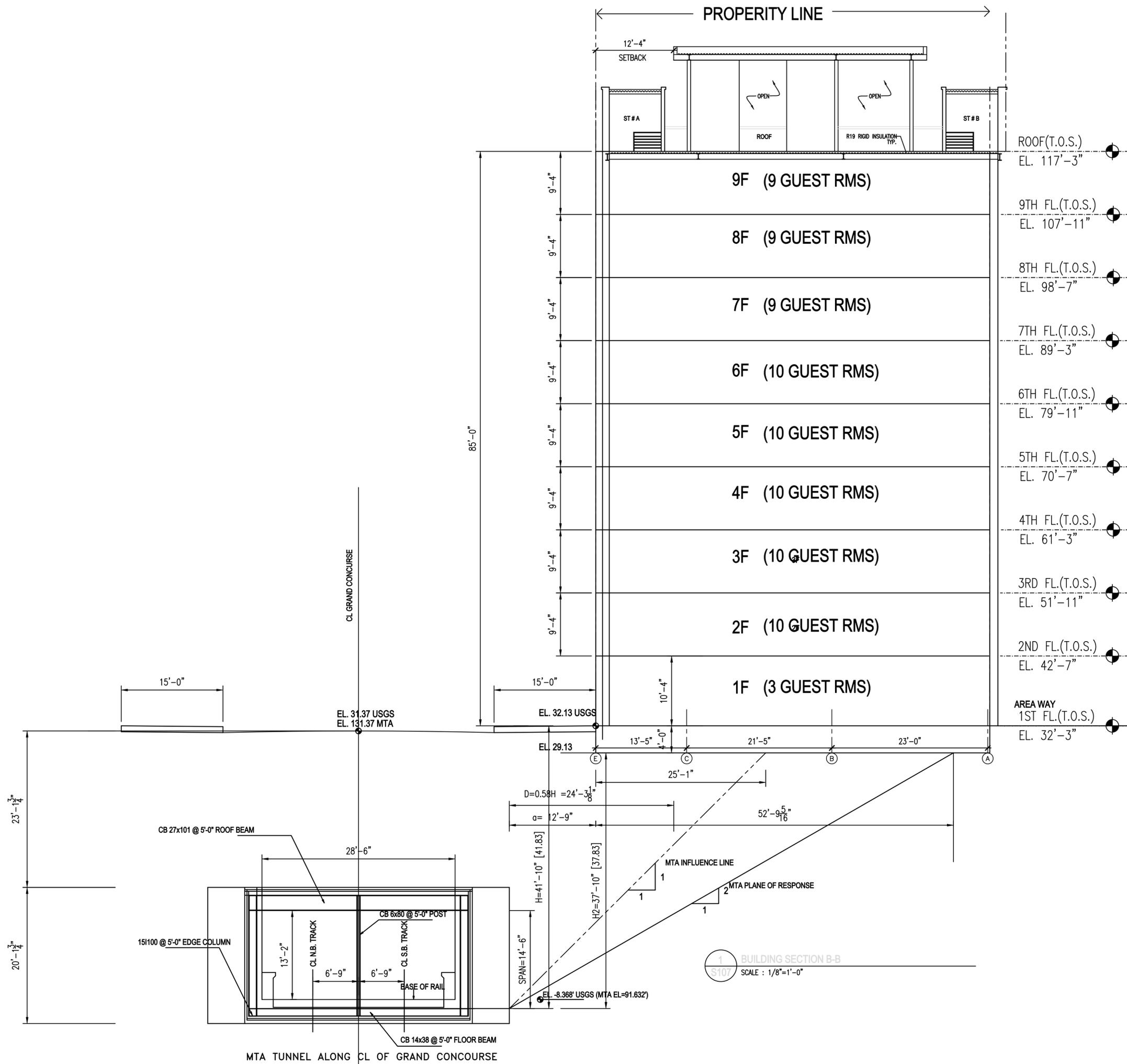


STRUCTURAL ENGINEER
 SST CONSULTANT ENGINEER, P.C.
 233-23 41st Ave. Douglaston NY 11363
 TEL: 718-279-8576 FAX: 718-279-8576
 E-Mail: SST8576@aol.com

DESIGN 101, LLC
 ARCHITECTURE + INTERIORS
 77-15 113TH ST. #51, FOREST HILLS, NY 11375
 TEL: 718.897.4741 E-MAIL: DESIGN101@GMAIL.COM

335 GRAND CONCOURSE
 BRONX, NY 10451

FOUNDATION PLAN
S-101.00 X OF X
 SCALE : 3/16"=1'-0" DATE : 7/8/2014



STRUCTURAL ENGINEER
 SST CONSULTANT ENGINEER, P.C.
 235-23 41st Ave. Douglaston NY 11363
 TEL: 718-278-8576 FAX: 718-278-8576
 E-Mail: SST8576@aol.com

