



**REMEDIAL ACTION WORK PLAN  
522-532 W 29<sup>TH</sup> STREET  
NEW YORK, NEW YORK 10001**

**VCP NUMBER: 13CVCP151M  
BLOCK 700/LOTS 47, 48 & 49  
CEQR NUMBER: 03DCP069M  
ULURP NUMBER: 050161 ZRM  
E DESIGNATION NUMBER: 13EHAN427M  
SPECIAL WEST CHELSEADISTRICT  
REZONING**

**PREPARED FOR:**

W29 Highline Owners LLC  
520 West 27<sup>th</sup> Street, Suite 302  
New York, New York 10001

**PREPARED BY:**

GZA GeoEnvironmental, Inc.  
104 West 29<sup>th</sup> Street, 10<sup>th</sup> Floor  
New York, New York 10001

JULY 2013

File No. 41.0162122.00

## TABLE OF CONTENTS

### Page

LIST OF ACRONYMS	
CERTIFICATION	
EXECUTIVE SUMMARY	2
COMMUNITY PROTECTION STATEMENT	6
REMEDIAL ACTION WORK PLAN	10
1.0 SITE BACKGROUND INFORMATION	11
1.1 SITE LOCATION AND CURRENT USAGE	11
1.2 PROPOSED REDEVELOPMENT PLAN	11
1.3 DESCRIPTION OF THE SURROUNDING PROPERTY	12
1.4 REMEDIAL INVESTIGATIONS	12
2.0 REMEDIAL ACTION OBJECTIVES	15
3.0 REMEDIAL ALTERNATIVES ANALYSIS	16
3.1 THRESHOLD CRITERIA	17
3.2 BALANCING CRITERIA	18
4.0 REMEDIAL ACTION	24
4.1 SUMMARY OF PREFERRED REMEDIAL ACTION	24
4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT	26
4.3 ENGINEERING CONTROLS	29
4.4 INSTITUTIONAL CONTROLS	30
4.5 SITE MANAGEMENT PLAN	31
4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT	32
5.0 REMEDIAL ACTION MANAGEMENT	36
5.1 PROJECT ORGANIZATION AND OVERSIGHT	36
5.2 SITE SECURITY	36
5.3 WORK HOURS	36
5.4 CONSTRUCTION HEALTH AND SAFETY PLAN	36
5.5 COMMUNITY AIR MONITORING PLAN	37
5.6 AGENCY APPROVALS	39
5.7 SITE PREPARATION	39
5.8 TRAFFIC CONTROL	42
5.9 DEMOBILIZATION	42
5.10 REPORTING AND RECORD KEEPING	42
5.11 COMPLAINT MANAGEMENT	43
5.12 DEVIATIONS FROM REMEDIAL ACTION WORK PLAN	43
6.0 REMEDIAL ACTION REPORT	45
7.0 SCHEDULE	47



## **TABLES**

TABLE 1	SOIL ANALYTICAL RESULTS
TABLE 2	GROUNDWATER ANALYTICAL RESULTS
TABLE 3	SOIL VAPOR RESULTS



## **FIGURES**

FIGURE 1	SITE LOCATION MAP
FIGURE 2	REDEVELOPMENT PLAN
FIGURE 3	ENDPOINT SAMPLE AND EXCAVATION LOCATIONS
FIGURE 4	VAPOR BARRIER/WATERPROOFING MEMBRANE DIAGRAMS

## **APPENDICES**

APPENDIX A	CITIZEN PARTICIPATION PLAN
APPENDIX B	SUSTAINABILITY STATEMENT
APPENDIX C	SOIL/MATERIALS MANAGEMENT PLAN
APPENDIX D	CONSTRUCTION HEALTH AND SAFETY PLAN
APPENDIX E	PROPOSED DEVELOPMENT PLANS
APPENDIX F	SAMPLE WASTE DISPOSAL MANIFEST
APPENDIX G	DESIGN DIAGRAM: VAPOR BARRIER/WATERPROOFING MEMBRANE SYSTEM

DRAFT

## LIST OF ACRONYMS



<b>Acronym</b>	<b>Definition</b>
AOC	Area of Concern
AWQS	Ambient Water Quality Standards and Guidance Values
BGS	Below Ground Surface
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
CHASP	Construction Health and Safety Plan
COC	Certificate of Completion
DCR	Declaration of Covenants and Restrictions
DUSR	Data Usability Summary Report
EC	Engineering Control
EC/IC	Engineering and Institutional Control
ELAP	Environmental Laboratory Approval Program
ESA	Environmental Site Assessment
ESI	Environmental Site Investigation
HAZWOPER	Hazardous Waste Operations and Emergency Response
IC	Institutional Control
mcg/m <sup>3</sup>	Micrograms per Cubic Meter
mg/kg	Milligrams per Kilogram
NOC	Notice of Completion
NYC DEP	New York City Department of Environmental Protection
NYC OER	New York City Office of Environmental Remediation
NYCRR	New York Codes, Rules, and Regulations
NYC VCP	New York City Voluntary Cleanup Program
NYSDEC	New York State Department of Environmental Conservation
NYSDEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYSDOH	New York State Department of Health
OER	See NYC OER
OSHA	United States Occupational Health and Safety Administration
PCB	Polychlorinated Biphenyls
PE	Professional Engineer
PID	Photo-Ionization Detector
PM-10	Particulate Matter Less Than 10 Micrometers in Size
PPM	Parts Per Million



QA/QC	Quality Analysis/Quality Control
QAO	Quality Assurance Officer
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAO	Remedial Action Objective
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan or Plan
RCA	Recycles Concrete Aggregate
RCNY	Rules of the City of New York
RI	Remedial Investigation
RIR	Remedial Investigation Report
SCO	Soil Cleanup Objective
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SMMP	Soil/Materials Management Plan
SPDES	State Pollution Discharge Elimination System
SPEED	Searchable Property Environmental E-Database
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCL	Target Compound List
TOGS	Technical and Operational Guidance Series
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VOC	Volatile Organic Compound

# CERTIFICATION

I, Ernest P. Hanna, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the 522-532 West 29<sup>th</sup> Street Site, Site number 13CVCP151M.



I, John M. Gavras am a Qualified Environmental Professional as defined in §43-140. I have secondary direct responsibility for implementation of the remedial action for the 522-532 West 29<sup>th</sup> Street Site, Site number 13CVCP151M.

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 conformance with applicable City, State and Federal laws and regulations. Importation of soil, fill and other material from off the Site will be in conformance with all applicable City, State and Federal laws and requirements. This RAWP has provisions to control nuisances during the remediation and invasive work, including dust and odor suppression.

Ernest Hanna  
Name  
065440  
NYS PE License Number  
Ernest Hanna  
Signature  
7-12-2013  
Date

John M. Gavras  
QEP Name  
[Signature]  
QEP Signature  
7/12/13  
Date



## EXECUTIVE SUMMARY

W29 Highline Owners LLC has enrolled in the New York City Voluntary Brownfield Cleanup Program (NYC VCP) to investigate and remediate a 19,749-square foot site located at 522-532 West 29<sup>th</sup> Street in New York, 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 522-532 West 29<sup>th</sup> Street in the Chelsea section of Manhattan, and is identified as Block 700, Lots 47, 48, and 49 on the New York City Tax Map. The site is 19,749 square feet and is located along the southern portion of West 29<sup>th</sup> Street between 10<sup>th</sup> and 11<sup>th</sup> Avenues. The Site is bounded by West 29<sup>th</sup> Street and Block 700 Lots 16, 22, 23, and 24 (under-development parking facility, art gallery, mixed-use multi-story commercial and residential building, and a storage facility, respectively) to the north, Block 700 Lot 9 (vacant land) to the south, Block 700 Lot 45 (auto repair garage) to the east, and Block 700 Lot 53 (multi-story religious facility) to the west. Currently the site is occupied by three buildings: a two-story brick building on Lot 47, and one-story buildings on Lots 48 and 49. The buildings were most recently occupied by a catering company and two art galleries, respectively. A Site location map is attached as Figure 1.

### Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of redeveloping the lot with an 11-story mixed use building. Layout of the proposed site development is presented in Figure 2. The current zoning designation is C6-3. The proposed use is consistent with existing zoning for the property.

The proposed development project will consist of demolishing the current buildings and constructing a new mixed-use building. The new building will feature eleven floors and one basement level. The basement will be primarily used for storage and utility rooms. Floor 1 will be used for commercial space and Floors 2 through 11 will be used for residential space. The building will rise approximately 135 feet above current street level. An approximate 15' by 100' parking area will be located on the western portion of the Site.

The top of the basement floor will be approximately 12 to 14 feet below sidewalk level, requiring excavation of the entire footprints of Lots 48 and 49 to approximately 15 feet below grade, with additional for the elevator pit to approximately 19 feet below sidewalk level. Lot 47, the proposed parking area, will be excavated to

approximately 2 to 3 feet below sidewalk level. A total of approximately 11,250 tons of soil will be removed.

### **Summary of the Remedy**

The proposed remedial action achieves protection of public health and the environment for the intended use of the property. The proposed remedial action achieves all of the remedial action objectives established for the project and addresses applicable standards, criterion, and guidance; is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants; is cost effective and implementable; and uses standards methods that are well established in the industry.



The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Track 1 Unrestricted Use SCOs for the proposed new building (Lot 48 and 49), and Track 4 Site Specific SCOs are proposed for the parking area (Lot 47).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Excavation and removal of soil/fill exceeding Track 1 Unrestricted Use SCOs in the area of the two buildings (Lots 48 and 49). Areas under the proposed new building will be excavated to a depth of approximately 15 feet below grade for development purposes. Parking lot area (Lot 47) will be excavated to the depths of 2-3 feet below grade. Approximately 11,250 tons of soil/fill will be excavated during remediation and development;
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.
7. Removal of a previously closed in place underground storage tanks (USTs) and removal of other USTs (if encountered) and closure of petroleum spills (if evidence of a new spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.



8. Transportation and off-Site disposal of soil/fill material to permitted facilities in conformance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities.
9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
10. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
11. The building slab will be built well into the water table and soil vapor will not accumulate beneath the building slab. Installation of a vapor barrier/waterproofing system below the concrete slab underneath the building, as well as behind foundation walls of the proposed building. The vapor barrier/water-proofing membrane will be comprised of Grace Preprufe 300R, Preprufe 160R, Bituthene 4000, and HydroDuct 220 below-grade foundation damp proofing material.
12. Construction and maintenance of an engineered composite cover consisting of approximately 3 feet thick cap in the parking lot area to mitigate the potential for human exposure to residual soil/fill remaining under the Site. As part of development, the building area will be covered with 12 inches thick concrete slab across the footprint of the new building.
13. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in conformance with applicable laws and regulations. Since groundwater is at a depth of 10 feet below ground surface, dewatering permits will be obtained from NYCDEP.
14. Implementation of storm-water pollution prevention measures in conformance with applicable laws and regulations.
15. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, describes the Engineering and Institutional Controls (ECs/ICs) to be implemented at the Site for parking areas, and lists any changes from this RAWP.
16. Submission of an approved Site Management Plan (SMP) in the RAR. SMP will provide long-term management of residual impacts, including plans for maintenance, inspection and certification of ECs/ICs and reporting at a specified frequency.
17. Continued registration with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls and management

of these controls 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.



DRAFT

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

**Remedial Investigation and Cleanup Plan.** Under the NYC 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 Health and Safety Plan that is designed to protect community residents and on-Site workers. The elements of this plan are in compliance with safety requirements of the United States Occupational Safety and Health Administration. This plan includes many protective elements including those discussed below.

**Site Safety Coordinator.** This project has not designated a Site safety coordinator to implement the Health and Safety Plan at this time. The safety coordinator will maintain an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator's name and phone number will be provided at a later date.

**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, Kenny Eybs, at (917) 299-8763, or NYC Office of Environmental Remediation Project Manager, Rebecca Bub, at (212) 341-2073.

**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 between 7:00 am through 5:00 pm on Monday through Friday. If Saturday work is to be performed, then the appropriate permits will be obtained from the New York City Department of Buildings for work variances.



**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 complaints. If you have complaints, you can call the facility Project Manager, Kenny Eybs, at (917) 299-8763, the NYC Office of Environmental Remediation Project Manager, Rebecca Bub, at (212) 341-2073, 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 at New York Public Library located at 188 Madison Avenue, Manhattan, NY.

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

# REMEDIAL ACTION WORK PLAN

## 1.0 SITE BACKGROUND



W29 Highline Owners, LEDC LC. has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 522-532 West 29th Street in the West Chelsea section of New York, New York (the “Site”). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this RAWP in a manner that will render the Site protective of human health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternative 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 human health and the environment, and conforms with applicable environmental standards, criteria and guidance and applicable laws and regulations.

In November 2003, High Ridge Enterprises, Inc. (HREI) contracted Fenley & Nicol (F&N) to close out and submit an underground storage tank (UST) closure report to the New York State Department of Environmental Conservation (NYSDEC) for Block 700, Lot 48. Due to petroleum impacts observed by F&N during sample collection, the NYSDEC opened Spill Number 03-07633 in October 2003. A limited subsurface investigation was performed by F&N in 2003 to delineate the extent of the hydrocarbon plume. In September 2004, a Remedial Action Plan was submitted by F&N and approved by the NYSDEC on October 2004. F&N submitted a Quarterly status report to the NYSDEC on February 2009 and June 2011. The NYSDEC issued a closure letter on March 2012.

In September 2010, a Phase I Environmental Site Assessment (ESA) was performed by French & Parrello on behalf of the Victor Group for the Commercial Building at 524 West 29<sup>th</sup> Street; comprised of block 700, lots 48 & 49. The objective of the assessment was to identify recognized environmental conditions (REC) associated with the Site. The assessment included a review of available historic documents and environmental databases, letter requests for Site data from local government agencies, a Site reconnaissance, interviews with persons knowledgeable about environmental conditions on the Site, and evaluation of available data. French & Parrello Associates identified several RECs associated with the Site and recommended proceeding with NYSDEC requirements to collect one confirmatory groundwater sample to close Spill No. 03-07633, perform further investigation regarding a closed-in-place 2,000-gallon UST, and assess the presence of asbestos-containing materials and/or lead-based paint on Site.

In March 2012, the NYSDEC submitted a notification to High Ridge Enterprises, Inc. informing it of the closure of Spill No. 0307633. The NYSDEC recommended the closure of all monitoring wells associated with the spill.

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



The Site is located at 522-532 West 29<sup>th</sup> Street in the Chelsea section of Manhattan, and is identified as Block 700, Lots 47, 48, and 49 on the New York City Tax Map. The site is 19,749 square feet and is located along the southern portion of West 29<sup>th</sup> Street between 10<sup>th</sup> and 11<sup>th</sup> Avenues. The Site is bounded by West 29<sup>th</sup> Street and Block 700 Lots 16, 22, 23, and 24 (under-development parking facility, art gallery, mixed-use multi-story commercial and residential building, and a storage facility, respectively) to the north, Block 700 Lot 9 (vacant land) to the south, Block 700 Lot 45 (auto repair garage) to the east, and Block 700 Lot 53 (multi-story religious facility) to the west. Currently the site is occupied by three buildings: a two-story brick building on Lot 47, and one-story buildings on Lots 48 and 49. The buildings were most recently occupied by a catering company and two art galleries, respectively. A Site location map is attached as Figure 1.

### **1.2 Proposed Redevelopment Plan**

The proposed future use of the Site will consist of redeveloping the lot with an 11-story mixed use building. Layout of the proposed site development is presented in Figure 2. The current zoning designation is C6-3. The proposed use is consistent with existing zoning for the property.

The proposed development project will consist of demolishing the current buildings and constructing a new mixed-use building. The new building will feature eleven floors and one basement level. The basement will be primarily used for storage and utility rooms. Floor 1 will be used for commercial space and Floors 2 through 11 will be used for residential space. The building will rise approximately 135 feet above current street level. An approximate 15' by 100' parking area will be located on the western portion of the Site on Lot 47.

The top of the basement floor will be approximately 12 to 14 feet below sidewalk level, requiring excavation of the entire footprints of Lots 48 and 49 to approximately 15 feet below grade, with additional for the elevator pit to approximately 19 feet below sidewalk level. Lot 47, the proposed parking area, will be excavated to approximately 2 to 3 feet below sidewalk level in order to achieve Track 1 SCOs for the Site. A total of approximately 11,250 tons of soil will be removed.

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

### 1.3 Description of Surrounding Property

The Site is currently in a mixed-use neighborhood approximately 1,500 feet east of the Hudson River. The current businesses in the area are various art galleries, a juice company, auto repair shop and a storage facility. A review of the New York City Office of Environmental Remediation (OER) Searchable Property Environmental E-Database (SPEED) shows two Petroleum Bulk Storage centers within a half mile radius. In addition, the SPEED database shows numerous sites with known chemical releases.



The surrounding area is primarily characterized by residential and commercial use. The Site is bounded to the west by a four-story mixed use building, which is currently occupied by a church; to the east by a one-story auto repair shop; to the north by a six-story storage center, a three-story building mixed-use building, and four-story mixed use building with art galleries on the first floor of the mixed use building. To the south, there is currently a new building under construction.

### 1.4 Remedial Investigations

A remedial investigation was performed and the results are documented in a companion document called "*Remedial Investigation Report, 522-532 West 29<sup>th</sup> Street*", dated May 2013 (RIR).

The Site was purchased from High Ridge Enterprises Inc. by W29 Highline Owners LLC. Based on a review of historic Sanborn maps, a lumberyard and residential dwelling occupied the Site in 1911. In 1930, the Site was occupied by commercial structures for Sheffield Farms, Dry Milk Co. an automotive repair shop and a coal yard. From 1950-1976, the Site was occupied by a motor-freight station until c. 2002. Most recently, the Site was occupied by three separate businesses. Lot 47 was occupied by a catering company and the Lot 48 building and Lot 49 were occupied by an art gallery.

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

- Urban Fill present at the Site from grade to 10 feet below ground surface (bgs);
- An underground storage tank that was closed-in-place at the 532 W. 29<sup>th</sup> St. building;
- Historical Industrial and Automotive Site use; and
- A former spill at the 524 W. 29<sup>th</sup> St. building.

## Summary of work performed under the Remedial Investigation

Phase II ESI field activities were performed from May 13-15, 2013 and included the collection of soil, soil vapor, and groundwater samples. The scope of the field activities and methods are summarized below.

GZA performed the following scope of work:



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

## Summary of Environmental Findings

1. The elevation of the property is approximately 10 feet.
2. Depth to groundwater is approximately 9 feet to 10 feet bgs.
3. Groundwater flow is generally east to west.
4. Depth to bedrock on Site is approximately 30 feet bgs.
5. The stratigraphy of the Site is generally 10 feet of urban fill underlain by loose to dense sand which is underlain by stiff to hard sand and silt.
6. No PCBs were detected from the soil samples collected. Several VOCs including acetone, methylene chloride, benzene, butanone, dioxane and DCE were detected in three soil samples exceeding Unrestricted Use SCOs. No VOCs were detected above their respective Restricted Residential SCOs in any soil sample. Several SVOCs were detected in soil samples from the Site with eight exceeding their respective Restricted Residential SCOs. These SVOCs included benzo(a)anthracene (max. of 5.4 mg/kg), benzo(a)pyrene (max. of 4.8 mg/kg), benzo(b)fluoranthene (max. of 6 mg/kg), benzo(k)fluoranthene (max. of 2.3 mg/kg), chrysene (max. of 6 mg/kg), dibenzo(a,h)anthracene (max. of 0.78 mg/kg), indeno(1,2,3-cd)pyrene (max. of 3.2 mg/kg) and 2-methylnaphthalene (max. of 23 mg/kg). Metals, including barium (maximum of 360 mg/kg), copper (maximum of 100 mg/kg), iron (maximum of 16000 mg/kg), lead (maximum of

1200 mg/kg), mercury (maximum of 4.4 mg/kg), nickel (maximum of 32 mg/kg) and zinc iron (maximum of 410 mg/kg) exceeded Unrestricted Residential (Track 1) SCOs, and of these barium, iron, lead and mercury also exceeded Restricted Residential (Track 2) SCOs.



7. Several VOCs were detected above NYSDEC Part 703.5 Groundwater Quality Standards (GQS) and included 1,1-dichloroethene (max. of 12 ug/l), cis-1,2-dichloroethene (max. of 160 ug/l), benzene (max. of 12 ug/l), n-butylbenzene (max. of 11ug/l), sec-butylbenzene (max. of 12 ug/l), isopropylbenzene (max. of 12 ug/l), naphthalene (max. of 35 ug/l), and n-propylbenzene (max. of 37 ug/l). Three SVOCs including acenaphthene (max. of 20 ug/l), naphthalene (max. of 24 ug/l) and benzo(a)pyrene (max. of 0.11 ug/l) were detected above their respective GQS. Four metals including iron, magnesium, manganese and sodium were detected in groundwater above their respective GQS. No PCBs were detected in any of the collected groundwater samples.
8. Moderate to high concentrations of petroleum and chlorinated VOCs were observed in each vapor sampling point. Tetrachloroethene (PCE) was identified in all samples at concentrations less than  $10\mu\text{g}/\text{m}^3$  except at one sampling point, at  $288\mu\text{g}/\text{m}^3$ . Trichloroethene (TCE) was identified in all samples at concentrations less than  $5\mu\text{g}/\text{m}^3$  except at one sampling point, at  $228\mu\text{g}/\text{m}^3$ . 1,1,1-Trichloroethane (TCA) was detected in one of five samples at  $231\mu\text{g}/\text{m}^3$ . These results for PCE, TCE and TCA are above the monitoring level ranges of the State DOH soil vapor guidance matrix and indicate that remedial action to address soil vapor is warranted. Highest concentrations of PCE, TCE and TCA are near the former spill location. Petroleum related VOCs included ethanol ( $999\mu\text{g}/\text{m}^3$ ), acetone ( $504\mu\text{g}/\text{m}^3$ ), n-hexane ( $7,820\mu\text{g}/\text{m}^3$ ), cyclohexane ( $4,200\mu\text{g}/\text{m}^3$ ), trimethylpentane ( $54,600\mu\text{g}/\text{m}^3$ ) and ethylbenzene ( $11,100\mu\text{g}/\text{m}^3$ ).

For more detailed results, refer to 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 anticipated at this Site.

## 2.0 REMEDIAL ACTION OBJECTIVES

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

### Groundwater

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



### Soil

- Prevent direct contact with contaminated soil.
- Prevent exposure to contaminants volatilizing from contaminated soil.
- Prevent migration of contaminants that would result in groundwater contamination.

### Soil Vapor

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

### 3.0 REMEDIAL ALTERNATIVES ANALYSIS

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



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

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

#### **Alternative 1:**

- Establishment of Track 1 Unrestricted Use SCOs.
- Removal of 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 in the proposed parking area. Based on the results of the Remedial Investigation, it is expected that this alternative would require excavation across the entire Site to a depth of approximately ten feet below grade surface. Excavation for construction of the new building's cellar level would take place to a depth of approximately 15 feet across Lots 48 and 49 (90 percent of the Site). The other 10 percent of the Site (Lot 47) is a proposed parking garage which will be excavated to depths of two to three feet bgs for development purposes. Attainment of Track 1 in the parking area would require removal of additional soil beneath the proposed depth of the parking area.
- The building will be built below the water table and there is no potential for soil vapor accumulation below the slab. A vapor barrier/waterproofing membrane would be installed beneath the cellar foundation and behind

foundation sidewalls of the new building as part of the development to prevent any potential future exposures from off-Site soil vapor.

- As part of the new development, placement of a final cover consisting of concrete slab and asphalt covered parking areas.

#### **Alternative 2 involves:**



- Establishment of Track 4 Site Specific SCOs.
- Removal of soil/fill exceeding Track 4 Site Specific SCOs and confirmation that Track 4 Site Specific SCOs has been achieved with post excavation endpoint sampling. Excavation for construction of the new building's cellar level would take place to a depth of approximately 15 feet beneath the footprint of building. Parking area on Lot 47 would be excavated to an approximate depth of three feet bgs. Therefore, if soil/fill containing analytes at concentrations above Track 4 Site-Specific SCOs is still present at the base of the excavation after removal of all soil required for new development, additional excavation would be performed to meet Track 4 Site-Specific SCOs;
- The building will be built below the water table and there is no potential for soil vapor accumulation below the slab. Installation of a soil vapor barrier/waterproofing system beneath the building slab and along foundation side walls of proposed building to prevent any potential future exposures from off-Site soil vapor;
- Placement of a final cover over the Site to prevent exposures to remaining soil/fill;
- Establishment of use restrictions including prohibitions on the use of groundwater from the Site; prohibitions of Sensitive Site uses such as farming or vegetable gardening, to mitigate the potential for future exposure pathways; and prohibition of a higher land use without OER approval;
- Establishment of an approved Site Management Plan (SMP) to ensure long-term management of these Engineering and Institutional Controls including the performance of periodic inspections and certification that the controls are performing as they were intended. SMP will note that the property owner and property owners' successors and it assigns must comply with the approved SMP; and
- The property will continue to be registered with an E-Designation at the NYC Buildings Department

### **3.1 Threshold Criteria**

#### **Protection of Human 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 impacted soil/fill that exceeds 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 protection of human health and the environment by excavating historic fill at the Site and by documenting that remaining soil/fill meets Track 4 Site Specific SCOs, as well as by placement of Institutional and Engineering Controls (EC/IC) including a composite cover system. The composite cover system would prevent direct contact with remaining on-Site soil/fill. Implementing Institutional Controls including a SMP and continued “E” Designation of the property would ensure that the composite cover system remains intact and protective. Establishment of Track 4 Site Specific SCOs would minimize the risk of constituents leaching into the groundwater.

For both Alternatives, potential exposure to impacted soil or groundwater during construction would be minimized by implementing a Construction Health and Safety Plan (CHASP), an approved Soil/Materials Management Plan (SMMP) and Community Air Monitoring Plan (CAMP). Potential contact with impacted groundwater would be mitigated as its use is prohibited by city laws and regulations.

The building will be built below the water table and there is not potential for soil vapor accumulation below the slab. For both alternatives, potential future migration of off-Site soil vapors into the new building would be prevented by installing a vapor barrier/waterproofing membrane below the new building’s basement slab and continuing the vapor barrier/waterproofing membrane up above the foundation walls.

### **3.2 Balancing Criteria**

#### **Conformance with Standards, Criteria and Guidance**

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

**Alternative 1** would achieve compliance with the remedial goals, chemical specific SCGs and RAOs for soil through removal of the soil to achieve Track 1 Unrestricted Use SCOs and Groundwater Protection Standards. Compliance with SCGs for soil vapor would also be achieved by extension of the building slab well below the water table and installing a vapor barrier/waterproofing membrane system below the new building’s basement slab and continuing the vapor barrier around the foundation walls,

as part of development.

**Alternative 2** would achieve compliance with the remedial goals, chemical specific SCGs and RAOs for soil through removal of the soil to achieve Track 4 Site Specific SCOs and placement of a continuous cover over the entire site. Compliance with SCGs for soil vapor would also be achieved by extension of the building slab well below the water table and installing a vapor barrier/waterproofing membrane system below the new building's basement slab and continuing the vapor barrier around foundation walls. A SMP would ensure that these controls remained protective for the long term.



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

### **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. Both alternatives would result in short-term dust generation impacts associated with excavation, handling, load out of materials, and truck traffic. Short-term impacts could potentially be higher for Alternative 1 if excavation of greater amounts of historical fill material is encountered below the excavation depth of the proposed parking areas. 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 the overall impact of these activities.

An additional short-term adverse impact and risk to the community associated with both remedial alternatives is increased truck traffic. Approximately 450, 25-ton capacity truck trips would be necessary to transport fill and soil excavated during Site development. Truck traffic will be routed on the most direct course using major thoroughfares where possible and flaggers will be used to protect pedestrians at Site entrances and exits.

Both alternatives would employ appropriate measures to mitigate the potential for short-term impacts, including a CHASP, a CAMP, and a SMMP during the on-Site

soil disturbance activities and would minimize the release of any contaminants into the environment. Both alternatives provide short term effectiveness in protecting the surrounding community by decreasing the risk of contact with on-Site constituents. Construction workers operating under appropriate management procedures and a CHASP would be protected from on-Site constituents (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 the impacted soil/fill that exceeds Track 1 Unrestricted Use SCOs. Removal of on-Site constituent sources would prevent the potential for future groundwater impacts.

**Alternative 2** would provide long-term effectiveness by removing most on-Site impacted media and attaining Track 4 Site Specific SCOs; a composite cover system across the Site's parking area maintaining use restrictions, establishing an SMP to document long-term management of EC/IC, and maintaining continued registration as an E-designated property to record these controls for long term. The SMP would document long-term effectiveness of the EC/IC by requiring periodic inspection and certification that these controls and restrictions continue to be in place and are functioning as they were intended assuring that protections designed into the remedy would continue to provide an acceptable level of protection in perpetuity.

Both would result in removal of impacted material exceeding the SCOs providing the highest level, most effective and permanent remedy over the long-term with respect to a remedy for impacted material, which would mitigate the migration to groundwater. Potential sources of soil vapor and groundwater impacts would also be eliminated as part of the remedy. In both cases, installation of the building slab well below the water table and installation of a waterproofing/vapor barrier outside the slab and foundation walls would provide protection against potential off site soil vapors.

### **Reduction of toxicity, mobility, or volume of contaminated material**

This evaluation criterion assesses the remedial alternative's use of remedial technologies that permanently and significantly reduce toxicity, mobility, or volume of contaminants as their principal element. The following is the hierarchy of source

removal and control measures that are to be used to remediate a Site, ranked from most preferable to least preferable: removal and/or treatment, containment, elimination of exposure and treatment of source at the point of exposure. It is preferred to use treatment or removal to eliminate contaminants at a Site, reduce the total mass of toxic contaminants, cause irreversible reduction in contaminants mobility, or reduce of total volume of contaminated media.

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



**Alternative 2** would remove most of the historic fill at the Site, and any remaining on-Site soil beneath the new building and parking area would meet Track 4 Site Specific SCOs.

### **Implementability**

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

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

### **Cost Effectiveness**

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

Since construction of the basement level calls for removal of soil down to approximately 15 feet bgs through most of the Site with exception of the parking area, costs associated with Alternative 1 and Alternative 2 are comparable. Costs associated with Alternative 1 and Alternative 2 could increase if lead levels are higher than the Track 4 Site Specific SCOs below the planned excavation cut of 3 feet bgs in the Parking Area. Long-term costs for Alternative 2 are likely higher than Alternative 1 based on implementation of a Site Management Plan as part of Alternative 2.

