

**1674-1684 Broadway
HENRY APARTMENTS - SITE A
BROOKLYN, NEW YORK**

Remedial Action Work Plan

NYC VCP Number: 15CVCP148K

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REMEDIAL ACTION WORK PLAN

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LIST OF ACRONYMS

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

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

CERTIFICATION

I, Thomas F. Lembo, am currently a registered professional engineer licensed by the State of New York. I performed professional engineering services and had primary direct responsibility for designing the remedial program for the 1674-1684 Broadway site, site number 15CVCP148K. I certify to the following:

- I have reviewed this document and the Stipulation List, to which my signature and seal are affixed.
- Engineering Controls developed for this remedial action were designed by me or a person under my direct supervision and designed to achieve the goals established in this Remedial Action Work Plan for this site.
- The Engineering Controls to be constructed during this remedial action are accurately reflected in the text and drawings of the Remedial Action Work Plan and are of sufficient detail to enable proper construction.
- This Remedial Action Work Plan (RAWP) has a plan for handling, transport and disposal of soil, fill, fluids and other materials removed from the property in accordance with applicable City, State and Federal laws and regulations. Importation of all soil, fill and other material from off-Site will be in accordance with all applicable City, State and Federal laws and requirements. This RAWP has provisions to control nuisances during the remediation and all invasive work, including dust and odor suppression.

Thomas F. Lembo, P.E.

Name

PE License Number

Signature

Date

PE Stamp

I, Eric C. Arnesen, am a qualified Environmental Professional. I will have primary direct responsibility for implementation of the remedial program for the 1674-1684 Broadway site, site number 15CVCP148K. I certify to the following:

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

Eric C. Arnesen, LPG

QEP Name

QEP Signature

Date

EXECUTIVE SUMMARY

Broadway Decatur Owners LLC has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 15,546-square foot site located at 1674-1684 Broadway in Brooklyn, New York. A limited Phase II investigation 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 subject property is located at 1674-1684 Broadway in the Bedford Stuyvesant section of Brooklyn, New York and identified as Block 1503, Lot 29 (previously Lots 29, 31, 34, and 38) on the New York City Tax Map. The property is situated on the northwest corner of Broadway and Decatur Street. The 15,546-square-foot subject property is currently developed with two (2) commercial buildings and two (2) paved parking/storage areas. The existing buildings are scheduled to be demolished.

For this VCP application, only the footprint of the proposed building of the subject property (the “Site”), will be considered. Figure 1 shows the Site Location and Site boundary.

Summary of Proposed Redevelopment Plan

The project involves the new construction of two (2) six-story supportive and affordable housing buildings on two (2) sites (the property which is the subject of this RAWP, Site A and a property to the south across Decatur Street, Site B). The buildings will collectively contain 134 permanent supportive and affordable housing units, 78 of which are set aside for NY/NYIII eligible individuals with severe and persistent mental illness, and families and individuals earning less than 60% of area median income. Seventy-eight (78) of the studio and one bedroom units are designated as permanent supportive housing units for single adults.

The building on Site A (the subject property) will consist of fifty-five(55) dwelling units including: forty (40) studio units, ten (10) one-bedroom units, and five (5) two-bedroom units,

in addition to 2,600 SF of office and community space (used exclusively in support of the residential units), 2,800 SF of commercial space, and approximately 4,230 SF of outdoor recreation space. One two-bedroom unit will be set aside for a superintendent (serving both buildings) in the Site B building. The cellar level will be used for storage, and mechanical rooms. The ground floor will contain the commercial and office space. Floors 2-6 will be used for the residential units.

The development will require excavation across the entire Site to a depth of approximately 12' below ground surface for the cellar level. Outside of the building footprint, there are 14 parking spaces and outdoor areas that include paved patios, gardens, tables and benches.

Summary of Environmental Findings

1. Elevation of the property is approximately 65 feet above mean sea level.
2. Groundwater was not encountered during the Phase II ESA.
3. Groundwater flow is believed to be generally southeast beneath the Site towards Jamaica Bay.
4. Depth to bedrock is unknown.
5. Limited soil investigation was conducted during Phase II. Soil/fill samples results were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives and Restricted Residential Soil Cleanup Objectives as presented in 6NYCRR Part 375-6.8. Soil/fill samples collected during the Phase II showed no VOCs or PCBs in any of the soil samples. Several SVOCs consisting of Polycyclic Aromatic Hydrocarbons (PAHs) were detected, but none exceeding Unrestricted Use SCOs. The pesticides 4,4'-DDE (max. of 40.1 µg/kg), 4,4'-DDD (max. of 30.2 µg/kg), 4,4'-DDT (max. of 65.5 µg/kg) exceeded Unrestricted Use SCOs in two shallow samples and one deep sample with chlordane (max. of 2,120 µg/kg) exceeding Unrestricted Use SCOs in one shallow sample. Several metals including copper (max. of 56.3 mg/kg), lead (max. of 920 mg/kg), mercury (max. of 2.2 mg/kg), and zinc (max. of 383 mg/kg) exceeded Unrestricted Use SCOs in one shallow sample. Of these metals, lead and mercury also exceeded Restricted Residential Use SCOs. Overall, the findings were consistent with observations for historic fill sites in

areas throughout NYC. Additional soil investigations will be conducted and the investigation report will be amended.

6. Groundwater was not encountered within a depth of 30 feet below grade during the RI and no samples taken. Groundwater will be investigated along with proposed soil investigations.
7. Soil vapor results collected during the Phase II were compared to the compounds listed in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion dated October 2006. The two soil vapor samples showed high levels of petroleum related VOCs in all soil vapor samples with total concentrations (BTEX) ranging from 289 $\mu\text{g}/\text{m}^3$ to 1,068 $\mu\text{g}/\text{m}^3$. Of the chlorinated VOCs, only tetrachloroethylene (PCE) was detected at 52 $\mu\text{g}/\text{m}^3$ in one soil vapor sample. The concentration for PCE was above the monitoring level range established within the State DOH soil vapor guidance matrix.

Summary of the Remedy

The proposed remedial action achieves protection of public health and the environment for the intended use of the Site. The proposed remedial action achieves all of the remedial action objectives established for the Site 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. Selection of NYSDEC 6NYCRR Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs);

4. Additional Site characterization sampling involving soils, groundwater and soil vapor will be conducted and the results will be submitted as an addendum report to OER.
5. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas;
6. Completion of additional Waste Characterization Study prior to excavation activities if required by disposal facility. Waste characterization soil samples will be collected at a frequency specified by disposal facility;
7. Excavation and removal of soil/fill exceeding Unrestricted Use (Track 1) SCOs. For development purposes, the entire Site will be excavated to a depth of 12 feet below grade for construction of the new building's cellar level. Approximately 6000 tons of will be excavated and removed from this Site;
8. 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;
9. Management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials;
10. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations;
11. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities;
12. Collection and analysis of five end-point samples to determine the performance of the remedy with respect to attainment of SCOs;
13. Import of materials to be used for backfill and cover in compliance with this plan and in

accordance with applicable laws and regulations;

14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations;
15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations; and
16. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP.

If Track 1 Unrestricted Use SCOs are not achieved, the following construction elements implemented as part of new development will constitute Engineering Controls:

17. As part of new development, installation of a vapor barrier consisting of [insert Vapor Barrier product and manufacturer] beneath the building slab and behind the foundation walls up to grade;
18. As part of new development, installation of a passive sub-slab depressurization system (SSDS), with the ability to turn active if necessary, beneath the basement foundation to prevent any potential future exposures from off-Site soil vapor;
19. As part of new development, construction and maintenance of an engineered composite cover consisting of a 6” thick concrete building slab and concrete sidewalks to prevent human exposure to residual soil/fill remaining under the Site;
20. If Track 1 SCOs are not achieved, submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency; and
21. If Track 1 SCOs are not achieved, the property will record a Declaration of Covenants and Restrictions that includes a listing of Engineering Controls and Institutional Controls and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it

safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

COMMUNITY PROTECTION STATEMENT

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

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

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

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

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

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

Site Safety Coordinator. This project has a designated Site safety coordinator to implement the Health and Safety Plan. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is Mr. Eric C. Arnesen and can be reached at 631-427-5665.

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 (CAMP). Results will be regularly reported to the NYC OER. 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, Ari Kikis at 347-782-5582 or NYC Office of Environmental Remediation Project Manager Ms. Sarah Pong at 212-442-8342.

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 OER 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 Monday through Friday 07:00 – 17:00.

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

Complaint Management. The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager Mr. Michael McCarthy at 212-566-8805 ext. 12, the NYC Office of Environmental Remediation Project Manager Ms. Sarah Pong at 212-442-8342, or call 311 and mention the Site is in the NYC Voluntary Cleanup Program.

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

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

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

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

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

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

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

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

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

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

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

Brooklyn Public Library
Saratoga Branch
8 Thomas S. Boyland Street
718-573-5224

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

REMEDIAL ACTION WORK PLAN

1.0 SITE BACKGROUND

Broadway Decatur Owners LLC has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 1674-1684 Broadway in the Bedford Stuyvesant section of Brooklyn, New York. Specifically, the footprint of the proposed building (the “Site”) is being enrolled into the NYC VCP program.

A limited Phase II investigation was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 SITE LOCATION AND CURRENT USAGE

The subject property is located at 1674-1684 Broadway in the Bedford Stuyvesant section of Brooklyn, New York and identified as Block 1503, Lot 29 (previously Lots 29, 31, 34 and 38) on the New York City Tax Map. The property is situated at the northwest corner of Broadway and Decatur Street. The 15,546-square-foot subject property is currently developed with two (2) commercial buildings and two (2) paved parking/storage areas. The existing buildings are scheduled to be demolished.

For this VCP application, only the footprint of the proposed building of the subject property (the “Site”), will be considered. Figure 1 shows the Site Location and Site boundary.

1.2 PROPOSED REDEVELOPMENT PLAN

The project involves the new construction of two (2) six-story supportive and affordable housing buildings on two (2) sites (the property which is the subject of this RAWP, Site A, and a property to the south across Decatur Street, Site B). The buildings will collectively contain 134

permanent supportive and affordable housing units, 78 of which are set aside for NY/NYIII eligible individuals with severe and persistent mental illness, and families and individuals earning less than 60% of area median income. Seventy-eight (78) of the studio and one bedroom units are designated as permanent supportive housing units for single adults.

The building on Site A (the subject property) will consist of fifty-five(55) dwelling units including: forty (40) studio units, ten (10) one-bedroom units, and five (5) two-bedroom units, in addition to 2,600 SF of office and community space (used exclusively in support of the residential units), 2,800 SF of commercial space, and approximately 4,230 SF of outdoor recreation space. One two-bedroom unit will be set aside for a superintendent (serving both buildings) in the Site B building. The cellar level will be used for storage, and mechanical rooms. The ground floor will contain the commercial and office space. Floors 2-6 will be used for the residential units.

The development will require excavation across the Site to a depth of approximately 12' below ground surface for the cellar level. Outside of the building footprint, there are 14 parking spaces and outdoor areas that include paved patios, gardens, tables and benches.

Layout of the proposed site development is presented in Figure 2 and Appendix 5. The current zoning designation is C1-3/R6 denoting the property as mixed use commercial and residential. The proposed use is consistent with existing zoning for the property.

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

1.3 DESCRIPTION OF SURROUNDING PROPERTY

This property is identified on the New York City Tax Map as Block 1503, Lot 29 (previously Lots 29, 31, 34 and 38) and occupies approximately 15,546 SF of land. The property is located on the northwest corner of Broadway and Decatur Street. Currently, the subject property is developed with two (2) commercial buildings and two (2) paved parking/storage areas. The existing buildings are scheduled to be demolished. The property is bounded by commercial businesses across Broadway to the north and east, residential walkups to the south across Decatur Street as well as commercial and residential properties bordering the site to the west.