DESIGN 101, LLC
 ARCHITECTURE + INTERIORS

77-15 113TH ST. #5L, FOREST HILLS, NY 11375
 TEL: 718.897.4741 E-MAIL: DESIGN101@GMAIL.COM

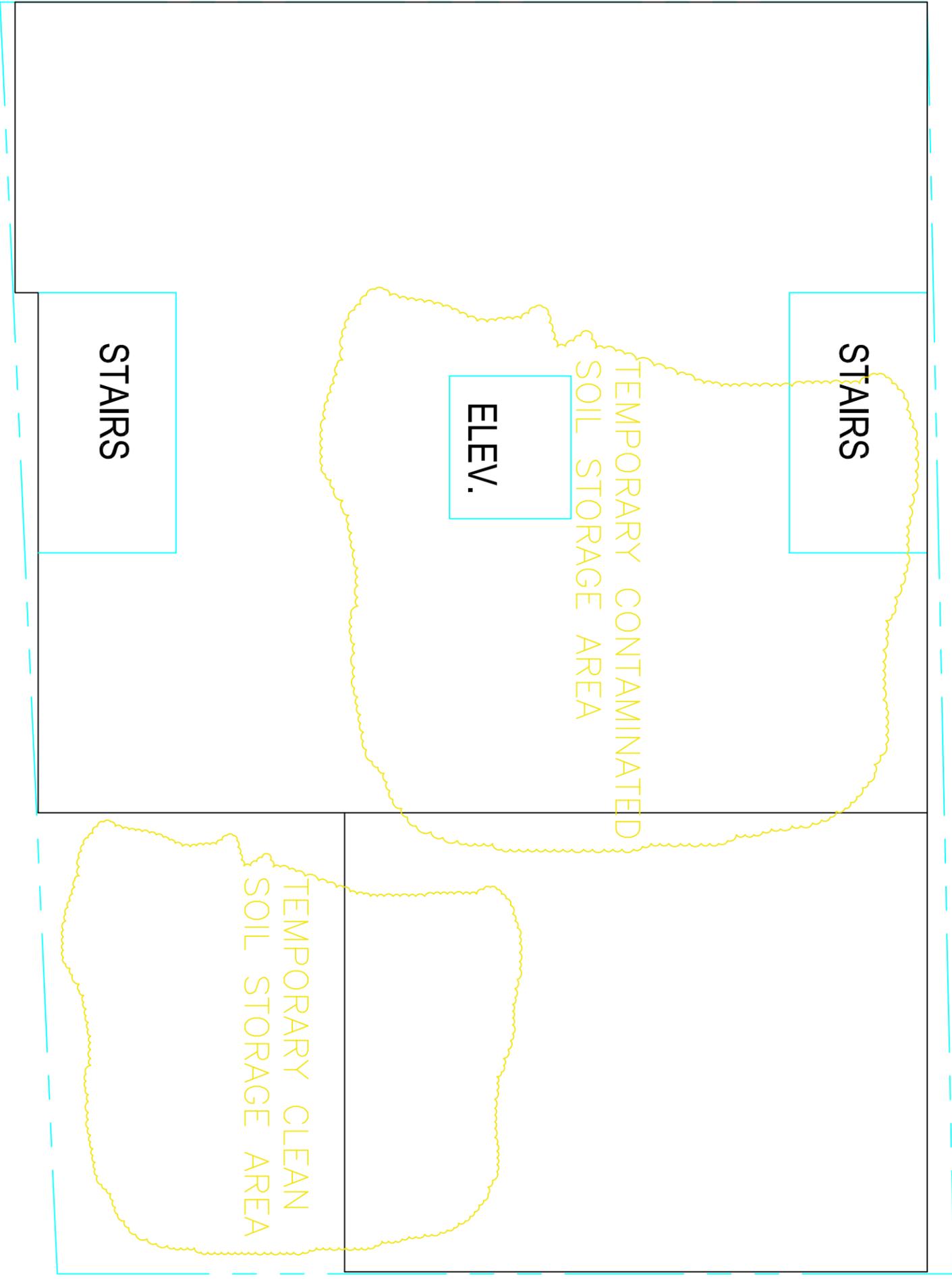
335 GRAND CONCOURSE
 BRONX, NY 10451

UPPERROOF FRAMING PL.

S-107.00 X OF X
 SCALE : 3/16"=1'-0" DATE : 7/8/2014



EAST 140TH. STREET



GRAND CONCOURSE

ESPL Environmental Consultants Corp.
Address: 2 West 32nd Street
NY 10001 Tel: 212-363-ESPL
Email: mail@espl.com www.espl.com

Sheet Title: SITE EXCAVATION AREA & SOIL STORAGE LOCATION
Client & Location: GCH LLC
335 Grand Concourse, Bronx NY