Additional costs of Alternative 1 would include additional shoring/underpinning of the adjacent building, disposal of additional soil and import of clean soil for backfill.

However, long term costs for Alternative 2 are likely higher than Alternative 1 based on implementation of a SMP as part of Alternative 2.

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



### **Community Acceptance**

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

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

### **Land use**

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

The proposed redevelopment of the Site is compatible with its current zoning and is consistent with recent development patterns. Following remediation, the Site will meet either Track 1 Unrestricted Use SCOs or Track 4 Site Specific SCOs, both of which are appropriate for the planned residential use. Improvements in the current environmental condition of the property achieved by both alternatives are also consistent with the City's goal for cleanup of impacted land and bringing such properties into productive reuse. Both alternatives are equally protective of natural resources and cultural resources.

### **Sustainability of the Remedial Action**

This criterion evaluates the overall sustainability of the remedial action alternatives and the degree to which sustainable means are employed to implement the remedial action including those that take into consideration NYC's sustainability goals defined in *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. The remedial plan would take into consideration the shorter trucking routes during off-Site disposal of historic fill and other soil, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. New York City Clean Soil Bank may be utilized for reuse of native soil. To the extent practicable, energy efficient building materials, appliances and equipment will be utilized to complete the development. A complete list of green remedial activities considered as part of the NYC VCP is included in the Sustainability Statement, included as **Appendix B**.

## 4.0 REMEDIAL ACTION

### 4.1 Summary of Preferred Remedial Action

The preferred remedial action alternative is a combined achievement of Track 1 SCOs for the building area and Achievement of Track 4 SCOs for the parking lot area. The preferred remedial action alternative achieves protection of public health and the environment for the intended use of the property. The preferred remedial action alternative will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action alternative is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants. The preferred remedial action alternative is cost effective and implementable and uses standards methods that are well established in the industry.



The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Track 1 Unrestricted Use SCOs for the proposed new building (Lot 48 and 49), and Track 4 Site Specific SCOs are proposed for the parking area (Lot 47).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Excavation and removal of soil/fill exceeding Track 1 Unrestricted Use SCOs in the area of the two buildings (Lots 48 and 49). Areas under the proposed new building will be excavated to a depth of approximately 15 feet below grade for development purposes. Parking lot area (Lot 47) will be excavated to the depths of 3 feet below grade. Approximately 11,250 tons of soil/fill will be excavated during remediation and development;
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.
7. Removal of a previously closed in place underground storage tanks (USTs) and removal of other USTs (if encountered) and closure of petroleum spills (if evidence of a new spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.



8. Transportation and off-Site disposal of soil/fill material to permitted facilities in conformance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities.
9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
10. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
11. The building slab will be built well into the water table and soil vapor will not accumulate beneath the building slab. Installation of a vapor barrier/waterproofing system below the concrete slab underneath the building, as well as behind foundation walls of the proposed building. The vapor barrier/water-proofing membrane will be comprised of Grace Preprufe 300R, Preprufe 160R, Bituthene 4000, and HydroDuct 220 below-grade foundation damp proofing material.
12. Construction and maintenance of an engineered composite cover consisting of approximately 3 feet thick cap in the parking lot area to mitigate the potential for human exposure to residual soil/fill remaining under the Site. As part of development, the building area will be covered with 12 inches thick concrete slab across the footprint of the new building.
13. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in conformance with applicable laws and regulations. Since groundwater is at a depth of 10 feet below ground surface, dewatering permits will be obtained from NYCDEP.
14. Implementation of storm-water pollution prevention measures in conformance with applicable laws and regulations.
15. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, describes the Engineering and Institutional Controls (ECs/ICs) to be implemented at the Site for parking areas, and lists any changes from this RAWP.
16. Submission of an approved Site Management Plan (SMP) in the RAR. SMP will provide long-term management of residual impacts, including plans for maintenance, inspection and certification of ECs/ICs and reporting at a specified frequency.
17. Continued registration with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls and management

of these controls 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 the new building areas. For the parking lot area, the following Track 4 Site Specific SCOs are proposed:

<u>Contaminant</u>	<u>Track 4 SCOs</u>
Total SVOCs	250 ppm
Lead	1,000 ppm
Mercury	2.5 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 C. The location of planned excavations is shown in Figure 3.

Soil and fill management at the Site will include impacted soil removal and disposal within the development cut. Excavation areas are shown on Figure 5. No over-excavation beyond the development cut is anticipated. If any hot-spot areas are identified during development and remediation at the site, they will be removed in consultation with OER. 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 11,250 tons. The proposed disposal locations for Site-derived impacted materials are listed below. Additional disposal locations based on Site soil characterization will be established later and reported promptly to the OER Project Manager.

<u>Disposal Facility</u>	<u>Waste Type</u>	<u>Estimated Quantities</u>
Lincoln Landfill	Historic Fill	8,500 tons
Clean Earth of Carteret	Petroleum Impacted Soil	500 tons
NYC Clean Soil Bank	Native Fill	2,250 tons

**End-Point Sampling**

Removal actions for development purposes under this plan will be performed in conjunction with confirmation soil sampling. Two confirmation samples will be collected from the base of the parking area excavation on Lot 47 at locations to be determined by OER for comparison to Track 4 SCOs. Analytes for these samples will

include trigger compounds and elements established on the Track 4 Site-Specific SCO list (SVOCs, lead and mercury). To evaluate attainment of Track 1 - Unrestricted Use SCOs beneath the building area on Lots 48 and 49, four samples will be collected and analyzed for SVOCs and metals. The approximate collection location of the six endpoint soil samples is shown on Figure 6. Post-excavation end-point sampling and testing will be performed promptly following materials removal and completed prior to Site development activities.



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 in order that hot spots are removed. Analytes for post remedial end-point sampling will be those parameters that are driving the hot-spot removal action and will be approved by OER. If hotspots are encountered, hotspot removal end-point sampling frequency will consist of the following:

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.
2. For excavations 20 to 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 higher impacts identified during previous sampling episodes unless field indicators such as field instrument measurements or visual impacts identified during the remedial action indicate that other locations and depths may be more heavily impacted. Post-remediation samples will be biased toward locations and depths of the higher expected impacts.

New York State Environmental Laboratory Approval Program (ELAP) certified labs will be used for confirmation and end-point sample analyses. Labs performing confirmation and end-point sample analyses will be reported in the RAR. The RAR File No. 41.0162122.00 Page 27 of 47 July 2013

will provide a tabular and map summary of the confirmation and end-point sample results and will include all data including non-detects and applicable standards and/or guidance values. End-point samples and 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 the required regulatory reporting (i.e. spills hotline) will be performed.

#### **Quality Assurance/Quality Control (QA/QC)**

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.

The selection of sample containers used to collect samples is based on the criteria of sample matrix, analytical method, and potential constituents of concern, reactivity of container material with the sample, QA/QC requirements, and regulatory protocol requirements. Sample bottles/jars will be provided by the analytical laboratory and will conform to the requirements of USEPA’s Specifications and Guidance for Constituent-Free Sample Containers.

Non-dedicated reusable equipment will require field decontamination. Reusable sampling equipment will be made of stainless steel. Acids and solvents will not be used in the field decontamination of such equipment. Decontamination typically involves scrubbing/washing with isopropyl alcohol rinse to remove visibly impacted material, followed by potable (tap) water and analyte-free water rinses. Tap water may be used from treated municipal water system; the use of an untreated potable water supply is not an acceptable substitute. If equipment becomes visually impacted, a hexane rinse may be used on the object, followed by triple rinsing with analyte free water. Equipment will be allowed to dry prior to use. Steam cleaning or high-pressure hot water cleaning may be used in the initial removal of gross, visibly impacted material.

In general, soil samples will be cooled to 4° C with no chemical preservatives added. Chemical preservatives will be added to the sample bottles (prior to sample collection) by the analytical laboratory if required. The pH of samples will be spot-checked in the field and additional preservative will be added as needed. Sample preservation is

checked upon sample receipt by the laboratory; this information is reported to the GZA Quality Assurance Officer (QAO) within two business days of sample receipt. If it appears that the level of chemical preservation added is not adequate, then laboratory preservative preparation and addition will be modified or additional preservative will be added in the field by the sampling team.



Equipment blanks demonstrate whether the sampling equipment has the potential for constituent crossover to give a false positive of constituents in the environmental sample. When blank water is used to rinse a piece of sampling equipment (before it is used to sample), the rinsate is collected and analyzed to see if the environmental samples could be biased by residual constituents on the equipment.

Once the sample containers are filled, they will be immediately placed in the cooler with ice (in sealed plastic bags to minimize leakage) or synthetic ice packs to maintain the samples at 4°C. The field sampler will indicate the sample designation/location number in the space provided on the chain-of-custody form for each sample. The chain of custody forms will be signed and placed in a sealed plastic bag in the cooler. The completed shipping container will be closed for transport with nylon strapping, or a similar shipping tape, and two paper seals will be affixed to the lid. The seals must be broken to open the cooler. Broken seals before receipt at the laboratory will indicate sample tampering. A label may be affixed identifying the cooler as containing "Environmental Samples" and the cooler will be shipped by an overnight delivery service to the laboratory. When the laboratory receives the coolers, the custody seals will be checked and lab personnel will sign the chain-of-custody form.

### **Import and Reuse of Soil**

Import of soil onto the property and reuse of soil already onsite, although not anticipated, will be performed in conformance with the Soil/Materials Management Plan in **Appendix C**. 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**

The parking lot will achieve Track 4 SCOs and the Engineering Controls for this area will consist of a composite cover consisting of asphalt and sub-base material. The building area will achieve Track 1 SCOs. The following elements will be incorporated into the building new: composite cover system and waterproofing/soil vapor barrier. The building slab will be built well below the water table and there is no potential for soil vapor to accumulate beneath the building slab.

#### **Composite Cover System**

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. The entire property will be covered by an engineered

permanent cover system. This cover system will be comprised of a 12 inch thick concrete-building slab beneath the area of the proposed building. Parking lot areas will be covered with compacted soil overlain by 2-inches of compacted gravel, overlain by a 12-inch concrete slab, overlain by a 2-inch layer of asphalt, and overlain by a 1 ½-inch top layer of asphalt.

The proposed development plans showing the concrete building slab are provided in **Appendix E and Appendix G**.



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

#### **Vapor Barrier/Waterproofing Membrane**

Migration of potential soil vapor from offsite in the future will be achieved with a combination of building slab and vapor barrier/waterproofing membrane. The vapor barrier will extend throughout the area occupied by the footprint of the new building and up the foundation sidewalls in accordance with manufacturer specifications.

The vapor barrier/water-proofing membrane will be comprised of Grace Preprufe 300R, Preprufe 160R, Bituthene 4000, and HydroDuct 220 below-grade foundation dampproofing material. Joints will be sealed with Preprufe LT tape and Bituthene EdgeGuard tape. The vapor barrier/water-resistant membrane will provide a barrier to water and moisture, and will be chemically resistant to the constituents present in groundwater.

The project's Professional Engineer licensed by the State of New York will have primary direct responsibility for overseeing the implementation of the vapor barrier. The extent of the proposed vapor barrier membrane is provided in Figure 8. The Remedial Action Report will include photographs of the installation process, PE certified letter on letterhead from the primary contractor responsible for installation oversight and field inspections, and a copy of the manufacturer's certificate of warranty.

#### **4.4 Institutional Controls**

Institutional Controls (IC) will be utilized in this remedial action to manage residual soil/fill 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 will be implemented under a site-specific Site Management Plan (SMP)

that will be included in the RAR. The property will continue to be registered with an E-Designation at the NYC Buildings Department.

Institutional Controls for this remedial action are:

- The property will continue to be registered with an E-Designation at 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 maintenance, inspection, reporting and certification of ECs and ICs. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification shall be submitted at a frequency to be determined 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 residential and commercial use and will not be used for a higher level of use without prior approval by OER.



#### **4.5 Site Management Plan**

Site Management 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 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 and the Site Management Plan are implemented.



The SMP will provide a detailed description of the procedures required to manage residual soil/fill left in place following completion of the remedial action in accordance with the Voluntary Cleanup Agreement with OER. This includes a plan for: (1) implementation of EC's and ICs; (2) operation and maintenance of EC's; (3) inspection and certification of EC's; and (4) 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 a maximum depth of about 10 feet below grade. Based on the results of the Remedial Investigation Report, the constituents of concern found are:

#### **Soil**

- Several VOCs including acetone, methylene chloride, benzene, butanone, dioxane and DCE were identified in soil samples, but none of them exceeded Restricted Residential Use SCOs.
- Metals, including barium, lead and mercury above Restricted Residential Use SCOs.
- Several SVOCs (PAH compounds) including benzo(a)anthracene, beno(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene,

dibenzo(a,h)anthracene, ideno(1,2,3-cd)pyrene and 2-methylnaphthalene above Restricted Residential Use SCOs.

### Groundwater

- Volatile Organics including 1,1-dichloroethene, cis-1,2-dichloroethene, benzene, n-butylbenzene, sec-butylbenzene, isopropylbenzene, naphthalene, n-propylbenzene, ethylbenzene, vinyl chloride, chloroethene, p/m xylene, o-Xylene, 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene were detected above GQS.
- SVOCs including acenaphthene, naphthalene and benzo(a)pyrene were detected above GQS.
- Metals including iron, magnesium, manganese and sodium were detected above their respective GQS



### Soil Vapor

- Chlorinated VOCs were detected below New York State Department of Health (NYSDOH) monitoring thresholds including PCE, TCE, vinyl chloride, DCE and carbon tetrachloride.
- Petroleum hydrocarbons including ethanol, acetone, n-hexane, cyclohexane, trimethylpentane and ethylbenzene were detected at moderate to high concentrations around SV-5.

### Nature, Extent, Fate and Transport of Constituents

VOCs, SVOCs, and metals are present in the historic fill throughout the Site. Historic fill thicknesses range up to 10 feet at the site. Dissolved metals including iron, magnesium, manganese, and sodium were detected above GQS throughout the site. VOC and SVOC also exceed GQS throughout the site. Chlorinated VOC exceed NYSDOH guidance values for both monitoring and action at the site. Petroleum related VOCs were identified in the soil vapor at elevated concentrations and were also detected in groundwater. Based on the Site history including a previously closed spill case, there is potential that the former spill continues to affect the groundwater.

### Potential Routes of Exposure

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

documented. An exposure pathway may be eliminated from further evaluation when any one of the elements has not existed in the past, does not exist in the present, and will not exist in the future. Three potential primary routes exist by which chemicals can enter the body:

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



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

Current Conditions: The exposure pathway for historic fill or soil is currently incomplete because of the existence of the building and its foundation. Groundwater is 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, groundwater is not used at the Site and there is no potential for exposure. As there is currently building structure onsite, accumulation of soil vapor may pose an exposure threat. The building is unoccupied and is slated to be demolished, and therefore, the exposure pathway for soil vapor is limited.

Construction/Remediation Activities: Once redevelopment activities begin, construction workers will come into direct contact with impacted historic fill/soil and groundwater, as a result of on-Site construction and excavation activities. On-Site construction workers could potentially ingest, inhale, have dermal contact or have contact via the eyes with impacted historic fill or soil. Off-Site receptors could potentially be exposed to dust particulates or vapor from impacted historic fill or soil from on-Site activities. Potential on-Site and off-Site exposures to particulates from impacted material on the Site will be addressed through a Soil/Materials Management Plan, dust controls, and through the implementation of both a Community Air Monitoring Program and a Construction Health and Safety Plan.

Proposed Future Conditions: Under future remediated conditions, all soils in excess of Track 1/Track 4 SCOs will be removed. The Site will be fully capped with building slab and parking lot, limiting potential direct exposure to soil and groundwater remaining in place, the building slab will be built into the water table and vapors will not accumulate beneath the slab, and a vapor barrier/waterproofing 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 recognizable off-Site pathways for ingestion, inhalation, or dermal exposure to constituents derived from the Site under future conditions.

### **Receptor Populations**

On-Site Receptors – The Site building is currently vacant and access to Site is restricted. Onsite receptors are limited to trespassers and site representatives and

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

Off-Site Receptors - During construction activities, potential on-Site receptors are construction workers performing the remedial construction, visitors, site representatives, trespassers, and any Site security personnel. Potential off-Site receptors within a 0.25-mile radius of the Site include commercial and construction workers, pedestrians, children, and nearby residents based on the following:

1. Commercial Business (up to 0.25 mile)
2. Residential Buildings (up to 0.25 mile)
3. Construction Sites (up to 0.25 mile)
4. Pedestrians, Cyclists (up to 0.25 mile)
5. City Parks (up to 0.25 mile)



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

There are potentially complete exposure pathways (i.e., source, route to exposure, receptor population) for the current condition and for the construction condition. There is no complete pathway for exposure after remediation and site development is complete. This assessment takes into consideration the reasonably anticipated use of the Site, which includes a residential structure, foundation cap, subsurface vapor barrier/waterproofing membrane. Post-construction groundwater use is not anticipated to be an issue because groundwater is not used as a potable water source in New York City. There is no surface water within 500 feet of the Site that could be considered potential receptors of site related impacts. Based on this analysis, on-Site exposure pathways appear to be present only during the remedial construction phase.

There is a potential complete exposure pathway that requires mitigation during implementation of the remedy. Under current conditions, potential on-Site exposure pathways exist if intrusive work is conducted below the current slab. During remedial construction, on-Site and off-Site exposures to impacted dust from historic fill and petroleum impacted fill will be addressed through dust and vapor control and the implementation of the Community Air Monitoring Program, the Soil/Material Management Plan, and a Construction Health and Safety Plan. After the remedial action is complete, there will be no remaining exposure pathways.

## 5.0 REMEDIAL ACTION MANGEMENT

### 5.1 Project Organization and Oversight

Principal personnel who will participate in the remedial action include Kenneth Eybs (Project Manager W29 Highline Owners LLC), James Bellew (Project Manager GZA), John M. Gavras (Associate Principal GZA), Ernest Hanna (Professional Engineer GZA), Rebecca Bub (Project Manager OER) and the eventual remedial contractor. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Ernest Hanna and James Bellew, respectively.



### 5.2 Site Security

Site access will be controlled by gated entrances to the fenced property. If necessary 24-Hour security may be employed.

### 5.3 Work Hours

The hours for operation of remedial construction will be from 7:00 am to 5:00 pm on Monday through Friday. These hours conform to the New York City Department of Buildings construction code requirements.

### 5.4 Construction Health and Safety Plan

The CHASP is included in **Appendix D**. The Site Safety Coordinator will be reported to OER prior to the start of construction. Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and United States Occupational Health and Safety Administration (OSHA) worker safety requirements and Hazardous Waste Operations and Emergency Response (HAZWOPER) requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the CHASP and applicable laws and regulations. The CHASP pertains to remedial and invasive work performed at the Site until the issuance of the 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 CHASP and be required to sign a CHASP 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 CHASP. That document will define the specific project contacts for use in case of emergency.



## **5.5 Community Air Monitoring Plan**

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

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

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

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

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm)



above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.
- All 15-minute readings must be recorded and be available for OER personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

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

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

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

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

## **5.6 Agency Approvals**

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



## **5.7 Site Preparation**

### **Pre-Construction Meeting**

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

### **Mobilization**

Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation, equipment mobilization (including securing 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 Mark out Ticket will be retained by the contractor prior to the start of drilling, excavation or other invasive subsurface operations. Overhead utilities may also be present within the anticipated work zones. Electrical hazards associated with drilling in the vicinity of overhead utilities will be prevented by maintaining a safe distance between overhead power lines and drill rig masts.

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



## **Dewatering**

Based on the proposed depth of the basement slab and the associated foundation elements, dewatering of the foundation excavation will be required during construction. W29 Highline Owners, LLC will subcontract for the preparation and filing of a dewatering permit application with the New York City Department of Environmental Protection Bureau of Wastewater Treatment for the Site. After the dewatering permit is issued, GZA will submit the permit to the OER on behalf of the Owner. The dewatering permit will outline the details of dewatering and any pre-treatment, if required.

## **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; lose



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; storm water management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, hay bales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

### **Storm Response**

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to OER at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911. Petroleum spills will be reported to NYS DEC within 2 hours of identification and consistent with State regulations. Emergency and spill conditions will also be reported to OER. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed. Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. 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  
File No. 41.0162122.00 Page 41 of 47 July 2013



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

## **5.8 Traffic Control**

Drivers of trucks leaving the NYC VCP Site with soil/fill will be instructed to proceed without stopping in the vicinity of the site to prevent neighborhood impacts. The planned route, assuming use of facilities in New Jersey, on local roads for trucks leaving the site is westward on 29<sup>th</sup> Street towards the West Side Highway. Trucks will then merge northward and take the George Washington Bridge to New Jersey.

## **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, 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 (e.g. jpeg files).

### 5.11 Complaint Management

The 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



DRAFT

## 6.0 REMEDIAL ACTION REPORT

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

- Information required by this RAWP;
- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan;
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;
- Tabular summary of all end point sampling results and all material characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action and DUSR;
- Test results or other evidence demonstrating that remedial systems are functioning properly;
- Account of the source area locations and characteristics of all contaminated material removed from the Site including a map showing source areas;
- Account of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material.
- Account of the origin and required chemical quality testing for material imported onto the Site.
- Continue registration of the property with an E-Designation at the NYC Department of Buildings.

Reports and supporting material will be submitted in digital form



## Remedial Action Report Certification

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

*I, Ernest P. Hanna, 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 522-532 West 29<sup>th</sup> Street Site, Site number 13CVCP151M.*



*I, John M. Gavras am a qualified Environmental Professional. I had secondary direct responsibility for implementation remedial program for the 522-532 West 29<sup>th</sup> Street Site, Site number 13CVCP151M.*

*I certify that the OER-approved Remedial Action Work Plan dated \_\_\_\_\_ was implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.*

## 7.0 SCHEDULE

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a 7-month remediation period is anticipated.

<b>Schedule Milestone</b>	<b>Weeks from Remedial Action Start</b>	<b>Duration (weeks)</b>
OER Approval of RAWP	0	-
Fact Sheet 2 announcing start of remedy	0	-
Mobilization	6	1
Remedial Excavation	7	8
Demobilization	15	1
Submit Remedial Action Report	25	-

## **Appendix A**

### **Citizen Participation Plan**

The NYC Office of Environmental Remediation (OER) and W29 Highline Owners LLC have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Voluntary Cleanup Program (VCP). This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYC VCP, W29 Highline Owners 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 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, Rebecca Bub, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 341-2073.

**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. W29 Highline Owners LLC will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

New York Public Library - Muhlenberg Branch  
209 West 23rd Street  
New York, NY 10011-2379

Manager: Ashley Curran

Phone Number: 212-924-1585

Repository Hours of Operation:

Monday & Wednesday: 11:00am – 6:00pm

Tuesday & Thursday: 11:00am – 7:00pm

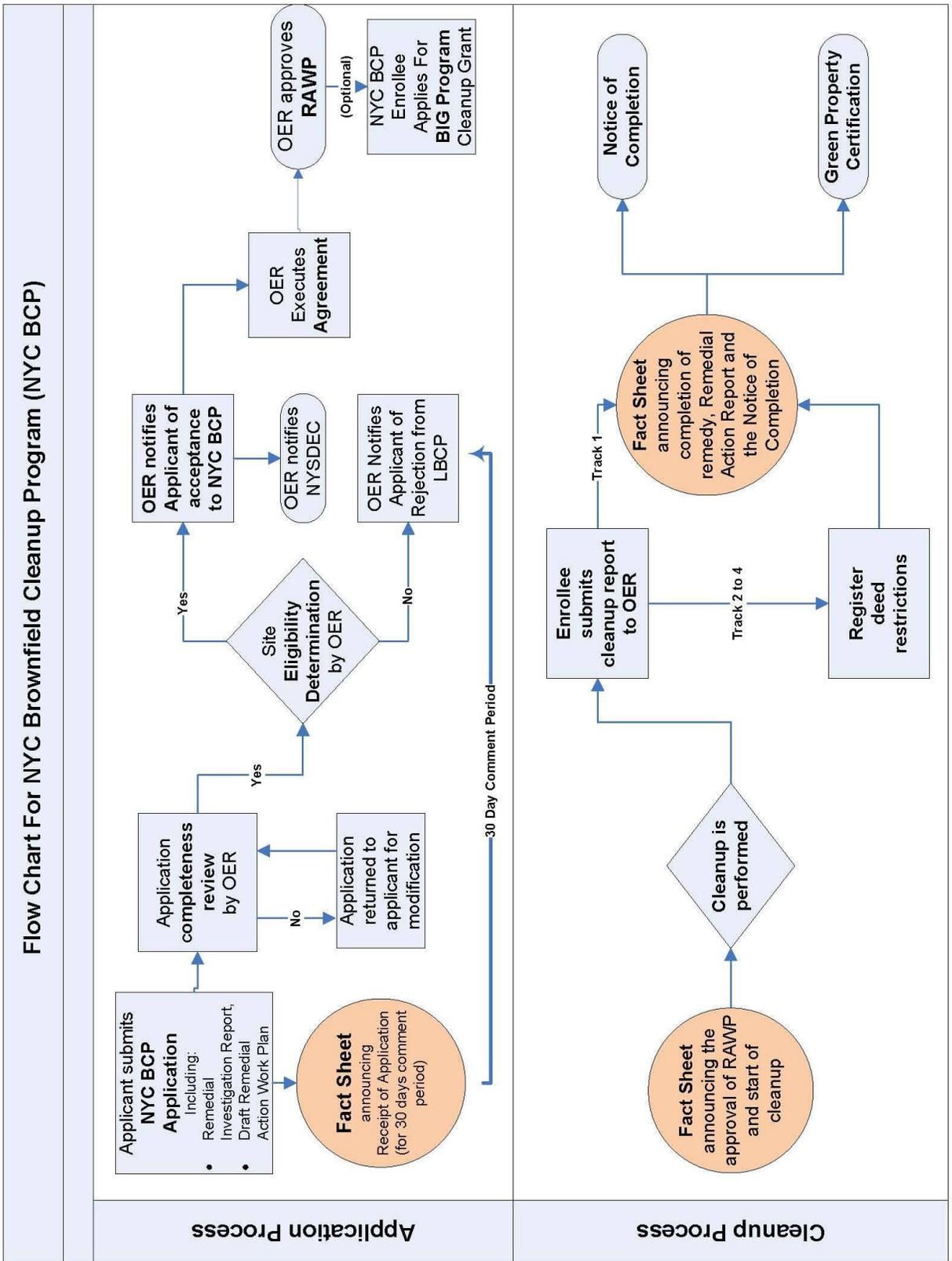
Friday & Saturday: 10:00am – 5:00pm

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.

**Issues of Public Concern.** There are no issues of public concern.

**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 W29 Highline Owners LLC, reviewed and approved by OER prior to distribution and mailed by W29 Highline Owners 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 (RIR) and Remedial Action Work Plan (RAWP) 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 RIR and RAWP 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.

## Site Contact List

### 1. Government Contacts

New York City Department of City Planning:  
Amanda M. Burden, Director, Department of City Planning and Chair  
City Planning Commission  
Department of City Planning  
22 Reade Street  
New York, NY 10007-1216

Carole Samol, Deputy Director  
Department of City Planning, Bronx Office  
One Fordham Plaza, 5th Fl.  
Bronx, NY 10458

New York City Councilperson:  
The Honorable Christine Quinn, New York City Council, District 3  
224 West 30<sup>th</sup> St (Suite 1206)  
New York, NY 10001

Borough of Manhattan, New York County:  
The Honorable President Scott Stringer, Manhattan Borough President  
1 Centre Street, 19th Floor  
New York, NY 10007

Community Board:  
Manhattan Community Board 4  
330 West 42nd Street, Suite 2618  
New York, NY 10036  
Chair: Mr. J.D. Nolan  
District Manager: Mr. Robert J. Benfatto

### 2. Residents and/or Owners of Site and Properties Immediately Adjacent

Owner of Site:  
Chelsea W26 LLC  
37 West 65<sup>th</sup> Street  
New York, NY 10023-6610

Adjacent to North:

Tuck-It Away Self Storage  
517 West 29<sup>th</sup> Street  
New York, NY 10001  
212-368-1717

David Nolan Art Gallery  
527 West 29<sup>th</sup> Street  
New York, NY 10001  
212-925-6190

Adjacent to East:

Brownfield Auto Services  
518 West 29<sup>th</sup> Street  
New York, NY 10001  
212-239-7037

Adjacent to South:

Active Construction Site

Adjacent to West:

534 West 29<sup>th</sup> Street  
New York, NY 10001

**3. Local News Media**

New York Times  
620 8th Ave.  
New York, NY 10018

New York Post  
1211 Avenue of the Americas  
New York, NY 10036  
212-930-8100

New York Daily News  
450 West 33<sup>rd</sup> Street  
New York, NY 10001

New York 1 News

75 Ninth Avenue  
New York, NY 10011

**4. Public Water Supplier**

The New York City Department of Environmental Protection (DEP)  
Bureau of Water Supply  
59-17 Junction Boulevard  
Flushing, NY 11373

**5. Any Person who has Requested to be on the Site Contact List**

N/A

**6. Administrator of any School or Day Care Facility Located on or Near the Site**

Avenues: The World School  
President: Alan Greenberg  
259 10<sup>th</sup> Avenue  
New York, NY 10001  
212-524-9000

P.S. 33, Chelsea Prep  
Principal: Linore Lindy  
281 9<sup>th</sup> Avenue  
New York, NY 10001  
212-244-6426

University of Medicine and Health Sciences  
Dean: Robert W. Amler, M.D.  
460 West 34<sup>th</sup> Street  
New York, NY 10001  
866-686-0380

Guardian Angel School  
Principal: Maureen McElduff  
193 10<sup>th</sup> Avenue  
New York, NY 10011  
212-989-8280

McCarton School  
Executive Director: Cecelia McCarton, M.D.  
331 West 25<sup>th</sup> Street  
New York, NY 10001  
212-675-3905

YAI-NY League Early Learning  
Chief Executive Officer: Stephen E. Freeman  
460 West 34<sup>th</sup> Street  
New York, NY 10001  
212-420-0510

Secret Garden Preschool  
422 West 20<sup>th</sup> Street  
New York, NY 10011  
212-627-7275

San Jose Day Nursery Inc.  
432 West 20<sup>th</sup> Street  
New York, NY 10011  
212-929-0839

Sitters Studio  
Daycare Director: Emma Morrison  
259 West 30<sup>th</sup> Street  
New York, NY 10001  
877-844-8204

Kids at Work  
Founder and Owner: Julie Averill  
242 West 27<sup>th</sup> Street  
New York, NY 10001  
212-488-8800

## **7. Document Repository**

New York Public Library - Muhlenberg Branch  
209 West 23rd Street  
New York, NY 10011-2379  
File No. 41.0162122.00

July 2013

Manager: Ashley Curran  
Phone Number: 212-924-1585

DRAFT

## **Appendix B**

### **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. If possible, W29 Highline Owners LLC will reuse clean, non-virgin materials; the results of which will be quantified and reported in the Remedial Action Report (RAR).