Superior Day Care Center is located approximately 400 feet to the southeast of the Site. There are no hospitals, schools or other day care facilities within 500 feet of the Site.

Figure 4 shows the surrounding land usage.

1.4 REMEDIAL INVESTIGATION

A remedial investigation was performed and the results are documented in a companion document called “Limited Phase II Environmental Site Assessment, The Henry Apartments” dated June 10,, 2013, Revised August 29, 2014. In addition, remedial delineation sampling was also conducted to determine the extent of impacted soils on the property and to classify soils for future disposal.

Summary of Past Uses of Site and Areas of Concern

Nelson, Pope & Voorhis, LLC conducted a Phase I Environmental Site Assessment (ESA) of the property at 1674-1684 Broadway in August 2014.

The subject property currently contains a two-story commercial building and a one-story commercial building with a loft, which collectively occupy approximately 5,270 square feet. The two-story commercial building contains a vacant commercial unit on the ground floor and office space for the adjacent hardware store on the second floor. The majority of the one-story commercial building is occupied by Henry Distributors hardware store and storage areas for the store, with an additional small commercial unit formerly utilized as a carpet, linoleum and tile store, and one (1) vacant commercial unit. These buildings will be demolished May 2015. The remainder of the property consists of two (2) paved areas for the parking of vehicles and storage space for the hardware store. The structures were reported to have been built in 1925 (according to the NYC Oasis resource).

The two-story commercial building is heated by a natural gas-fired boiler located in the basement of the building. A natural gas-fired hot water heater and a natural gas meter were observed in the basement, in addition to an empty concrete tank vault that previously contained a storage tank. A sealed fuel oil fill port was also observed in the sidewalk adjacent to the basement. There was no evidence of staining or floor drains in the vicinity of the empty tank vault. The hardware store building presently heated by natural gas-fired, ceiling-mounted Modine heaters. Two (2)

275 gallon above ground storage tanks and an inactive fuel oil-fired boiler were observed in the basement beneath the hardware store building, buried by trash and storage materials. It was not possible to determine whether the storage tanks contained liquid or to inspect the concrete floor in the vicinity of the boiler for staining; however, no fuel oil odors were noted and the tanks appeared to be inactive.

An unused, empty 275 gallon storage tank was observed in the loft area of the hardware store; this area of the store appeared to be used for retail sales. The loft area and vacant outdoor areas were utilized for the storage of materials and garbage for the hardware store. Several empty paint cans and empty storage drums were observed in the paved parking area. Some staining was observed on the paved surface, although it is not expected to adversely affect the subsurface resources of the subject property since it is on an impervious surface. In addition, a gooseneck pipe was observed outside of the fencing of the southwestern paved storage area. This pipe evidenced a possible former sanitary system for the concession stand observed in previous Sanborn maps (identified below). There was no other evidence of any drums, floor drains, leaching pools or hazardous materials on the subject property. In addition, there was no other evidence of discharge, areas of stressed vegetation, staining, residue of oils or other toxic substances, pools of discharge, petroleum or chemical odors, or other such indicators noted during the site reconnaissance.

Aerial photographs from 1954, 1966, 1975, 1984, 1994, 2006, 2009 and 2011 were reviewed in order to determine if any prior uses occupied the subject property. The subject property appeared to be developed with the existing buildings in all of the available aerial photographs, and an additional triangular building was present on the southeastern corner of the subject property in the 1954-1984 aerial photographs. The triangular building was not present on the subject property in the latter aerials. The southwestern portion of the property was vacant in all of the aerial photographs. The surrounding area was very densely developed with very little open space or green areas present in all of the aerial photographs.

Sanborn map coverage from 1888, 1908, 1932, 1951, 1962, 1965, 1976, 1978-1980, 1982, 1987, 1988, 1991-1993, 1995, and 2001-2007 was available for the subject property. These maps were reviewed in order to determine the prior uses of the subject property and surrounding area. The northwestern portion of the subject property contained a one-story store and two (2) small accessory structures in the 1888 Sanborn map; and, the eastern edge of the subject property contained one (1) three-story commercial building, three (3) one-story commercial buildings, and one (1) small accessory building in the 1908 Sanborn map. The surrounding area was moderately developed during these years, primarily with dwellings and some stores along Broadway. The existing buildings were present on the subject property in all of the remaining Sanborn maps, in addition to a one-story triangular building on the southeast corner of the subject property in the 1932-1987 Sanborn maps. The larger existing building was identified as a movie theatre with two (2) store units in the 1932-1951 Sanborn maps, a warehouse with store units in the 1962-1979 Sanborn maps, and a church with commercial units in all of the remaining Sanborn maps. The occupants of the additional store units located on the subject property were not specifically identified in any of the Sanborn maps. The southwestern portion of the subject property was vacant in all of the available Sanborn maps, with the exception of the 1932 Sanborn map, when it was depicted as an area for "Open Air Movies," and contained a small concession stand. The surrounding area was densely developed, primarily with dwellings and apartment buildings along Decatur Street and McDonough Street, and commercial uses, churches, and a shelter along Broadway.

USGS Brooklyn Quadrangle Maps from 1900, 1924, 1947, 1956, 1967, 1979 and 1995 were reviewed. This review revealed that the subject property appeared to be developed in the 1900-1947 topographic maps, and was located within a very densely developed area in all of the remaining topographic maps. The surrounding area appeared to be densely developed, with very little open space or green areas. There were several schools, libraries, fire stations, churches and other community facilities in the immediate vicinity of the subject property, in addition to several small parks and playgrounds and a large cemetery.

An extensive government records search found no potential sources of environmental degradation on the subject property. The subject property was not listed as an “E” designated site, or as an historic landmark.

The assessment identified the following with respect to recognized environmental conditions, historic recognized environmental conditions and de minimus conditions in connection with the subject property, subject to the methodology and limitations of this report.

Three (3) recognized environmental conditions were noted on the subject property based on the site reconnaissance, interviews and regulatory agency records review.

1. Two (2) 275 gallon above ground storage tanks and an inactive fuel oil-fired boiler were observed in the basement beneath the hardware store building, buried by trash and storage materials. It was not possible to determine whether the storage tanks contained liquid or to inspect the concrete floor in the vicinity for staining; however, no fuel oil odors were noted and the tanks appeared to be inactive.
2. The laboratory analysis performed on the shallow soil sample collected from the basement of the building located on the subject property in 2013 exhibited elevated concentrations of two (2) metals (lead and mercury) that exceed the NYSDEC Soil Cleanup Objectives by relatively small margins. However, it is possible that the metals found to exceed NYSDEC Soil Cleanup Objectives are naturally occurring in soils.
3. The results of a soil gas survey conducted on the subject property in 2013 revealed that thirteen (13) of the compounds were detected above their respective NYSDOH 2006 database levels in the basement soil vapor sample and eleven (11) of the compounds were detected above their respective NYSDOH 2006 database levels in the soil vapor sample collected from the southeast paved parking area. Several of the volatile organic compounds detected in both of the soil vapor samples exceeded the NYSDOH guidance values by large margins.

No controlled recognized environmental conditions were noted on the subject property based on the site reconnaissance, interviews and regulatory agency records review.

Four (4) de minimus conditions were noted on the subject property based on the site reconnaissance, interviews and regulatory agency records review. Although these are de minimus conditions, recommendations are provided for each condition.

1. An empty concrete tank vault that previously contained a storage tank was observed in the basement beneath the two-story building, and a sealed fuel oil fill port was observed in the sidewalk adjacent to the basement. Since there was no evidence of staining or floor drains in the vicinity of the empty tank vault, the former storage tank is not expected to have adversely affected the subsurface resources of the subject property.
2. Some staining was observed in the southwestern outdoor storage area. Since this staining was observed on a paved surface, it is not expected to adversely affect the subsurface resources of the subject property.
3. Empty drums, empty paint cans, and assorted trash and debris were observed on the subject property. Although not expected to adversely impact the subject property, it is recommended that the drums, paint cans, trash and debris be removed.
4. There were four (4) active boiler violations associated with the two-story building, issued from 2008-2011 for failure to file annual boiler inspection reports. Since boiler records for this building indicated that the boiler was last inspected in April, 2012 and that no defects were identified, these violations are not expected to adversely affect the subject property. However, the violations should be addressed, and the property owner should continue to comply with the New York City Building Department boiler regulations to avoid future violations.

No historic recognized environmental conditions were noted on the subject property based on the site reconnaissance, interviews and regulatory agency records review.

Summary of the Work Performed under the Remedial Investigation

Nelson, Pope & Voorhis, LLC performed the following scope of work in February 20, 2014:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed three (3) soil probes across the entire property, and collected six soil samples from the soil borings for chemical analysis to evaluate soil quality;
3. Groundwater samples were not collected since groundwater was not encountered within 30' bgs; and
4. Installed two soil vapor probes and collected two samples for chemical analysis.

Summary of Environmental Findings

1. Elevation of the property is approximately 65 feet above mean sea level.
2. Groundwater was not encountered during the Phase II ESA.
3. Groundwater flow is believed to be generally southeast beneath the Site towards Jamaica Bay.
4. Depth to bedrock is unknown.
5. Limited soil investigation was conducted during Phase 11. Soil/fill samples results were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives and Restricted Residential Soil Cleanup Objectives as presented in 6NYCRR Part 375-6.8. Soil/fill samples collected during the Phase 11 showed no VOCs or PCBs in any of the soil samples. Several SVOCs consisting of Polycyclic Aromatic Hydrocarbons (PAHs) were detected, but none exceeding Unrestricted Use SCOs. The pesticides 4,4'-DDE (max. of 40.1 µg/kg), 4,4'-DDD (max. of 30.2 µg/kg), 4,4'-DDT (max. of 65.5 µg/kg) exceeded Unrestricted Use SCOs in two shallow samples and one deep sample with chlordane (max. of 2,120 µg/kg) exceeding Unrestricted Use SCOs in one shallow sample. Several

metals including copper (max. of 56.3 mg/kg), lead (max. of 920 mg/kg), mercury (max. of 2.2 mg/kg), and zinc (max. of 383 mg/kg) exceeded Unrestricted Use SCOs in one shallow sample. Of these metals, lead and mercury also exceeded Restricted Residential Use SCOs. Overall, the findings were consistent with observations for historic fill sites in areas throughout NYC. Additional soil investigations will be conducted and the investigation report will be amended.

6. Groundwater was not encountered within a depth of 30 feet below grade during the RI and no samples taken. Groundwater will be investigated along with proposed soil investigations.
7. Soil vapor results collected during the Phase 11 were compared to the compounds listed in in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion dated October 2006. The two soil vapor samples showed high levels of petroleum related VOCs in all soil vapor samples with total concentrations (BTEX) ranging from 289 $\mu\text{g}/\text{m}^3$ to 1,068 $\mu\text{g}/\text{m}^3$. Of the chlorinated VOCs, only tetrachloroethylene (PCE) was detected at 52 $\mu\text{g}/\text{m}^3$ in one soil vapor sample. The concentration for PCE was above the monitoring level range established within the State DOH soil vapor guidance matrix.

For more detailed results, consult the Phase II report found in Appendix 5. Based on an evaluation of the data and information from the Phase II and this RAWP, disposal of significant amounts of hazardous waste is suspected at this site.