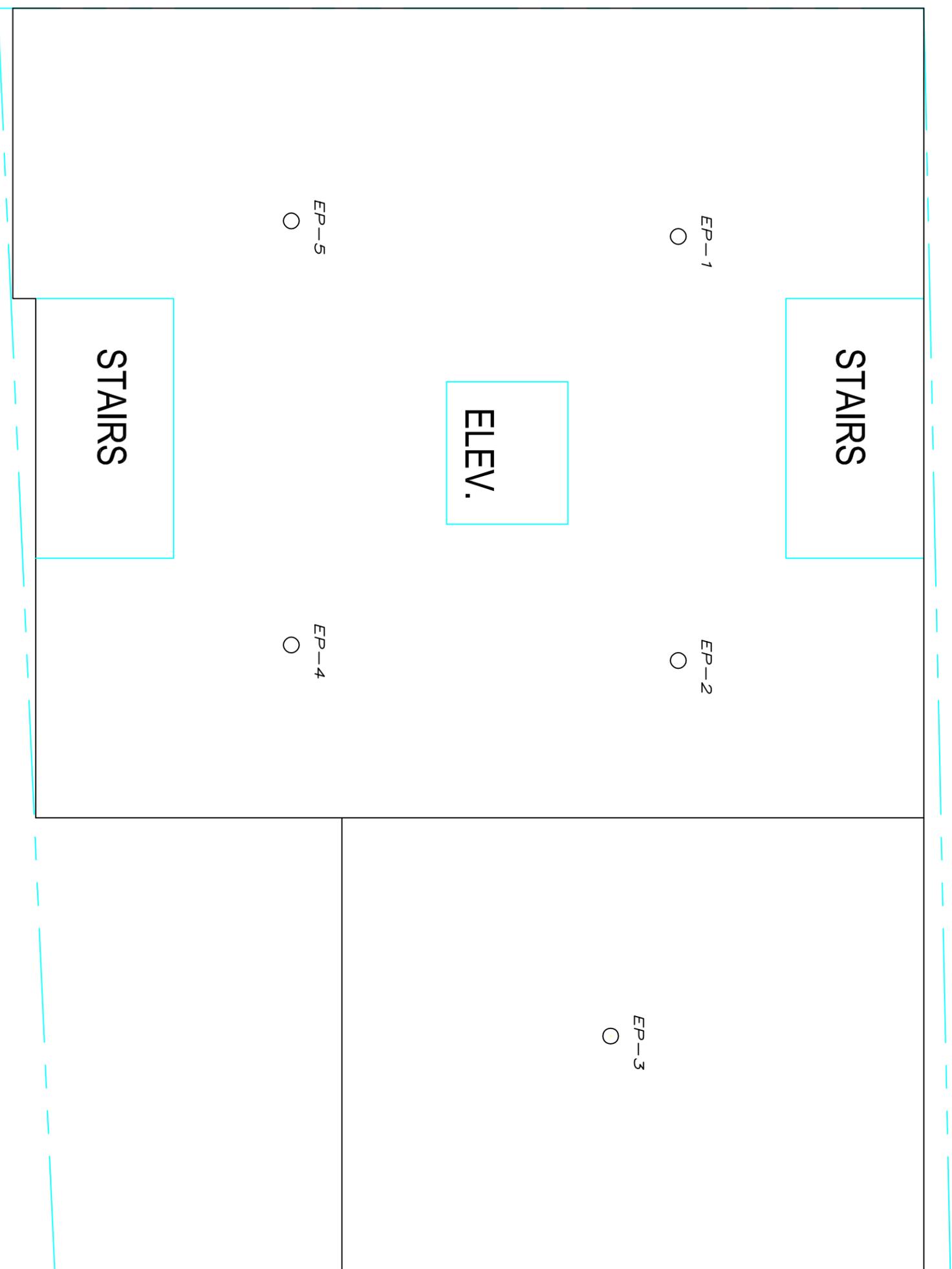
Project #: 131-4
Date: August 1, 2014

Scale: As Shown
Drawn By: T.H.

Figure 3



EAST 140TH. STREET



GRAND CONCOURSE

ESPL Environmental
Consultants
Corp.

Address: 2 West 32nd Street
NY 10001 Tel: 212-363-ESPL
Email: mail@espl.com www.espl.com