**Reduced Energy Consumption and Promotion of Greater Energy Efficiency.** Reduced energy consumption lowers greenhouse gas emissions, improves local air quality, lessens in-city power generation requirements, can lower traffic congestion, and provides substantial cost savings. Best efforts will be made to quantify energy efficiencies achieved during the remediation and will be reported in the RAR. Where energy savings cannot be easily quantified, a gross indicator of the amount of energy saved or the means by which energy savings was achieved will be reported.

**Conversion to Clean Fuels.** Use of clean fuel improves NYC's air quality by reducing harmful emissions. An estimate of the volume of clean fuels used during remedial activities will be quantified and reported in the RAR.

**Recontamination Control.** Recontamination after cleanup and redevelopment is completed undermines the value of work performed, may result in a property that is less protective of public health or the environment, and may necessitate additional cleanup work later or impede future redevelopment. Recontamination can arise from future releases that occur within the property or by influx of contamination from off-Site. An estimate of any area of the Site that utilizes recontamination controls under this plan will be reported in the RAR in square feet.

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

influent to local surface waters. An estimate of any enhanced storm-water retention capability of the redevelopment project will be included in the RAR.

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

**Paperless Voluntary Cleanup Program.** W29 Highline Owners LLC is participating in OER's Paperless Voluntary 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.** W29 Highline Owners LLC is participating in OER's low-energy project management program. Under this program, whenever possible, meetings are held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation.

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

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

## **Appendix C**

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

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

Visual, olfactory and photo ionization detector (PID) soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional (QEP) and will be reported in the Remedial Action Report (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, underground storage tanks or 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 NYC Office of Environmental Remediation (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. Silt fencing or equivalent will surround soil stockpiles except for areas where access by equipment is required. Silt fencing, hay bales, and/or straw wattles 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 Professional Engineer (PE) or 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 Remedial Action Work Plan (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 New York Codes, Rules, and Regulations (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 to take a left onto West 29<sup>th</sup> Street followed by a right onto 12<sup>th</sup> Avenue, a right onto West 57<sup>th</sup> Street, a left onto 10<sup>th</sup> Avenue, a left onto West 72<sup>nd</sup> Street, a right onto Riverside Drive North, and continuing to the final destination. 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 or QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE, QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in New York, 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 RAR 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 Quality Analysis/Quality Control will be reported in the RAR. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the RAR. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

#### **1.7 MATERIALS REUSE ON-SITE**

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site; although, no soils are expected to remain on-Site. The soil cleanup objectives for on-Site reuse are listed in **Table 1**. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to the NYC VCP agreement subject to Engineering and Institutional Controls. The project PE or QEP

will ensure that reused materials are segregated from other materials to be exported from the Site.

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 above the water table, 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 Site Management Plan (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; although, no backfill or imported material is anticipated for the completion of this project. All Imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives will be consistent with the New York State File No. 41.0162122.00

July 2013

Department of Environmental Conservation (NYSDEC) Department of Environmental Remediation guidance document, DER-10, Appendix 5 - Allowable Constituent Levels for Imported Fill or Soil and/or design engineering specifications.

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 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 NYSDEC.

All materials received for import to the Site will be approved by a PE or 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 or 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 unless certified by a PE that the material is obtained from a native, virgin-source, aggregate mine or rock quarry. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

RCA will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the RAR. A PE or 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 State Pollution Discharge Mitigation System (SPDES) permit issued by NYSDEC.

### **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, except at entrance and exit points, 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 Target Compounds and Analytes (TAL) metals, Target Compound List (TCL) volatiles and semi-volatiles, TCL pesticides and polychlorinated biphenyls (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 or QEP who is in responsible charge and is designated to certify the RAR.

#### **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 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 or QEP who is in responsible the RAR.

**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.

DRAFT

**Table 1**  
**Soil Analytical Results**

Table 1 - Summary of Soil Analytical Results  
 522-532 West 29th Street  
 New York, New York  
 Phase II Site Investigation Report

LOCATION SAMPLING DATE LAB SAMPLE ID SAMPLE TYPE SAMPLE DEPTH (ft.)	CasNum	NY-RESK	Units	SB-1		SB-1		SB-1		SB-2		SB-2		SB-3		SB-3		SB-4		SB-4		SB-5		SB-5		SB-6		SB-6		SB-7		SB-7		SB-8		SB-8		SB-9			
				5/14/2013		5/14/2013		5/14/2013		5/14/2013		5/14/2013		5/14/2013		5/14/2013		5/14/2013		5/14/2013		5/14/2013		5/14/2013		5/14/2013		5/14/2013		5/14/2013		5/14/2013		5/14/2013		5/14/2013		5/14/2013			
				Soil	Qual	Soil	Qual																																		
General Chemistry - Westborough Lab																																									
Solids, Total	NONE	%		88.6		90.8		90.1		92.5		85.5		90.9		87.7		92		82.7		78.1		86.4		89.9		85.8		86.2		77.2		89.1		84.4		83.5			
Polychlorinated Biphenyls by GC - Westborough Lab																																									
Semivolatile Organics by GC/MS - Westborough Lab																																									
Acephenanthrene	83-32-3	100	mg/kg	0.083	J	0.72	U	0.73	U	0.14	U	0.15	U	0.043	J	0.15	U	0.14	U	0.16	U	0.17	U	0.15	U	0.091	J	0.15	U	0.5		0.17	U	0.15	U	0.15	U	0.23			
Fluoranthene	206-44-0	100	mg/kg	1.7	U	0.54	U	0.72	U	0.72	U	0.081	J	1.8	J	0.11	U	0.11	U	0.12	U	0.72	U	0.12	U	2.3	U	0.11	U	0.5		0.13	U	0.11	U	0.039	J	0.066	U		
Naphthalene	91-20-3	100	mg/kg	0.082	J	1.9	U	0.18	U	0.19	U	0.1	J	0.18	U	0.18	U	0.2	U	0.19	U	0.36	U	0.19	U	0.18	J	0.21	U	0.18	U	0.19	U	0.15	U	1.2	U	0.19	U	0.12	U
Benzo[a]anthracene	86-55-3	1	mg/kg	0.82	U	0.28	J	0.31	U	0.32	U	0.84	U	0.11	U	0.11	U	0.12	U	0.36	U	0.12	U	0.09	U	0.89	U	0.11	U	5.4	U	0.13	U	0.11	U	0.15	U	0.12	U		
Benzo[a]pyrene	50-32-8	1	mg/kg	0.69	U	0.73	U	0.73	U	0.31	U	0.15	U	0.84	U	0.15	U	0.14	U	0.16	U	0.21	U	0.12	U	0.87	U	0.15	U	4.8	U	0.17	U	0.15	U	0.047	J	0.16	U		
Benzo[b]fluoranthene	205-99-2	1	mg/kg	0.83	U	0.54	U	0.26	J	0.38	U	0.12	U	1	U	0.11	U	0.11	U	0.12	U	0.41	U	0.12	U	1.1	U	0.11	U	6	U	0.13	U	0.11	U	0.058	J	0.12	U		
Benzo[k]fluoranthene	207-09-9	100	mg/kg	0.41	U	0.54	U	0.13	U	0.66	U	0.12	U	0.47	U	0.11	U	0.12	U	0.17	U	0.12	U	0.11	U	0.47	U	0.11	U	2.3	U	0.13	U	0.11	U	0.12	U	0.12	U		
Chrysene	218-01-9	1	mg/kg	0.92	U	0.54	U	0.35	J	0.38	U	0.12	U	0.93	U	0.11	U	0.11	U	0.12	U	0.37	U	0.12	U	1.1	U	0.11	U	6	U	0.13	U	0.11	U	0.12	U	0.12	U		
Acephenanthrene	208-96-8	100	mg/kg	0.16	U	0.72	U	0.73	U	0.059	J	0.15	U	0.16	U	0.15	U	0.14	U	0.16	U	0.079	J	0.15	U	0.16	J	0.15	U	0.71	U	0.17	U	0.15	U	0.15	U	0.16	U		
Anthracene	120-12-7	100	mg/kg	0.26	U	0.3	J	0.38	J	0.98	J	0.12	U	0.25	U	0.082	J	0.12	U	0.082	J	0.12	U	0.32	U	0.11	U	1.3	U	0.13	U	0.11	U	0.11	U	0.091	J				
Benzo[e]pyrene	191-24-2	100	mg/kg	0.38	U	0.72	U	0.73	U	0.2	U	0.15	U	0.55	U	0.15	U	0.14	U	0.16	U	0.18	U	0.15	U	0.46	U	0.15	U	2.7	U	0.17	U	0.15	U	0.044	J	0.16	U		
Fluorene	86-73-7	100	mg/kg	0.096	J	1.3	U	2.8	U	0.18	U	0.19	U	0.054	J	0.18	U	0.18	U	0.2	U	0.21	U	0.19	U	0.11	J	0.19	U	0.48	U	0.21	U	0.18	U	0.19	U	0.51	U		
Phenanthrene	85-01-8	100	mg/kg	1.5	U	3.1	U	6.9	U	0.51	U	0.62	J	1	U	0.11	U	0.11	U	0.12	U	0.29	U	0.12	U	1.7	U	0.11	U	8.2	U	0.13	U	0.11	U	0.12	U	1.1	U		
Benzo[a]fluoranthene	83-70-3	0.33	mg/kg	0.12	U	0.54	U	0.55	U	0.046	J	0.12	U	0.11	U	0.11	U	0.12	U	0.05	J	0.12	U	0.13	J	0.11	J	0.19	U	0.78	U	0.13	U	0.11	U	0.12	U	0.12	U		
Indeno[1,2,3-cd]Pyrene	193-39-5	0.5	mg/kg	0.32	U	0.72	U	0.73	U	0.2	U	0.15	U	0.59	U	0.15	U	0.14	U	0.16	U	0.2	U	0.15	U	0.56	U	0.15	U	3.2	U	0.17	U	0.15	U	0.15	U	0.16	U		
Pyrene	129-00-0	100	mg/kg	1.8	U	0.59	U	1.5	U	0.62	U	0.071	J	1.6	U	0.11	U	0.11	U	0.12	U	0.69	U	0.12	U	2	U	0.11	U	12	U	0.13	U	0.11	U	0.042	J	0.1	U		
Benzo[ghi]perylene	132-64-9	14	mg/kg	0.063	J	0.9	U	0.91	U	0.18	U	0.2	U	0.21	U	0.19	U	0.36	U	0.19	U	0.27	J	0.21	U	0.18	U	0.19	U	0.3	U										
2-Methylnaphthalene	91-57-6	0.41	mg/kg	0.066	J	12	U	23	U	0.21	U	0.23	U	0.22	U	0.22	U	0.22	U	0.096	J	0.25	U	0.23	U	0.43	U	0.23	U	0.13	U	0.25	U	0.22	U	0.23	U	4.2	U		
Carbazole	86-74-8	100	mg/kg	0.01	J	0.9	U	0.91	U	0.05	J	0.19	U	0.081	J	0.18	U	0.18	U	0.2	U	0.21	U	0.19	U	0.15	J	0.19	U	0.48	U	0.21	U	0.18	U	0.19	U	0.2	U		
TCLP Metals by EPA 1311 - Westborough Lab																																									
Barium, TCLP	7440-39-3		mg/kg	-		-		-		-		-		-		-		-		-		-		-		-		-		-		-		-		-		-			
Total Metals - Westborough Lab																																									
Aluminum, Total	7429-90-5		mg/kg	6100		8800		6400		4100		3900		5500		3300		6600		6600		4000		6300		6200		4900		8600		8100		8400		7500					
Antimony, Total	7440-36-0		mg/kg	1.1	U	4.2	U	4.3	U	1.1	J	4.5	U	1.5	J	4.3	U	2.1	U	2.3	U	1.2	J	2.2	U	1.1	J	2.3	U	2.6	U	4.2	U	4.7	U	4.7	U	2.5	U		
Arsenic, Total	7440-38-2		mg/kg	4.2	U	3	U	2	U	3	J	0.62	J	7.8	U	0.72	J	2.2	U	2.1	U	7.1	U	2.2	U	6.2	U	2.7	U	1.9	U	3	U	2.7	U	3	U	2.5	U		
Barium, Total	7440-39-3		mg/kg	350	U	200	U	180	U	380	U	34	U	140	U	20	U	52	U	51	U	80	U	28	U	88	U	85	U	270	U	40	U	39	U	100	U	38	U		
Beryllium, Total	7440-41-7		mg/kg	14	U	0.3	J	0.23	J	0.21	J	0.19	J	0.33	J	0.2	J	0.29	J	0.33	J	0.18	J	0.25	J	0.25	J	0.25	J	0.38	J	0.31	J	0.35	J	0.29	J				
Cadmium, Total	7440-43-9		mg/kg	2.5	U	0.5	J	0.22	J	0.56	J	0.13	J	0.44	J	0.12	J	0.28	J	0.25	J	0.33	J	0.3	J	0.26	J	0.78	J	1.2	J	0.34	J	0.22	J	0.67	J	0.36	J		
Calcium, Total	7440-70-2		mg/kg	59000		24000		36000		25000		5100		6400		1000		3800		2500		6400		820		59000		1300		16000		1400		1400		2800					
Chromium, Total	7440-47-3		mg/kg	11	U	16	U	12	U	13	U	9.8	U	14	U	9.1	U	15	U	21	U	9.2	U	9.9	U	14	U	9.8	U	12	U	14	U	16	U	18	U	14	U		
Cobalt, Total	7440-48-4		mg/kg	30	U	3.2	U	5.3	U	3.8	U	3.2	U	5.1	U	3.3	U	5	U	5.8	U	3.2	U	4.9	U	6.2	U	5.4	U	6.5	U	5.2	U	5.3	U	5.2	U	5.7	U		
Copper, Total	7440-50-8		mg/kg	270	U	24	U	24	U	20	U	8.7	U	80	U	13	U	17	U	15																					

**Table 2**  
**Groundwater Analytical Results**

Table 2 - Summary of Groundwater Analytical Results  
 522-532 Wes 29th Street  
 New York, New York  
 Phase II Site Investigation Report

LOCATION				MW-1		DUP (MW-1)		MW-2		MW-3		FN-5		FIELD BLANK		TRIP BLANK	
SAMPLING DATE				5/15/2013		5/15/2013		5/15/2013		5/15/2013		5/15/2013		5/15/2013		5/15/2013	
LAB SAMPLE ID				L1308725-04		L1308725-05		L1308725-03		L1308725-01		L1308725-02		L1308725-06		L1308725-07	
CASNum				NY-AWQS		Units		Qual									
PCB by GC - Westborough Lab																	
Volatile Organics by GC/MS - Westborough Lab																	
1,1-Dichloroethane	75-34-3	5	ug/l	25	U	25	U	16		3.5		44		2.5	U	2.5	U
Benzene	71-43-2	1	ug/l	12		11		2	U	0.5	U	11		0.5	U	0.5	U
Toluene	108-88-3	5	ug/l	25	U	25	U	10	U	2.5	U	1.7	J	2.5	U	2.5	U
Ethylbenzene	100-41-4	5	ug/l	25	U	25	U	10	U	2.5	U	15		2.5	U	2.5	U
Vinyl chloride	75-01-4	2	ug/l	10	U	10	U	26		0.89	J	9.4		1	U	1	U
Chloroethane	75-00-3	5	ug/l	25	U	25	U	3.8	J	2.5	U	5.4		2.5	U	2.5	U
1,1-Dichloroethene	75-35-4	5	ug/l	5	U	5	U	1.4	J	0.75	U	0.5	U	0.5	U	0.5	U
trans-1,2-Dichloroethene	156-60-5	5	ug/l	25	U	25	U	10	U	2.2	J	2.5	U	2.5	U	2.5	U
Trichloroethene	79-01-6	5	ug/l	5	U	5	U	2	U	1.9	U	0.5	U	0.5	U	0.5	U
p/m-Xylene	179601-23-1	5	ug/l	25	U	25	U	10	U	2.5	U	82		2.5	U	2.5	U
o-Xylene	95-47-6	5	ug/l	25	U	25	U	10	U	2.5	U	14		2.5	U	2.5	U
cis-1,2-Dichloroethene	156-59-2	5	ug/l	25	U	25	U	160		43		3		2.5	U	2.5	U
Acetone	67-64-1	50	ug/l	17	J	14	J	4.8	J	13		5	U	2.5	J	1.8	J
n-Butylbenzene	104-51-8	5	ug/l	9.8	J	11	J	10	U	2.5	U	2.3	J	2.5	U	2.5	U
sec-Butylbenzene	135-98-8	5	ug/l	10	J	12	J	10	U	2.5	U	1.8	J	2.5	U	2.5	U
Isopropylbenzene	98-82-8	5	ug/l	18	J	19	J	10	U	2.5	U	6.4		2.5	U	2.5	U
Naphthalene	91-20-3	10	ug/l	32		35		10	U	2.5	U	22		2.5	U	2.5	U
n-Propylbenzene	103-65-1	5	ug/l	34		37		10	U	2.5	U	8.9		2.5	U	2.5	U
1,3,5-Trimethylbenzene	108-67-8	5	ug/l	25	U	25	U	10	U	2.5	U	6		2.5	U	2.5	U
1,2,4-Trimethylbenzene	95-63-6	5	ug/l	25	U	8	J	10	U	2.5	U	77		2.5	U	2.5	U
1,4-Diethylbenzene	105-05-5		ug/l	7.4	J	8.3	J	8	U	2	U	7.8		2	U	2	U
4-Ethyltoluene	622-96-8		ug/l	20	U	20	U	8	U	2	U	21		2	U	2	U
1,2,4,5-Tetramethylbenzene	95-93-2		ug/l	29		34		8	U	2	U	7.9		2	U	2	U
Semivolatile Organics by GC/MS-SIM - Westborough Lab																	
Acenaphthene	83-32-9	20	ug/l	20		15		0.2	U	0.2	U	4.2		0.2	U	-	-
Naphthalene	91-20-3	10	ug/l	23		24		0.09	J	0.2	U	15		0.2	U	-	-
Benzo(a)pyrene	50-32-8	0	ug/l	4	U	4	U	0.11	J	0.2	U	0.2	U	0.2	U	-	-
Fluorene	86-73-7	50	ug/l	26		20		0.2	U	0.2	U	1.4		0.2	U	-	-
Phenanthrene	85-01-8	50	ug/l	43		31		0.14	J	0.2	U	1.3		0.2	U	-	-
Pyrene	129-00-0	50	ug/l	5.6		3.7	J	0.1	J	0.2	U	0.1	J	0.2	U	-	-
2-Methylnaphthalene	91-57-6		ug/l	270		210		0.2	U	0.2	U	5.9		0.2	U	-	-
Pentachlorophenol	87-86-5	1	ug/l	16	U	16	U	0.8	U	0.8	U	0.8	U	0.8	U	-	-
Hexachloroethane	67-72-1	5	ug/l	16	U	16	U	0.8	U	0.8	U	0.8	U	0.8	U	-	-
Total Metals - Westborough Lab																	
Aluminum, Total	7429-90-5		ug/l	6320		11100		5540		376		374		10	U	-	-
Antimony, Total	7440-36-0	3	ug/l	0.31	J	0.39		1.09		0.39	J	0.25	J	0.11	J	-	-
Arsenic, Total	7440-38-2	25	ug/l	5.65		7.73		4.69		1.29		3.83		0.5	U	-	-
Barium, Total	7440-39-3	1000	ug/l	626.8		724.2		349.8		103.3		288.3		0.5	U	-	-
Beryllium, Total	7440-41-7	3	ug/l	0.51		1.11		0.33	J	0.5	U	0.5	U	0.5	U	-	-
Cadmium, Total	7440-43-9	5	ug/l	0.08	J	0.25		0.23		0.2	U	0.2	U	0.2	U	-	-
Calcium, Total	7440-70-2		ug/l	226000		223000		198000		251000		171000		100	U	-	-
Chromium, Total	7440-47-3	50	ug/l	12.66		21.87		13.85		1	U	0.33	J	1	U	-	-
Cobalt, Total	7440-48-4		ug/l	5.83		9.93		5.6		1.61		0.58		0.5	U	-	-
Copper, Total	7440-50-8	200	ug/l	16.31		31.59		25.39		0.19	J	0.76	J	1.5	U	-	-
Iron, Total	7439-89-6	300	ug/l	22200		29500		8740		1050		14000		50	U	-	-
Lead, Total	7439-92-1	25	ug/l	38.01		257		484.3		1.85		8.85		0.5	U	-	-
Magnesium, Total	7439-95-4	35000	ug/l	51700		51900		38600		50900		39900		100	U	-	-
Manganese, Total	7439-96-5	300	ug/l	4097		4607		4035		2075		4061		0.5	U	-	-
Mercury, Total	7439-97-6	0.7	ug/l	0.2	U	0.4		0.66		0.2	U	0.2	U	0.2	U	-	-
Nickel, Total	7440-02-0	100	ug/l	9.8		16.35		10.92		1.41		1.17		1	U	-	-
Potassium, Total	7440-09-7		ug/l	44400		45200		31600		24400		36400		100	U	-	-
Silver, Total	7440-22-4	50	ug/l	0.4	U	0.4	U	0.31	J	0.4	U	0.8		0.4	U	-	-
Sodium, Total	7440-23-5	20000	ug/l	366000		359000		85600		44100		225000		50.1	J	-	-
Vanadium, Total	7440-62-2		ug/l	23.54		43.92		15.34		1.72	J	1.3	J	5	U	-	-
Zinc, Total	7440-66-6	2000	ug/l	21.49		91.13		171.5		1.22	J	10.14		10	U	-	-
Dissolved Metals - Westborough Lab																	
Aluminum, Dissolved	7429-90-5		ug/l	47		17		76.6		2.34	J	70.6		10	U	-	-
Antimony, Dissolved	7440-36-0	3	ug/l	0.57	J	0.65	J	1.12		0.78	J	0.82	J	0.73	J	-	-
Arsenic, Dissolved	7440-38-2	25	ug/l	1.22		1.06		1.5		0.86		3.75		0.5	U	-	-
Barium, Dissolved	7440-39-3	1000	ug/l	463.9		456.5		64.44		95.32		271.5		0.5	U	-	-
Calcium, Dissolved	7440-70-2		ug/l	218000		206000		174000		238000		157000		100	U	-	-
Cobalt, Dissolved	7440-48-4		ug/l	1.31		1.56		1.05		1.32		0.38	J	0.5	U	-	-
Iron, Dissolved	7439-89-6	300	ug/l	959		895		165		144		13500		50	U	-	-
Lead, Dissolved	7439-92-1	25	ug/l	0.5	J	0.46	J	15.18		1	U	1.05		1	U	-	-
Magnesium, Dissolved	7439-95-4	35000	ug/l	48600		48300		31400		46900		39400		100	U	-	-
Manganese, Dissolved	7439-96-5	300	ug/l	3477		3828		3389		2062		3882		0.15	J	-	-
Nickel, Dissolved	7440-02-0	100	ug/l	1.82		1.95		1.24		1.72		0.78		0.5	U	-	-
Potassium, Dissolved	7440-09-7		ug/l	40700		41200		27900		23000		34400		100	U	-	-
Sodium, Dissolved	7440-23-5	20000	ug/l	360000		357000		83400		43700		207000		88.9	J	-	-
Zinc, Dissolved	7440-66-6	2000	ug/l	10	U	10	U	4.11	J	11		11.06		10	U	-	-

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated

concentration for Tentatively Identified Compounds (TICs).

U - Not detected at the reported detection limit for the sample.

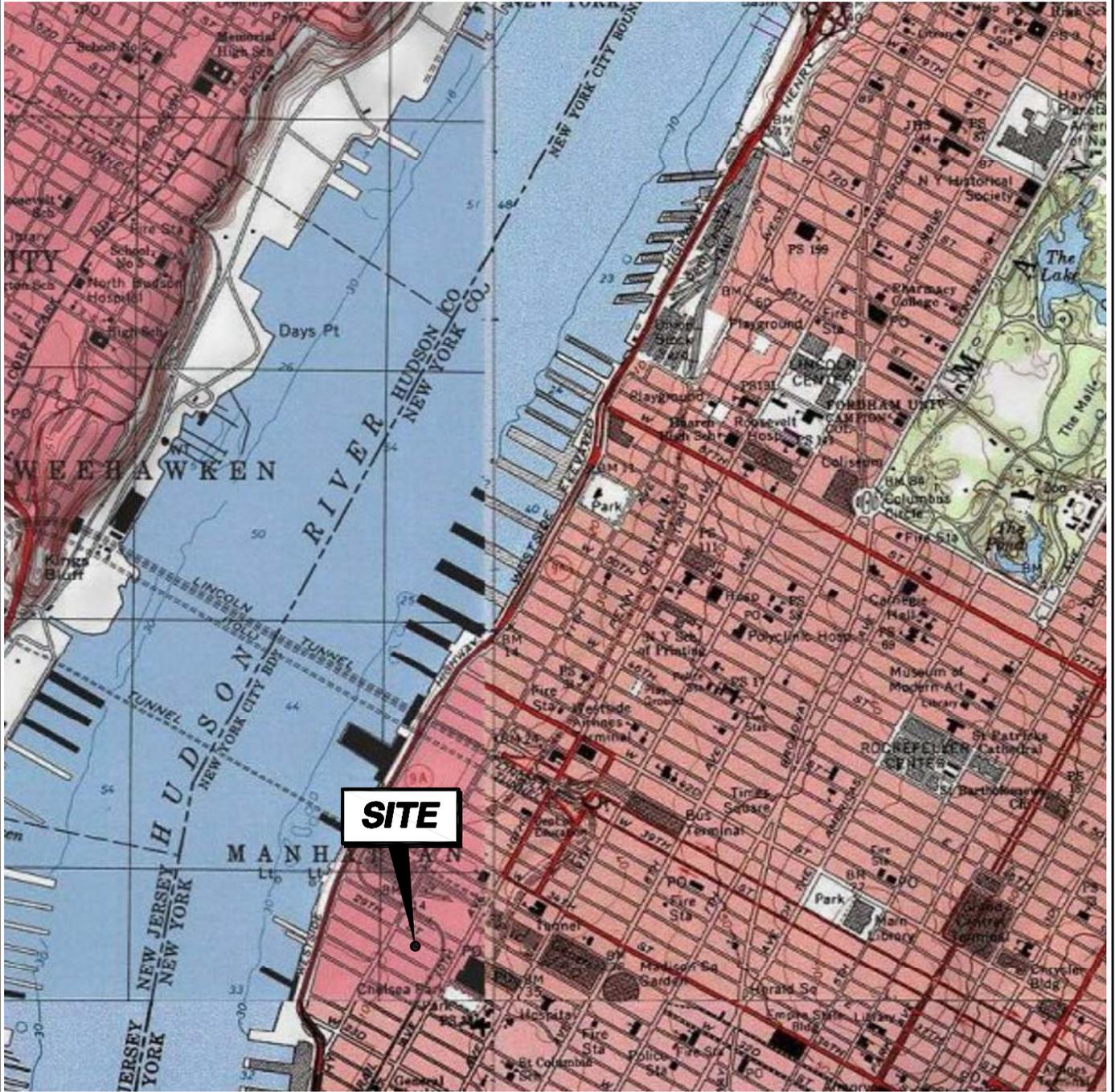
Value Exceeds NY TOGS AWQS

**Table 3**  
**Soil Vapor Analytical Results**

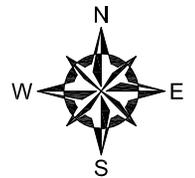
Table 3 - Summary of Soil Vapor Analytical Results  
522-532 Wes 29th Street  
New York, New York  
Phase II Site Investigation Report

LOCATION			SV-1		SV-2		SV-3		SV-4		SV-5		SV-6	
SAMPLING DATE			5/14/2013		5/13/2013		5/13/2013		5/13/2013		5/15/2013		5/13/2013	
LAB SAMPLE ID			L1308604-01		L1308532-03		L1308532-04		L1308532-02		L1308732-01		L1308532-01	
	CasNum	Units		Qual										
Volatile Organics in Air - Mansfield Lab														
Propylene	115-07-1	ug/m3	5.78		15		23.9		1.88	U	182	U	8.95	
Dichlorodifluoromethane	75-71-8	ug/m3	2.89		3.02		2.7		2.78		210	U	2.96	
Chloromethane	74-87-3	ug/m3	1.43		1.32		0.915	U	0.9	U	93.8	U	0.921	U
Vinyl chloride	75-01-4	ug/m3	1.09	U	1.12	U	1.57		1.11	U	108	U	1.14	U
1,3-Butadiene	106-99-0	ug/m3	1.43		2.52		1.52		0.965	U	93.8	U	1.11	
Ethanol	64-17-5	ug/m3	10.1	U	15.9		10.4	U	10.3	U	999	U	12.7	
Acetone	67-64-1	ug/m3	62		224		111		44.7		504	U	141	
Isopropanol	67-63-0	ug/m3	2.63	U	3.69		2.73	U	2.68	U	261	U	2.8	
Methylene chloride	75-09-2	ug/m3	9.94		7.64	U	7.71	U	7.57	U	736	U	8.82	
Carbon disulfide	75-15-0	ug/m3	15.2		4.86		15.9		3.89		132	U	4.8	
Methyl tert butyl ether	1634-04-4	ug/m3	1.54	U	81.5		3.32		1.57	U	153	U	1.61	U
2-Butanone	78-93-3	ug/m3	5.19		57.8		35.1		12		125	U	43.9	
cis-1,2-Dichloroethene	156-59-2	ug/m3	1.69	U	1.74	U	1.76	U	1.73	U	168	U	3.02	
Chloroform	67-66-3	ug/m3	11.4		2.15	U	81.1		54.7		207	U	18.9	
n-Hexane	110-54-3	ug/m3	10.7		18.1		31.3		7.05		7820		18.1	
1,1,1-Trichloroethane	71-55-6	ug/m3	2.33	U	12.9		2.42	U	2.38	U	231	U	10	
Benzene	71-43-2	ug/m3	8.15		14.2		8.98		4.34		680		11	
Cyclohexane	110-82-7	ug/m3	8.64		4.16		6.06		1.5	U	4200		6.4	
Bromodichloromethane	75-27-4	ug/m3	2.86	U	2.95	U	6		4.64		284	U	2.99	U
Trichloroethene	79-01-6	ug/m3	2.29	U	2.36	U	2.38	U	2.34	U	228	U	5.37	
2,2,4-Trimethylpentane	540-84-1	ug/m3	2.23		2.06	U	79.9		2.04	U	54600		2.08	U
Heptane	142-82-5	ug/m3	13.9		20.2		22.6		9.55		8110		45.9	
4-Methyl-2-pentanone	108-10-1	ug/m3	1.77		6.88		5.45		1.79	U	174	U	1.83	U
Toluene	108-88-3	ug/m3	245		154		79.9		136		245		113	
2-Hexanone	591-78-6	ug/m3	1.75	U	4.88		1.82	U	1.79	U	174	U	1.83	U
Tetrachloroethene	127-18-4	ug/m3	2.9	U	10.2		3	U	2.96	U	288	U	7.46	
Ethylbenzene	100-41-4	ug/m3	54.7		57.3		35		28.4		11100		53	
p/m-Xylene	179601-23-1	ug/m3	228		259		159		132		1030		241	
Styrene	100-42-5	ug/m3	2.48		2.91		1.92		1.86	U	181	U	2.56	
o-Xylene	95-47-6	ug/m3	84.7		95.6		59.1		52.6		315		92.5	
4-Ethyltoluene	622-96-8	ug/m3	36.9		47.8		28.8		26.4		767		45.8	
1,3,5-Trimethylbenzene	108-67-8	ug/m3	31.4		37.4		24		21.6		208	U	43.7	
1,2,4-Trimethylbenzene	95-63-6	ug/m3	125		149		96.4		92.9		208	U	151	

**Figure 1**  
**Site Location Map**



SOURCE:  
 USGS TOPOGRAPHIC MAPS WEEHAWKEN, NJ-NY (1981) &  
 CENTRAL PARK, NY-NJ (1979). CONTOUR INTERVAL 10 FT.,  
 ORIGINAL SCALE 1:24,000 (1"=2,000 FT.).



UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

522-532 WEST 29TH STREET  
 NEW YORK, NEW YORK

PREPARED BY:  
 GZA GeoEnvironmental  
 of New York  
 Engineers and Scientists  
 104 WEST 20TH STREET, 10TH FLOOR  
 NEW YORK, NEW YORK 10011

PREPARED FOR:  
 FOUNDATIONS GROUP

**SITE LOCATION PLAN**

PROJ MGR: JB	REVIEWED BY: JB	CHECKED BY: JB
DESIGNED BY: JB	DRAWN BY: MT	SCALE: 1" = 2000'
DATE: APRIL 2013	PROJECT NO. 41.0162122.00	REVISION NO.

FIGURE  
**1**  
 SHEET NO.

**Figure 2**  
**Redevelopment Plan**

OWNER:  
WEST 29TH HIGHLINE OWNERS LLC.  
520 WEST 27TH STREET, SUITE 302  
NEW YORK, NY 10001

ARCHITECT:  
Montroy DeMarco LLP  
99 Madison Avenue 14th Floor  
NEW YORK, NY 10016  
TEL: (212) 481-8900  
FAX: (212) 481-7481

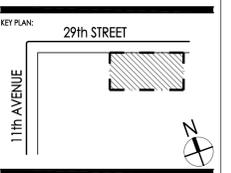
DESIGN ARCHITECT:  
SCDA  
8 TECH LUM ROAD  
SINGAPORE, 088385  
TEL: 65 6334-5458  
FAX: 65 6334-5450

STRUCTURAL ENGINEER:  
ALEXANDRU MARIN, P.E.  
MARIN CONSULTING ENGINEER PLLC  
48 JAY STREET, SUITE 201  
BROOKLYN, NY 11201  
TEL: (917) 705-5534

MECHANICAL ENGINEERS:  
IMTAZ MULLA, P.E.  
PLUS GROUP CONSULTING  
ENGINEERING, PLLC  
231 WEST 29TH STREET, RM. 706  
NEW YORK, NY 10001  
TEL: (212) 233-2700

FACADE CONSULTANT:  
LAUFS E.D. LLC  
LAUFS ENGINEERING DESIGN  
200 PARK AVE SOUTH, SUITE 1401  
NEW YORK, NY 10003  
TEL: (212) 529-3956

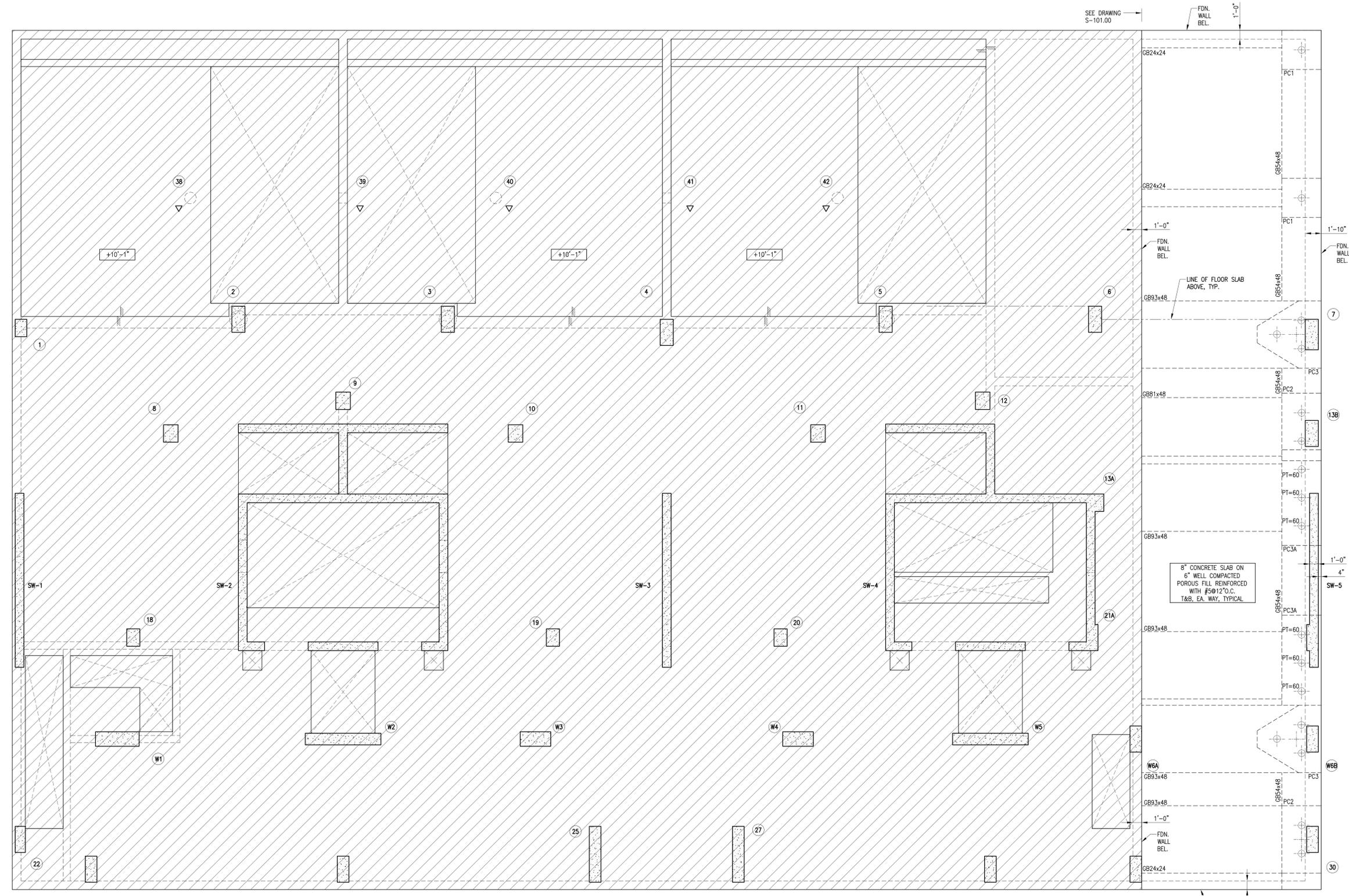
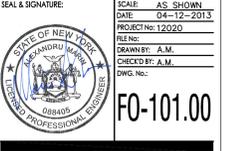
No.	Date	Revision
1	02/28/2013	ISSUED TO D.O.B.
2	04/15/2013	ISSUED FOR PRICING
3	04/29/2013	ISSUED TO D.O.B.
4	04/27/2013	ISSUED TO R.A.P.



PROJECT:  
**522 West 29th Street NY, NY**

TITLE:  
**FOUNDATION PLAN**

SCALE: AS SHOWN  
DATE: 04-12-2013  
PROJECT No: 12020  
DRAWN BY: A.M.  
CHECKED BY: A.M.  
DWG. No.: **FO-101.00**

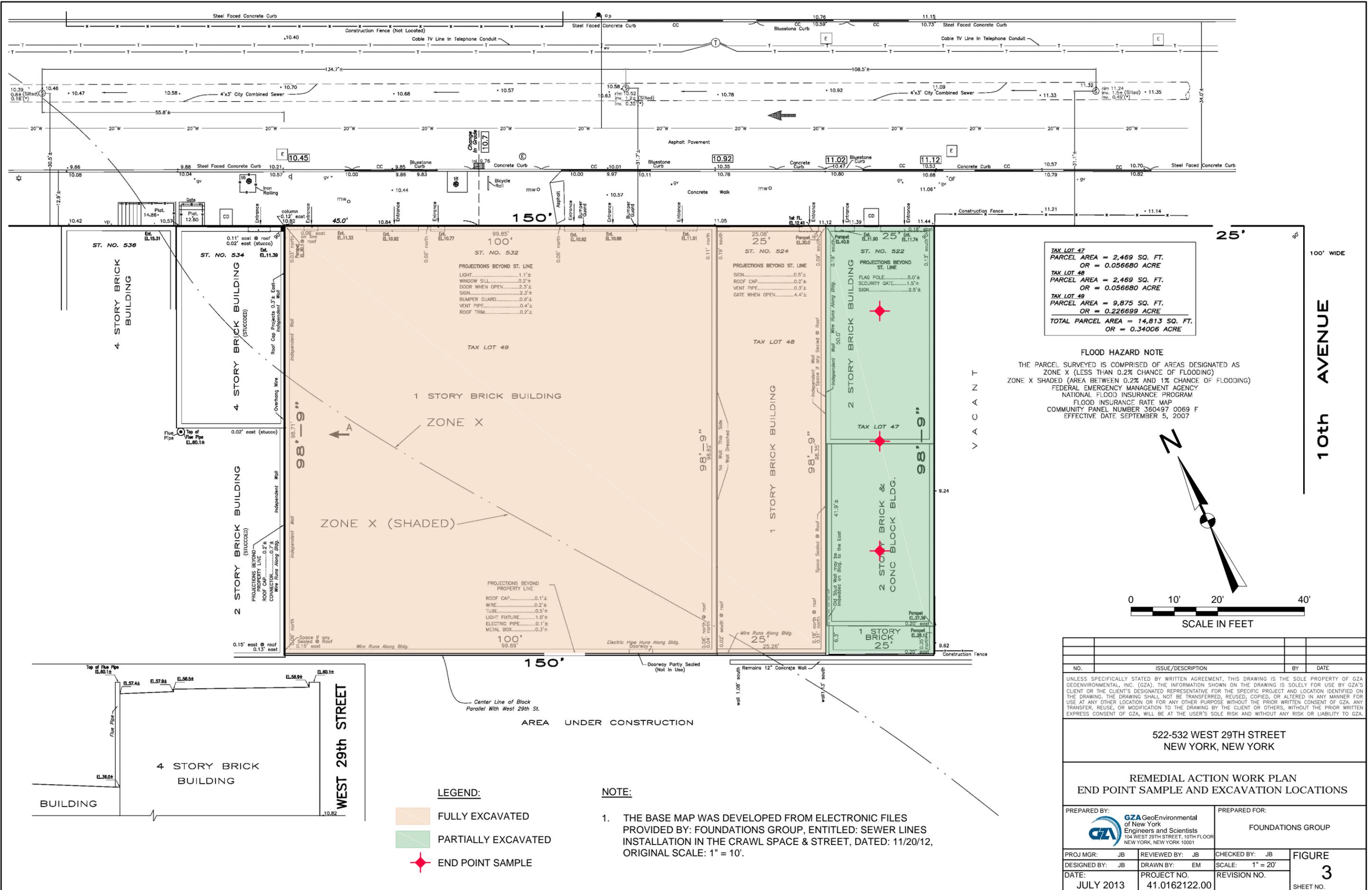


**1ST FLOOR FOUNDATION PLAN**  
SCALE: 1/4"=1'-0"

- NOTES:
- TOP OF CONCRETE SLAB ELEVATION IS +11'-1" ABOVE TOP OF CELLAR SLAB, UON ON PLAN THUS [EX'-X"].
  - SEE DRAWING S-101.00 FOR 1ST FLOOR CONSTRUCTION ABOVE CELLAR AREA.
  - TOP OF PILE CAPS SHALL BE 1'-0" BELOW TOP OF SLAB, UON.
  - INDICATES MINI CAISSON PILE WITH AN ALLOWABLE AXIAL COMPRESSIVE CAPACITY OF 300 KIPS. MINI CAISSONS SHALL BE A STEEL CASING 11.875 O.D EXTRA STRONG STEEL CASING REINFORCED WITH SINGLE #20 THREADBAR (GRADE 75), WITH ROCKET SOCKET DIAMETER OF 10 IN AND 7 FT. LONG FILLED WITH 5,000 PSI CEMENT GROUT; MINI CAISSON SHALL BE FILLED WITH 5,000 PSI GROUT WITH WATER REDUCING AGENT. ALL MINI CAISSON SUBJECT TO UPLIFT ARE INDICATED IN PLAN AS "PT= ".
  - ALL WALLS SHALL BE REINFORCED WITH #4@12"O.C. VERTICAL AND HORIZONTAL EACH FACE UNLESS OTHERWISE SHOWN ON PLAN, IN SECTIONS OR ON SHEAR WALL SCHEDULES. DESIGNATION SHOWN ON PLAN INDICATES NET UPLIFT IN KIPS AT THE PILE.

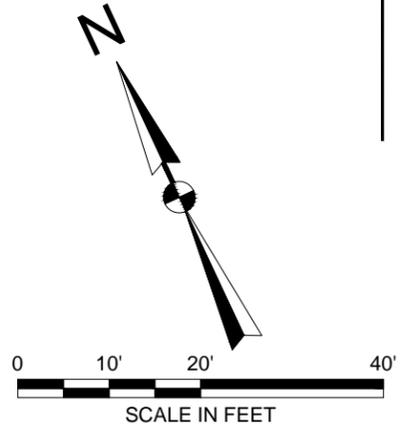
**Figure 3**

**End Point Sample and Excavation Locations**



<b>TAX LOT 47</b>	PARCEL AREA = 2,469 SQ. FT. OR = 0.056680 ACRE
<b>TAX LOT 48</b>	PARCEL AREA = 2,469 SQ. FT. OR = 0.056680 ACRE
<b>TAX LOT 49</b>	PARCEL AREA = 9,875 SQ. FT. OR = 0.226699 ACRE
<b>TOTAL PARCEL AREA</b>	= 14,813 SQ. FT. OR = 0.34006 ACRE

**FLOOD HAZARD NOTE**  
 THE PARCEL SURVEYED IS COMPRISED OF AREAS DESIGNATED AS ZONE X (LESS THAN 0.2% CHANCE OF FLOODING)  
 ZONE X SHADED (AREA BETWEEN 0.2% AND 1% CHANCE OF FLOODING)  
 FEDERAL EMERGENCY MANAGEMENT AGENCY  
 NATIONAL FLOOD INSURANCE PROGRAM  
 FLOOD INSURANCE RATE MAP  
 COMMUNITY PANEL NUMBER 360497 0069 F  
 EFFECTIVE DATE SEPTEMBER 5, 2007



NO.	ISSUE/DESCRIPTION	BY	DATE

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

**522-532 WEST 29TH STREET  
 NEW YORK, NEW YORK**

**REMEDIAL ACTION WORK PLAN  
 END POINT SAMPLE AND EXCAVATION LOCATIONS**

PREPARED BY: <b>GZA</b> GeoEnvironmental of New York Engineers and Scientists 104 WEST 29TH STREET, 10TH FLOOR NEW YORK, NEW YORK 10001	PREPARED FOR: FOUNDATIONS GROUP
PROJ MGR: JB DESIGNED BY: JB DATE: JULY 2013	REVIEWED BY: JB DRAWN BY: EM PROJECT NO. 41.0162122.00
CHECKED BY: JB SCALE: 1" = 20' REVISION NO.	FIGURE <b>3</b> SHEET NO.

**Figure 4**

**Vapor Barrier/ Waterproofing Membrane Diagrams**

OWNER:  
WEST 29TH HIGHLINE OWNERS LLC.  
520 WEST 27TH STREET, SUITE 302  
NEW YORK, NY 10001

ARCHITECT:  
Montray DeMarco LLP  
99 Madison Avenue 14th Floor  
NEW YORK, NY 10016  
TEL: (212) 481-8500  
FAX: (212) 481-7481

DESIGN ARCHITECT:  
SCDA  
8 TECK LIND ROAD  
SINGAPORE, 06338  
TEL: +65 6334-5466  
FAX: +65 6334-5400

STRUCTURAL ENGINEER:  
ALEXANDRU MARIN, P.E.  
MARIN CONSULTING ENGINEER PLLC  
48 JAY STREET, SUITE 201  
BROOKLYN, NY 11201  
TEL: (917) 705-5334

MECHANICAL ENGINEER:  
IMTAZ MULLA, P.E.  
PLUS GROUP CONSULTING  
ENGINEERING, PLLC  
231 WEST 29TH STREET, RM. 704  
NEW YORK, NY 10001  
TEL: (212) 233-2700

FAÇADE CONSULTANT:  
LAUPS E.D. LLC  
LAUPS ENGINEERING DESIGN  
200 PARK AVE SOUTH, SUITE 1401  
NEW YORK, NY 10003  
TEL: (212) 529-9865

**LEGEND**

--- 1 HR FIRE-RATED WALL  
--- 2 HR FIRE-RATED WALL  
--- 3 HR FIRE-RATED WALL

**NOTE:**  
REFER TO DRAWING G-003 FOR PARTITION TYPE

**SMOKE / CARBON MONOXIDE DETECTING DEVICES & OTHER NOTES**

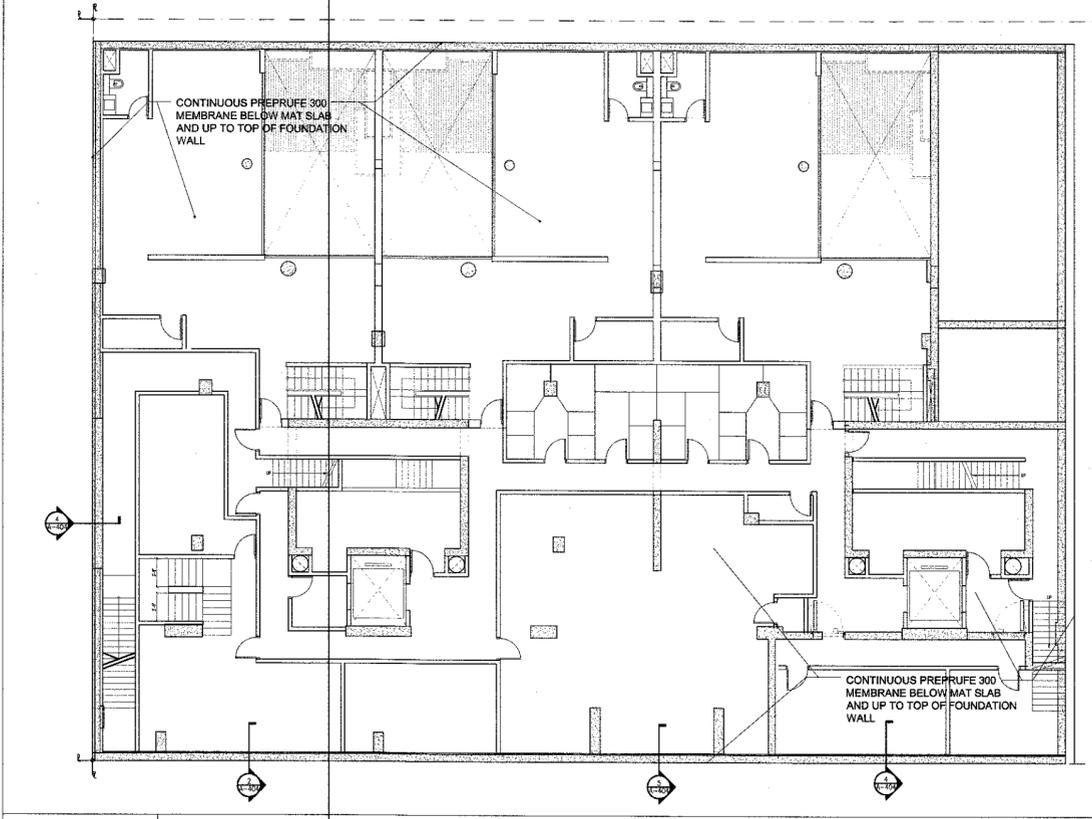
- SMOKE DETECTING DEVICES SHALL CONFORM TO SECTION 907 OF THE NEW YORK CITY BUILDING CODE AND THE HOUSEHOLD FIRE-WARNING EQUIPMENT PROVISIONS OF NFPA 72.
- SEE DETAIL NOTES ON DRAWING G-001 FOR SMOKE / CARBON MONOXIDE DETECTING DEVICES
- FOYER: IN ALL APARTMENTS 20% MAX. FOYER PERMITTED AS ALL ROOM SIZES EXCEED BY MORE THAN 20% OF THEIR REQ'D MIN. SIZES OF 132 SF FOR L.R. & 96 SF BEDROOM M.D.L. SECT. 24(5)(b)
- ALL DRYERS SHALL BE NOT VENTED (CONDENSING) (CONDENSING) DRYER TYPE SIMILAR TO ASCO MODEL #7721

1	04/27/2013	ISSUED TO O.D.S.
2	04/15/2013	90% D.D. - ISSUED FOR PRICING
3	03/28/2013	ISSUED TO O.D.S.
4	01/28/2013	ISSUED TO O.D.S.

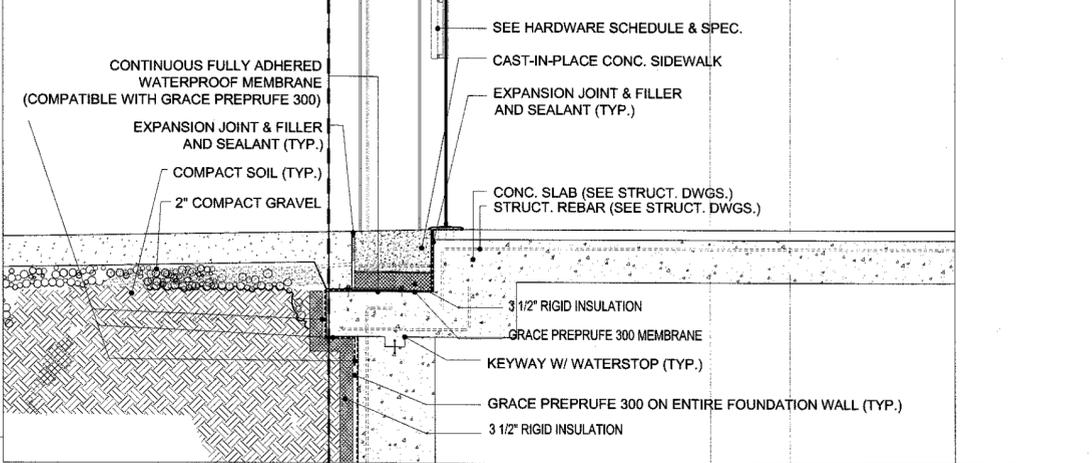


REGISTERED ARCHITECT  
**RICHARD DEMARCO**  
STATE OF NEW YORK  
018593

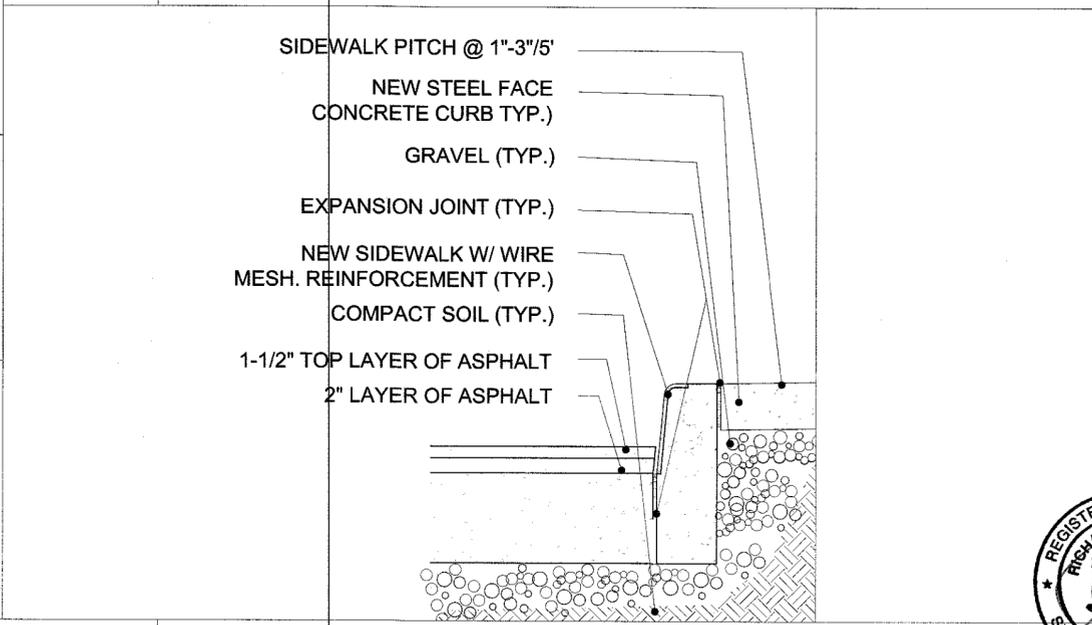
SCALE: AS SHOWN  
DATE: 12-12-2012  
PROJECT: 12123  
FILE NO:  
DRAWN BY: M.S.  
CHECKED BY: R.D.  
DWG. NO.:  
**A-404.00**



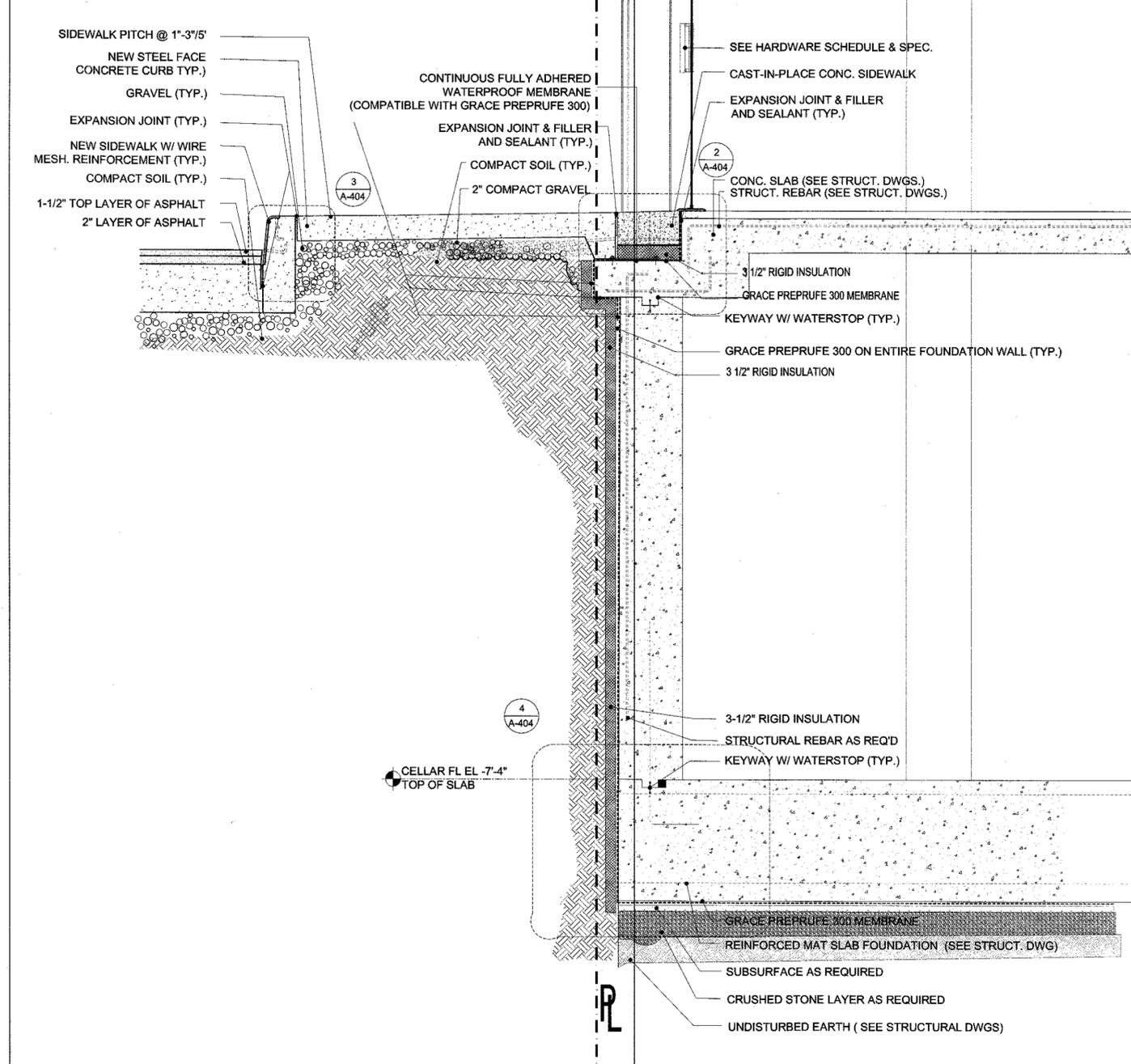
**1 CELLAR PLAN**  
1/8" = 1'-0"