2.0 REMEDIAL ACTION OBJECTIVES

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

Soil

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

Soil Vapor

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

3.0 REMEDIAL ALTERNATIVES ANALYSIS

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

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

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

Alternative 1 involves:

- Selection of NYSDEC 6NYCRR Part 375 Unrestricted Use (Track 1) Unrestricted Use Soil Cleanup Objectives (SCOs);
- Removal of all soil/fill exceeding Track 1 Unrestricted Use SCOs throughout the Site and confirmation that Track 1 Unrestricted Use SCOs have been achieved with post-excavation endpoint sampling. Excavation for construction of the new building's cellar level would take place to a depth of approximately 10 to 12 feet below grade across the entire Site. If soil/fill containing analytes at concentrations above Track 1 Unrestricted Use SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building's cellar is complete, additional excavation will be

performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCO;

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

Alternative 2 involves:

- Establishment of Site-Specific (Track 4) SCOs;
- Removal of all soil/fill exceeding Track 4 Site-Specific SCOs and confirmation that Track 4 Site-Specific SCOs have been achieved with post-excavation endpoint sampling. Historic fill at this Site extends to depths of four feet below grade. Excavation for the construction of the new building's cellar level would take place to a depth of approximately 10-12 feet bgs across the entire Site footprint. If soil/fill containing analytes at concentrations above Track 4 Site-Specific SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building is complete, additional excavation will be performed to meet Track 4 Site-Specific SCOs;
- Installation of a soil vapor barrier beneath the new building slab and along foundation sidewalls to prevent potential exposures from soil vapor;
- Placement of a final cover over the entire building footprint to prevent exposure to remaining soil/fill;
- Establishment of use restrictions including prohibitions on the use of groundwater from the Site; and prohibitions on other sensitive site uses, such as farming or vegetable gardening, to prevent future exposure pathways; and prohibition of a higher level of land use without OER approval;
- Establishment of an approved Site Management Plan (SMP) to ensure long-term management of these Engineering and Institutional Controls including the performance of periodic inspections and certification that the controls are performing as they were

intended. The SMP will note that the property owner and property owner's successors and assigns must comply with the approved SMP; and

- Establishment of a deed restriction to ensure long term management of residual materials on the property

3.1 THRESHOLD CRITERIA

Protection of Public Health and the Environment

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

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

Alternative 2 would achieve comparable protections of human health and the environment by excavating the historic fill at the Site and by ensuring that remaining soil/fill on-Site meets Track 4 Site-Specific SCOs, as well as by placement of Institutional and Engineering controls including a composite cover system. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. A vapor barrier and SSDS would mitigate any vapor issues. Implementing Institutional Controls including a Site Management Plan and deed restriction would ensure that the composite cover system remains intact and protective. Establishment of Track 4 Site-Specific SCOs would minimize the risk of contamination leaching into groundwater.

For both Alternatives, potential exposure to the contaminated soils or groundwater during construction would be minimized by implementing a Construction Health and Safety Plan (CHASP), an approved Soil/Materials Management Plan, and Community Air Monitoring Plan (CAMP). Since groundwater is at a minimum 60 feet below grade and not anticipated during construction and remediation, dewatering activities will not be required during the Site

development. As such, there is minimal risk of contact with groundwater. In future, potential contact with contaminated groundwater would be prevented as its use is prohibited by city laws and regulations. Potential future migration of off-Site soil vapors into the new building would be prevented by installing a passive SSDS and vapor barrier below the proposed new building slab.

3.2. BALANCING CRITERIA

Compliance with Standards, Criteria and Guidance (SCGs)

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

Alternative 1 would achieve compliance with the remedial goals, chemical specific SCGs, and RAOs for soil through removal to achieve Track 1 Unrestricted Use SCOs and Protection of Groundwater SCOs. Compliance with SCGs for soil vapor will also be achieved by installing a passive SSDS and vapor/moisture barrier below the new building's basement slab and continuing the vapor barrier around foundation walls, as part of development. As part of development, a 6-inch thick building concrete slab will prevent human exposure to residual soil/fill remaining under the Site.

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

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

Short-term effectiveness and impacts

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

Both Alternative 1 and Alternative 2 have similar short-term effectiveness during their 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 historic fill material is encountered below the excavation depth of the proposed building. However, focused attention to means and methods during the remedial action during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize or negate the overall impact of these activities.

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

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

Long-term effectiveness and permanence

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

Alternative 1 would achieve long-term effectiveness and permanence related to on-Site contamination by permanently removing all impacted soil/fill above Track 1 Unrestricted Use SCOs. Removal of on-Site contaminant sources will prevent future groundwater contamination. Additionally, the proposed development plan includes the installation of a cover system as well as a SSDS and vapor barrier which would prevent potential future migration of soil vapors into the basement and building.

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

Both alternatives would result in removal of soil contamination exceeding their respective SCOs, providing the highest level, most effective and permanent remedy over the long-term with respect to a remedy for contaminated soil, which will eliminate any migration to groundwater. Potential sources of soil vapor and groundwater contamination will also be eliminated as part of the remedy.

Reduction of toxicity, mobility, or volume of contaminated material

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

Alternative 1 would permanently eliminate the toxicity, mobility, and volume of contaminants from on-Site soil by excavating and removing all soils that exceed Track 1 Unrestricted Use SCOs.

Alternative 2 would remove most of the historic fill at the Site thus would permanently eliminate the toxicity, mobility, and volume of contaminants, and any remaining on-Site soil beneath the new building would meet Track 4 Site-Specific SCOs. The Site will be capped via the proposed construction of a six-story building which will cover the entire Site footprint with a concrete slab. Permanent institutional controls including a Site Management Plan and deed restriction will be established to protect future site workers and/or residents should the need to break the site cap be necessary.

Alternative 1 would eliminate a greater total mass of contaminants on Site. The removal of soil to 10 to 12 feet for the new development in both scenarios would probably result in relatively minor differences between these two alternatives.

Implementability

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

The techniques, materials and equipment to implement 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 any of the activities proposed.

Cost effectiveness

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

Since historic fill at the Site was found during the Phase II to only extend to a depth of up to 4 feet below grade, and the new building requires excavation of the entire Site to a depth of 10 to 12 ft, the costs associated with both Alternative 1 and Alternative 2 will likely be the comparable. Costs associated with Alternative 1 could potentially be higher than Alternative 2 if soil with analytes above Track 1 Unrestricted Use SCOs is encountered below the excavation depth required for development. Additional costs would include installation of additional shoring/underpinning, 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 Site Management Plan as part of Alternative 2.

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

Community Acceptance

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

Based on the overall goals of the remedial program and initial observations by the project team, both of the alternatives are expected to be acceptable to the community. This RAWP will be subject to and undergo public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternatives and selected remedial action. This public comment will be considered by OER prior to approval of this plan. The Citizen Participation Plan for the project is provided in Appendix 1. Observations here will be supplemented by public comment received on the RAWP.

Land use

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

Both Alternatives for remedial action at the site are comparable with respect to the proposed use and to land uses in the vicinity of the Site. The proposed use is consistent with the existing zoning designation for the property and is consistent with recent development patterns. The Site is surrounded by residential and commercial properties and the proposed alternative provides comprehensive protection of public health and the environment for these uses. Improvements in the current environmental condition of the property achieved by the alternatives are also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse. Both alternatives are equally protective of natural resources and cultural resources.

Additional land use factors such as accessibility to infrastructure, proximity to cultural resources, population growth patterns and projections, and proximity to natural resources have

been taken into consideration as part of the development plans for the Site and are not considered to be inconsistent with the remedial alternatives and the planned future use of the Site.

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 shortest trucking routes during off-Site disposal of historic fill and other soils, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. The New York City Clean Soil Bank program may be utilized for reuse of native soils. To the extent practicable, energy efficient building materials, appliances, and equipment will be utilized to complete the development. A complete list of green remedial activities considered as part of the NYC VCP is included in the Sustainability Statement, included as Appendix 2.

4.0 REMEDIAL ACTION

4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

The preferred remedial action alternative is the Track 1, Alternative 1. 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 standard 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. Selection of NYSDEC 6NYCRR Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs);
4. Additional Site characterization sampling involving soils, groundwater and soil vapor will be conducted and the results will be submitted as an addendum report to OER.
5. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas;
6. Completion of additional Waste Characterization Study prior to excavation activities if required by disposal facility. Waste characterization soil samples will be collected at a frequency specified by disposal facility;
7. Excavation and removal of soil/fill exceeding Unrestricted Use (Track 1) SCOs. For development purposes, the entire Site will be excavated to a depth of 12 feet below

grade for construction of the new building's cellar level. Approximately 7,000 tons of will be excavated and removed from this Site;

8. 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;
9. Management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials;
10. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations;
11. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities;
12. Collection and analysis of five end-point samples to determine the performance of the remedy with respect to attainment of SCOs;
13. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations;
14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations;
15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations; and
16. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP.

If Track 1 Unrestricted Use SCOs are not achieved, the following construction elements implemented as part of new development will constitute Engineering Controls:

17. As part of new development, installation of a vapor barrier consisting of [insert Vapor Barrier] beneath the building slab and behind the foundation walls.
18. As part of new development, installation of a passive sub-slab depressurization system (SSDS), with the ability to turn active if necessary, beneath the basement foundation to prevent any potential future exposures from off-Site soil vapor;
19. As part of new development, construction and maintenance of an engineered composite cover consisting of a 6” thick concrete building slab and concrete sidewalks to prevent human exposure to residual soil/fill remaining under the Site;
20. If Track 1 SCOs are not achieved, submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency; and
21. If Track 1 SCOs are not achieved, the property will record a Declaration of Covenants and Restrictions that includes a listing of Engineering Controls and Institutional Controls and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT

Track 1 Unrestricted Use SCOs are proposed for this project. The SCOs for this Site are listed in NYCRR Part 375, Table 6.8(a). If Track 1 Unrestricted Use SCOs are not achieved, the following Site Specific SCOs will be used:

<u>Contaminant</u>	<u>Track 4 SCOs</u>
Total SVOCs	150 ppm
Barium	600 ppm
Lead	1000 ppm
Mercury	1.5 ppm

Soil and materials management on-Site and off-Site, including excavation, handling and disposal, will be conducted in accordance with the Soil/Materials Management Plan in Appendix 3. The location of planned excavations is shown in Figure 4.

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

Estimated Soil/Fill Removal Quantities

The total quantity of soil/fill expected to be excavated and disposed off-Site is 7000 tons (I calculated 7000 tons based on 11,000 sf X11 feet, if different, please correct).

The proposed disposal locations for Site-derived impacted materials will be reported promptly to the OER Project Manager.

End-Point Sampling

Removal actions for development purposes under this plan will be performed in conjunction with confirmation soil sampling. Five (5) confirmation samples will be collected from the base of the excavation at locations shown in Figure 5. For comparison to Track 1 Unrestricted Use SCOs, samples will be analyzed for VOCs, SVOC, pesticides, PCBs and metals according to analytical methods described below.

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

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.

2. For excavations 20 to 300 feet in perimeter:

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

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

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

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

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

Soil analytical methods will include:

- Volatile organic compounds by EPA Method 8260;
- Semi-volatile organic compounds by EPA Method 8270;

- Target Analyte List metals; and
- Pesticides/PCBs by EPA Method 8081/8082.

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

Quality Assurance/Quality Control

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

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

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

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

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

- Rinse with distilled or deionized water

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

Import and Reuse of Soils

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

4.3 ENGINEERING CONTROLS

The excavation required for the proposed Site development will achieve Track 1 Unrestricted Use SCOs. Track 1 remedial actions do not require Engineering Controls. However, the construction elements below will be incorporated into the foundation design as part of the new development. If Track 1 is not achieved, these elements will constitute Engineering Controls that will be employed in the remedial action to address residual contamination remaining at the Site.

- Composite cover system consisting the 6-inch thick concrete building slabs;
- Vapor Barrier system;
- Passive Sub-Slab Depressurization System

Composite Cover System

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. This composite cover system is comprised of the 6-inch thick concrete building slab and sidewalls of the proposed building.

Appendix 5 includes the location of each cover type at the Site.

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

Vapor Barrier

As part of development, migration of potential soil vapor from on-Site or off-Site sources in the future will be mitigated with a combination of the concrete building slab as well as a passive SSDS and vapor barrier. The vapor barrier will consist of Grace Preprufe 300R which is a 46 mil high density polyethylene (HDPE) installed beneath entire building basement concrete slab and Grace Preprufe 160R which is a 31-mil high density polyethylene (HDPE) installed along foundation sidewalls. The vapor barrier will be installed prior to pouring the building's concrete slab behind and alongside the existing foundation slab. The vapor barrier will up the foundation sidewalls in accordance with manufacturer specifications. The specifications for installation will be provided to the construction management company and the foundation contractor or installer of the liner. The specifications state that all vapor barrier seam, penetrations, and repairs will be sealed either by the tape method or weld method, according to the manufacturer's recommendations and instructions.