Sheet Title: Map of End-Point Sampling Location

Client & Location: GCH LLC
335 Grand Concourse, Bronx NY

Project #: 131-4

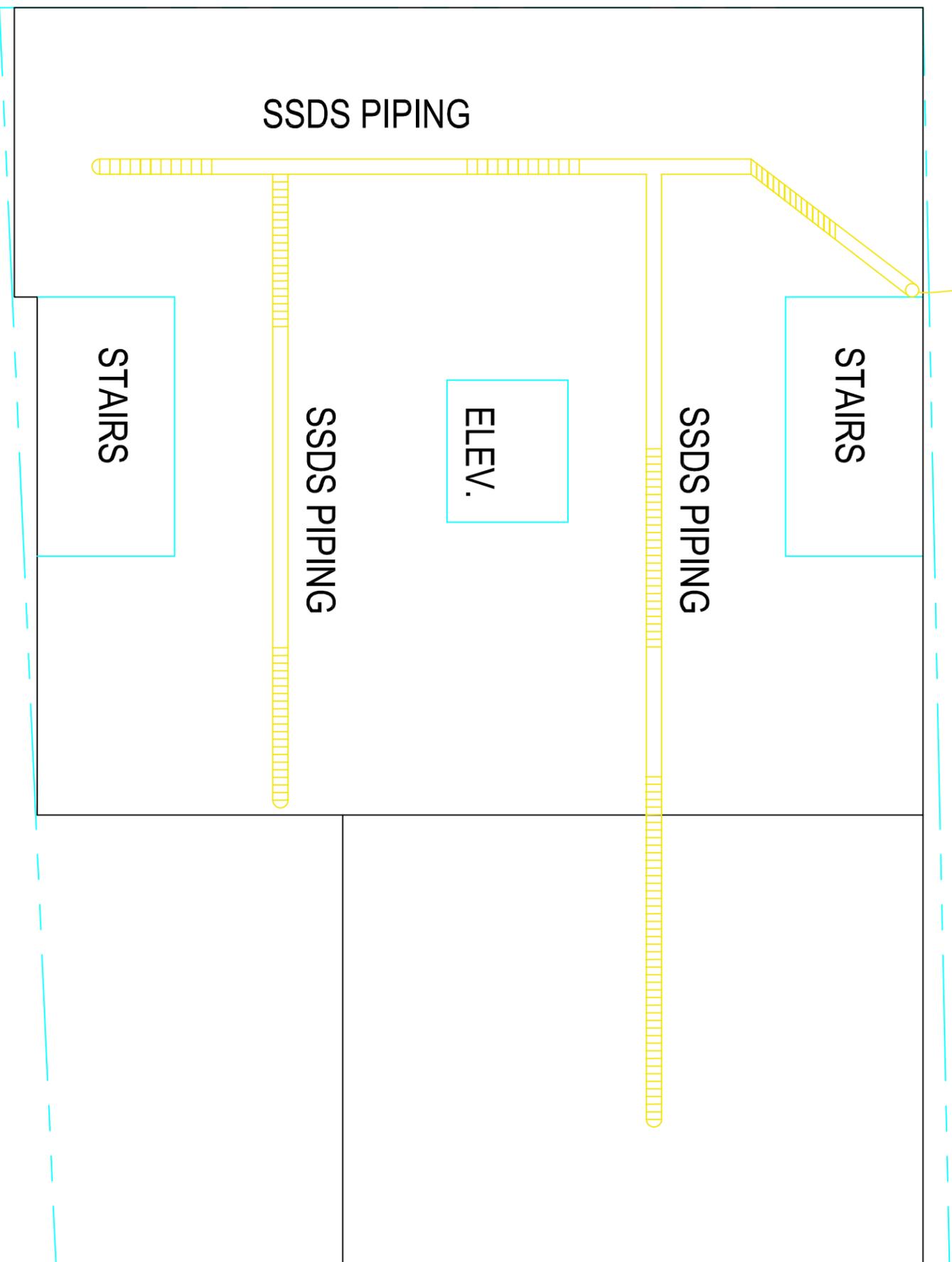
Date: August 1, 2014

Scale: As Shown

Drawn By: T.H.

Figure 4

UNDERSLAB PIPING TIE-IN TO THE RISER



EAST 140TH. STREET

GRAND CONCOURSE



ESPL

Environmental
Consultants
Corp.

Address: 2 West 32nd Street
NY 10001 Tel: 212-363-ESPL
Email: mail@espl.com www.espl.com

Sheet Title:

Sub-Slab Depressurization Piping Layout

Project #: 131-4

Scale: As Shown

Client & Location:

GCH LLC
335 Grand Concourse, Bronx NY

Date:

August 1, 2014

Drawn By: T.H.

Figure 5

TABLES

TABLE 1
335 Grand Concourse
Volatile Organic Compounds Analysis (VOC)
Soil Samples

Sample ID	Date Collected	Matrix	EPA Methodology	Date Analyzed	Parameter/Units	CAS #		EP-1 (D)		EP-2 (D)		EP-3 (D)		Track 1 Unrestricted Use Part 375- 6.8(a)	Track 2 Restricted Use
						Soil	8260	Soil	8260	Soil	8260	ug/kg	ug/kg		
						Results	RL	Results	RL	Results	RL				
sec-Butylbenzene	135-98-8													11,000	100,000
Styrene	100-42-5														
tert-Butylbenzene	98-06-6													5,900	100,000
Tetrachloroethene	127-18-4													1,300	5,500
Tetrahydrofuran (THF)	109-99-9														
Toluene	108-88-3													700	100,000
Total Xylenes	1330-20-7														
trans-1,2-Dichloroethene	156-60-5														100,000
trans-1,3-Dichloropropene	10061-02-6														
trans-1,4-dichloro-2-butene	110-57-6														
Trichloroethene	79-01-6													470	10,000
Trichlorofluoromethane	75-69-4														
Trichlorotrifluoroethane	76-13-1														
Vinyl chloride	75-01-4													20	210

EPB-1 (D) Sample ID (Depth)
 Values Exceed NYSDEC levels
 ND Not Detected
 BDL Below Detection Level

TABLE 2
335 Grand Concourse
Semi-Volatile Organic Compounds Analysis (SVOC)
Soil Samples

Sample ID Date Collected Matrix EPA Methodology Date Analyzed Parameter/Units	CAS #	EP-1 (D)		EP-2 (D)		EP-3 (D)		Track 1 Unrestrict ed Use Part 375- 6.8(a)	Track 2 Restrict ed Use
		Soil		Soil		Soil			
		8270		8270		8270			
		ug/kg		ug/kg		ug/kg			
		Results	RL	Results	RL	Results	RL		
		Hexachlorobutadiene	87-68-3						
Hexachlorocyclopentadiene	77-47-4								
Hexachloroethane	67-72-1								
Indeno(1,2,3-cd)pyrene	193-39-5							500	500
Isophorone	78-59-1								
Naphthalene	91-20-3							12,000	100,000
Nitrobenzene	98-95-3								
N-Nitrosodimethylamine	62-75-9								
N-Nitrosodi-n-propylamine	621-64-7								
N-Nitrosodiphenylamine	86-30-6								
Pentachloronitrobenzene	608-93-5								
Pentachlorophenol	87-86-5							800	2,400
Phenanthrene	85-01-8							100,000	100,000
Phenol	108-95-2							330	100,000
Pyrene	129-00-0							100,000	100,000
Pyridine	110-86-1								

EPB-1 (D) Sample ID (Depth)
 Values Exceed NYSDEC levels
ND Not Detected

TABLE 3
335 Grand Concourse
Polychlorinated Biphenyls Analysis (PCBs)
Soil Samples