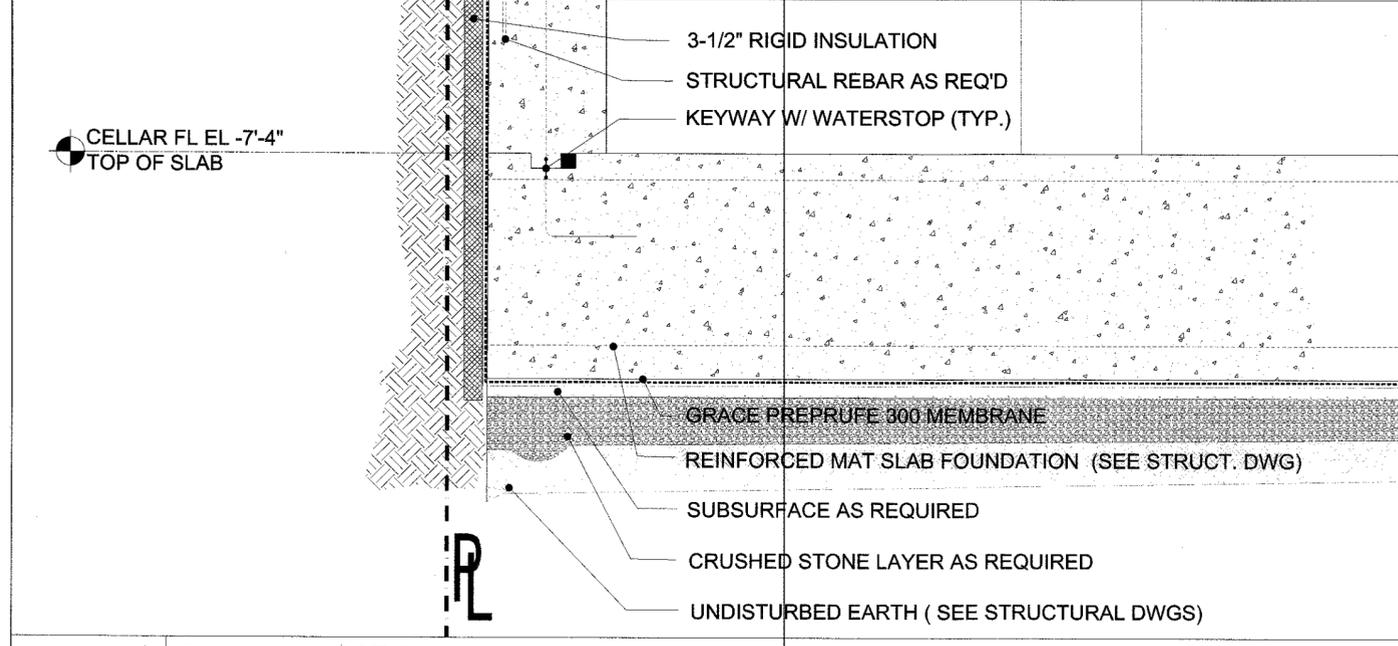
**2 EXTERIOR WALL DETAIL AT GRADE**  
1" = 1'-0"



**3 CURB DETAIL**  
1 1/2" = 1'-0"



**5 FOUNDATION WALL SECTION**  
1" = 1'-0"



**4 FOUNDATION WALL DETAIL**  
1 1/2" = 1'-0"

SIDEWALK PITCH @ 1"-3"/5'  
NEW STEEL FACE CONCRETE CURB (TYP.)  
GRAVEL (TYP.)  
EXPANSION JOINT (TYP.)  
NEW SIDEWALK W/ WIRE MESH REINFORCEMENT (TYP.)  
COMPACT SOIL (TYP.)  
1-1/2" TOP LAYER OF ASPHALT  
2" LAYER OF ASPHALT

CONTINUOUS FULLY ADHERED WATERPROOF MEMBRANE (COMPATIBLE WITH GRACE PREPRUFE 300)  
EXPANSION JOINT & FILLER AND SEALANT (TYP.)  
COMPACT SOIL (TYP.)  
2" COMPACT GRAVEL  
3 1/2" RIGID INSULATION  
GRACE PREPRUFE 300 MEMBRANE  
KEYWAY W/ WATERSTOP (TYP.)  
GRACE PREPRUFE 300 ON ENTIRE FOUNDATION WALL (TYP.)  
3 1/2" RIGID INSULATION

SEE HARDWARE SCHEDULE & SPEC.  
CAST-IN-PLACE CONC. SIDEWALK  
EXPANSION JOINT & FILLER AND SEALANT (TYP.)  
CONC. SLAB (SEE STRUCT. DWGS.)  
STRUCT. REBAR (SEE STRUCT. DWGS.)

3-1/2" RIGID INSULATION  
STRUCTURAL REBAR AS REQ'D  
KEYWAY W/ WATERSTOP (TYP.)

GRACE PREPRUFE 300 MEMBRANE  
REINFORCED MAT SLAB FOUNDATION (SEE STRUCT. DWG)  
SUBSURFACE AS REQUIRED  
CRUSHED STONE LAYER AS REQUIRED  
UNDISTURBED EARTH (SEE STRUCTURAL DWGS)

3-1/2" RIGID INSULATION  
STRUCTURAL REBAR AS REQ'D  
KEYWAY W/ WATERSTOP (TYP.)

GRACE PREPRUFE 300 MEMBRANE  
REINFORCED MAT SLAB FOUNDATION (SEE STRUCT. DWG)  
SUBSURFACE AS REQUIRED  
CRUSHED STONE LAYER AS REQUIRED  
UNDISTURBED EARTH (SEE STRUCTURAL DWGS)

SIDEWALK PITCH @ 1"-3"/5'  
NEW STEEL FACE CONCRETE CURB (TYP.)  
GRAVEL (TYP.)  
EXPANSION JOINT (TYP.)  
NEW SIDEWALK W/ WIRE MESH REINFORCEMENT (TYP.)  
COMPACT SOIL (TYP.)  
1-1/2" TOP LAYER OF ASPHALT  
2" LAYER OF ASPHALT

**Appendix A**  
**Citizen Participation Plan**

## **APPENDIX A**

# **CITIZEN PARTICIPATION PLAN**

The NYC Office of Environmental Remediation (OER) and W29 Highline Owners LLC have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Voluntary Cleanup Program (VCP). This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYC BCP, W29 Highline Owners LLC will maintain a repository for project documents and provide public notice at specified times during 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 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, TBD, 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. A member of the public or organization will be added to the Site Contact List on request. A copy of the Site Contact List is maintained by OER's project manager. If you would like to be added to the Project Contact List, contact NYC OER at (212) 788-8841 or by email at [brownfields@cityhall.nyc.gov](mailto:brownfields@cityhall.nyc.gov).

**Repositories.** A document repository is maintained in the nearest public library that maintains evening and weekend hours. This document repository is intended to house, for community review, the principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and the public notices and fact sheets produced during the lifetime of the remedial project. W29 Highline Owners LLC will inspect the repositories to check that they are populated with project information. The repository for this project is:

New York Public Library - Muhlenberg Branch  
209 West 23rd Street  
New York, NY 10011-2379  
Manager: Ashley Curran  
Phone Number: 212-924-1585

Repository Hours of Operation:

Monday & Wednesday: 11:00am – 6:00pm

Tuesday & Thursday: 11:00am – 7:00pm

Friday & Saturday: 10:00am – 5:00pm

Sunday: Closed

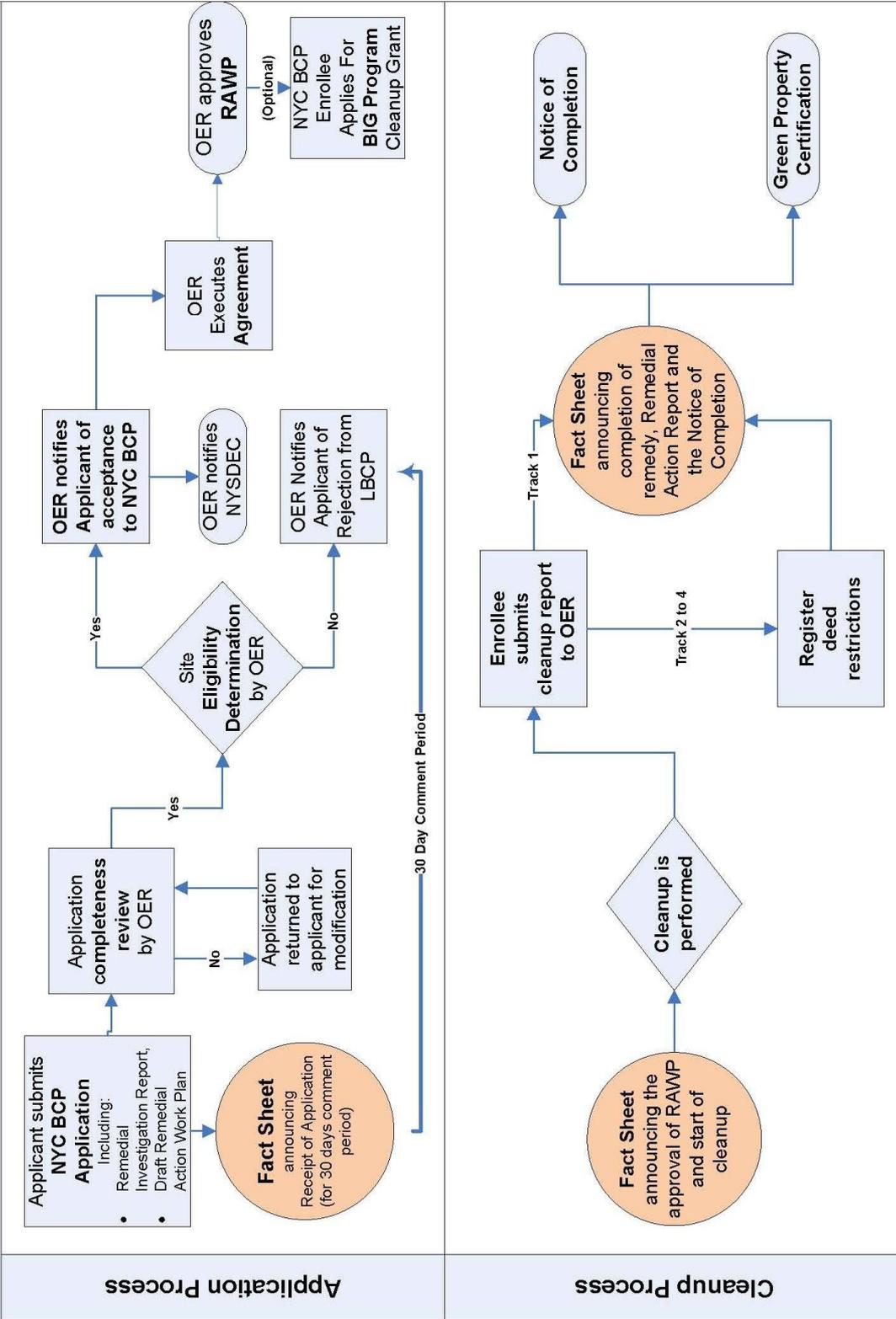
**Digital Documentation.** OER strongly encourages the use of digital documents in repositories as a means of minimizing paper use while also increasing convenience in access and ease of use.

**Issues of Public Concern.** There are no issues of public concern.

**Public Notice and Public Comment.** Public notice to 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 W29 Highline Owners LLC, reviewed and approved by OER prior to distribution and mailed by W29 Highline Owners LLC. Public comment is solicited in public notices for all work plans

developed under the NYC Brownfield Cleanup Program. Final review of all work plans by OER will consider the public comments. Approval will not be granted until the public comment period has been completed.

## Flow Chart For NYC Brownfield Cleanup Program (NYC BCP)



**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 (RIR) and Remedial Action Work Plan (RAWP) 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 the parties listed on the Site Contact List announcing the availability of the RIR and RAWP 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 the 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 the parties listed on the Site Contact List announcing the completion of remediation, providing a list of the Institutional and Engineering Controls implemented for to the Site and announcing the issuance of the Notice of Completion.

## Site Contact List

### 1. Government Contacts

State of New York:

The Honorable Andrew M. Cuomo  
Governor of New York State NYS State Capitol Building Albany,  
NY 12224

The Honorable Charles E. Schumer US Senate  
757 Third Avenue, Room 1702  
New York, NY 10017

The Honorable Kirsten E. Gillebrand US Senate  
531 Dirksen Senate Office Building  
Washington D.C. 20510

The Honorable Jerrold Nadler US House of Representatives 2334  
Rayburn House Office Building  
Washington, DC 20515

New York State Assembly:

The Honorable Richard N. Gottfried New York State Assembly, District 75  
242 West 27th Street  
New York, NY 10001

New York State Senate:

The Honorable Thomas K. Duane  
New York State Assembly, District 29  
322 Eighth Avenue Suite 1700  
New York, NY 10001

City of New York:

The Honorable Michael R. Bloomberg  
Mayor, City of New York  
c/o The Mayor's Office of Environmental Remediation  
253 Broadway, 14th Floor  
New York, NY 10007

New York City Department of City Planning:

Amanda M. Burden, Director, Department of City Planning and Chair  
City Planning Commission  
Department of City Planning  
22 Reade Street  
New York, NY 10007-1216

Carole Samol, Deputy Director  
Department of City Planning, Bronx Office  
One Fordham Plaza, 5th Fl.  
Bronx, NY 10458

New York City Councilperson:

The Honorable Christine Quinn, New York City Council, District 3  
224 West 30<sup>th</sup> St (Suite 1206)  
New York, NY 10001

Borough of Manhattan, New York County:

The Honorable President Scott Stringer, Manhattan Borough President  
1 Centre Street, 19th Floor  
New York, NY 10007

Community Board:

Manhattan Community Board 4  
330 West 42nd Street, Suite 2618  
New York, NY 10036

Chair: Mr. J.D. Nolan

District Manager: Mr. Robert J. Benfatto

## **2. Residents and/or Owners of Site and Properties Immediately Adjacent**

Owner of Site:

Chelsea W26 LLC  
37 West 65<sup>th</sup> Street  
New York, NY 10023-6610

Adjacent to North:

Tuck-It Away Self Storage  
517 West 29<sup>th</sup> Street  
New York, NY 10001

212-368-1717

David Nolan Art Gallery  
527 West 29<sup>th</sup> Street  
New York, NY 10001  
212-925-6190

Adjacent to East:

Brownfield Auto Services  
518 West 29<sup>th</sup> Street  
New York, NY 10001  
212-239-7037

Adjacent to South:

Active Construction Site

Adjacent to West:

Chelsea W26 LLC  
534 West 29<sup>th</sup> Street  
New York, NY 10001

Skylight Gallery  
538 West 29<sup>th</sup> Street  
New York, NY 10001  
646-772-2407

### **3. Local News Media**

New York Times  
620 8th Ave.  
New York, NY 10018

New York Post  
1211 Avenue of the Americas  
New York, NY 10036  
212-930-8100

New York Daily News  
450 West 33<sup>rd</sup> Street  
New York, NY 10001

New York 1 News  
75 Ninth Avenue  
New York, NY 10011

**4. Public Water Supplier**

The New York City Department of Environmental Protection (DEP)  
Bureau of Water Supply  
59-17 Junction Boulevard  
Flushing, NY 11373

**5. Any Person who has Requested to be on the Site Contact List**

N/A

**6. Administrator of any School or Day Care Facility Located on or Near the Site**

Avenues: The World School  
President: Alan Greenberg  
259 10<sup>th</sup> Avenue  
New York, NY 10001  
212-524-9000

P.S. 33, Chelsea Prep  
Principal: Linore Lindy  
281 9<sup>th</sup> Avenue  
New York, NY 10001  
212-244-6426

University of Medicine and Health Sciences  
Dean: Robert W. Amler, M.D.  
460 West 34<sup>th</sup> Street  
New York, NY 10001  
866-686-0380

Guardian Angel School  
Principal: Maureen McElduff  
193 10<sup>th</sup> Avenue  
New York, NY 10011

212-989-8280

McCarton School  
Executive Director: Cecelia McCarton, M.D.  
331 West 25<sup>th</sup> Street  
New York, NY 10001  
212-675-3905

YAI-NY League Early Learning  
Chief Executive Officer: Stephen E. Freeman  
460 West 34<sup>th</sup> Street  
New York, NY 10001  
212-420-0510

Secret Garden Preschool  
422 West 20<sup>th</sup> Street  
New York, NY 10011  
212-627-7275

San Jose Day Nursery Inc.  
432 West 20<sup>th</sup> Street  
New York, NY 10011  
212-929-0839

Sitters Studio  
Daycare Director: Emma Morrison  
259 West 30<sup>th</sup> Street  
New York, NY 10001  
877-844-8204

Kids at Work  
Founder and Owner: Julie Averill  
242 West 27<sup>th</sup> Street  
New York, NY 10001  
212-488-8800

## **7. Document Repository**

New York Public Library - Muhlenberg Branch  
209 West 23rd Street

New York, NY 10011-2379  
Manager: Ashley Curran  
Phone Number: 212-924-1585

**Appendix B**  
**Sustainability Statement**

## APPENDIX B 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. If possible, W29 Highline Owners LLC will reuse clean, non-virgin materials; the results of which will be quantified and reported in the Remedial Action Report (RAR).

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

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

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

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

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

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

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

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

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

**Paperless Brownfield Cleanup Program.** W29 Highline Owners 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.** W29 Highline Owners LLC is participating in OER's low-energy project management program. Under this program, whenever possible, meetings are held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation.

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

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

**Appendix C**  
**Soil/ Materials Management Plan**

## **APPENDIX C**

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

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

Visual, olfactory and photo ionization detector (PID) soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional (QEP) and will be reported in the Remedial Action Report (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, underground storage tanks or 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 NYC Office of Environmental Remediation (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.

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. Silt fencing or equivalent will surround soil stockpiles except for areas where access by equipment is required. Silt fencing, hay bales, and/or straw wattles 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 Professional Engineer (PE) or QEP overseeing the remedial action will:

- Oversee remedial work and the excavation and load-out of excavated material;
- Check that there is a party responsible for the safe execution of invasive and other work performed under this work plan;
- Check that Site development activities and development-related grading cuts will not interfere with, or otherwise impair or compromise the remedial activities proposed in this Remedial Action Work Plan (RAWP);
- Check that the presence of utilities and easements on the Site has been investigated and that identified risks from work proposed under this plan are properly addressed by appropriate parties;
- Check that loaded outbound trucks are inspected and cleaned if necessary before leaving the Site; and,
- Check that 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 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 New York Codes, Rules, and Regulations (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 to take a left onto West 29<sup>th</sup> Street followed by a right onto 12<sup>th</sup> Avenue, a right onto West 57<sup>th</sup> Street, a left onto 10<sup>th</sup> Avenue, a left onto West 72<sup>nd</sup> Street, a right onto Riverside Drive North, and continuing to the final destination. 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, 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 or QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE, QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in New York, 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 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 RAR will include an itemized account of the destination of material removed from the Site during this remedial action. Documentation associated with disposal of materials will include records and approvals for receipt of the material. This information will be presented in the RAR.

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 Quality Analysis/Quality Control will be reported in the RAR. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the RAR. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

## **1.7 MATERIALS REUSE ON-SITE**

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site; although, no soils are expected to remain on-Site. The soil cleanup objectives for on-Site reuse are listed in **Table 1**. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to the NYC Brownfield Voluntary Cleanup Program agreement subject to Engineering and Institutional Controls. The project PE or QEP will check that reused materials are segregated from other materials to be exported from the Site.

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 other invasive remedial activities above the water table, 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 Site Management Plan (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) 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 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; although, no backfill or imported material is anticipated for the completion of this project. Imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives will be consistent with the New York State Department of Environmental Conservation (NYSDEC) Department of Environmental Remediation guidance document, DER-10, Appendix 5 - Allowable Constituent Levels for Imported Fill or Soil and/or design engineering specifications.

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 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; and,
- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYSDEC.

All materials received for import to the Site will be approved by a PE or 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 or QEP in in responsible charge to check that the truck loads of imported material are inspected for evidence of contamination; and
- Fill material will not contain reportable quantities 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 unless certified by a PE that the material is obtained from a native, virgin-source, aggregate mine or rock quarry. Once it is determined that the fill

material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

RCA will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the RAR. A PE or QEP is in responsible charge to check 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 State Pollution Discharge Mitigation System (SPDES) permit issued by NYSDEC.

### **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 perimeter of the remedial construction area, except at entrance and exit points, and inspected once a week and

after every storm event to document that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in limiting significant impacts to receptors. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. 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, as soon as practical, 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 NYSDEC 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 Target Compounds and Analytes (TAL) metals, Target Compound List (TCL) volatiles and semi-volatiles, TCL pesticides and polychlorinated biphenyls (PCBs), as appropriate.

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

#### **Odor Control**

The necessary means will be employed to limit 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 nuisance odors have been abated. OER will be notified of all odor complaint events. Implementation of odor controls, including halt of work, will be the responsibility of the PE or QEP who is in responsible charge and is designated to certify the RAR.

### **Dust Control**

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

- Use of a water spray methodology for roads, excavation areas and stockpiles;
- Use of properly anchored tarps to cover stockpiles;
- Exercise care during dry and high-wind periods; and,
- Use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and essentially 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 nuisance dust emissions have been abated. OER will be notified of dust complaint events. Implementation of dust controls, including halt of work, will be the responsibility of the PE or QEP who is in responsible charge and is designated to certify the RAR.

### **Other Nuisances**

Noise control will be exercised during the remedial program. 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 limit rodent nuisances.

**Appendix D**  
**Construction Health and Safety Plan**

**CONSTRUCTION  
HEALTH AND SAFETY PLAN  
522-532 WEST 29<sup>th</sup> STREET  
NEW YORK, NEW YORK  
OER Project Number:  
13EHAN427M**

Prepared For:  
W29 Highline Owners LLC  
520 West 27<sup>th</sup> Street, Suite 302  
New York, New York 10001

Prepared By:  
GZA GeoEnvironmental of New  
York 104 West 29th Street, 10th  
Floor New York, New York 10001

July, 2013

## TABLE OF CONTENTS

<b>1.0 INTRODUCTION</b>	1
1.1 Overview	1
1.2 Site Hazards	1
1.3 Project Team	1
<b>2.0 HAZARD ASSESSMENT</b>	2
2.1 Chemical Hazards and Known/ Suspect Chemicals of Concern	2
2.2 Volatile Organic Compounds (VOCs)	5
2.3 Semi-Volatile Organic Compounds (SVOCs)	5
2.4 Metals	6
<b>3.0 AIR MONITORING</b>	6
3.1 Organic Vapor Monitoring	6
3.2 Total Particulates	7
3.3 Particulate Monitoring, Response Levels, and Actions	8
3.4 Personal Exposure Monitoring	8
<b>4.0 PERSONAL PROTECTIVE EQUIPMENT</b>	8
4.1 General Site Work	8
4.2 Excavation Areas and Other Soil Handling	9
<b>5.0 SITE CONTROL</b>	9
5.1 Work Zone	9
5.2 Support Zone	10
5.3 Other Site Control and Safety Measures	10
5.4 Site Security	10
<b>6.0 DECONTAMINATION</b>	11
6.1 Personal Decontamination	11
6.2 Equipment Decontamination	11
<b>7.0 MEDICAL MONITORING AND TRAINING REQUIREMENTS</b>	12
7.1 Medical Monitoring	12
7.2 Training	12
7.3 Subcontractors	12
7.4 Site Safety Meetings	13
<b>8.0 EMERGENCY ACTION PLAN</b>	13
8.1 Employee Information	13
8.2 Emergency Signal and Alarm Systems	13
8.3 Emergency Contacts	14
8.4 Hospital Location	14
8.5 Incident Reporting Procedures	14

### ATTACHMENTS

- Attachment A Health and Safety Briefing/Site Orientation Record
- Attachment B Directions To Hospital
- Attachment C Daily Safety Meeting
- Attachment D Incident Analysis/Reporting Form

## 1.0 INTRODUCTION

### 1.1 Overview

This project-specific Construction Health and Safety Plan (CHASP) has been developed by GZA GeoEnvironmental of New York (GZA) on behalf of W29 Highline Owners LLC (Client) to establish the procedures necessary for protection from potential contaminated soils resulting from the excavation of soils at 522-532 West 29<sup>th</sup> Street in New York, New York (Site) due to re-development plans. This CHASP is intended to supplement the Client's Corporate Safety Management Program (CSMP). The procedures in this plan have been developed based on current knowledge regarding the hazards which are known or anticipated for the operations to be conducted at this Site.

### 1.2 Site Hazards

This CHASP covers only the hazards associated with potential chemical exposures. Physical hazards such as injuries from typical excavation field work activities, including the operation of heavy equipment, noise exposure, heat and cold stress, electrical hazards, fire hazards, excavation hazards and general safety hazards associated with walking on working surfaces (trip and fall) are covered by the Client's CSMP.

Site activities may pose chemical exposure hazards. Potential chemical exposure hazards include skin contact, ingestion and inhalation hazards which may result from the presence of volatile organic compounds, semi-volatile organic compounds, and inorganic metallic elements (metals) on-Site. The potential adverse health effects from these detected contaminants are diverse. Many of these compounds are known or suspected to result in chronic illness from long-term exposures. However, due to the limited nature of the proposed construction, only acute effects are a potential concern. See Section 2.0 for detailed chemical hazard information.

### 1.3 Project Team

The organizational structure established for the implementation of health and safety requirements established by this CHASP are outlined in the CSMP. Personnel who have been assigned specific authority to implement and enforce the provisions of this CHASP are identified below.

Name	Project Title/Assigned Role	Phone Numbers
James Bellew	Project Manager	Work: 646-929-8923 Cell: 347-640-2759
James Bellew	Site Supervisor	Work: 646-929-8923 Cell: 347-640-2759
James Bellew	Site Health and Safety Officer	Work: 646-929-8923 Cell: 347-640-2759

The control of Site hazards is dependent upon the degree to which management enforces compliance and employees cooperate with the specified health and safety requirements.

Therefore, personnel at all levels of the organization must recognize their individual responsibility to comply. All activities covered by this CHASP must be conducted in compliance with this CHASP and with applicable federal, state, and local health and safety regulations, including 29 CFR 1910.120. Personnel covered by this CHASP who cannot or will not comply must be excluded from Site activities by the Project Superintendent, as defined in the CSMP.

## 2.0 HAZARD ASSESSMENT

The following hazard assessment applies only to the activities within the specified scope of this CHASP.

### 2.1 Chemical Hazards and Known/ Suspect Chemicals of Concern

The chemical hazard information provided below is based on data provided in the Phase II Investigation Report and Phase II Investigation Summary Report dated April 2013 and May 2013, respectively. Both reports were prepared by GZA GeoEnvironmental of New York (GZANY). During the investigations, representative Site soils and groundwater were sampled for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), priority pollutant metals, pesticides, and polychlorinated biphenyl (PCBs). Elevated concentrations of VOCs, SVOCs, and metal compounds were detected in the soil and groundwater. Constituents with exceeding concentrations and their respective health effects are listed below for reference. Information presented is based upon established Occupational Safety and Health Administration (OSHA) permissible exposure limits (PEL) and The National Institute for Occupational Safety and Health (NIOSH) recommended exposure limits (RELs). All other analytical parameters were reported within acceptable levels for Site urban residential land use. See Section 4.2 for a description of the PPE that should be used for this Site.

Chemicals	REL/PEL/STEL (ppm)	Health Hazards
Barium (chloride)	PEL = 0.5 mg/m <sup>3</sup> REL = 0.5 mg/m <sup>3</sup>	Irritation eyes, skin, upper respiratory system; skin burns; gastroenteritis; muscle spasm; slow pulse, extrasystoles; hypokalemia, affects eyes, skin, respiratory system, heart, central nervous system.
Benzene	PEL = 1 ppm REL = 0.1 ppm STEL = 5 ppm	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude, dermatitis; bone marrow depression, potential occupational carcinogen.
Benzo(a)anthracene	PEL = 0.2 mg/m <sup>3</sup> TWA REL = 0.1 mg/m <sup>3</sup> TWA	Irritation to respiratory system, bladder, kidneys, skin; dermatitis, bronchitis, cumulative lung damage; suspect human carcinogen.
Benzo(a)pyrene	PEL = 0.2 mg/m <sup>3</sup> TWA REL = 0.1 mg/m <sup>3</sup> TWA	Irritation to respiratory system, bladder, kidneys, skin; dermatitis, bronchitis, cumulative lung damage; suspect human carcinogen.
Benzo(b)flouranthene	PEL = 0.2 mg/m <sup>3</sup> TWA REL = 0.1 mg/m <sup>3</sup> TWA	No signs or symptoms of acute or chronic exposure have been reported in humans; suspect human carcinogen.