The project's Professional Engineer licensed by the State of New York will have primary direct responsibility for overseeing the implementation of the vapor barrier. The extent of the proposed vapor barrier membrane is provided in Figure 6. The manufacturer specification for the vapor barrier is included in Appendix 6.

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

Sub-Slab Depressurization System

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

The passive SSDS will consist of a network of sub-slab 4" ID Schedule 40 PVC piping connected to a riser pipe (via a vertical suction point pipe penetrating the building slab) that leads to a discharge point located above the roof-line. The riser pipe will consist of a 4" ID cast iron pipe with fire stops and any other requirements. All sub-slab piping will be sealed with plumber's cement (or similar product) to be applied according to the manufacturer's specifications. The riser pipe joints will consist of cast iron, no-hub couplers in accordance with applicable building code. All piping joints will be inspected once the system is installed. Temporary monitoring points will be located throughout the building slab to confirm adequate vacuum and system connectivity. Detailed information regarding this SSDS system is contained in Appendix 8

4.4 INSTITUTIONAL CONTROLS

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

If Track 1 SCOs are not achieved, Institutional Controls for this remedial action are:

- Recording of an OER-approved Declaration of Covenant and Restrictions (DCR) with the City Register or county clerk, as appropriate. The DCR will include a description of all ECs and ICs, will summarize the requirements of the Site Management Plan, and will note that the property owner and property owner's successors and assigns must comply with the DCR and the approved SMP. The recorded DCR will be submitted in the Remedial Action Report. The DCR will be recorded prior to OER issuance of the Notice of Completion;

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

4.5 SITE MANAGEMENT PLAN

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

The SMP will provide a detailed description of the procedures required to manage residual soil/fill left in place following completion of the remedial action in accordance with the

Voluntary Cleanup Agreement with OER. This includes a plan for: (1) implementation of EC's and ICs; (2) implementation of monitoring programs; (3) operation and maintenance of EC's; (4) inspection and certification of EC's; and (5) reporting.

Site management activities, reporting, and EC/IC certification will be scheduled by OER on a periodic basis to be established in the SMP and will be subject to review and modification by OER. The Site Management Plan will be based on a calendar year and certification reports will be due for submission to OER by July 30 of the year following the reporting period.

4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

The objective of the qualitative exposure assessment is to identify potential receptors 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 is believed to be the predominant source of contaminants at the site. Historic fill is present throughout the site from grade to approximately 4 feet bgs. Based on results of the RIR, the contaminants of concern are:

Soil

- Pesticides, including 4,4'-DDD, 4,4'-DDT, 4,4'-DDE, and chlordane were identified exceeding Unrestricted Use SCOs; and

- Metals, including copper, lead, mercury, and zinc exceeding Unrestricted Use SCOs with lead and mercury also exceeding Restricted Residential Use SCOs.

Groundwater

- Groundwater samples were not collected during the RI

Soil Vapor

- Chlorinated VOC tetrachloroethylene (PCE) detected above NYS DOH monitoring thresholds
- Petroleum-related hydrocarbons including BTEX were detected at elevated concentrations.

Nature, Extent, Fate and Transport of Contaminants

Metals and pesticides were detected in the shallow soil underneath the current building's basement and are associated with historic fill placed beneath the ground surface at this site. Pesticides and metals in the soil vary throughout the site and indicative of contamination which was present in the historic fill. Groundwater was not encountered in previous investigations and lies at a depth greater than 30 feet bgs. The chlorinated compound, tetrachloroethylene (PCE), was detected in one soil gas sample at elevated concentrations, but not detected in any of the soil samples collected at the Site.

Potential Routes of Exposure

The five elements of an exposure pathway are: (1) contaminant source, (2) contaminant release and transportation, (3) exposure points, (4) exposure routes, and (5) receptor population.. An exposure pathway is considered complete when all five elements of an exposure pathway are documented. A potential exposure path way exists when any one of the five elements comprising an exposure pathway cannot be documented. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway has not existed in the past, does not exist in the present, and will never exist in the future. Three potential primary routes exist by which chemicals can enter the body:

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

Existence of Human Health Exposure

Current Conditions

The entire site is currently developed with an existing building. There are no areas where human exposure to contaminated soil is possible as the site is covered by the building slab and the remainder of the property consists of paved parking areas. As such, potential migration pathway is likely not complete for dermal absorption, ingestion, and inhalation. The Site is served by 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. There is no building currently constructed on the Site, therefore there is no potential for soil vapor to intrude into an on-Site building.

Construction/Remediation Activities

During remedial action, construction workers will be exposed to site constituents including metals in soils as a result of on-Site construction and excavation activities. The proposed Site development includes the removal of existing soil to a depth of approximately 10-12 feet across the entire Site and construction of a new 6-story building with a full basement floor slab over the entire footprint of the Site. On-Site construction workers potentially could ingest, inhale or have dermal contact with any exposed impacted soil, and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through the implementation of the Soil/Materials Management Plan, storm-water pollution prevention, dust controls, and through the implementation of the Community Air-Monitoring Program and a Construction Health and Safety Plan.

Proposed Future Conditions

Under future remediated conditions, all soils in excess of Track 1 Unrestricted Use SCOs will be removed. The Site will be fully capped, limiting potential direct exposure to soil

remaining in place, and a vapor barrier system as well as the SSDS will prevent any exposure to potential off-Site soil vapors in the future. The Site is served by a public water supply, and groundwater is not used at the Site for potable supply. There are no plausible off-Site pathways for ingestion, inhalation, or dermal exposure to contaminants derived from the Site under future conditions.

Receptor Populations

On-Site Receptors

The Site is currently a vacant lot under redevelopment with construction trailers and workers. A perimeter fence restricts access to the Site. Therefore, the only potential on-Site receptors are Site representatives, workers, visitors, and trespassers. Once the Site is redeveloped, the on-Site potential sensitive receptors will include workers, consumers, child and adult residents and visitors.

Off-Site Receptors

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

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

Overall Human Health Exposure Assessment

Based upon this analysis, complete on-site exposure pathways appear to be present only during current conditions and the remedial action phase. Under current conditions, on-Site exposure pathways do not exist for site personnel and are also further minimized by preventing access to the Site. During the remedial action, on-Site and off-Site exposures to contaminated dust from historic fill material will be addressed through dust controls, and through the implementation of the Community Air Monitoring Program, the Soil/Materials Management Plan, and a Construction Health and Safety Plan. After the remedial action is complete, there will

be no remaining exposure pathway to on-Site soil/fill, as all soil above Track 1 Unrestricted Use SCOs will have been removed and a vapor barrier will have been installed as part of development. The SSDS and vapor barrier system will prevent potential vapor intrusion. The composite cover system and use restrictions will prevent contact with residual soil or groundwater and continued protection after the remedial action will be achieved by the implementation of site management including periodic inspection and certification of the performance of remedial controls. Potential post-construction use of groundwater is not considered an option because groundwater in this area of New York City is not used as a potable water source. There are no surface waters in close proximity to the Site that could be impacted or threatened.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 PROJECT ORGANIZATION AND OVERSIGHT

Principal personnel who will participate in the remedial action include Thomas F. Lembo, PE of N&P who will serve as the on-site Environmental Engineer. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Mr. Eric C. Arnesen and Steven J. McGinn of NP&V.

5.2 SITE SECURITY

Site access will be controlled by gated entrances to the fenced property.

5.3 WORK HOURS

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

5.4 CONSTRUCTION HEALTH AND SAFETY PLAN

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

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

Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign an HASP acknowledgment. Site-specific training will be provided to field

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

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

5.5 COMMUNITY AIR MONITORING PLAN

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

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

VOC Monitoring, Response Levels, and Actions

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

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

5.6 AGENCY APPROVALS

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

5.7 SITE PREPARATION

Pre-Construction Meeting

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

Mobilization

Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation, equipment mobilization (including securing all sampling equipment needed for the field investigation), marking/staking sampling locations and

utility mark-outs. Each field team member will attend an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

Utility Marker Layouts, Easement Layouts

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

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

Equipment and Material Staging

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

Stabilized Construction Entrance

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

Truck Inspection Station

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

Extreme Storm Preparedness and Response Contingency Plan

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

Storm Preparedness

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

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted

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

Storm Response Reporting

A site inspection report will be submitted to OER at the completion of site inspection. An inspection report established by OER is available on OER's website (www.nyc.gov/oer) and will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the OER project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number. Damage

and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYS DEC; description of corrective actions; schedule for corrective actions. This report should be completed and submitted to OER project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

5.8 TRAFFIC CONTROL

Drivers of trucks leaving the NYC VCP Site with soil/fill will be instructed to proceed without stopping in the vicinity of the site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site is to pull out of the site and head east on Decatur Street, and then proceed to the disposal facility.

5.9 DEMOBILIZATION

Demobilization will include:

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

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

5.10 REPORTING AND RECORD KEEPING

Daily Reports

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

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

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

Record Keeping and Photo-Documentation

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

5.11 COMPLAINT MANAGEMENT

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

5.12 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

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

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

6.0 REMEDIAL ACTION REPORT

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

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

Remedial Action Report Certification

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

I, _____, am currently a professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the Site name Site number.

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

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

7.0 SCHEDULE

The 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 three (3) month remediation period is anticipated.

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAWP	0	1
Fact Sheet 2 announcing start of remedy	0	-
Mobilization	1	-
Remedial Excavation	1	5
Demobilization	6	2
Submit Remedial Action Report	10	1

APPENDIX 1

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Alembic Community Development have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Voluntary Cleanup Program. This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYC VCP, Alembic Community Development will maintain a repository for project documents and provide public notice at specified times throughout the remedial program. This Plan also takes into account potential environmental justice concerns in the community that surrounds the project Site. Under this Citizen Participation Plan, project documents and work plans are made available to the public in a timely manner. Public comment on work plans is strongly encouraged during public comment periods. Work plans are not approved by the NYC Office of Environmental Remediation (OER) until public comment periods have expired and all comments are formally reviewed. An explanation of cleanup plans in the form of a public meeting or informational session is available upon request to OER's project manager assigned to this Site, Sarah Pong, who may be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 442-8342.

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. Brookfield will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

Brooklyn Public Library
Saratoga Branch
8 Thomas S. Boyland Street
718-573-5224

Sunday 10:00 am to 6:00 pm

Monday 8:00 am to 11:00 pm

Tuesday 8:00 am to 11:00 pm

Wednesday 8:00 am to 11:00 pm

Thursday 8:00 am to 11:00 pm

Friday 8:00 am to 8:00 pm

Saturday 10:00 am to 6:00 pm

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

Identify Issues of Public Concern. No specific issues of concern to stakeholders proximate to the project site were identified during a review of this project.

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 Brookfield, reviewed and approved by OER prior to distribution and mailed by Brookfield. Public comment is solicited in public notices for all work plans developed under the NYC Voluntary Cleanup Program. Final review of all work plans by OER will consider all public comments. Approval will not be granted until the public comment period has been completed.

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

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

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

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

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

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

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

APPENDIX 2

SUSTAINABILITY STATEMENT

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

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.

Installation of an SSDS system and vapor barrier will be incorporated into the building design and can eliminate the risk of future migration of soil vapor contamination from off-Site.

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

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

An estimate of the number of tons of clean, non-virgin materials that will be reused under this plan will be quantified and reported in the RAR.