Sample ID	CAS #	EP-1 (D)		EP-2 (D)		EP-3 (D)		Track 1 Unrestrict ed Use Part 375- 6.8(a)	Track 2 Restricted Use
Date Collected		Soil		Soil		Soil			
Matrix		8082		8082		8082			
EPA Methodology									
Date Analyzed									
Parameter/Units		ug/kg		ug/kg		ug/kg			
	Results	RL	Results	RL	Results	RL			
PCB-1016	12674-11-2							100	1,000
PCB-1221	11104-28-2							100	1,000
PCB-1232	11141-16-5							100	1,000
PCB-1242	53469-21-9							100	1,000
PCB-1248	12672-29-6							100	1,000
PCB-1254	11097-69-1							100	1,000
PCB-1260	11096-82-5							100	1,000
PCB-1262	37324-23-5							100	1000
PCB-1268	11100-14-4							100	1000

EPB-1 (D) Sample ID (Depth)
 Values Exceed NYSDEC levels
ND Not Detected
BDL Below Detection Level

TABLE 4
372 Lafayette Avenue, NY, NY,
Metals Analysis
Soil Samples

Sample ID	CAS #	EP-1 (D)		EP-2 (D)		EP-3 (D)		Track 1 Unrestricted Use Part 375- 6.8(a)	Track 2 Restricted Use
Date Collected									
Matrix		Soil		Soil		Soil			
EPA Methodology		6010-7471		6010-7471		6010-7471			
Date Analyzed**									
Parameter/Units		mg/Kg		mg/Kg		mg/Kg			
		Results	RL	Results	RL	Results	RL		
Aluminum	7429-90-5								
Antimony	7440-36-0								
Arsenic	7440-38-2							13	16
Barium	7440-39-3							350	350
Beryllium	7440-41-7							7.2	14
Cadmium	7440-43-9							2.5	2.5
Calcium	7440-70-2								
Chromium	7440-47-3								
Cobalt	7440-48-4								
Copper	7440-50-8							50	270
Iron	7439-89-6								
Lead	7439-92-1							63	400
Magnesium	7439-95-4								
Manganese	7439-96-5							1,600	2,000
Mercury	7439-97-6							0.18	0.81
Nickel	7440-02-0							30	140
Potassium	7440-09-7								
Selenium	7782-49-2							4	36
Silver	7440-22-4							2	36
Sodium	7440-23-5								
Thallium	7440-28-0								
Vanadium	7440-62-2								
Zinc	7440-66-6							109	2,200

EPB-1 (D)

Sample ID (Depth)
 Values Exceed NYSDEC levels
 ND Not Detected
 BDL Below Detection Level

ND
 BDL

Soil Cleanup Objectives and Soil/Fill Management

Track 1 Soil Cleanup Objectives (SCOs) are proposed for this project.

If Track 1 is not achieved, the following Track 4 Site-Specific SCOs will be used:

<u>Contaminant</u>	<u>Track 4 SCOs</u>
Total SVOCs	250 ppm
Lead	1000 ppm
Mercury	1.5 ppm
Copper	750 ppm

UNDER-SLAB GAS BARRIER / VAPOR RETARDER (Class A)

PART 1 – GENERAL

1.1 SUMMARY

- A. Products Supplied Under This Section
 - 1. Gas Barrier / Vapor Retarder, Seam Tape, and Pipe Boots

1.2 REFERENCES

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

1.3 SUBMITTALS

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

PART 2 – PRODUCTS

2.1 MATERIALS

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

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

Other Manufacturer accepted meeting the above specification:

- CETCO Liquid Boot Company - 714-384-0111

2.2 ACCESSORIES

A. Seam Tape

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

B. Pipe Boots

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

PART 3 – EXECUTION

3.1 PREPARATION

A. Ensure that subsoil is approved by architect

1. Level and tamp or roll aggregate, sand or tamped earth base.

3.2 INSTALLATION

A. Install Gas Barrier / Vapor Retarder:

1. Installation shall be in accordance with manufacturer's instructions and ASTM E 1643. (Instructions on architectural or structural drawings should be reviewed and followed.)
 - A. Unroll VaporBlock Plus with the longest dimension parallel with the direction of the pour and pull open all folds to full width.
 - B. Lap VaporBlock Plus over footings and seal to the vertical foundation walls with 2-Sided Raven Butyl Seal tape.
 - C. Overlap joints a minimum of 12 inches and seal in-between overlap with 2-Sided Raven Butyl Seal tape then center the Raven VaporBond Plus Tape or other 4" wide gas barrier tape approved by gas barrier / vapor retarder manufacturer over the seal overlap.
 - D. Seal around sewer pipes, support columns or any other penetration with Raven VaporBoot Plus pipe boots or at minimum a combination of VaporBlock Plus and VaporBond Plus Tape or VaporBoot Tape, creating a monolithic membrane between the surface of the slab and moisture sources below as well as at the slab perimeter.
 - E. When VaporBlock Plus gas barrier is used as a part of an active control system for radon gas and other VOCs, a ventilation system will be required. When installed as a passive system it is still recommended to include a ventilation system that could be converted to an active system later.
 - F. Repair damaged areas by cutting patches of VaporBlock Plus, overlapping damaged area 12 inches and taping all four sides with VaporBond Plus Tape or other 4" wide gas barrier tape approved by vapor retarder / gas barrier manufacturer.