Chloroethane	PEL = 1000 ppm REL = Handle with caution in the workplace	Incoordination, inebriation; abdominal cramps; cardiac arrhythmias, cardiac arrest; liver, kidney damage. Targets Liver, kidneys, respiratory system, cardiovascular system, central nervous system.
Chrysene	PEL = 0.2 mg/m <sup>3</sup> TWA REL = 0.1 mg/m <sup>3</sup> TWA	Irritation to respiratory system, bladder, kidneys, skin; dermatitis, bronchitis, cumulative lung damage; suspect human carcinogen.
Cis-1,2-dichloroethene	PEL = 200 ppm REL = 200 ppm	Irritation mucous membranes, skin; central nervous system depression, nausea, vomiting, weakness, tremor, epigastric cramps, burning of the eyes, vertigo, and narcosis.
Ethylbenzene	PEL = 100 ppm REL = 100 ppm	Irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma.
Fuel Oil	PEL = 400 ppm REL = 350 mg/m <sup>3</sup>	Nausea, irritation – eyes, hypertension, headache, lightheadedness, loss of appetite, poor coordination; long-term exposure – kidney damage, blood clotting problems; potential carcinogen.
Iron (ferric oxide dust)	PEL = 10 mg/m <sup>3</sup> TWA REL: 5 mg/m <sup>3</sup> TWA	Irritation of eyes, skin, respiratory system, cough; metal fume fever; siderosis (iron staining of the eyes); respiratory system.
Isopropylbenzene	PEL = 50 ppm REL = 50 ppm	Eye, mucous membrane irritation; headaches; dry skin, dermatitis; dizziness, ataxia, drowsiness, narcosis; coma. NOTE: 1) Above 31°C, explosive vapor/air mixtures may be formed. 2) Unconsciousness may occur at levels of 4,000 ppm or greater. 3) Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis.
Lead	PEL = 0.05 mg/m <sup>3</sup> REL = 0.05 mg/m <sup>3</sup>	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension.
Magnesium	PEL = N/A	N/A

Manganese (fume)	PEL: 5 mg/m <sup>3</sup> REL: 1 mg/m <sup>3</sup> STEL: 3 mg/m <sup>3</sup>	Parkinson's, asthenia, insomnia, mental confusion; hypersomnia, anorexia; headache; metal fume fever: dry throat; cough, chest tightness, dyspnea, rales, flu-like fever; low-back pain; vomiting; malaise; lassitude (weakness, exhaustion); kidney damage; bronchitis, pneumonitis; lung and cumulative CNS damage.
Mercury	PEL = 0.05 mg/m <sup>3</sup> REL = 0.1 mg/m <sup>3</sup>	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria.
Napthalene	PEL = 10 ppm TWA REL = 10 ppm TWA	Irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage. Targets eyes, skin, blood, liver, kidneys, central nervous system.
Nickel	PEL = 1 mg/m <sup>3</sup> REL = 0.015 mg/m <sup>3</sup>	Sensitization dermatitis, allergic asthma, cough, shortness of breath, pneumonitis; decreased sense of smell; Affects nasal cavities, lungs, skin; potential occupational carcinogen.
1,3,5-Trimethylbenzene	PEL = none REL = 25 ppm TWA	Irritation eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid). Targets eyes, skin, respiratory system, central nervous system, blood.
1,2,4-Trimethylbenzene	PEL = none REL = 25 ppm TWA	Irritation eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid). Targets eyes, skin, respiratory system, central nervous system, blood.
Vinyl Chloride	PEL = 1 ppm TWA REL = Carcinogen	Lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen]. Targets liver, central nervous system, blood, respiratory system, lymphatic system.

Total Xylenes	PEL = 100 ppm TWA REL = 100 ppm TWA	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis. Targets eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys.
---------------	--	--

## 2.2 Volatile Organic Compounds (VOCs)

VOCs including acetone were detected in groundwater samples MW-1, MW-2, MW-3 and FN-5 at concentrations exceeding their regulatory criteria. Laboratory analytical results indicate that 1,1-dichloroethane, benzene, ethylbenzene, vinyl chloride, chloroethane, xylenes, cis-1,2-dichloroethene, n-butylbenzene, sec-butylbenzene, isopropylbenzene, naphthalene, n-propylbenzene, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene were detected above NYSDEC Aqueous Water Quality Standards (AWQS) groundwater criteria. The odor threshold for benzene is higher than the PEL and employees may be overexposed to benzene without sensing its presence, therefore, detector tubes must be utilized to evaluate airborne concentrations.

The vapor pressures of these compounds are high enough to generate significant quantities of airborne vapor. On sites where high concentrations of these compounds are present, a potential inhalation hazard to the field team during subsurface investigations can result. However, if the site is open and the anticipated quantities of BTEX contamination are small (i.e., part per million concentrations in the soil or groundwater), overexposure potential will also be small. Air quality monitoring for VOC concentrations will be implemented throughout the Site during all phases of excavation, and dust management will be in place to ensure minimal exposure to soil and groundwater VOCs.

## 2.3 Semi-Volatile Organic Compounds (SVOCs)

Elevated levels of SVOC compounds identified in the soils and groundwater at the Site exceeded the New York State Department of Environmental Conservation (NYSDEC) standards promulgated in the Part 375 Unrestricted Residential criteria. SVOC compounds with exceedences on Site include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, and 2-methylnaphthalene. However, due to the relatively low vapor pressure of SVOC compounds, vapor hazards at ambient temperatures are not expected to occur. However, if Site conditions are dry, the generation of contaminated dusts may pose a potential inhalation hazard. Therefore, dust levels should be controlled with wetting if necessary, as described in Section 3.2. In addition, repeated contact with certain SVOCs compounds have been associated with the development of skin cancer. Contact of SVOC compounds with the skin may cause photosensitization of the skin, producing skin burns after subsequent exposure to ultraviolet radiation. Protective measures, such as the wearing of chemically resistant gloves, are appropriate when handling SVOC contaminated materials.

## 2.4 Metals

Various metals including mercury, barium, iron, lead, sodium, and magnesium were detected in concentrations exceeding NYSDEC Part 375 Unrestricted Residential criteria in soil and groundwater samples collected and are attributed to historic fill materials present throughout the Site. Overexposure to metal compounds has been associated with a variety of local and systemic health hazards, both acute and chronic in nature, including lung damage, neurological effects, gastrointestinal effects, kidney and liver damage, allergic dermatitis and other skin disorders. Exposure to metals is most commonly through inhalation and ingestion of dust. Metallic mercury is unique among metals, as it releases toxic vapors at normal room temperatures, and can be absorbed through the skin.

To estimate health risk, GZA calculated the airborne mercury exposure through dust. The basis of comparison used was the more conservative nuisance dust standard of the ACGIH Threshold Limit Value, 8-hour time-weighted average of 10 milligram per cubic meter of air ( $\text{mg}/\text{m}^3$ ). This nuisance dust is a general rule of thumb for the dust allowed before preventive measures, such as soil wetting of exposed soil, are used.

Based on the maximum concentration of mercury detected in soil of 0.418 mg/kg, GZA converted the units for better comparison:

$$\frac{0.418 \text{ mg}}{1 \text{ kg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{1 \text{ g}}{1000 \text{ mg}} = \frac{0.0000004 \text{ mg mercury}}{10 \text{ mg soil (dust)}}$$

Since the maximum dust in air concentration is anticipated to be  $10 \text{ mg}/\text{m}^3$ , the maximum mercury concentration is anticipated to be  $0.000004 \text{ mg}/\text{m}^3$ . The OSHA Permissible Exposure Level (PEL) for mercury is a ceiling concentration of  $0.1 \text{ mg}/\text{m}^3$ . When compared, the expected mercury in air concentration is a full six orders of magnitude less than the OSHA PEL.

GZA believes that airborne mercury and additional listed metals are not a significant risk to Site workers. GZA understands that mercury is a volatile element. GZA does not anticipate measurable mercury vapor concentrations, given the relatively low soil concentrations.

## 3.0 AIR MONITORING

Air monitoring falls into two separate categories: direct reading/environmental monitoring, and personal exposure monitoring. The following Sections summarize the types of environmental monitoring as well as the appropriate response actions applicable to the Site.

### 3.1 Organic Vapor Monitoring

Volatile organic vapor hazards have been identified for the Site (see Section 2.0). Therefore, organic vapor monitoring with a photoionization detector (PID) is expected to be required for the Site.

AIR MONITORING INSTRUMENTS AND ACTION LEVELS: PHOTO-IONIZATION DETECTOR

Organic Vapor Detector (H-Nu, OVM, OVA) - Breathing Zone Readings

__ 0 __ to __ 10 __ ppm	Remain in Level D. Use colorimetric tubes or other chemical specific device to verify PID readings do not contain low PEL toxic materials (Benzene, Vinyl Chloride, etc.) where applicable. If benzene is present above 1 ppm withdraw from excavation and proceed to level C.
__ 10 __ to __ 250 __ ppm	Withdraw from work area and contact Project Management. Proceed to Level C protection for re-entry, or discontinue operation
> __ 250 __ ppm	Secure operations, withdraw from work area, and discontinue work at that location until contaminants can be evaluated, and detailed (SSHP) plan implemented.

**3.2 Total Particulates**

Due to the presence of SVOCs, VOCs and metals in soils and groundwater on-Site, total respirable particulates may be a concern. Dust levels should be visually monitored and if levels become noticeable, soils should be wetted down to control dusty conditions. Wetting may be accomplished using various methods, including a hose connected to a fire hydrant or other on-Site source of water. The Client’s Project Superintendent shall be responsible for determining when the wetting of soils is needed and the most appropriate method to use. In addition, recommended measurements for particulate monitoring are detailed below.

Upwind concentrations should be measured at the start of each work day during active handling of excavated materials (including stockpiling and truck loading) and periodically thereafter to establish background conditions. The particulate air monitoring work will be conducted using a pDR-1200 personal airborne particulate monitor (or approved equivalent) calibrated daily.

The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers (um) in size (PM-10) and capable of integrating over a period of 5-minutes or less for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate excess of the action level.

Dust migration will be visually assessed during all work activities, and at no time will the downwind perimeter particulate levels be allowed to exceed a total standard of 10 mg/m<sup>3</sup> (or “nuisance” dust levels).

If the downwind PM-10 particulate level is 100 micrograms per cubic meter (ug/m<sup>3</sup>) greater than the background (upwind perimeter) for a 5-minute period, or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques (e.g., soil wetting) provided the downwind PM-10 particulate levels do not exceed 150 ug/m<sup>3</sup> above the upwind level and no visible dust is

migrating from the work area.

If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than  $150 \text{ ug/m}^3$  above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentrations to within  $150 \text{ ug/m}^3$  of the upwind level and in preventing visible dust migration.

### 3.3 Particulate Monitoring, Response Levels, and Actions

Parameter	Monitoring Instrument	Response Levels (above background levels)	Action	Conditions for Continuing Work Activities
Particulates < 10 um (PM-10)	Dust Meter	Fugitive dust migration	1. Implement dust suppression	Dust suppression techniques are in place
		$> 100 \text{ ug/m}^3$ but $< 150 \text{ ug/m}^3$	1. Implement dust suppression techniques	Levels must not exceed $150 \text{ ug/m}^3$ with dust suppression techniques in place
		$> 150 \text{ ug/m}^3$	1. Halt activity 2. Re-evaluate activities	Levels decrease below $150 \text{ ug/m}^3$ and fugitive dust migration is prevented

### 3.4 Personal Exposure Monitoring

No asbestos, no lead-based paint, and no radiological hazards have been identified within the vicinity of the proposed excavation area at the Site (see Section 2.0). Therefore, personal exposure monitoring is not required during soil excavations.

## 4.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) will be donned as described below for the activities covered by this CHASP. Based on available analytical data and the proposed intrusive activities, the China Perfect Construction Corp. (Contractor), anticipates that all activities will require Level D or Modified Level D PPE.

### 4.1 General Site Work

General Site work conducted outside the excavation areas, operators of heavy equipment, and non-intrusive activities which do not generate dust will require Level D protective equipment.

Level D is defined as:

- Hardhat
- Eye protection
- Hearing protection (with site workers at all times and donned when appropriate)
- Steel-toed work boots
- Work clothes

Workers shall wear appropriate hearing protection during designated hearing protection-required tasks (such as, jack hammering, pile driving etc.). To reduce the exposure to noise, personnel working in areas of excessive noise must use hearing protectors (earplugs or earmuffs) in accordance with the CSMP. Rule-of-Thumb: Wherever actual data from sound level meters or noise dosimeters is unavailable, if it is necessary to raise one's voice above a normal conversational level to communicate with others within 3 to 5 feet away, hearing protection should be worn.

#### **4.2 Excavation Areas and Other Soil Handling**

Personnel working in the areas of active excavation, but not operating heavy equipment, and any other personnel potentially contacting contaminated materials will be required to wear Modified Level D PPE. Modified Level D is defined as:

- Hardhat
- Eye protection
- Hearing protection (as warranted see above)
- Steel-toed work boots
- Tyvek Coveralls
- Disposable nitrile chemically resistant gloves

Level C PPE and Level B are not expected to be required.

### **5.0 SITE CONTROL**

To prevent both exposure of unprotected personnel and migration of contamination due to tracking by personnel or equipment, work areas along with personal protective equipment requirements will be clearly identified with signage. Pedestrian traffic will be managed to the extent possible by the Contractor's Traffic and Pedestrian Control Plan.

The Contractor will designate a work zone and support zone as defined

below. **5.1 Work Zone**

Work zones on Site will be temporary or dynamic, encompassing the work area(s) actively being worked in on that particular day(s). Site personnel will be advised of the current work area(s) as part of site safety meetings.

## **5.2 Support Zone**

The support zone will consist of an area outside the areas of active excavation and soil handling, where equipment and support vehicles will be located. Eating, drinking and smoking will be permitted only in this area. Sanitary facilities will be located on Site. In addition, potable water and water and soap for hand washing will be available at the Site.

## **5.3 Other Site Control and Safety Measures**

The following measures are designed to augment the specific health and safety guidelines provided in this plan. These issues will form the basis of the Site ordination and daily safety meetings discussed in Section 7.0, below.

- The Site hazards will be evaluated by the Client's Project Superintendent using the Site Safety Checklist as defined by the CSMP.
- No one is to perform field work alone. Team members must be intimately familiar with the procedures for initiating an emergency response.
- Avoidance of contamination is of the utmost importance. Whenever possible, avoid contact with contaminated (or potentially contaminated) surfaces or materials. Walk around (not through) puddles and dis-colored surfaces. Do not kneel on the ground or set equipment on the ground.
- Eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited except in the support zone after proper decontamination as defined in Section 6.0.
- The use of alcohol or drugs is prohibited during the conduct of field operations.
- Safety equipment (PPE) will be required for all field personnel unless otherwise approved by the subcontractor's health and safety representatives and/or the Project Superintendent.

## **5.4 Site Security**

The Site shall be unoccupied during Site work except for Contractor personnel and subcontractors. If possible, access to the work areas during field work will be limited by closing site gates to reduce unauthorized pedestrian traffic. The Client's Project Superintendent is responsible for identifying the presence of all employees on Site.

Equipment left on Site during off hours must be locked, immobilized and/or otherwise secured to prevent theft or unauthorized use or access. The Contractor and subcontractors' employees will not be permitted on Site during off-hours without specific client approval.

## **6.0 DECONTAMINATION**

Proper decontamination will be performed for personnel and equipment before leaving the Site. All solid waste generated during decontamination will be bagged by the Contractor personnel and stored on Site for disposal. Water will be disposed of by on-Site infiltration into soil within an exclusion zone.

### **6.1 Personal Decontamination**

Personal decontamination will be accomplished by following a systematic procedure of cleaning and removal of personal protective equipment (PPE). The Contractor will supply decontamination equipment to allow PPE to be brushed to remove gross contamination and then scrubbed clean in a detergent solution and then rinsed clean. To facilitate this, a three-basin wash system will be set up on site by the Contractor.

Disposable PPE, such as Tyvek coveralls, gloves, and hearing protection, etc. will be placed in trash bags in an on-Site container pending a disposal. Alternative chemical decontamination procedures, such as steam-cleaning reusable rubber outer boots, may be used if necessary.

Steps required in a decontamination sequence will depend on the level of protection worn in accordance with Section 4.0:

1. Remove and wipe clean hard hat
2. Brush boots and gloves of gross contamination
3. Scrub boots and gloves clean
4. Rinse boots and gloves
5. Dry non-disposable equipment with paper towels
6. Remove Tyvek coveralls
7. Remove eye protection
8. Remove chemically resistant gloves

### **6.2 Equipment Decontamination**

Hand tools and portable equipment will be decontaminated upon leaving the active excavation areas using the same procedures for personal decontamination. Wooden tools are difficult to decontaminate because they absorb chemicals. Wooden hand tools will be kept on Site for the project duration and handled only by protected workers. At the end of the Site activities, wooden tools will be discarded if they cannot be decontaminated properly.

Large Equipment will be decontaminated in an area near the entrance to the Site. Decontamination of large equipment will mitigate the risk of spreading potentially-contaminated soil off-Site. The Contractor will use a combination of long-handled brushed, rods and shovels for general exterior cleaning and dislodging contaminated soil caught in tires and the undersides of vehicles and equipment.

Prior to leaving the Site, large equipment will be inspected to assure that excess material has not adhered to the equipment. If needed, the Contractor will clean the large equipment, including washing tires and undercarriages with a hose to remove excess adhered soil prior to leaving the Site.

Exposed excavated material will be covered on each truck after loading. The cover will be secured and remain in place until the container has reached the disposal facility.

## **7.0 MEDICAL MONITORING AND TRAINING REQUIREMENTS**

Training records for Site personnel and subcontractors shall be provided by the Contractor prior to on-Site work, and will be maintained on Site.

### **7.1 Medical Monitoring**

Respiratory protection is not required by the levels of soil contamination. Therefore, no medical monitoring requirements will be instituted for this project.

### **7.2 Training**

All personnel covered by this CHASP must have completed the appropriate training requirements specified in 29 CFR 1910.1200 Hazard Communication and 29 CFR 1910.120(e).

Workers requiring access to the excavation (laborers and operators) prior to completion of soil remedial activities will require 40-hour HAZWOPER training due to the presence of gasoline contaminated soils and underground storage tanks.

Also, at least one Contractor employee must be on Site during all activities to act as the Site Foreman and will be responsible for identifying existing and predictable hazards in surroundings or working conditions that are unsanitary, hazardous, or dangerous to Site workers and or the community, and will have the authorization to take prompt corrective measures to eliminate them. This individual must have documentation of at least three days of supervised field experience as well as completion of the specified 8-hour training course for managers and supervisors. Records of certifications and training should be kept by the Contractor.

### **7.3 Subcontractors**

Subcontractors will be required to provide to the Contractor Project (Site) Manager specific written documentation that each individual assigned to this project has completed the medical monitoring and training requirements specified above. This information must be provided prior to their performing any work on Site.

## **7.4 Site Safety Meetings**

Prior to the commencement of on-Site investigative activities, a Site safety meeting will be held to review the specific requirements of this CHASP. Sign-off sheets will be collected at this meeting (see Attachment A). Short safety refresher meetings will be conducted daily or as conditions or work activates change. In addition, the Project Superintendent will document that Site visitors have had the required training in accordance with 29 CFR 1910.120 and will provide documented pre-entry safety briefings.

## **8.0 EMERGENCY ACTION PLAN**

OSHA defines emergency response as any "response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual-aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result in an uncontrolled release of a hazardous substance." The Contractor personnel covered by this CHASP may not participate in any emergency response where there are potential safety or health hazards (i.e., fire, explosion, or chemical exposure). The Contractor response actions will be limited to evacuation and medical/first aid as described within this section below.

The basic elements of an emergency evacuation plan include employee training, alarm systems, escape routes, escape procedures, critical operations or equipment, rescue and medical duty assignments, designation of responsible parties, emergency reporting procedures, and methods to account for all employees after evacuation.

### **8.1 Employee Information**

General training regarding emergency evacuation procedures are included in the Contractor initial and refresher training courses. Also as described, employees must be instructed in the specific aspects of emergency evacuation applicable to the Site as part of the site safety meeting prior to the commencement of all on-site activities. On-Site refresher or update training is required anytime escape routes or procedures are modified or personnel assignments are changed. This information will be provided during the Site safety meetings (see Section 7.4) will be documented by the Contractor.

### **8.2 Emergency Signal and Alarm Systems**

An emergency communication system must be in effect at all sites. The most simple and effective emergency communication system in many situations will be direct verbal communications. Each site must be assessed at the time of initial Site activity and periodically as the work progresses. Verbal communications must be supplemented anytime voices cannot be clearly perceived above ambient noise levels (i.e., noise from heavy equipment, trucks, etc.) and anytime a clear line-of-sight cannot be easily maintained amongst all personnel because of distance, terrain or other obstructions. The Contractor will maintain an air horn (or whistle) on-Site that will be used to signal an emergency so that it can be heard over other construction noises on-Site.

### **8.3 Emergency Contacts**

Police: 911  
Fire: 911  
Ambulance: 911  
Bellevue Hospital: (212) 562-4141

### **8.4 Hospital Location**

Bellevue Hospital is located at 462 1<sup>st</sup> Avenue, New York, New York. The most direct route to the hospital from the Site is to go west on W 29<sup>th</sup> Street, turn left onto 11<sup>th</sup> Avenue go 0.3 miles, turn left onto W 23<sup>rd</sup> Street go 1.4 miles, turn left onto 3<sup>rd</sup> Avenue go 0.1 miles, turn right onto right onto E 26<sup>th</sup> Street go 0.3 miles, turn left onto 1<sup>st</sup> Avenue and arrive at Bellevue Hospital. **Attachment B** presents a hospital route map.

### **8.5 Incident Reporting Procedures**

Any incident (other than minor first aid treatment) resulting in injury, illness or property damage requires an accident investigation and report. The investigation should be initiated as soon as emergency conditions are under control. The purpose of this investigation is not to attribute blame but to determine the pertinent facts so that repeat or similar occurrences can be avoided.

The investigation should begin while details are still fresh in the mind of anyone involved. The person administering first aid may be able to start the fact gathering process if the injured are able to speak. Pertinent facts must be determined. Questions beginning with who, what, when, where, and how are usually most effective to discover ways to improve job performance in terms of efficiency and quality of work, as well as safety and health concerns.

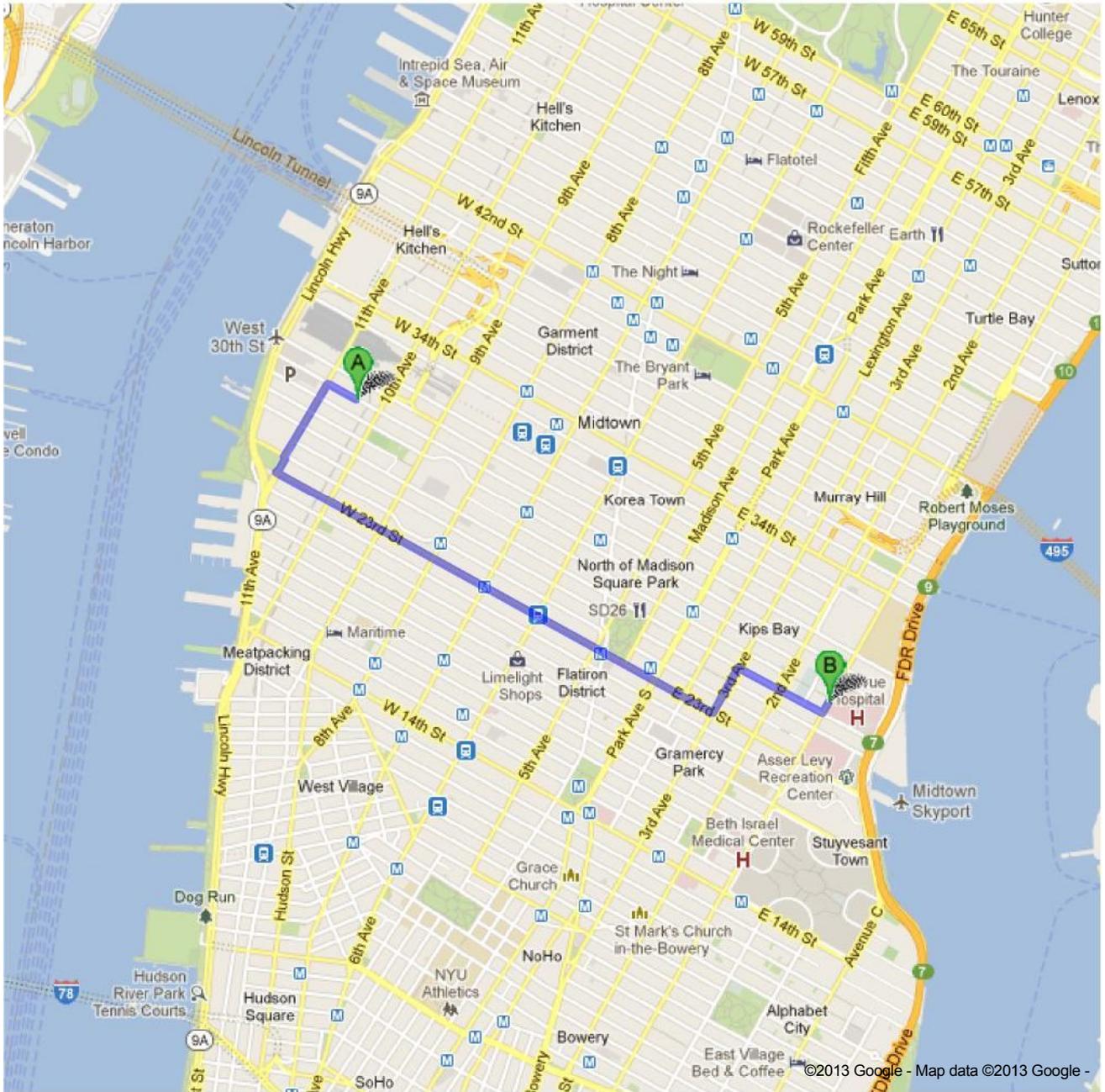
ATTACHMENT A  
HEALTH AND SAFETY BRIEFING



ATTACHMENT B  
ROUTE TO HOSPITAL



**Directions to Bellevue Hospital**  
462 1st Ave, New York, NY 10016  
2.3 mi – about 11 mins





522 W 29th St, New York, NY 10001

1. Head **northwest** on **W 29th St** toward **11th Ave**go 492 ft  
total 492 ft2. Take the 1st left onto **11th Ave**  
About 1 mingo 0.3 mi  
total 0.4 mi3. Turn left onto **W 23rd St**  
About 7 minsgo 1.4 mi  
total 1.8 mi4. Turn left onto **3rd Ave**  
About 50 secsgo 0.1 mi  
total 2.0 mi5. Turn right onto **E 26th St**  
About 1 mingo 0.3 mi  
total 2.2 mi6. Turn left onto **1st Avenue**  
Destination will be on the rightgo 207  
ft total 2.3**Bellevue Hospital**

462 1st Ave, New York, NY 10016

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2013 Google

Directions weren't right? Please find your route on [maps.google.com](http://maps.google.com) and click "Report a problem" at the bottom left.

ATTACHMENT C  
DAILY SAFETY MEETING



ATTACHMENT D  
INCIDENT ANALYSIS/REPORTING FORM



# INCIDENT/ACCIDENT REPORT and ANALYSIS



*For initial report to be submitted within 24 hours of the incident, fill in as much information as available in Sections 1 through 4, and submit to your EHS Coordinator, EHS Director (J. Chatterjee), and Property and Casualty Insurance Manager (S.Domko).  
Incident analysis to be completed ASAP thereafter, and distributed as appropriate.*

**Initial Incident Report Prepared/Submitted by:**

Name	GZA Office	Date
------	------------	------

**1. Classify Incident (select all that apply):**


**2. Description of Incident/Injury and Related Information** (Attach photos, drawings, separate page if needed.)

a. Date of Incident:	b. Time of Incident:
b. Address Where Incident Occurred:	
c. If incident occurred on a project work site, provide project information (project number, project name, client info., etc.): -	
d. GZA Supervisor/Project Manager/PIC:	
e. Work conducted out of which GZA office?	
f. EHS Coordinator in Your Office:	
g. Detailed Description of the Incident:	

**3. For Work Place Injury or Illness, Fill in this Section (otherwise, skip to Section 4),**

a. Person Injured/Illness:	
b. Full Name of Injured:	
c. Injured Person's Mailing Address:	
d. Injured Person's Title, Department, etc.	
e. Home or Cell Phone No.	f. Date of Birth:
g. Detailed Description of Injury (be specific):	
h. Was 1 <sup>st</sup> aid administered on site?	
i. If yes, who administered 1 <sup>st</sup> aid, and describe actions:	
j. Did injured person receive emergency medical treatment or ambulance service?	
k. If yes, describe:	
l. Did injured receive professional medical care and/or treatment? m. If yes, what was the nature of care?	
n. Date of first treatment or hospitalization:	
o. Identify name of clinic, hospital, doctor, specialty, (name, address, city, state, zip code, and phone):	
p. Describe the specific medical care or treatment (provide details, specific treatment, specific medications, over-the-counter or prescription, recommendations for follow up, etc.):	
q. Did injured person resume work on the same day of the incident?	
r. Did injured person miss any days at work after the day of the incident?	

s. If yes, first day missed:  
t. Total number of days of work missed:  
u. Was injured person assigned any days of restricted duty at work?  
v. If yes, first day of restricted work duty:  
w. Total number of days of restricted work duty:

**4. Names of Other Individuals Directly Involved or Witnesses (if any)**

Name	Nature of Involvement	Contact Info. (Company, Phone No.)

**5. Contributory Factors**

a. What was the apparent immediate or direct cause(s) of the incident?  
b. Was any safety equipment provided?  
c. If yes, was it used?  
d. Was an unsafe act being performed, or was an unsafe condition present?  
e. If yes, describe:  
f. Were any machine parts, tools, or equipment involved?  
g. If yes, describe:  
h. Was the machine part/tool/equipment in proper working order?  
i. If no, explain:  
j. Was a non-GZA party (subcontractor, public, etc.) involved in or responsible for the incident?  
k. If yes, explain and provide contact information:  
l. Identify possible indirect causes, root causes of the incident:  
m. Other Comments:

**6. Corrective Actions, Recommendations, Follow-up** (Attach separate page if necessary.)

a. Describe corrective or preventative actions implemented at the time of the incident:  
b. Suggest additional corrective or preventative actions that may prevent recurrence of the incident:  
c. Suggest additional follow-up actions (such as corrective actions needed for similar work, safety alert, information, or guidelines to be communicated company-wide, etc.):

**7. Distribution**

V.P. Risk Management: Kenneth Johnston  
EHS Director: Jayanti Chatterjee  
Property and Casualty Insurance Manager: Susan Domko  
Regional Office Managers: William Hadge and Kim Anderson  
District Office Manager:  
Principal-in-Charge (if project-related):  
Project Manager (if project-related):  
Employee Supervisor:  
Other:

**8. Participants in Incident Analysis/Investigation**

Name	Title	Role/Involvement
------	-------	------------------


**9. Incident Analysis Completion**

OSHA-Recordable?

Explain:

For hospitalization, have discharge papers been received?

Explain:

For police involvement, has police report been received?