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

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX 3

SOIL/MATERIALS MANAGEMENT PLAN

1.1 SOIL SCREENING METHODS

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

1.2 STOCKPILE METHODS

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

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

1.3 CHARACTERIZATION OF EXCAVATED MATERIALS

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

1.4 MATERIALS EXCAVATION, LOAD-OUT AND DEPARTURE

The PE/QEP overseeing the remedial action will:

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

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

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

1.5 OFF-SITE MATERIALS TRANSPORT

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

Outbound truck transport route includes exiting the Site and traveling south on Ninth Avenue and then taking using the Lincoln Tunnel to leave Manhattan. This routing takes into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c) minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

1.6 MATERIALS DISPOSAL OFF-SITE

The following documentation will be established and reported by the PE/QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE/QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in Manhattan, New York under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Enrollee. The letter will include as an attachment a summary of all chemical data for the material being transported; and (2) a letter from each disposal facility stating it is in receipt of the correspondence (1, above) and is approved to accept the material. These documents will be included in the RAR.

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

All impacted soil/fill or other waste excavated and removed from the Site will be managed as regulated material and will be disposed in accordance with applicable laws and regulations. Historic fill and contaminated soils taken off-Site will be handled as solid waste and will not be disposed at a Part 360-16 Registration Facility (also known as a Soil Recycling Facility).

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization

sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the RAR. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the RAR. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

1.7 MATERIALS REUSE ON-SITE

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to the NYC VCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed. No material reuse is anticipated at this 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, and prior to backfilling, the top of the residual soil/fill will be defined by one of three methods: (1) placement of a demarcation layer. The demarcation layer will consist of geosynthetic fencing or equivalent material to be placed on the surface of residual soil/fill to provide an observable reference layer. A description or map of the approximate depth of the demarcation layer will be provided in the SMP; or (2) a land survey of the top elevation of residual soil/fill before the placement of cover soils, pavement and associated sub-soils, or other materials or structures or, (3) all materials beneath the approved cover will be considered impacted and subject to site management after the remedy is complete. Demarcation may be established by one or any combination of these three methods. As appropriate, a map showing the method of demarcation for the Site and all associated documentation will be presented in the RAR.

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

1.9 IMPORT OF BACKFILL SOIL FROM OFF-SITE SOURCES

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. The import of backfill soil from off-site sources is not anticipated at the Site.

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

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

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

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

Source Screening and Testing

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

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

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

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

1.10 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable laws and regulations. Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYC DEP). The NYC DEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. Discharge to the New York City sewer system will require an authorization and sampling data demonstrating that the

groundwater meets the City's discharge criteria. The dewatering fluid will be pretreated as necessary to meet the NYC DEP discharge criteria. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility.

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

1.11 STORM-WATER POLLUTION PREVENTION

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

1.12 CONTINGENCY PLAN

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

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

1.13 ODOR, DUST AND NUISANCE CONTROL

Odor Control

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

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

Dust Control

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

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

This dust control plan is capable of controlling emissions of dust. If nuisance dust emissions are identified, work will be halted and the source of dusts will be identified and corrected. Work will not resume until all nuisance dust emissions have been abated. OER will

be notified of all dust complaint events. Implementation of all dust controls, including halt of work, will be the responsibility of the PE/QEP's responsible for certifying the Remedial Action Report.

Other Nuisances

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

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

APPENDIX 4

HEALTH AND SAFETY PLAN

NELSON, POPE & VOORHIS, LLC

HEALTH AND SAFETY

PLAN

FOR THE

**HENRY APARTMENTS SITE A
BROOKLYN, NEW YORK**

Prepared by:
Future Environment Designs, Inc.
6800 Jericho Turnpike, Suite 120W
Syosset, NY 11791

June 2, 2015

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STATEMENT OF COMMITMENT

NELSON, POPE & VOORHIS, LLC employees and subcontractors may be exposed to risks from hazardous conditions related to various work tasks including but limited to emergency response, utility line repairing, working in confined spaces, and trenches, etc. **NELSON, POPE & VOORHIS, LLC** policy is to minimize the possibility of work related injury through the use of personal protective equipment; engineering controls, continued training and the use of fully trained and experienced supervisors. **NELSON, POPE & VOORHIS, LLC** has implemented this corporate health and safety policy to help protect personnel to the maximum reasonable extent.

This corporate Health and Safety Plan applies to **NELSON, POPE & VOORHIS, LLC** personnel, as well as directly or third party contracted personnel where operations involve actual or potential exposure to safety or health hazards. This safety plan describes emergency response procedures for actual and potential physical and chemical hazards that **NELSON, POPE & VOORHIS, LLC** employees and subcontractors may be exposed to as part of related job tasks. It is also intended to give guidance to all personnel.

NELSON, POPE & VOORHIS, LLC will require that all personnel take action in accordance with this safety plan, and **NELSON, POPE & VOORHIS, LLC** requests that its subcontractor's protect their personnel in a manner that they deem necessary or sufficient.

1.0 INTRODUCTION

NELSON, POPE & VOORHIS, LLC had this Health and Safety Plan prepared to serve as a guide for sample collection activities (including collecting samples of soil, groundwater and/or soil vapor) in compliance with Occupational Safety and Health Standards for Construction (29 CFR 1926). The following principles formulate the basis of this plan:

- All accidents and injuries can be prevented.
- Management and employees together are responsible for maintaining safe working conditions and for preventing injuries
- Working safely is as important as working efficiently and productively.
- A commitment must be made by management of various entities involved in the project to provide the necessary resources, adequate job training, and education to create a safe work environment.

Within this plan, **NELSON, POPE & VOORHIS, LLC** had recommendations outlined for the adoption of safe policies, establishment of specific safety goals and objectives, implementation procedures, emergency response guidelines, and the establishment of a record-keeping format.

Successful implementation will require the full cooperation of the sample collection team, including the prime contractor, subcontractors, and all individuals involved with sample collection activities. Responsibilities must be clearly established, procedural guidelines followed, potential hazards identified, and remedial actions taken.

As an integral part of the remediation team, **NELSON, POPE & VOORHIS, LLC** will oversee the contractor's activities, inspect the jobsite conditions, and make recommendations to guide the proper implementation of this safety plan.

2.0 POLICY STATEMENT

It is **Nelson, Pope & Voorhis, LLC** belief that our employees and the employees of the contractor and subcontractors are the most important assets on the project and that the preservation of the employee's safety and health must remain a constant consideration in every phase of the project.

It is our intent to provide a health and safety plan that will create a work environment as free of hazards as possible. All employees are responsible for working safely and productively; always remaining aware of hazards in their jobs and following recognized safe work practices, including the use of Personal Protective Equipment (PPE).

It is also **NELSON, POPE & VOORHIS, LLC** belief that any safety and health program must have total employee involvement. Therefore, this program has the management's highest priority, support, and participation.

2.1 SCOPES AND APPLICABILITY

The goal of **NELSON, POPE & VOORHIS, LLC** Health and Safety Plan for sample collection activities is to provide an injury free and safe work place. To achieve this goal all employees must assume the necessary accountability and responsibility to ensure that the provisions and guidelines of the **NELSON, POPE & VOORHIS, LLC** Health and Safety Plan are implemented.

All personnel on site, including contractors and subcontractors, shall be informed of site work procedures and any potential fire, explosion, health or safety hazards of the operation. It is important that all employees be on the lookout for unsafe conditions. If you observe a condition that is unsafe, the following actions are to be taken:

- If possible, correct the condition immediately. Many safety hazards like a piece of missing guardrail are easy to correct.
- If you are not able to take corrective action, report the condition to your immediate supervisor for correction.
- All company employees with any supervisory responsibility have been instructed to take corrective action or contact someone who can when a safety concern is raised.

We appreciate your cooperation in reporting all safety problems. If we all work together, we can all work safely.

This plan must be reviewed and an agreement to comply with the requirements must be signed by all personnel prior to entering the work area.

2.2 Personnel

The organizational structure will be reviewed and updated periodically by the qualified individual, and Health and Safety Officer.

Project Manager: _____ Steven J. McGinn, Nelson, Pope & Voorhis _____

Record keeper: _____ Steven J. McGinn, Nelson, Pope & Voorhis _____

Field Supervisor: _____ Steven J. McGinn, Nelson, Pope & Voorhis _____

2.2.1 Site Specific Health and Safety Personnel

The site Health and Safety Officer (HSO) has total responsibility for ensuring that the provisions of this Safety and Health Plan are adequately and properly implemented on the site. Changing site condition may require decisions to be made concerning adequate protection programs. Therefore it is important for personnel assigned as HSO be experienced and meet the additional training requirements specified by OSHA in 29 CRF 1910.120 and 29CFR 1926.62. The HSO is also responsible for conducting site inspections on a regular basis in order to ensure the effectiveness of this plan.

The HSO at this site is: Steven J. McGinn, Nelson, Pope & Voorhis 631-786-8494

Designated alternatives include: Eric Arnesen, Nelson Pope & Voorhis 631-219-8438

Other Contractors: _____

Other: _____

2.3 Objectives

NELSON, POPE & VOORHIS, LLC Health and Safety Plan for collecting samples of soil, groundwater and/or soil vapor been developed to outline the requirements of our employees and subcontractors relative to job site safety. **NELSON, POPE & VOORHIS, LLC** Health and Safety Plan shall be implemented in conjunction with and/or supplemental to the Health and Safety Plan of the Client and/or Owner. The Health and Safety Plan shall be reviewed periodically and be revised, upgraded or changed as needed to remain current with OSHA regulations.

2.4 Management Commitment

NELSON, POPE & VOORHIS, LLC is committed to providing a safe and healthy workplace and support the contractor fully in achieving these goals. To ensure full compliance with this safety and health plan, **NELSON, POPE & VOORHIS, LLC** will take the following actions:

- Appoint a Safety Coordinator for each job site with full enforcement authority over safety matters.
- Establish annual job site goals and objectives
- Promote and take part in employee's safety training programs.
- Establish and enforce disciplinary procedures for employees.
- Support the safety and health program with people, authority, and training.
- Establish accountability and responsibilities for management and employees to follow.
- Record all instances of violations and investigate all accidents.

2.5 Employee's Responsibilities

It is the duty of **NELSON, POPE & VOORHIS, LLC** and our Subcontractor's employees to know the safety rules and conduct their work in compliance with the Health and Safety Plan. Disregard of the safety and health rules shall be considered grounds for disciplinary action up to and including termination. It shall be the duty of each employee to make full use of the safeguards provided for their protection. Every employee shall receive an orientation when hired and receive a copy of the Health and Safety Plan. The following is a partial list of these rules:

- Read, understand, and follow safety and health rules and procedures.
- Employees working in areas where there is possible danger of injury will wear Personal Protective Equipment (PPE) at all times.
- Suitable work clothes shall be worn at all times, including hard hats and safety glasses.
- Employees observed working in a manner which might cause injury to themselves or other workers shall be warned of the danger and immediately correct their method of operation.
- Employees shall report all injuries immediately, no matter how slight it appears, to their supervisor/foreman, and seek treatment promptly.
- Employees shall be aware of the location of first aid, firefighting equipment, and other Safety Devices.
- Employees shall attend any and all required safety and health meetings.
- **Until they are properly trained**, employees are not to perform potentially hazardous tasks, or to use any hazardous material. Employees are to follow all proper procedures when performing those tasks.

3.0 IMPLEMENTATION

All persons who come on site for any reason during sample collection activities are required to comply with the specific safety regulations established for the project site and with appropriate Federal, State, and Local laws and regulations. In addition, visitors will be expected to comply with relevant OSHA requirements such as medical monitoring, training, and respiratory protection. **NELSON, POPE & VOORHIS, LLC** subcontractors are committed by contract to observe and comply with applicable safety regulations including the Health and Safety Plan. **NELSON, POPE & VOORHIS, LLC** Safety Coordinator shall attend site safety meetings. The safety coordinator shall discuss problems that have arisen or that are anticipated. Accidental injuries as well as near –misses that occurred in the previous week shall be discussed along with measures to be taken to prevent them from reoccurring. Visitors will also be expected to provide their own protective equipment.