NOTE: See manufacturers full-length VaporBlock Plus Installation Guidelines located at www.ravenefd.com for complete details.

VaporBlock® Plus™

UNDERSLAB VAPOR RETARDER / GAS BARRIER

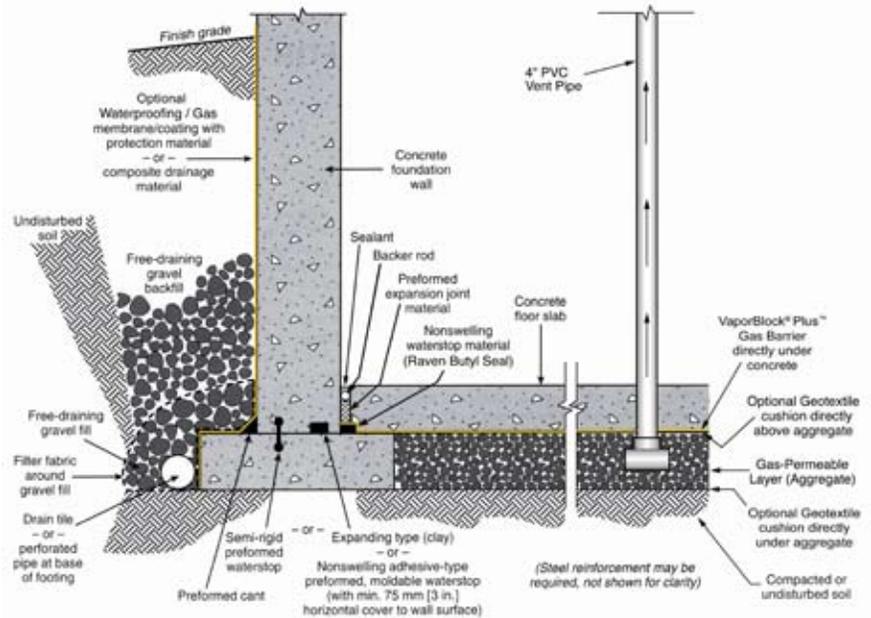
INSTALLATION GUIDELINES

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

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

Materials List:

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



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

VAPORBLOCK® PLUS™ PLACEMENT

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

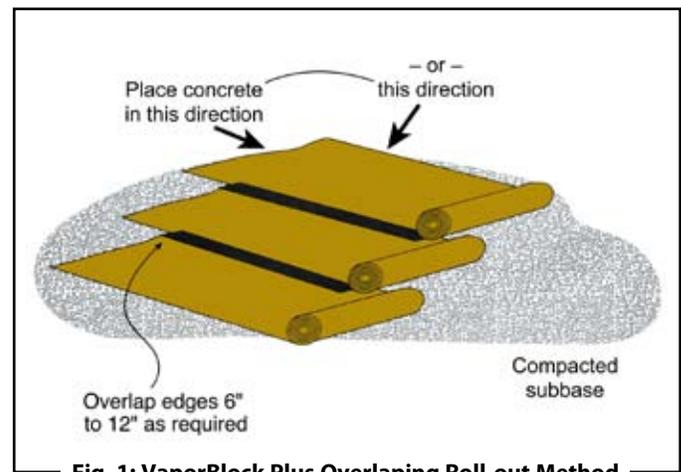


Fig. 1: VaporBlock Plus Overlapping Roll-out Method

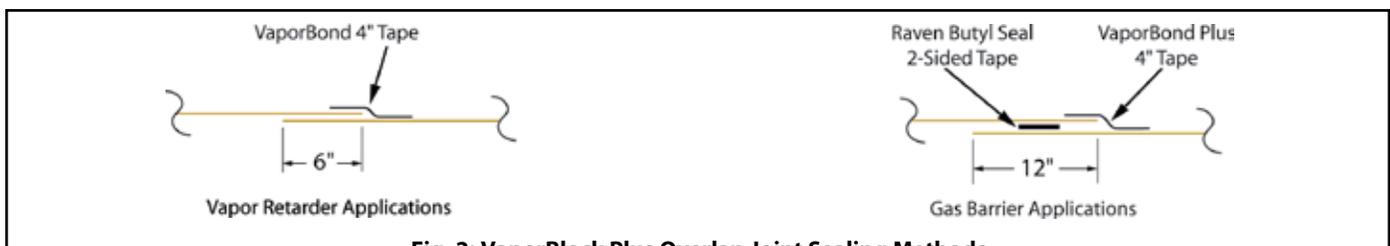


Fig. 2: VaporBlock Plus Overlap Joint Sealing Methods

Top original diagram and figure #1 were reprinted with permission by the Portland Cement Association. Reference: Kanare, Howard M., Concrete Floors and Moisture, EB119, Portland Cement Association, Skokie, Illinois, and National Ready Mixed Concrete Association, Silver Spring, Maryland, USA, 2008, 176 pages.

SINGLE PENETRATION PIPE BOOT INSTALLATION

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

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

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

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

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

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

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

VaporBond Plus Tape (option) - Tape completely around pipe overlapping the to get a tight seal against the pipe.