Explain:

\_\_\_\_\_  
Susan Domko, Property & Casualty Insurance Manager

\_\_\_\_\_  
Date

\_\_\_\_\_  
Jayanti Chatterjee, EHS Director

\_\_\_\_\_  
Date

\_\_\_\_\_  
Kenneth Johnston, VP Risk Management

\_\_\_\_\_  
Date

**APPENDIX E**  
**Proposed Development Plans**

## Letter of Transmittal

**TO:** W29 Highline LLC  
 520 West 27<sup>th</sup> Street, Suite 302  
 New York, NY 10001

DATE: 06/21/2013	NO. 12020-08
ATTENTION: Saif Sumaida	
RE: 522 West 29 <sup>th</sup> Street, NY, NY	
VIA: Email	

We are sending you  Attached  Under separate cover \_\_\_\_\_ the following items:

- Shop Drawings   
  Prints   
  Plans   
  Submittal   
  Specifications  
 Copy of Letter   
  Change Order   
  Other

COPIES	DATE	NO.	DESCRIPTIONS
PDF	06/21/2013	-	FO-100.00, FO-101.00, FO-200.00 – Issued for R.A.P. (Signed & Sealed)

These are transmitted as checked below:

- For approval   
  For your use   
  As requested   
  For review and comments

COMMENTS:

Copy to:

FROM: Alexandru Marin, PE

OWNER:  
WEST 29TH HIGHLINE OWNERS LLC.  
520 WEST 27TH STREET, SUITE 302  
NEW YORK, NY 10001

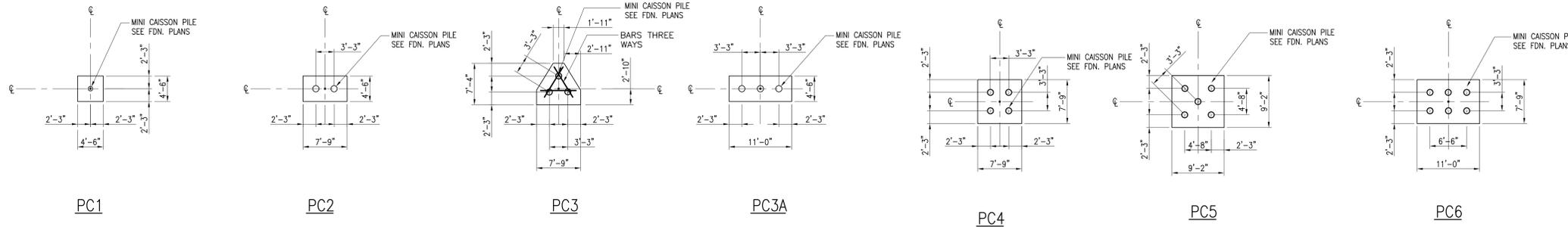
ARCHITECT:  
Montroy DeMarco LLP  
99 Madison Avenue 14th Floor  
NEW YORK, NY 10016  
TEL: (212) 481-9900  
FAX: (212) 481-7481

DESIGN ARCHITECT:  
SCDA  
8 TECK LIM ROAD  
SINGAPORE, 08385  
TEL: 65 6324-5458  
FAX: 65 6324-5420

STRUCTURAL ENGINEER:  
ALEXANDRU MARIN, P.E.  
MARIN CONSULTING ENGINEER PLLC  
48 JAY STREET, SUITE 201  
BROOKLYN, NY 11201  
TEL: (917) 705-6534

MECHANICAL ENGINEERS:  
IMTAZ MULLA, P.E.  
PLUS GROUP CONSULTING  
ENGINEERING, PLLC  
231 WEST 29TH STREET, RM. 706  
NEW YORK, NY 10001  
TEL: (212) 233-2700

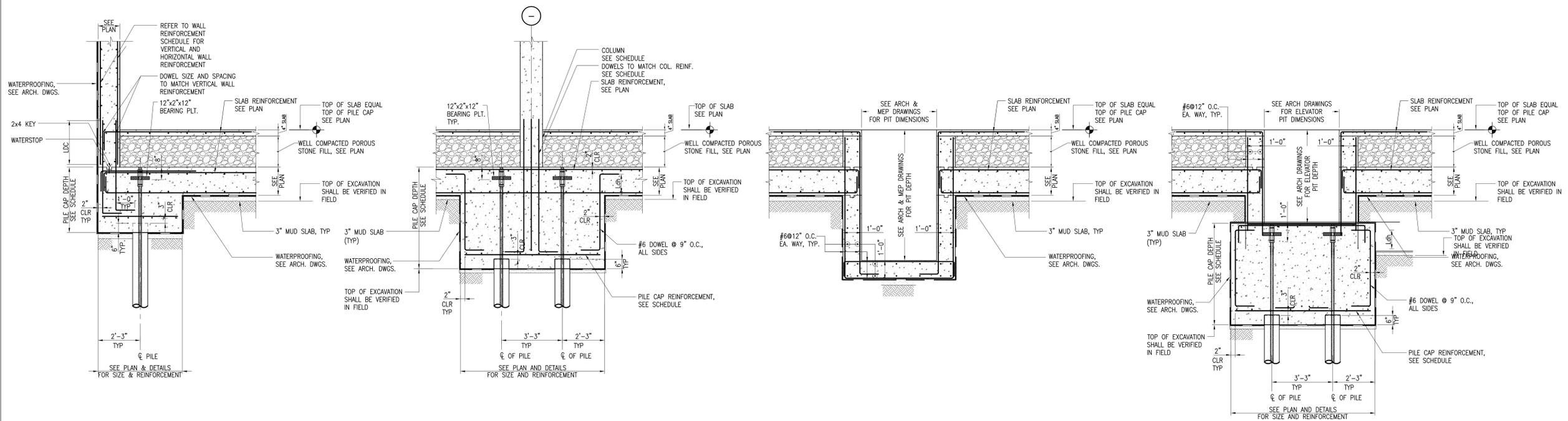
FACADE CONSULTANT:  
LAUFS E.D. L.L.C.  
LAUFS ENGINEERING DESIGN  
200 PARK AVE SOUTH, SUITE 1401  
NEW YORK, NY 10003  
TEL: (212) 527-9505



PILE CAP SCHEDULE				
TYPE	DEPTH (FT.)	REINF. SHORT BAR	REINF. LONG BAR	REMARKS
PC1	4'-0"	4#7 BOTT.	4#7 BOTT.	TOP BAR AS PER SLAB REINF.
PC2	4'-0"	6#4 BOTT.	6#10 BOTT.	TOP BAR AS PER SLAB REINF.
PC3	4'-0"	3 WAYS	3#11 BOTT.	TOP BAR AS PER SLAB REINF. 3 WAY REINF.
PC3A	4'-0"	10#4 BOTT.	6#10 BOTT.	TOP BAR AS PER SLAB REINF.
PC4	4'-0"	8#11 BOTT.	8#11 BOTT.	TOP BAR AS PER SLAB REINF.
PC5	5'-0"	10#11 BOTT.	10#11 BOTT.	TOP BAR AS PER SLAB REINF.
PC6	5'-0"	11#11 BOTT.	12#11 BOTT.	TOP BAR AS PER SLAB REINF.

NOTE: HOOK BOTH END OF ALL BARS 180°.

1 TYPICAL PILE CAP DETAILS  
SCALE: 1/8"=1'-0"



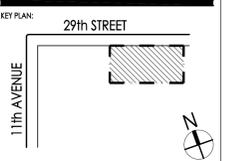
2 SECTION AT EXTERIOR WALL WITH PILE CAP  
SCALE: 1/2"=1'-0"

3 TYPICAL COLUMN SECTION WITH PILE CAP  
SCALE: 1/2"=1'-0"

4 TYPICAL MEP PIT SECTION  
SCALE: 1/2"=1'-0"

5 TYPICAL ELEVATOR PIT SECTION  
SCALE: 1/2"=1'-0"

No.	Date	By	Revision
1	04/27/2013	ISSUED TO R.A.P.	
2	04/29/2013	ISSUED TO D.O.B.	
3	06/15/2013	ISSUED FOR PRICING	
4	02/28/2013	ISSUED TO D.O.B.	



PROJECT:  
522 West 29th Street NY, NY

TYPICAL FOUNDATION DETAILS

SCALE: AS SHOWN  
DATE: 04-12-2013  
PROJECT No: 12020  
DRAWN BY: A.M.  
CHECKED BY: A.M.  
DWG. No.:  
**FO-200.00**



OWNER:  
WEST 29TH HIGHLINE OWNERS LLC.  
520 WEST 27TH STREET, SUITE 302  
NEW YORK, NY 10001

ARCHITECT:  
Montroy DeMarco LLP  
99 Madison Avenue 14th Floor  
NEW YORK, NY 10016  
TEL.: (212) 481-8900  
FAX: (212) 481-7481

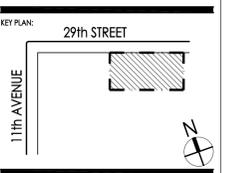
DESIGN ARCHITECT:  
SCDA  
8 TECH LUM ROAD  
SINGAPORE, 08385  
TEL.: 65 6334-5458  
FAX: 65 6334-5450

STRUCTURAL ENGINEER:  
ALEXANDRU MARIN, P.E.  
MARIN CONSULTING ENGINEER PLLC  
48 JAY STREET, SUITE 201  
BROOKLYN, NY 11201  
TEL.: (917) 705-5534

MECHANICAL ENGINEERS:  
IMTAZ MULLA, P.E.  
PLUS GROUP CONSULTING  
ENGINEERING, PLLC  
231 WEST 29TH STREET, RM. 706  
NEW YORK, NY 10001  
TEL.: (212) 233-2700

FACADE CONSULTANT:  
LAUFS E.D. LLC  
LAUFS ENGINEERING DESIGN  
200 PARK AVE SOUTH, SUITE 1401  
NEW YORK, NY 10003  
TEL.: (212) 529-3956

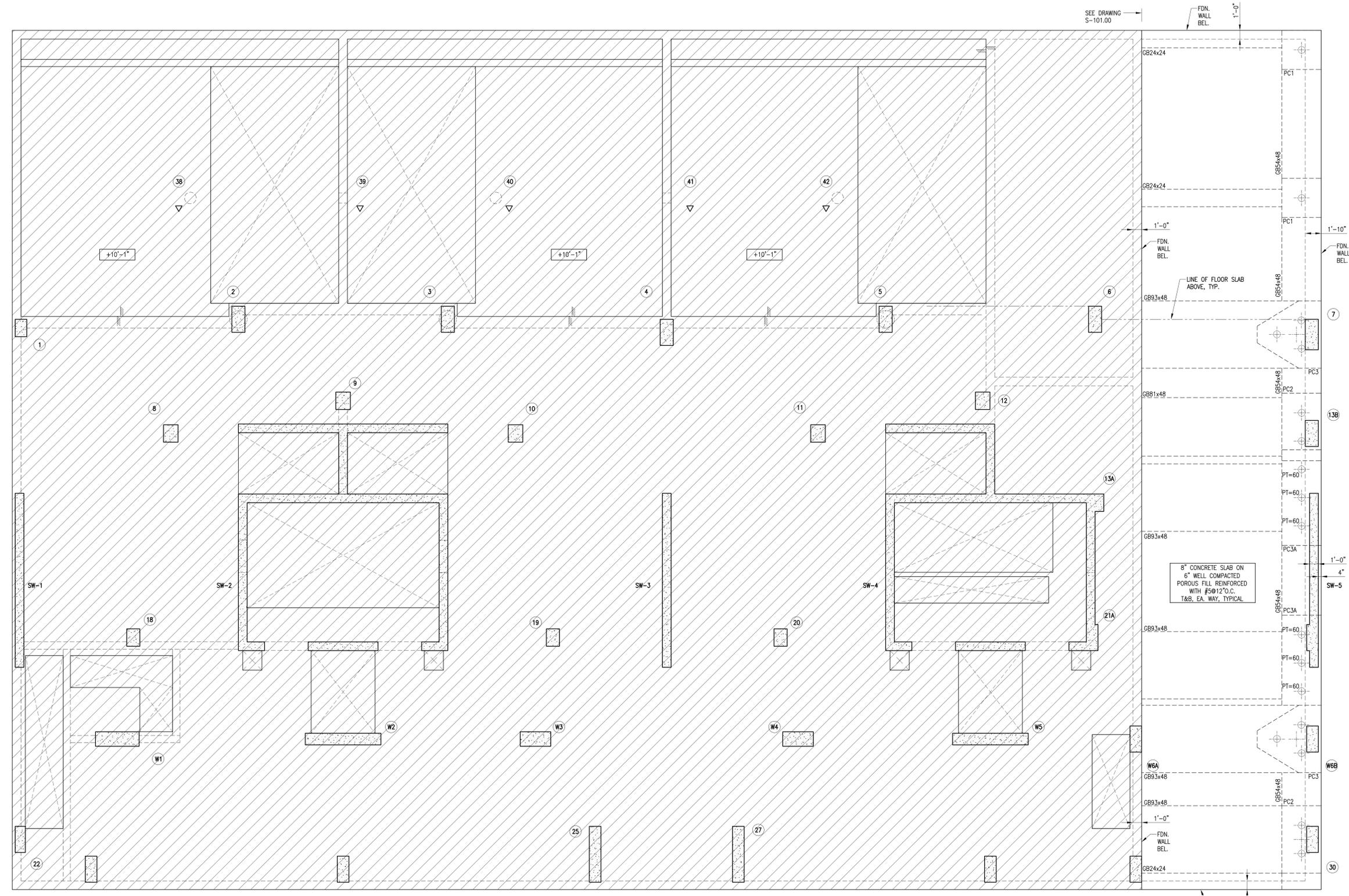
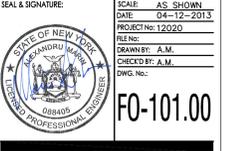
No.	Date	Revision
1	02/28/2013	ISSUED TO D.O.B.
2	04/15/2013	ISSUED FOR PERICING
3	04/29/2013	ISSUED TO D.O.B.
4	04/27/2013	ISSUED TO R.A.P.



PROJECT:  
**522 West 29th Street NY, NY**

TITLE:  
**FOUNDATION PLAN**

SCALE: AS SHOWN  
DATE: 04-12-2013  
PROJECT No: 12020  
DRAWN BY: A.M.  
CHECKED BY: A.M.  
DWG. No.: **FO-101.00**



**1ST FLOOR FOUNDATION PLAN**  
SCALE: 1/4"=1'-0"

- NOTES:
- TOP OF CONCRETE SLAB ELEVATION IS +11'-1" ABOVE TOP OF CELLAR SLAB, UON ON PLAN THUS [EX'-X"].
  - SEE DRAWING S-101.00 FOR 1ST FLOOR CONSTRUCTION ABOVE CELLAR AREA.
  - TOP OF PILE CAPS SHALL BE 1'-0" BELOW TOP OF SLAB, UON.
  - ⊕ INDICATES MINI CAISSON PILE WITH AN ALLOWABLE AXIAL COMPRESSIVE CAPACITY OF 300 KIPS. MINI CAISSONS SHALL BE A STEEL CASING 11.875 O.D EXTRA STRONG STEEL CASING REINFORCED WITH SINGLE #20 THREADBAR (GRADE 75), WITH ROCKET SOCKET DIAMETER OF 10 IN AND 7 FT. LONG FILLED WITH 5,000 PSI CEMENT GROUT; MINI CAISSON SHALL BE FILLED WITH 5,000 PSI GROUT WITH WATER REDUCING AGENT. ALL MINI CAISSON SUBJECT TO UPLIFT ARE INDICATED IN PLAN AS "PT= ".
  - ALL WALLS SHALL BE REINFORCED WITH #4@12"O.C. VERTICAL AND HORIZONTAL EACH FACE UNLESS OTHERWISE SHOWN ON PLAN, IN SECTIONS OR ON SHEAR WALL SCHEDULES. DESIGNATION SHOWN ON PLAN INDICATES NET UPLIFT IN KIPS AT THE PILE.

OWNER:  
WEST 29TH HIGHLINE OWNERS LLC.  
520 WEST 27TH STREET, SUITE 302  
NEW YORK, NY 10001

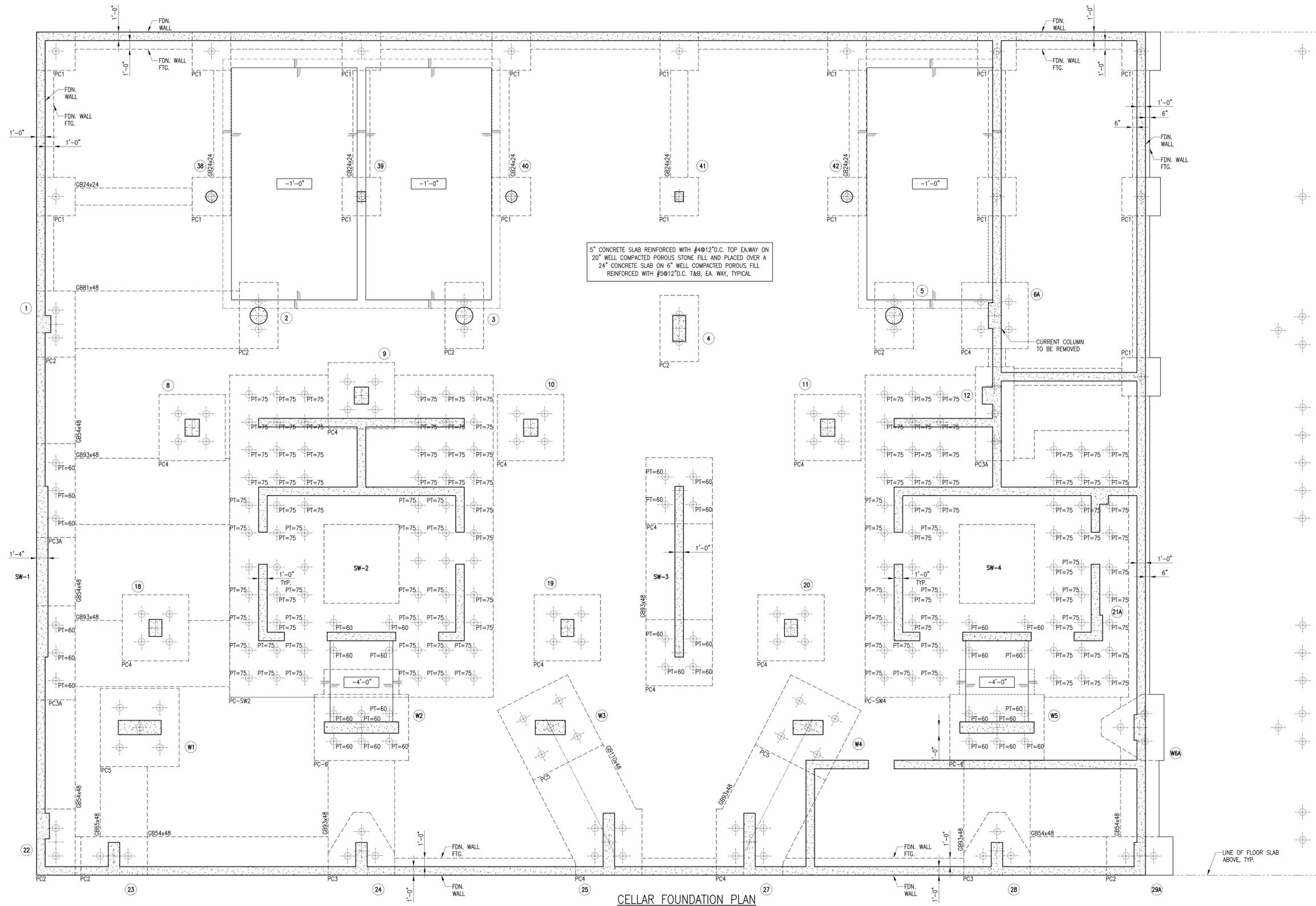
ARCHITECT:  
Montroy DeMarco LLP  
99 Madison Avenue 14th Floor  
NEW YORK, NY 10017  
TEL: (212) 481-9900  
FAX: (212) 481-7481

DESIGN ARCHITECT:  
SCDA  
8 TECH LUM ROAD  
SINGAPORE, 088385  
TEL: 65 6334-5438  
FAX: 65 6334-5437

STRUCTURAL ENGINEER:  
ALEXANDRU MARIN, P.E.  
MARIN CONSULTING ENGINEER PLLC  
48 JAY STREET, SUITE 201  
BROOKLYN, NY 11201  
TEL: (917) 705-6334

MECHANICAL ENGINEERS:  
IMTIYAZ MULLA, P.E.  
PLUS GROUP CONSULTING  
ENGINEERING, PLLC  
231 WEST 29TH STREET, RM. 706  
NEW YORK, NY 10001  
TEL: (212) 233-2700

FAÇADE CONSULTANT:  
LAUPS E.D. LLC  
LAUPS ENGINEERING DESIGN  
200 PARK AVE SOUTH, SUITE 1401  
NEW YORK, NY 10003  
TEL: (212) 529-3905



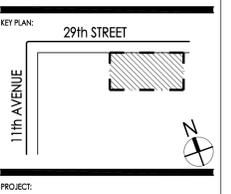
5" CONCRETE SLAB REINFORCED WITH #4@12"O.C. TOP EA.WAY ON 20" WELL COMPACTED POROUS STONE FILL AND PLACED OVER A 24" CONCRETE SLAB ON 6" WELL COMPACTED POROUS FILL REINFORCED WITH #5@12"O.C. T&B, EA. WAY, TYPICAL

**CELLAR FOUNDATION PLAN**  
SCALE: 1/4"=1'-0"

- NOTES:
- TOP OF 4" CONCRETE SLAB ELEVATION IS +0'-0", UON ON PLAN THUS  $\pm X'-X"$ .
  - TOP OF PILE CAPS SHALL BE AT TOP OF SLAB, UON.
  - $\odot$  INDICATES MINI CAISSON PILE WITH AN ALLOWABLE AXIAL COMPRESSIVE CAPACITY OF 300 KIPS. MINI CAISSONS SHALL BE A STEEL CASING 11.875 O.D EXTRA STRONG STEEL REINFORCED WITH SINGLE #20 THREADBAR (GRADE 75), WITH ROCKET SOCKET DIAMETER OF 10 IN AND 7 FT. LONG FILLED WITH 5,000 PSI CEMENT GROUT; MINI CAISSON SHALL BE FILLED WITH 5,000 PSI GROUT WITH WATER REDUCING AGENT. ALL MINI CAISSON SUBJECT TO UPLIFT ARE INDICATED IN PLAN AS "PT=".
  - ALL WALLS SHALL BE REINFORCED WITH #7@12"O.C. VERTICAL AND #5@12"O.C. HORIZONTAL EACH FACE UNLESS OTHERWISE SHOWN ON PLAN, IN SECTIONS OR ON SHEAR WALL SCHEDULES. DESIGNATION SHOWN ON PLAN INDICATES NET UPLIFT IN KIPS AT THE PILE.

1	04/27/2013	ISSUED TO R.A.P.
2	04/29/2013	ISSUED TO D.O.B.
3	04/15/2013	ISSUED FOR PRICING
4	02/28/2013	ISSUED TO D.O.B.

No. Date Revision:



PROJECT:  
**522 West 29th Street NY, NY**

TITLE:  
**FOUNDATION PLAN**

SEAL & SIGNATURE: [Signature]

SCALE: AS SHOWN  
DATE: 04-12-2013  
PROJECT No: 12020  
PLNG: [Signature]  
DRAWN BY: A.M.  
CHECKED BY: A.M.  
DWG. No.: **FO-100.00**

**Appendix F**  
**Sample Waste Disposal Manifest**

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		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 Quantity	12. Unit Wt./Vol.	13. Waste Codes
		No.	Type			
1.						
2.						
3.						
4.						
14. Special Handling Instructions and Additional Information						
15. <b>GENERATOR'S/OFFEROR'S CERTIFICATION:</b> 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. 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.						
Generator's/Offeree'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)					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



Manifest # 4205

GLOBAL JOB NUMBER: \_\_\_\_\_ FACILITY APPROVAL NUMBER: \_\_\_\_\_

**Please Check One:**

- |   |  |  |  |
|---|--|--|--|
| <input type="checkbox"/> Clean Earth of Carteret<br>24 Middlesex Avenue<br>Carteret, NJ 07008<br>Ph: 732-541-8909         | <input type="checkbox"/> Clean Earth of Maryland<br>1469 Oak Ridge Place<br>Hagerstown, MD 21740<br>Ph: 301-791-6220 | <input type="checkbox"/> Clean Earth of New Castle<br>94 Pyles Lane<br>New Castle, DE 19720<br>Ph: 302-427-6633                  | <input type="checkbox"/> Other<br>_____<br>_____ |
| <input type="checkbox"/> Clean Earth of Philadelphia<br>3201 S. 61st Street<br>Philadelphia, PA 19153<br>Ph: 215-724-5520 | <input type="checkbox"/> Clean Earth of North Jersey<br>115 Jacobus Avenue<br>Kearny, NJ 07032<br>Ph: 973-344-4004   | <input type="checkbox"/> Clean Earth of Southeast Pennsylvania<br>7 Steel Road East<br>Morrisville, PA 19067<br>Ph: 215-428-1700 |  |

**Non-Hazardous Material Manifest**

(Type or Print Clearly)

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

**DESCRIPTION OF MATERIAL/SAMPLE ID AND LOCATION**

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

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

Name: \_\_\_\_\_ Title: \_\_\_\_\_  
Signature: \_\_\_\_\_ Date and Time: \_\_\_\_\_

**TRANSPORTER**

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

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

Driver Signature: \_\_\_\_\_ Date and Time: \_\_\_\_\_

**DESTINATION**

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

Driver Signature: \_\_\_\_\_ Date and Time: \_\_\_\_\_

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

Authorized Signature: \_\_\_\_\_ Date and Time: \_\_\_\_\_

SITE

## **APPENDIX G**

### **Design Diagram: Vapor Barrier/ Waterproofing Membrane System**

OWNER:  
WEST 29TH HIGHLINE OWNERS LLC.  
520 WEST 27TH STREET, SUITE 302  
NEW YORK, NY 10001

ARCHITECT:  
Montroy DeMarco LLP  
99 Madison Avenue 14th Floor  
NEW YORK, NY 10016  
TEL: (212) 481-8500  
FAX: (212) 481-7481

DESIGN ARCHITECT:  
SCDA  
8 TECK LIND ROAD  
SINGAPORE, 063385  
TEL: +65 6334-5466  
FAX: +65 6334-5400

STRUCTURAL ENGINEER:  
ALEXANDRU MARIN, P.E.  
MARIN CONSULTING ENGINEER PLLC  
48 JAY STREET, SUITE 201  
BROOKLYN, NY 11201  
TEL: (917) 705-5334

MECHANICAL ENGINEER:  
IMTAZ MULLA, P.E.  
PLUS GROUP CONSULTING  
ENGINEERING, PLLC  
231 WEST 29TH STREET, RM. 704  
NEW YORK, NY 10001  
TEL: (212) 233-2700

FAÇADE CONSULTANT:  
LAUPS E.D. LLC  
LAUPS ENGINEERING DESIGN  
200 PARK AVE SOUTH, SUITE 1401  
NEW YORK, NY 10003  
TEL: (212) 529-9865