3.1 Recommended Contractor/Sample Collection Manager Responsibilities

In order for **NELSON, POPE & VOORHIS, LLC** to implement our Health and Safety Plan for sample collection activities, it is recommended that the prime contractor/sample collection manager do the following:

1. Abide by all safety and health regulations, and standards.
2. Notify **NELSON, POPE & VOORHIS, LLC** and all other contractors when actions or activities undertaken by them could affect health or safety of **NELSON, POPE & VOORHIS, LLC** employees or other companies.
3. Inform **NELSON, POPE & VOORHIS, LLC** of all injuries to workers.
4. Report to **NELSON, POPE & VOORHIS, LLC** any unsafe conditions that come to their attention.
5. The Site Supervisor shall insure that all subcontractors and suppliers comply with this policy.

3.2 The Trade Subcontractor's Responsibilities

1. Notify the contractor/sample collection manager's safety representative and **NELSON, POPE & VOORHIS, LLC** if the activities of another trade contractor generate a hazard to the safety of his workmen.
2. Notify the contractor/sample collection manager's safety representative and **NELSON, POPE & VOORHIS, LLC** furnishing the names of his employees who are qualified in First Aid.
3. Notify the contractor/sample collection manager's safety representative and **NELSON, POPE & VOORHIS, LLC** as soon as possible after any injury to his employees, except First Aid cases.
4. Shall, in accordance with their contract, provide for the contractor/sample collection manager and **NELSON, POPE & VOORHIS, LLC**, one copy of each report of injury to any of their employees, within one working day.

3.3 Inspections

NELSON, POPE & VOORHIS, LLC Safety Coordinator shall make daily inspections to cover the activities of **NELSON, POPE & VOORHIS, LLC** and Subcontractor personnel. At least once a week, the inspections should be made jointly with the Contractor's Field Superintendent. As part of the inspection program, the Safety Coordinator shall also establish records and follow-up information to determine that deficiencies are corrected in a reasonable time.

3.3.1 Procedure

During the inspections in the work areas, **NELSON, POPE & VOORHIS, LLC** Safety Coordinator shall observe the work of **NELSON, POPE & VOORHIS, LLC** and Subcontractor personnel, taking appropriate action to correct unsafe conditions or procedures as soon as possible.

3.4 Safety Orientation Program

As soon as practicable before work begins, all of **NELSON, POPE & VOORHIS, LLC** employees, including those of the Subcontractor, will be briefed on this Health and Safety Plan. The Safety Orientation shall include:

1. Information to acquaint the employee with special hazards at the work site and traffic regulations, including the review of the "Job Safety Analysis"
2. Description of the nature of the project.
3. Hazards that may be expected during the work.
4. Safety equipment that must be used.
5. Work practices to minimize the possibility of an accident, including lifting, falls, fire, and housekeeping.
6. A review of the contents of this Health and Safety Plan.
7. Warning that violations of safety rules shall result in disciplinary action or layoff.

3.5 Training and Education

Training is an essential component of an effective safety and health plan. It addresses the responsibilities of both management and employees at the site. Training will be incorporated into the orientation program, reviewing performance requirements and job site practices. Training programs shall be provided as follows:

1. Initially when the work commences.
2. For all new employees and Subcontractors.
3. When new equipment, materials, or processes are introduced.
4. When procedures have been updated or revised.
5. When experiences/operations show that employee performance has to be improved or at least annually.

3.6 General Safety Rules and Requirements

NELSON, POPE & VOORHIS, LLC Safety Coordinator will have the responsibility for monitoring and enforcing compliance by our employees and Subcontractors in accordance with the Health and Safety Plan for Sample Collection Activities. Appropriate steps will be taken by **NELSON, POPE & VOORHIS, LLC** Safety Coordinator to assure that the applicable safety work standards are met. These steps shall include disciplinary action up to and including termination of employment or termination of Subcontractor's agreement. Members of the public passing near work area must also be protected from any site-generated hazards. Work areas should be barricaded and the appropriate warning signs be posted and proper device be used to control traffic. A complete list of the requirements for Work Area Protection can be found in Title 29 Code of Federal Regulations, Part 1910, Section 144 and 145, and Part 1926, Subpart G.

3.7 Protective Equipment

NELSON, POPE & VOORHIS, LLC will provide the necessary safety equipment required by our employees for the performance of their work. **Each Subcontractor employed by NELSON, POPE & VOORHIS, LLC** is responsible for providing the special items needed for controlling hazards under the OSHA Standards for Construction (29 CFR 1926). The following check list shall provide a selection of proper PPE for operations under this Health and Safety Plan:

- Hard Hats
- Long sleeve garment
- Trousers
- Safety toes work boots
- Proper eye and face protection
- Work Gloves, rubber or neoprene when working with or on chemicals
- NIOSH approved respirator where or when the job hazard may require
- Hearing protection
- Rubber or neoprene boots when exposed to waste-water or products

3.8 Codes and Regulations

NELSON, POPE & VOORHIS, LLC and Subcontractor employees shall comply with all State, Local, and OSHA Codes Regulations. Notwithstanding the contents of **NELSON, POPE & VOORHIS, LLC** Health and Safety Plan, it shall be the responsibility of the Contractor to ensure that their employees and the employees of their Subcontractors comply with State, Local and OSHA Codes and Regulations. Information within this Health and Safety Plan is provided as general baseline data. Determination of full compliance with State, Local & OSHA regulations, including (29 CFR 1926) promulgated by OSHA, along with the texts of Standards for General Industry that have been identified by OSHA. Copies of these references are at the field office.

3.9 Safety and Health Provisions

1. No employee shall undertake a job until that person has received adequate training.
2. All employees shall be trained on every potential hazard that they could be exposed to and how to protect themselves.
3. No employee shall work under conditions, which are unsanitary, dangerous, and hazardous to their health.
4. Only qualified and trained personnel are permitted to operate machinery or equipment
5. All OSHA posters shall be posted.
6. Emergency numbers shall be posted and reviewed with personnel.
7. Employees working in areas where there is a possible danger of head injury, excessive noise exposure, or potential eye and face injury, shall be protected by Personal Protection Equipment (PPE).
8. All hand and power tools and similar equipment, whether furnished by the employer or the employee, shall be maintained in a safe condition.
9. All materials stored in tiers shall be stacked, racked, blocked, interlocked or otherwise secured to prevent sliding, falling or collapse.
10. Each employee shall comply with the fire prevention procedures. All work shall be in accordance with the OSHA Standards for Construction (29 CFR 1926) subpart "F." Fire Protection & Prevention. There shall be no unauthorized open fires.

4.0 HAZARD COMMUNICATION PROGRAM

NELSON, POPE & VOORHIS, LLC will ensure that the hazards of all chemicals used within the owner's facility are evaluated, and that information concerning their hazards is transmitted to all employees. This standard practice instruction is intended to address comprehensively the issues of; evaluating the potential hazards of chemicals, communicating information concerning these hazards, and establishing appropriate protective measures for employees.

RESPONSIBILITY: NELSON, POPE & VOORHIS, LLC Safety Officer is solely responsible for all facets of this program and has full authority to make necessary decisions to ensure success of the program. The Safety Officer will develop written detailed instructions covering each of the basic elements in this program, and is the sole person authorized to amend these instructions. This company has expressly authorized the Safety Officer to halt any operation of the company where there is danger of serious personal injury.

Contents of the **NELSON, POPE & VOORHIS, LLC** Hazard Communication Program are:

1. **Written Program.** - This standard practice instruction will be maintained in accordance with 29 CFR 1926.59 and updated as required. Where no update is required this document will be reviewed annually. Effective implementation of this program requires support from all levels of management within this company. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.
2. **Training Program.** **NELSON, POPE & VOORHIS, LLC** shall provide employees with information and training on hazardous chemicals in their work area at the time of their initial assignment, annually, and whenever a new chemical is introduced into their work area that could present a potential hazard. Employee hazard communication training at **NELSON, POPE & VOORHIS, LLC** shall be conducted annually. An approved training instructor will conduct this training. Newly hired personnel will be briefed on the general requirements of the OSHA hazard communication standard by **NELSON, POPE & VOORHIS, LLC** Safety Officer, as well as duty specific hazards by their immediate supervisor before they begin any duties within the department.
3. **Labeling Program.** Labeling requirements of containers of chemicals used at **NELSON, POPE & VOORHIS, LLC**, as well as of containers of chemicals and hazardous materials being shipped off site. The following procedures apply:
 - a. **Unmarked Containers.** No unmarked container containing chemicals may be used in conjunction with any duties or operations at **NELSON, POPE & VOORHIS, LLC**. Unless the container is a portable container in the control of a specific person for their immediate use.
 - b. **Container Labeling.** **NELSON, POPE & VOORHIS, LLC** will maintain and provide a container labeling kit to any employee requesting its use. Employees shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced. Containers containing hazardous chemicals will be properly disposed of and the labels defaced after use. Once they are emptied, chemical containers can never be used in the place of any other container (for example, trash receptacles).

4. Material Safety Data Sheets (MSDS)/Safety Data Sheets (SDS) Program. Evaluation and Distribution of Material Safety Data Sheets/Safety Data Sheets to Employees.
 - a. **NELSON, POPE & VOORHIS, LLC** shall maintain copies of any material safety data sheets/safety data sheets that are received with incoming shipments of the sealed containers of hazardous chemicals. Shall obtain a material safety data sheet/safety data sheets for sealed containers of hazardous chemicals received without a material safety data sheet/safety data sheets. Shall provide the material safety data sheet/safety data sheets, if an employee requests and shall ensure that the material safety data sheets/safety data sheets are readily accessible during each work shift.
 - b. Master copies of each MSDS/SDS will be maintained in the field office.
 - c. Right-To-Know (worker) copies will be available to all employees in the facility, and located as a minimum in the field office. Additionally, a list of the hazardous chemicals known to be present in each department using an identity that is referenced from the appropriate MSDS/SDS will be located in the field office. **NELSON, POPE & VOORHIS, LLC** will ensure a system is in place to maintain a current set of MSDS's/SDS's.
 - d. MSDS/SDS copies will be maintained for all chemicals abandoned for use for a period of 30 years.
 - e. MSDS/SDS requests. A request letter will be forwarded to any vender who does not provide an MSDS/SDS with a product received by this company. The letter will be forwarded within one day of receipt of the material. The format will be the same as the sample letter located at the back of this instruction.
5. Sub-Contractors Employees Program. Non-Company Employees, Visitors, Contract Employees, Contractor Personnel, and In-House Representatives. Any contractor bringing chemicals on-site must provide **NELSON, POPE & VOORHIS, LLC** with the appropriate hazard information on these substances, including the labels used and the precautionary measures to be taken in working with these chemicals. Consult with the Health and Safety Officer where this determination is unclear or assistance is required.

4.1 Sample Letter Requesting an MSDS

NELSON, POPE & VOORHIS, LLC
572 Walt Whitman Road
Melville, New York 11747

Dear Sir:

The Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200) requires employers be provided Material Safety Data Sheets (MSDS's)/Safety Data Sheets (SDS) for all hazardous substances used in their facility, and to make these MSDS's/SDS's available to employees potentially exposed to these hazardous substances.

We, therefore, request a copy of the MSDS/SDS for your product listed as Stock Number _____. We did not receive an MSDS/SDS with the initial shipment. We also request any additional information, supplemental MSDS's/SDS's, or any other relevant data that your company or supplier has concerning the safety and health aspects of this product.

Please consider this letter as a standing request to your company for any information concerning the safety and health aspects of using this product that may become known in the future.

The MSDS/SDS and any other relevant information should be sent to us within 10, 20, 30, days (select appropriate time). Delays may prevent use of your product. Send the information to the address listed below.

Please be advised that if we do not receive the MSDS/SDS on the above chemical by _____, we may have to notify OSHA of our inability to obtain this information.

Your cooperation is greatly appreciated. Thank you for your timely response to this request. If you have any questions please contact me at (631) 427-5665.