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

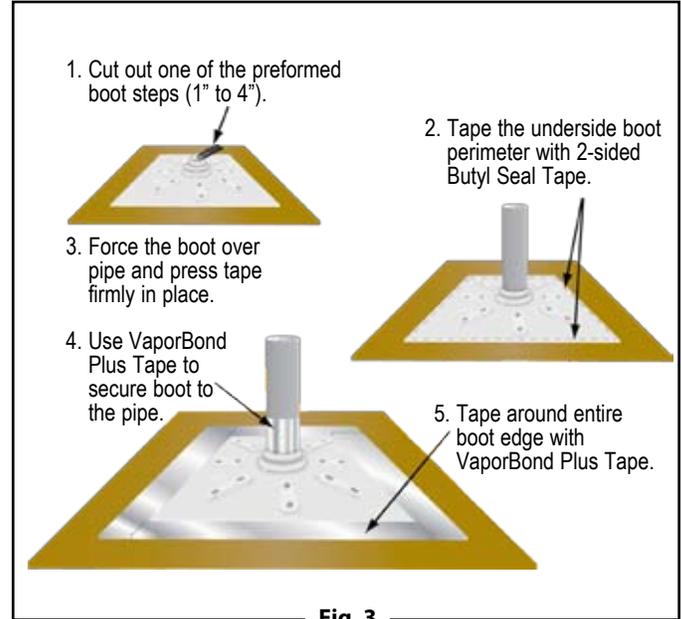


Fig. 3

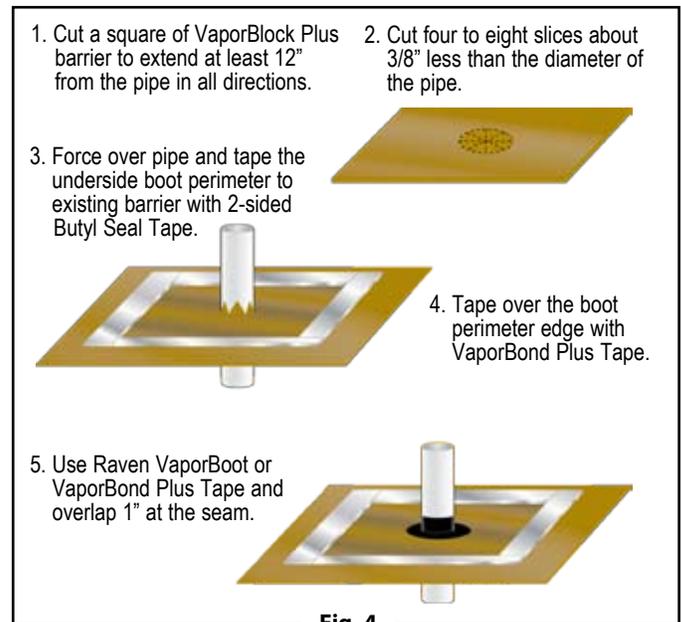


Fig. 4

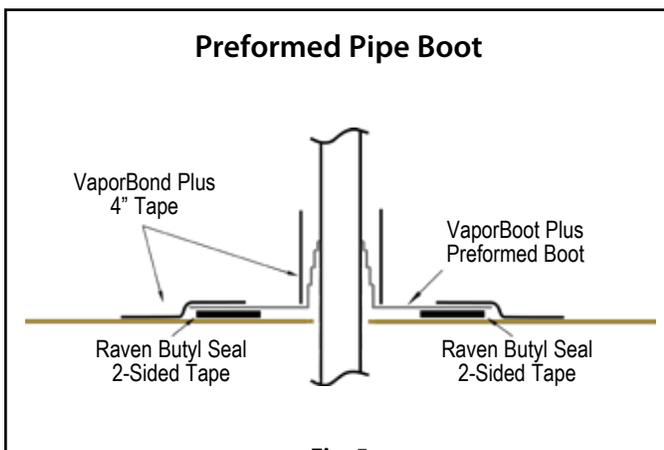


Fig. 5

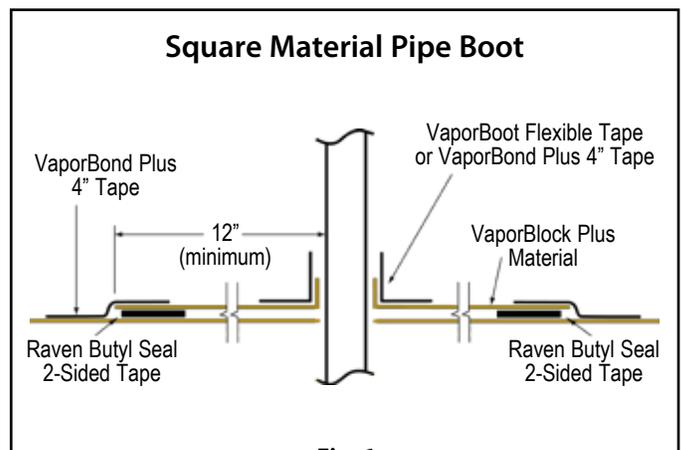


Fig. 6

MULTIPLE PENETRATION PIPE BOOT INSTALLATION

1.5. For side-by-side multiple penetrations;

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

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

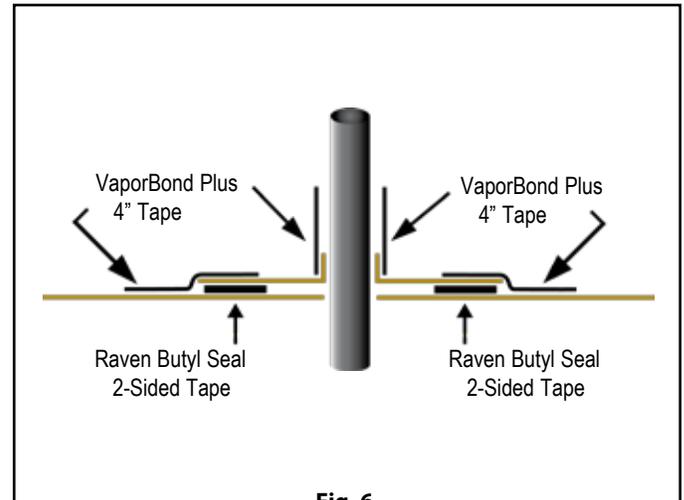