**LEGEND**

--- 1 HR FIRE-RATED WALL  
--- 2 HR FIRE-RATED WALL  
--- 3 HR FIRE-RATED WALL

**NOTE:**  
REFER TO DRAWING G-003 FOR PARTITION TYPE

**SMOKE / CARBON MONOXIDE DETECTING DEVICES & OTHER NOTES**

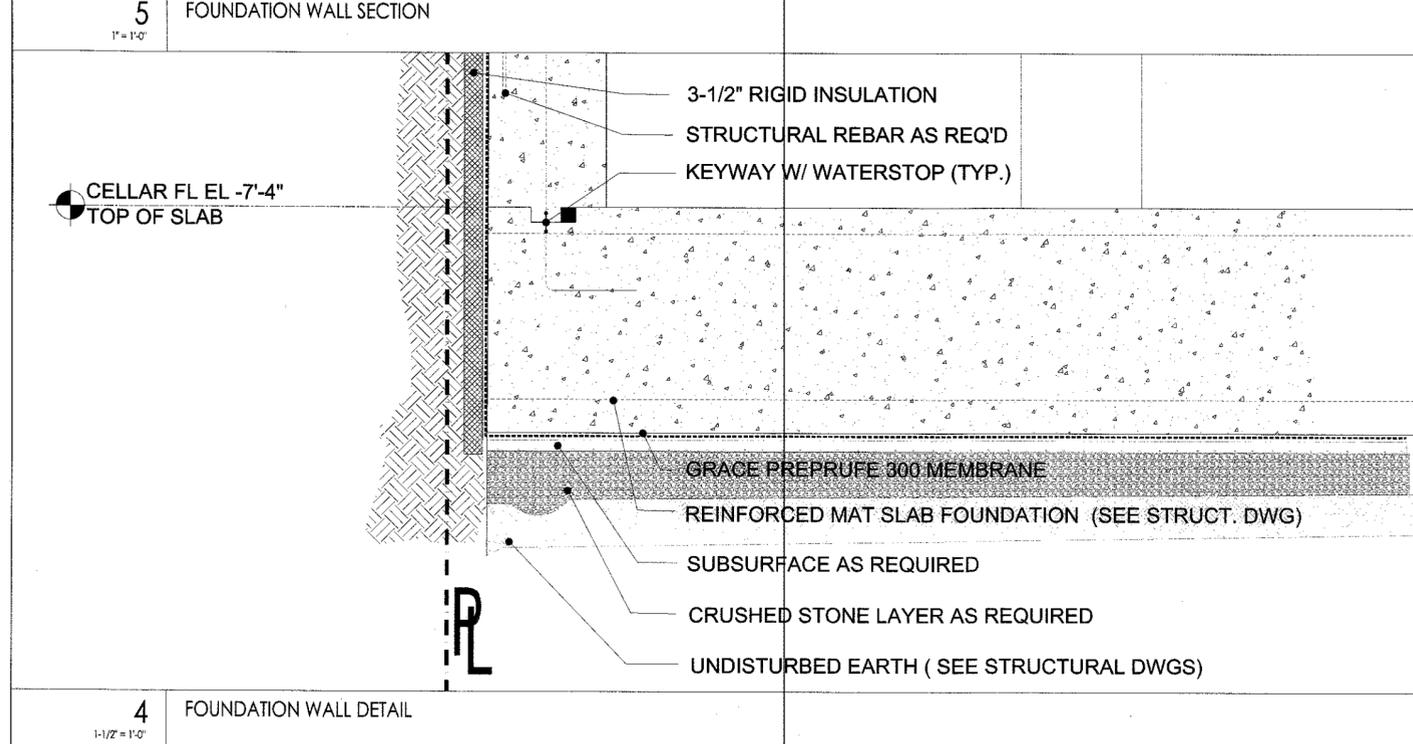
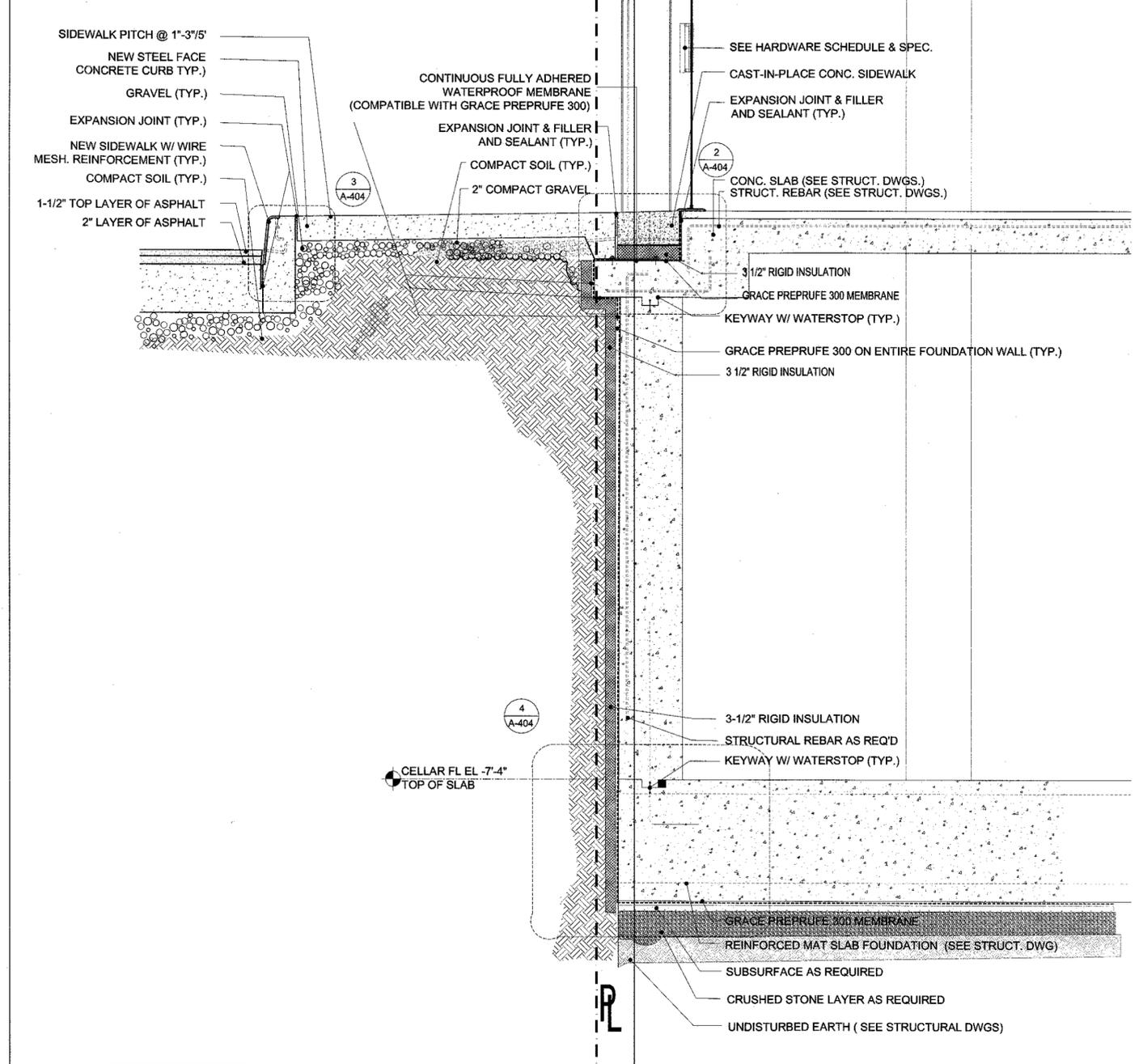
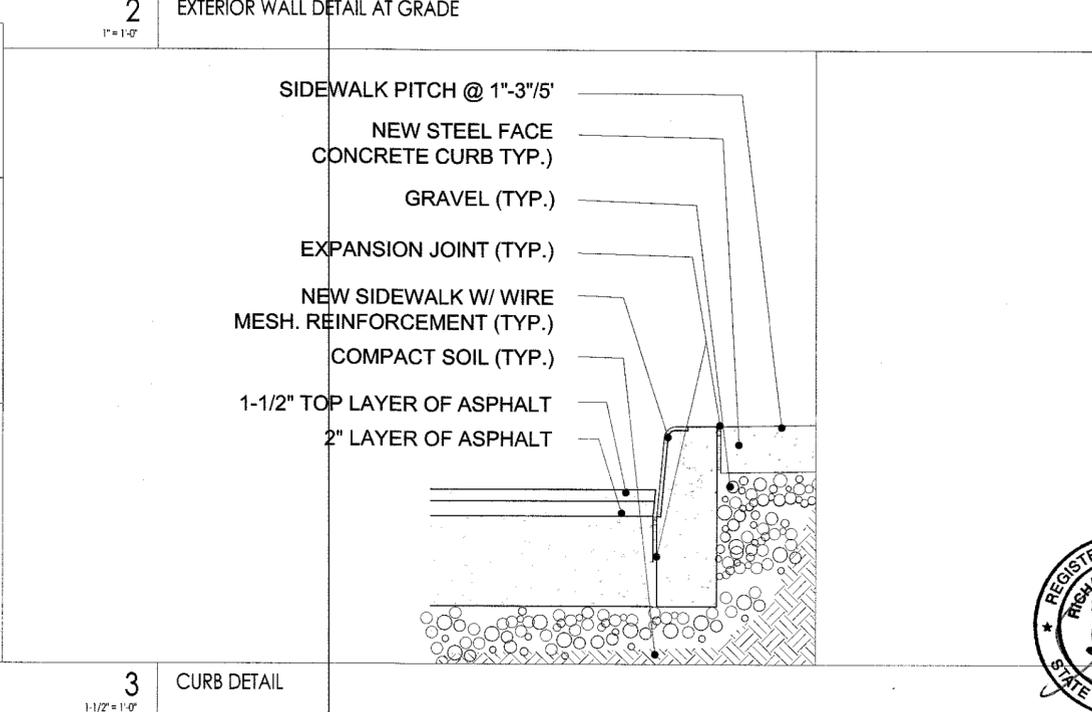
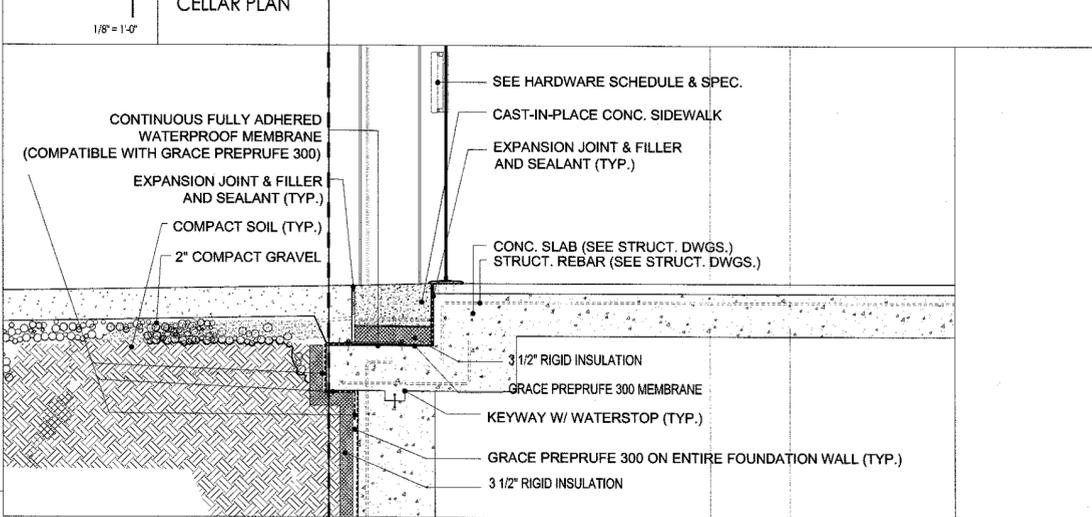
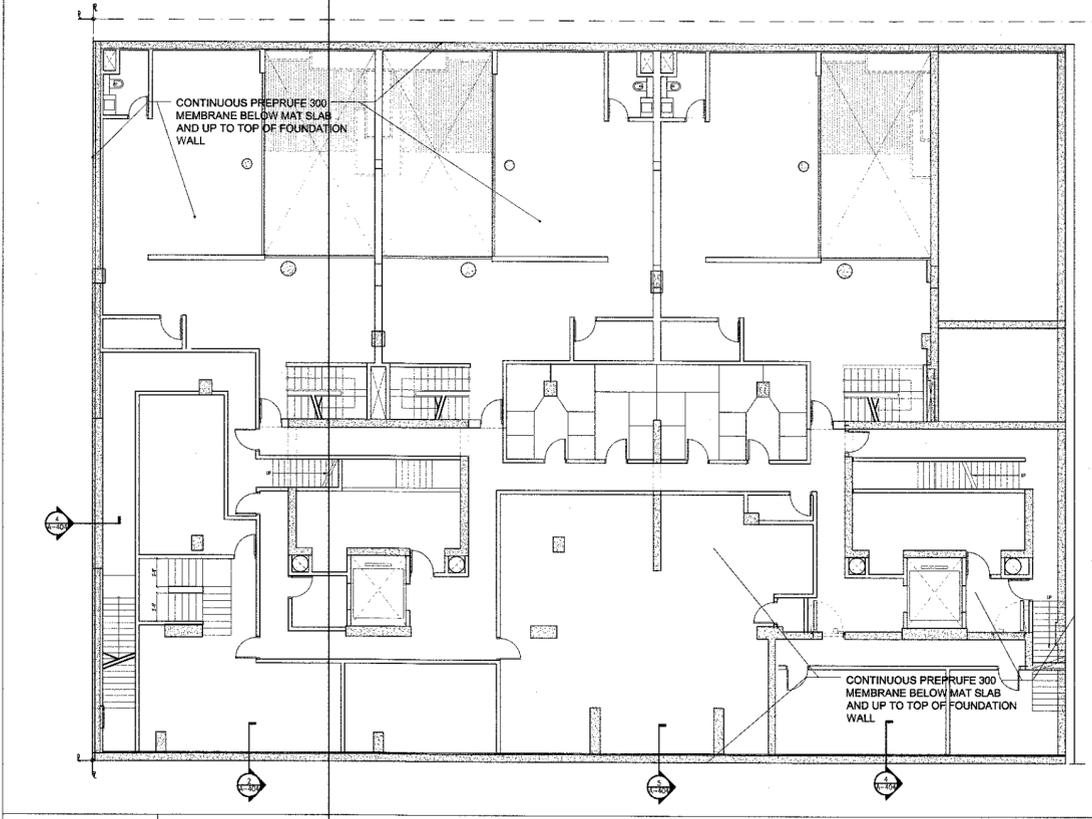
- SMOKE DETECTING DEVICES SHALL CONFORM TO SECTION 907 OF THE NEW YORK CITY BUILDING CODE AND THE HOUSEHOLD FIRE-WARNING EQUIPMENT PROVISIONS OF NFPA 72.
- SEE DETAIL NOTES ON DRAWING G-001 FOR SMOKE / CARBON MONOXIDE DETECTING DEVICES
- FOYER: IN ALL APARTMENTS 20% MAX. FOYER PERMITTED AS ALL ROOM SIZES EXCEED BY MORE THAN 20% OF THEIR REQ'D MIN. SIZES OF 132 SF FOR L.R. & 96 SF BEDROOM M.D.L. SECT. 24(5)(b)
- ALL DRYERS SHALL BE NOT VENTED (CONDENSING) (CONDENSING) DRYER TYPE SIMILAR TO ASCO MODEL #7721

1	04/27/2013	ISSUED TO O.D.S.
2	04/15/2013	90% D.D. - ISSUED FOR PRICING
3	03/28/2013	ISSUED TO O.D.S.
4	01/28/2013	ISSUED TO O.D.S.



REGISTERED ARCHITECT  
**RICHARD DEMARCO**  
STATE OF NEW YORK  
018593

SCALE: AS SHOWN  
DATE: 12-12-2012  
PROJECT: 12123  
FILE NO:  
DRAWN BY: M.S.  
CHECKED BY: R.D.  
DWG. NO.:  
**A-404.00**



SIDEWALK PITCH @ 1"-3"/5'

NEW STEEL FACE CONCRETE CURB (TYP.)

GRAVEL (TYP.)

EXPANSION JOINT (TYP.)

NEW SIDEWALK W/ WIRE MESH REINFORCEMENT (TYP.)

COMPACT SOIL (TYP.)

1-1/2" TOP LAYER OF ASPHALT

2" LAYER OF ASPHALT

CONTINUOUS FULLY ADHERED WATERPROOF MEMBRANE (COMPATIBLE WITH GRACE PREPRUFE 300)

EXPANSION JOINT & FILLER AND SEALANT (TYP.)

COMPACT SOIL (TYP.)

2" COMPACT GRAVEL

CONC. SLAB (SEE STRUCT. DWGS.)

STRUCT. REBAR (SEE STRUCT. DWGS.)

3 1/2" RIGID INSULATION

GRACE PREPRUFE 300 MEMBRANE

KEYWAY W/ WATERSTOP (TYP.)

GRACE PREPRUFE 300 ON ENTIRE FOUNDATION WALL (TYP.)

3 1/2" RIGID INSULATION

SEE HARDWARE SCHEDULE & SPEC.

CAST-IN-PLACE CONC. SIDEWALK

EXPANSION JOINT & FILLER AND SEALANT (TYP.)

2 A-404

3 A-404

4 A-404

CELLAR FL EL. -7'-4" TOP OF SLAB

3-1/2" RIGID INSULATION

STRUCTURAL REBAR AS REQ'D

KEYWAY W/ WATERSTOP (TYP.)

GRACE PREPRUFE 300 MEMBRANE

REINFORCED MAT SLAB FOUNDATION (SEE STRUCT. DWG)

SUBSURFACE AS REQUIRED

CRUSHED STONE LAYER AS REQUIRED

UNDISTURBED EARTH (SEE STRUCTURAL DWGS.)

3-1/2" RIGID INSULATION

STRUCTURAL REBAR AS REQ'D

KEYWAY W/ WATERSTOP (TYP.)

CELLAR FL EL. -7'-4" TOP OF SLAB

GRACE PREPRUFE 300 MEMBRANE

REINFORCED MAT SLAB FOUNDATION (SEE STRUCT. DWG)

SUBSURFACE AS REQUIRED

CRUSHED STONE LAYER AS REQUIRED

UNDISTURBED EARTH (SEE STRUCTURAL DWGS.)

1-1/2" = 1'-0"

## Section 071324 Pre-Applied Sheet Membrane Waterproofing

### PART 1 — GENERAL

#### 1.01 SUMMARY

- A. The Work of this Section includes, but is not limited to, pre-applied sheet membrane waterproofing that forms an integral bond to poured concrete for the following applications:
  - 1. Vertical Applications: Membrane applied against soil retention system prior to placement of concrete foundation walls;
  - 2. Horizontal Applications: Membrane applied on prepared subbase prior to placement of concrete slabs.
- B. Related sections include, but are not limited to, the following:
  - 1. Section 031000 - Concrete Forming
  - 2. Section 312000 – Earth Moving
  - 3. Section 031500 – Concrete Accessories
  - 4. Section 031500 – Hydrophilic Waterstop
  - 5. Section 316200 - Driven Piles
  - 6. Section 316400 - Caissons
  - 1. Section 032000 - Concrete Reinforcing
  - 2. Section 033000 – Cast-In-Place Concrete

-----  
**NOTE TO SPECIFIER: For vertical applications, coordinate with concrete formwork section to require one-sided wall forming system to minimize punctures to the sheet membrane waterproofing during formwork installation.**  
-----

#### 1.02 SUBMITTALS

- A. Submit manufacturer's product data, installation instructions and membrane samples for approval.

#### 1.03 REFERENCE STANDARDS

- A. The following standards and publications are applicable to the extent referenced in the text.
- B. American Society for Testing and Materials (ASTM):
  - C 836 Standard Specification for High Solids, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
  - D 412 Standard Test Methods for Rubber Properties in Tension
  - D 570 Standard Test Method for Water Absorption of Plastics
  - D 903 Standard Test Method for Peel or Stripping Strength of Adhesive Bonds
  - D 1876 Standard Test Method for Peel Release of Adhesives (T-Peel)
  - D 1970 Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection

- D 3767 Standard Practice for Rubber - Measurements of Dimensions
- D 5385 Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes
- E 96 Standard Test Methods for Water Vapor Transmission of Materials
- E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover

#### **1.04 QUALITY ASSURANCE**

- A. **Manufacturer:** Sheet membrane waterproofing system shall be manufactured and marketed by a firm with a minimum of 20 years experience in the production and sales of sheet membrane waterproofing. Manufacturers proposed for use but not named in these specifications shall submit evidence of ability to meet all requirements specified, and include a list of projects of similar design and complexity completed within the past 5 years.
- B. **Installer:** A firm which has at least 3 years experience in work of the type required by this section.
- C. **Materials:** For each type of material required for the work of this section, provide primary materials which are the products of one manufacturer.
- D. **Pre-Installation Conference:** A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Agenda for meeting shall include review of special details and flashing.
- E. **Schedule Coordination:** Schedule work such that membrane will not be left exposed to weather for longer than that recommended by the manufacturer.

#### **1.05 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials in labeled packages. Store and handle in strict compliance with manufacturer's instructions. Protect from damage from weather, excessive temperature and construction operations. Remove and dispose of damaged material in accordance with applicable regulations.

#### **1.06 PROJECT CONDITIONS**

- A. Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials used. Proceed with installation only when the substrate construction and preparation work is complete and in condition to receive sheet membrane waterproofing.

#### **1.07 WARRANTY**

- A. **Sheet Membrane Waterproofing:** Provide written five year material warranty issued by the membrane manufacturer upon completion of work.

## PART 2 — PRODUCTS

### 2.01 MATERIALS

- A. Pre-applied Integrally Bonded Sheet Waterproofing Membrane: Preprufe® 300R Membrane [or Preprufe 300LT Membrane for application temperatures between 25°F (-4°C) and 60°F (+16°C)] by Grace Construction Products, a 1.2mm (0.046 in) nominal thickness composite sheet membrane comprising 0.8 mm (0.030 in.) of high density polyethylene film, and layers of specially formulated synthetic adhesive layers. The membrane shall form an integral and permanent bond to poured concrete to prevent water migration at the interface of the membrane and structural concrete. Provide membrane with the following physical properties:

-----  
**NOTE TO SPECIFIER:** Preprufe 300R and Preprufe 300LT can both be installed at temperatures 25°F (-4°C) and above. For temperatures 25°F (-4°C) to 55°F (13°C) Grace Technical Bulletin #16 states the use of Preprufe LT Tape is recommended at all sidelaps when using Preprufe 300R. Alternatively, contractors may elect the use of Preprufe 300LT which does not require the use of Preprufe LT Tape at sidelaps in temperature ranges 25°F (-4°C) to 55°F (13°C). For this reason, Grace suggests that both products be incorporated into the specification.  
 -----

#### PHYSICAL PROPERTIES FOR PREPRUFE 300R (or 300LT) MEMBRANE:

Property	Test Method	Typical Value
Color		White
Thickness	ASTM D 3767 Method A	1.2 mm (0.046 in.) nominal
Lateral Water Migration Resistance	ASTM D 5385 Modified <sup>1</sup>	Pass at 71 m (231 ft) of hydrostatic head pressure
Low Temperature Flexibility	ASTM D 1970	Unaffected at -29°C (-20°F)
Elongation	ASTM D 412 Modified <sup>2</sup>	500%
Crack Cycling at -23°C (-9.4°F), 100 Cycles	ASTM C 836	Unaffected, Pass
Tensile Strength, film	ASTM D 412	27.6 MPa (4,000 lbs/in. <sup>2</sup> )
Peel Adhesion to Concrete	ASTM D 903 Modified <sup>3</sup>	880 N/m (5.0 lbs/in.)
Lap Adhesion	ASTM D 1876 Modified <sup>4</sup>	880 N/m (5.0 lbs/in.)
Resistance to Hydrostatic Head	ASTM D 5385 Modified <sup>5</sup>	71 m (231 ft)
Puncture Resistance	ASTM E 154	990 N (221 lbs)
Permeance	ASTM E 96 Method B	0.6 ng/Pa × s × m <sup>2</sup> (0.01 perms)
Water Absorption	ASTM D 570	0.5%

*Footnotes:*

- Lateral water migration resistance is tested by casting concrete against membrane with a hole and subjecting the membrane to hydrostatic head pressure with water. The test measures the resistance of lateral water migration between the concrete and the blind side waterproofing membrane. A hydrostatic head pressure of 71 m (231 ft) of water is the limit of the apparatus.*
- Elongation of membrane is run at a rate of 50 mm (2 in.) per minute.*
- Concrete is cast against the protective coating surface of the membrane and allowed to cure (7 days minimum). Peel adhesion of membrane to concrete is measured at a rate of 50 mm (2 in.) per minute at room temperature.*
- The test is conducted 15 minutes after the lap is formed as per manufacturer's instructions and run at a rate of 50 mm (2 in.) per minute.*
- Hydrostatic head tests are performed by casting concrete against the membrane with a lap. Before the concrete sets a 3 mm (0.125 in.) spacer is inserted perpendicular to the membrane to create a gap. The cured block is placed in a chamber where water is introduced to the membrane surface up to a head of 71 m (231 ft) of water which is the limit of the apparatus.*

- B. Pre-applied Integrally Bonded Sheet Waterproofing Membrane: Preprufe® 160R Membrane [or Preprufe 160LT Membrane for application temperatures between 25°F (-4°C) and 60°F (+16°C)] by Grace Construction Products, a 1.0mm (0.032 in) nominal thickness composite sheet membrane comprising 0.4 mm (0.016 in.) of high density polyethylene film, and layers of specially formulated synthetic adhesive layers. The membrane shall form an integral and permanent bond to poured concrete to prevent water migration at the interface of the membrane and structural concrete. Provide membrane with the following physical properties:

-----  
**NOTE TO SPECIFIER: Preprufe 160R and Preprufe 160LT can both be installed at temperatures 25°F (-4°C) and above. For temperatures 25°F (-4°C) to 55°F (13°C) Grace Technical Bulletin #16 states the use of Preprufe LT Tape is recommended at all sidelaps when using Preprufe 160R. Alternatively, contractors may elect the use of Preprufe 160LT which does not require the use of Preprufe LT Tape at sidelaps in temperature ranges 25°F (-4°C) to 55°F (13°C). For this reason, Grace suggests that both products be incorporated into the specification.**  
 -----

**PHYSICAL PROPERTIES FOR PREPRUFE 160R (or 160LT) MEMBRANE:**

Property	Test Method	Typical Value
Color		White
Thickness	ASTM D 3767 Method A	1.0 mm (0.032 in.) nominal
Lateral Water Migration Resistance	ASTM D5385, Modified <sup>1</sup>	Pass at 71 m (231 ft) of hydrostatic head pressure
Low Temperature Flexibility	ASTM D 1970	Unaffected at -29°C (-20°F)
Elongation	ASTM D 412 Modified <sup>2</sup>	500%
Crack Cycling at -23°C (-9.4°F), 100 Cycles	ASTM C 836	Unaffected, Pass
Tensile Strength, film	ASTM D 412	27.6 MPa (4,000 lbs/in. <sup>2</sup> )
Peel Adhesion to Concrete	ASTM D 903 Modified <sup>3</sup>	880 N/m (5.0 lbs/in.)
Lap Adhesion	ASTM D 1876 Modified <sup>4</sup>	880 N/m (5.0 lbs/in.)
Resistance to Hydrostatic Head	ASTM D 5385 Modified <sup>5</sup>	Pass at 71 m (231 ft)
Puncture Resistance	ASTM E 154	445 N (100 lbs)
Permeance	ASTM E 96 Method B	0.6 ng/Pa x s x m <sup>2</sup> (0.01 perms)
Water Absorption	ASTM D 570	0.5%

*Footnotes:*

- Lateral water migration resistance is tested by casting concrete against membrane with a hole and subjecting the membrane to hydrostatic head pressure with water. The test measures the resistance of lateral water migration between the concrete and the blind side waterproofing membrane. A hydrostatic head pressure of 71 m (231 ft) of water is the limit of the apparatus.*
- Elongation of membrane is run at a rate of 50 mm (2 in.) per minute.*
- Concrete is cast against the protective coating surface of the membrane and allowed to cure (7 days minimum). Peel adhesion of membrane to concrete is measured at a rate of 50 mm (2 in.) per minute at room temperature.*
- The test is conducted 15 minutes after the lap is formed as per manufacturer's instructions and run at a rate of 50 mm (2 in.) per minute.*
- Hydrostatic head tests are performed by casting concrete against the membrane with a lap. Before the concrete sets a 3 mm (0.125 in.) spacer is inserted perpendicular to the membrane to create a gap. The cured block is placed in a chamber where water is introduced to the membrane surface up to a head of 71 m (231 ft) of water which is the limit of the apparatus.*

- C. Waterstop: Adcor™ ES hydrophilic non-bentonite waterstop by Grace Construction Products for non-moving concrete construction joints.

**PHYSICAL PROPERTIES FOR GRACE ADCOR™ ES HYDROPHYLIC WATERSTOP:**

Property	Typical Value
Color	Green
Size	1.0 in. x ½ in. x 16 ft. rolls (25.4 mm x 12.7 mm x 4.9 m)
Hydrostatic Head Resistance	70 m (231 ft)
Wet - Dry Cycling [25 Cycles @ 231 ft. (70 m)]	No Effect
Adhesion to Concrete using Adcor ES Adhesive	Excellent

- D. Preformed Soil Retention Wall Tieback Cover: Preprufe Tieback Cover by Grace Construction Products as a prefabricated detail for soil retention wall tiebacks.
- E. Preformed Inside and Outside Corners: Preprufe Preformed Corners by Grace Construction Products as prefabricated inside and outside corners.
- F. Tape for covering cut edges, roll ends, penetrations and detailing: Preprufe Tape LT (for temperatures between 25°F (-4°C) and 86°F (+30°C)) and Preprufe Tape HC (for use in Hot Climates, minimum 50°F (10°C))
- G. Miscellaneous Materials: accessories specified or acceptable to manufacturer of pre-applied waterproofing membrane.

**PART 3 — EXECUTION**

**3.01 EXECUTION**

- A. The installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify the Contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.

**3.02 SUBSTRATE PREPARATION**

- A. It is essential to create a sound and solid substrate to eliminate movement during the concrete pour. Substrates must be regular and smooth with no gaps or voids greater than 0.5 in. (12 mm). Grout around all penetrations such as utility conduits, etc. for stability.
1. Horizontal Surfaces - The substrate must be free of loose aggregate and sharp protrusions. Avoid curved or rounded substrates. When installing over earth or crushed stone, ensure substrate is well compacted to avoid displacement of substrate due to traffic or concrete pour. The surface does not need to be dry, but standing water must be removed.
  2. Vertical Surfaces - Use concrete, plywood, insulation or other approved facing to sheet piling to provide support to the membrane. Board systems such as timber lagging must be close butted to provide support and not more than 0.5 in. (12 mm) out of alignment.

### 3.03 INSTALLATION, HORIZONTAL APPLICATIONS

- A. Strictly comply with installation instructions in manufacturer's published literature, including but not limited to, the following:
1. Place the membrane HDPE film side to the substrate with the clear plastic release liner facing towards the concrete pour. End laps should be staggered to avoid a build-up of layers.
  2. Leave the plastic release liner in position until overlap procedure is completed.
  3. Accurately position succeeding sheets to overlap the previous sheet 3 in. (75 mm) along the marked selvedge. Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap.
  4. Peel back the plastic release liner from between the overlaps as the two layers are bonded together. Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller.
  5. Completely remove the plastic liner to expose the protective coating. Any initial tack will quickly disappear.

### 3.04 INSTALLATION, VERTICAL APPLICATIONS

- A. Strictly comply with installation instructions in manufacturer's published literature, including but not limited to, the following:
1. Mechanically fasten the membrane vertically using fasteners appropriate to the substrate with the clear plastic release liner facing towards the concrete pour. The membrane may be installed in any convenient length.
  2. Fastening through the selvedge using a small and low profile head fastener so that the membrane lays flat and allows firmly rolled overlaps.
  3. Immediately remove the plastic release liner.
  4. Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap.
  5. Roll firmly to ensure a watertight seal.
  6. Overlap all roll ends and cut edges by a minimum 3 in. (75 mm) and ensure the area is clean and free from contamination, wiping with a damp cloth if necessary.
  7. Allow to dry and apply Preprufe Tape LT (or HC in hot climates) centered over the lap edges and roll firmly.
  8. Immediately remove printed plastic release liner from the tape.

### 3.05 WATERSTOP INSTALLATION

- A. Strictly comply with installation instructions in manufacturer's published literature, including but not limited to, the following:
1. Secure Adcor ES using masonry nails 1½ in. - 2 in. (40 mm – 50 mm) long with a washer ¾ in. (20 mm) in diameter. Hilti EM6-20-12 FP8 shot fired fixings with ¼ in. (6 mm) nuts and ¾ in. (20 mm) diameter washers may also be used. Fixings should be spaced at a maximum of 12 in. (300 mm) centers with a minimum spacing that ensures proper contact to substrate.
  2. On irregular concrete faces, or on vertical surfaces, apply a ½ in. (12 mm) bead of Adcor ES Adhesive as bedding for Adcor ES.

3. Adcor ES joints should overlap a minimum of 4 in. (100 mm), ensuring full contact between jointed pieces.

### 3.06 PROTECTION

- A. Protect membrane in accordance with manufacturer's recommendations until placement of concrete. Inspect for damage just prior to placement of concrete and make repairs in accordance with manufacturer's recommendations.

**END OF SECTION**

---

**W.R. Grace & Co.-Conn.      62 Whittemore Avenue      Cambridge, MA 02140**

Preprufe and Hydroduct are registered trademarks of W.R. Grace & Co.-Conn.

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate and is offered for the users' consideration, investigation and verification, but we do not warrant the results to be obtained. Please read all statements, recommendations or suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation or suggestion is intended for any use which would infringe any patent or copyright. W. R. Grace & Co.-Conn., 62 Whittemore Avenue, Cambridge, MA 02140. In Canada, W. R. Grace & Co. Canada, Ltd. 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

This product may be covered by patents or patents pending.

Copyright 2012. W.R. Grace & Co.-Conn.

Document Code: GSWP-001B

Updated: 7/2012