Sincerely

Safety and Health Manager
NELSON, POPE & VOORHIS, LLC
572 Walt Whitman Road
Melville, New York 11747

5.0 FALL PROTECTION PLAN (WORKING AT ELEVATION)

5.1 Holes

All openings greater than 12 in. x 12 in. will have perimeter guarding or a covering. All predetermined holes will have the plywood covers made in the precasters' yard and shipped with the member to the jobsite. Prior to cutting holes on the job, proper protection for the hole must be provided to protect the workers. Perimeter guarding or covers will not be removed without the approval of the foreman.

The following is a list of other fall protection measures available to be used on some jobsites. If during the course of work the employee sees an area that could be erected more safely by the use of these fall protection measures, the foreman should be notified.

1. Scaffolds
2. Vehicle mounted platforms
3. Crane suspended personnel platforms
4. Harnesses and lifelines

6.0 PERMIT REQUIRED CONFINED SPACE SAFETY PLAN

NELSON, POPE & VOORHIS, LLC may encounter Permit Required Confined Space (PRCS) during Emergency Response Procedures. This program is in accordance with the Occupational Safety and Health Administration's (OSHA) Permit-Required Confined Spaces Standard, Title 29, Code of the Federal Regulations 1910.146.

A Confined Space/Limited Egress enclosure is any space or enclosure that:

- (1) Has limited openings for entry and egress;
- (2) May have limited ventilation; may contain or produce life threatening atmosphere due to oxygen deficiency or the presence of toxic, flammable, and or corrosive contaminants; and which is not intended for employee occupancy. Examples of such enclosures may include but not limited to: storage tanks, process / reaction vessels, stacks, pits, basement, silos, vats degreasers, boilers, ventilation and exhaust ducts, manholes, sewers, tunnels, underground vaults with pipelines, and any open topped space several feet in-depth that is subject to inadequate ventilation.

6.1 Responsibility

The configuration of the space and the proposed operation to be conducted within that space will ultimately determine if a permit required confined space exists. **NELSON, POPE & VOORHIS, LLC** safety coordinator is responsible for the overall implementation and maintenance of any program or certification concerning the requirements of the permit required confined space.

6.2 Training

The safety coordinator is also responsible for ensuring that affected personnel are properly trained and that refresher training is given. Personnel who may be included are any authorized entrants, attendants, entry supervisors, and on-site rescue team members.

7.0 TRENCHING AND EXCAVATION SAFETY PLAN

Regulatory Standard: 29 CFR 1926. Subpart P.

The primary hazard to which employees may be exposed during excavation work is a cave-in, which occurs when the soil forming the sides of the excavation can no longer resist forces applied to it. This results from a reduction in the frictional and cohesive capacities of the soil to resist forces. Changing environmental conditions, such as freezing and thawing, or the addition of water from the pores of the soil can reduce the ability of a soil to resist forces. The additions of superimposed loads from spoil piles, or the placement of equipment or materials near the edge of the excavation also create forces that can exceed the ability of the soil to resist.

NELSON, POPE & VOORHIS, LLC will ensure that whenever an excavation operation is being undertaken, that work practices and proper condition are met prior to beginning, during and at the conclusion of such excavation operation. It shall not be assumed that every acceptable safety precaution is contained herein or that unusual circumstances may not require further or additional procedures, equipment, and practices. Employees will cease operation if there is a question regarding a hazard or if such is suspected or discovered.

7.1 Responsibility

The safety coordinator is solely responsible for all facets of this program and has authority to make necessary decisions to ensure success of the program. The safety coordinator is the sole person authorized to amend these instructions and is authorized to halt any operation of the area where there is a danger of serious personal injury.

7.2 General Requirements

NELSON, POPE & VOORHIS, LLC will establish procedures for “trenching and excavation” undertaken by its employees, and subcontractor’s personnel through the use of this document. Preventing future work-place injuries in our company is the principal purpose of this document. This document will help identify hazards in the work place and enable us to determine the best course of action to take to reduce or eliminate known hazards. The following procedures are designed to provide employees of this company and subcontractors with a system of protection and safe conditions while working in a trenching or excavation environment. These guidelines are designed for use by employees at all levels within the work force.

- **NELSON, POPE & VOORHIS, LLC** will **call before we dig**. Requesting locations of utilities from regional UFPO or all Municipalities that don't subscribe to UFPO, to have all utilities marked in a timely manner.
- All utilities should be clearly marked out by the appropriate authority prior to commencing.
- All underground hazards should be de-energized or removed or supported.
- A ladder or other safe means of exit must be used in excavations greater than 4 feet at all times.
- A competent person must conduct daily inspection of the excavation and surrounding areas before work begins and as needed during the workday.
- When the atmosphere in an excavation is/or becomes hazardous, proper atmospheric testing must be conducted.
- Adequate protective systems must be used at all times.
- Adequate protective physical barriers must be used around all excavations.
- All excavations greater than 4 feet deep must be properly sloped, shored, braced, shielded, or protected by a system designed by a professional engineer.
- If a potentially hazardous material is encountered during excavation, all work must stop until an industrial hygienist or equivalent can evaluate the material.

7.3 Surface Encumbrances and Underground Installations Safety Guidelines

All surface encumbrances that are located to create a hazard to employees will be removed or supported, as necessary to safeguard employees. The estimated location of utility installations, such as sewer, telephone, fuel, electric, waterlines, or any other underground installations reasonable may be expected to be encountered during excavation work, will be determined prior to opening an excavation. Utility service companies should be contacted and advise them prior to the start of all actual excavation.

7.4 Trench Safety

There shall be at every trench excavation site a competently trained person, who is capable of identifying existing and predictable hazards and who shall have the authority to take prompt corrective action. This individual shall be able to identify soil classifications and protective systems to be used in compliance with OSHA Trenching Standards found in 29 CFR 1926.652. Trenches more than 4 feet deep require shoring or will be laid back to a slope. Portable trench boxes used in place of shoring and sloping shall be designed by a professional engineer and maintained to continue providing protection at least equal to the required sheeting and shoring.

8.0 SOIL REMEDIATION

8.1 Hazardous Characterization/Identification

The primary concern at the site is to protect the workers from contaminated soil at the 0-4 foot interval at the site. **NELSON, POPE & VOORHIS, LLC** will perform personal sampling of workers during any soil disturbance procedures and any field operations that warrant it. The health and safety officer will discuss the chemical exposure concerns for the site with all field personnel at the beginning of each workday.

Each day that field work is to be performed, **NELSON, POPE & VOORHIS, LLC** employees and subcontractors will be made aware of the chemical compounds that may be present on site. The health and safety officer will discuss the health and safety symptoms of exposure to those chemical compounds with workers on the site. The health and safety officer will interview the workers on site the previous day to see if they experience any of the symptoms of exposure.

8.2 Potential Exposures

Potential exposure during work at the site will be considered on a daily basis during sample collection activities. Therefore, all workers collecting samples will wear disposable gloves and goggles during any contact with the soil on the site. In addition, the health and safety officer will perform representative personal air sampling for volatile and semi-volatile organic compounds, TAL metals, pesticides and herbicides. The health and safety officer will perform representative personal air sampling in compliance with each representative standard and the analysis methods for the sampling of each contaminant. Representative 8-hour time weighted average worker exposure shall be determined based on one or more samples representing the full-shift exposure for workers at the remediation site. The health and safety officer will place the samples within the breathing zone of each worker. The health and safety officer will compare the personal sampling results with the OSHA permissible exposure levels (see Section 8.6) and determine the level of exposure. The level of exposure will dictate the level of protection required for the workers at the site.

8.2.1 Level of Protection

Level of protection during the remediation will be Level D and will be upgraded, if conditions require (as per 8.2 above).

8.2.2 Description of Potential Health Effects and Hazards

NELSON, POPE & VOORHIS, LLC will perform a Limited Phase II Environmental Site Assessment to determine if the soil is contaminated with volatile and semi-volatile organic compounds, TAL metals, pesticides and herbicides. Each of these contaminants has different health effects and hazards. All persons collecting samples at the site will be informed regarding the health effects and hazards of the contaminants in the soil. The health effects for each contaminant are:

- Semi-volatile organic compounds health effects will depend on the specific compound in the soil. Benzo-a-Pyrene inhalation is harmful due to its being a carcinogen, contact may cause burns to skin and eyes, fire may produce irritating, corrosive, and/or toxic gases. The routes of exposure are inhalation and skin and/or eye contact.
- Volatile organic compounds health effects will depend on the specific compound in the soil. Benzene inhalation is irritating to the eyes, skin, nose, and respiratory system and is a carcinogen. Breathing benzene vapors results in adverse health effects related to the central nervous system including drowsiness, dizziness, rapid heart rate, headache, lightheadedness, nausea, tremors, impaired gait, confusion, loss of consciousness, shortness of breath, respiratory depression, coma,

and possibly death. The routes of exposure are inhalation, skin absorption, ingestion, and skin and/or eye contact.

- Pesticides/poly chlorinated biphenyls (PCBs) health effects will depend upon the specific pesticide in the soil. PCBs are probable carcinogens and symptoms include irritation to eyes, chloracne, liver damage, and reproductive effects. The routes of exposure are inhalation, skin absorption, ingestion and skin and/or eye contact.
- An arsenic health effect includes ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyper-pigmentation of skin, and is a potential carcinogen. The routes of exposure are inhalation, skin absorption, ingestion and skin and/or eye contact.
- Lead dust health effects include weakness, lassitude, insomnia, facial pallor, anorexia, low weight, malnutrition, constipation, abdominal pain, colic, anemia, gingival lead line, tremor, paralysis of the wrist and ankles, encephalopathy, kidney disease, irritation of the eyes, and hypotension. The routes of exposure are inhalation, ingestion, and skin and/or eye contact.
- Mercury vapor health effects include irritation to the eyes and skin, cough, chest pain, tremor, insomnia, irritability, indecision, headaches, fatigue, weakness, salivation, gastrointestinal disturbance, and anorexia. The routes of exposure are inhalation, skin absorption, ingestion, and skin and/or eye contact.

8.2.3 General Work Practices

The following general health and safety requirement will apply to all persons collecting samples of the soil at the site:

1. All personnel working on the sample collection team shall read the Health and Safety Plan.
2. No employee or subcontractor will be allowed in the remediation area without the prior knowledge of the health and safety manager.
3. All personnel involved in the remediation at the site will notify the health and safety manager of any unsafe conditions or activities.
4. Standard hygiene practices will be implemented such as no smoking, eating or drinking during soil remediation work activities and require a thorough washing of hands and face prior to smoking, eating or drinking. At all times, personnel should perform remediation activities from upwind directions.
5. Workers will avoid unnecessary contamination such as walking through, sitting on, leaning on, or kneeling in areas that are in the remediation area.
6. All site personnel shall observe their partners for any signs of adverse effects associated with the work activity and will inform their partner or supervisor of any unusual signs or symptoms that they are experiencing themselves.

8.2.4 Termination of Sampling

If the health and safety officer, by statistically reliable measurements, has determined that the levels of exposure at the work site are below the OSHA permissible exposure levels listed in section 8.6 of this health and safety plan then personal air sampling may be discontinued for those workers represented by the sampling.

8.3 Orientation and Training

Each member of the sample collection team has completed the 40-hour training course required by the Occupational Safety and Health Administration for personnel working at hazardous waste sites. Each field team member is trained and experienced in the standard field sampling techniques and procedures to be utilized in this project.

Each person who may be required to use respiratory protection has been medically approved, trained and fit tested with a NIOSH approved respirator appropriate for the conditions likely to be encountered. In addition, each field team member participated in an orientation session prior to commencing work at the site. The orientation will include the following:

- Project goals and objectives
- Overview of the Health and Safety Plan
- Health and safety requirements and procedures
- Chemicals contaminating the site and their properties
- Potential health and safety hazards
- Safe sampling procedures
- First aid and emergency procedures
- Use of respiratory protection and respirator fit testing
- Use of protective clothing
- Decontamination procedures
- Waste disposal procedures

8.4 Monitoring Equipment

The principal forms of chemical contamination at the site are unknown and the anticipated exposure is expected to be a low hazard level if appropriate precautionary measures are used. However, routine personal air monitoring for health and safety purposes will be performed during all sample collection activities.