Fig. 6

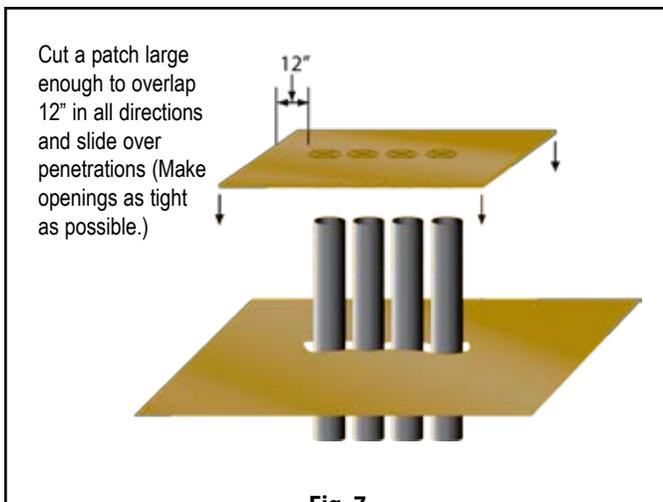


Fig. 7

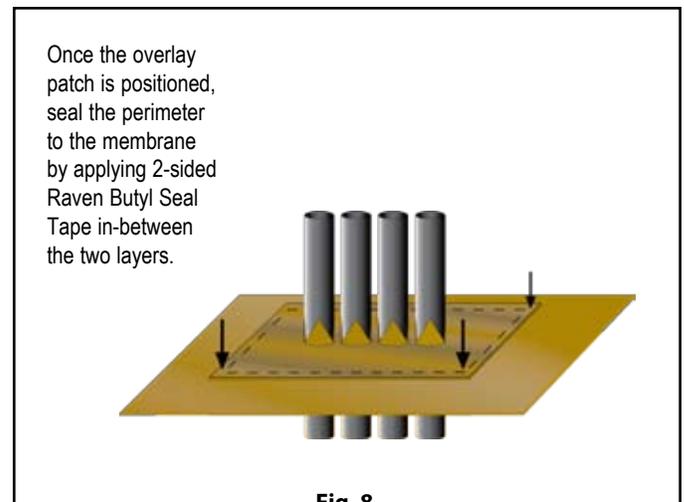


Fig. 8

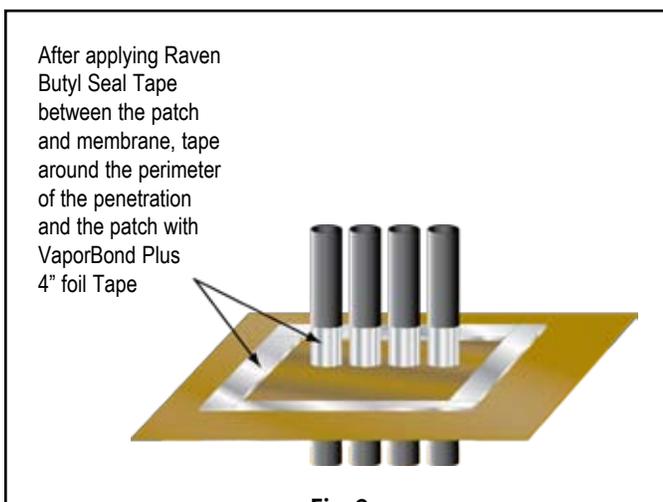


Fig. 9

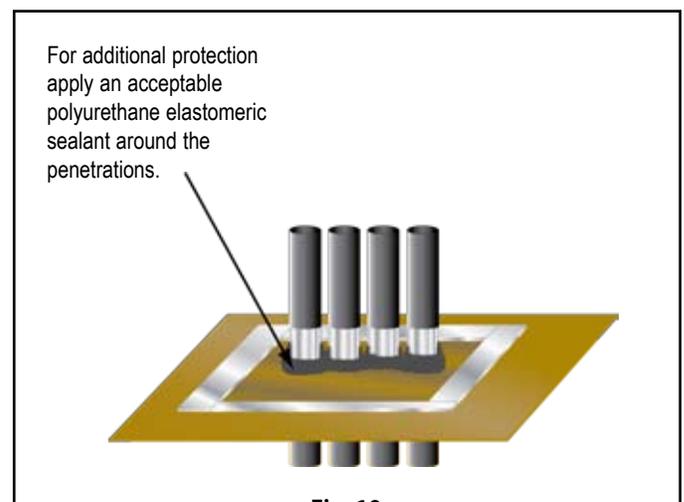


Fig. 10

VAPORBLOCK® PLUS™ PROTECTION

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



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



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



ISO 9001:2000
CERTIFIED MANAGEMENT SYSTEM

www.vaporblockplus.com

6/09 EFD 1127