The health and safety officer will operate, maintain, and calibrate personal air monitoring equipment each working day in accordance with the manufacturer's instructions and quality assurance procedures required by the laboratory. Personal sampling for semi-volatile organic compounds, volatile organic compounds, pesticides/poly chlorinated biphenyls, and heavy metals (specifically arsenic, lead, and mercury) will be conducted during sample collection activities. Should contaminant levels indicate high hazard potential, operations will be discontinued until situation is evaluated.

8.5 Injuries

Injured or over-exposed person will be removed from the area immediately. Where applicable, first aid will be administered and/or emergency rescue team called. Depending on the nature of the injury/emergency, appropriate notifications will be made. The closest hospital to the work site is the Woodhull Medical Center located on the corner of Broadway and Flushing Avenue approximately 1.9 miles northwest of the project site.

8.6 Levels of Protection

Four protection levels (A, B, C, and D) will be used as benchmarks for selection of personal protection equipment.

Level A requires the highest degree of protection including fully encapsulating, chemical resistant suit with full face piece, SCBA, or supplied air respirator. No situations are anticipated during the sample collection activities that would require this level of protection.

Level B protection requires full chemical resistant clothing with a full-face piece SCBA or supplied air respirator. Again we do not anticipate this level of protection for this site. However, provisions will be made to have this equipment available should its use be required. Remediation activities that may result in this level of projection will not be implemented, until the equipment has been transported to the site.

Implementation of level B protection shall only be performed when sufficient trained personnel (minimum of two) are available.

Level C protection requires full-face piece, air purifying cartridge-equipped respirator (or a half-face, air purifying cartridge-equipped respirator if specifically approved), and protective coveralls, (Tyvek or full chemical resistant clothing or other protective clothing if specifically approved). Level of contaminants in the remediation area is not expected to require this level of protection. Activities that significantly disturb the soil or generate dust will be closely monitored to determine if upgrading to this level of protection is appropriate. The collection of samples onsite could result in potential exposures to where this level of protection is warranted. The decision to require this level of protection will be made on a case-by-case basis. Unknown hazardous conditions suspected of containing risks that have not been identified, as part of this plan shall be investigated with Level C protection.

Level D protection requires standard work clothes, such as protective coveralls, work boots, safety glasses/goggles, disposable gloves, and hardhat. This protection level applies to situations in which there is minimal risk of dust generation with subsequent inhalation and dermal risk to hazardous chemicals. It is anticipated that this level of protection will be applicable to all sample collection activities at the site.

Should personal air monitoring during the sample collection indicate a need for higher protection levels than those currently in use, implementation of the appropriate level or cessation of all activities, which are generating the excessive levels, shall be performed. The personal air monitoring levels at which initial work activities would be halted if concentrations which exceed:

1. 0.2 milligrams per cubic meter of Benzo-a-Pyrene based on an 8-hour time weighted average.
2. 1 part per million of Benzene based on an 8-hour time weighted average.
3. 0.5 milligrams per cubic meter (skin) of PCBs based on an 8-hour time weighted average.
4. 0.010 milligrams per cubic meter of Arsenic based on an 8-hour time weighted average.
5. 0.05 milligrams per cubic meter of lead dust based on an 8-hour time weighted average.
6. 0.05 milligrams per cubic meter of mercury (vapor) based on a 8-hour time weighted average.

8.7 Personal Protective Equipment

All employees at the site will be required to use appropriate equipment for protection against potential hazards at the site. Since Level D is anticipated for the sample collection, equipment listed under Level D in Section 8.6 will be required.

APPENDIX "A" **OVERVIEW**

NELSON, POPE & VOORHIS, LLC projects use a hierarchical management organization, a typical Project Management Organization. This typical organization reflects the basic characteristics existing in most **NELSON, POPE & VOORHIS, LLC** projects.

NELSON, POPE & VOORHIS, LLC Project Manager assumes responsibility for overall Project Management. In addition to project leadership, **NELSON, POPE & VOORHIS, LLC** requires the Project Manager to be the point of contact for any communications regarding the Project. This includes communications regarding Subcontractor provided work as well as negotiation with the Owner. The Project Manager is available to receive Owner-originated requests or comments, and takes responsibility for the response. Delineation of project work between the different organizations in the **NELSON, POPE & VOORHIS, LLC** project team is, for the most part, transparent to the Owner.

SAFETY

NELSON, POPE & VOORHIS, LLC Safety Engineer/Manager ensures that all personnel perform their tasks in a safe manner. The Safety Engineer/Manager performs the following functions:

- Maintains project safety records and completes required reports.
- Ensures employees follow proper on-the-job safety practices.
- Ensures employees adhere to and maintain proper safety standards.
- Ensures safety rules and regulations are followed.
- Ensures safety-training programs.
- Manages safety-training programs.

The Safety Engineer/Manager reports directly to the Project Manager and assumes also the Quality Assurance/Quality Control (QA/QC) role in which monitors system quality to assure that **NELSON, POPE & VOORHIS, LLC** provides high quality products and supporting services. The primary responsibility in this function includes the following.

- Perform quality audits and spot checks of completed operations.
- Enforce **NELSON, POPE & VOORHIS, LLC** quality assurance procedure.
- Monitor all quality aspects associated with the system installation and the system operation.
- Monitor software quality assurance.
- Monitor quality of training.
- Monitor Subcontractor's quality procedure and practices.
- Monitor performance and acceptance test results.
- Coordinate maintenance prior the project acceptance.
- Monitor warranty support

JOB SITE SAFETY PROCEDURES

NELSON, POPE & VOORHIS, LLC has established this Health and Safety Plan for our Company and for our Subcontractors to follow during sample collection activities. **NELSON, POPE & VOORHIS, LLC** shall develop a site-specific health and safety plan for each job site. This site-specific safety plan shall review all the specific hazards for each job and develop a plan to address those hazards.

UTILITIES

NELSON, POPE & VOORHIS, LLC will **call before we dig**. Requesting locations of utilities from regional UFPO or all Municipalities that don't subscribe to UFPO, to have all utilities marked in a timely manner. **NELSON, POPE & VOORHIS, LLC** project manager will designate someone to review the latest drawings, all revisions, and/or as-builds. If some underground lines have been located, verify the depth of the line. Use potholing probes, pits, etc. to determine the exact location of utility lines. While locating, potholing, or excavating in the vicinity of an existing Gas Main, only hand digging is allowed. If gas leaks are noticed leave and evacuate the area of spill immediately and use the emergency procedure calling the authorities having jurisdiction over the facilities. Make sure that nobody smokes in the area and no sources of sparks are present, including running engines, power tools, etc. Have always handy all Emergency phone #'s. If not, call 911. While locating, potholing or excavating in the vicinity of existing underground high or low voltage electric lines, use special precaution:

- a) Only hand digging shall be allowed.
- b) A competent supervisor knowledgeable in electric underground installation shall monitor all work closely to identify the hazard conditions.

Applies to all utilities: If the utility cannot be found we will not assume that it does not exist. We will stop work and contact the proper authorities.

ACCIDENT INVESTIGATION

Because "Those who do not learn from the past are condemned to repeat it," each and every accident must be investigated. An accident is any unplanned occurrence that could have caused injury or damage, not just occurrences that did. If a sling breaks and drops a load, it is an accident whether anyone was hurt or not. Accidents should be investigated by immediate supervision. Results should be reported completely on a standard form. Completely is the key. In today's world of litigation an incomplete form is of no use three years down the road when the case comes to court. The safety coordinator should review the immediate supervisor's report. Appropriate steps to prevent reoccurrence should be taken. Accident reports should highlight problem areas. Patterns can be detected and resources directed towards preventing a re-occurrence. Accident reports make excellent training tools. The causes and effects of accidents can be reviewed at safety meetings. The accident report form is in **Appendix B**.

APPENDIX "B"

NELSON, POPE & VOORHIS, LLC ACCIDENT REPORT

INJURED PERSON: _____ REPORT DATE: _____

SOCIAL SECURITY NO: _____

DOCTOR / HOSPITAL NAME: _____

HOME ADDRESS: _____

OCCUPATION: _____ AGE _____ SEX _____

ADDRESS ACCIDENT OCCURRED: _____ TIME OF ACCIDENT _____ AM PM

DATE STOPPED WORK BECAUSE OF THIS INJURY: _____

NATURE OF INJURY & PART (S) OF BODY AFFECTED: _____

DID YOU PROVIDE MEDICAL CARE? IF YES, WHEN? _____

HAS EMPLOYEE RETURNED TO WORK YES NO

IF YES, DATE: _____

WHAT WAS EMPLOYEE DOING WHEN INJURED?
(PLEASE BE SPECIFIC, IDENTIFY TOOLS, EQUIPMENT OR MATERIAL THE EMPLOYEE WAS USING)

HOW DID THE ACCIDENT OR EXPOSURE OCCUR?
(PLEASE DISCRIBE FULLY THE EVENTS THAT RESULTED IN INJURY. TELL WHAT HAPPENED AND HOW IT HAPPENED.) PLEASE USE SEPARATE SHEETS IF NECESSARY.

OBJECT OR SUBJECT THAT DIRECTLY INJURED EMPLOYEE: _____

DATE SUPERVISOR FIRST KNEW OF THE INJURY: _____

SUPERVISOR SIGNATURE: _____

TITLE: _____

Key Job Steps	Tools Used	Potential Health & Injury Hazard	Safe Practices, Apparel, and Equipment		
Setting up Cones and Signs	Traffic Signs & Cones	1. Employee being struck By oncoming vehicles, Exposed to abrasions, Contusions, broken bones and or death.	A. Observes traffic in both directions		
			B. Stay within marked off zones		
			C. Wear reflective vest and hard hat at all times.		
				D. Set up cones and signs in accordance with the contract specifications	
				E. Have a "LOCKOUT " posted	
				2. Employees tripping and Falling into roadways	
			A. Be careful of walking working surfaces & note objects in the way.		
			B. Practice good housekeeping & minimize trip and fall hazards or remove them.		
		3. Back strain from setting up or collecting cones	A. Divide task among employees		
			B. Get help if it is too heavy		
Machinery in or at roadway	Heavy equipment	1. Crash between roadway traffic & heavy equipment	A. Ensure that road signs & cones are set up in accordance with requirements of the contract		
			B. Use signals to make others aware of your intentions when moving heavy equipment		
			C. Be aware of your surroundings at all times		
			D. Only Qualified employees must be allowed to operate equipment		
					1. Back strain and sprains
					2. Slipping and falling while getting on or off heavy equipment.
		3. Equipment sliding off deck and striking employee, or a vehicle while employee is a passenger in			
		4. Driver or passenger of vehicle exiting vehicle into the way of traffic			
			A. Get as close to the object as feasible		
			B. Lift using the legs not the back		
			C. Get help to lift heavy objects		
			A. Check area for mud, oil or fuel and wipe off if necessary.		
			A. Check area for mud, oil or fuel and wipe off if necessary.		
			B. Be qualified to operate equipment		
			A. Pull vehicle entirely off pavement so employees are not in traffic lane		
			B. Do not exit onto the shoulder. use passenger door if necessary		
Securing load	Chocks, chains & Bindings	1. Equipment rolling or parts dropping & striking on employee	A. Be sure equipment wheels are properly checked and brakes are on.		
			B. Be sure that all equipment is in a secure storing position		
				2. Chaining & binding may spring loose & strike employees	
					A. Use proper binding equipment
					B. Have a person experience in using binders and chains
			C. If possible connect binders on driver's side in his view		
Transporting Equipment & Materials	Flatbeds, tractor trailers, cranes and slings	1. Load becoming loose while in transit	A. Stop and check load periodically		
		2. Equipment overloaded And unable to stop	A. Be knowledgeable on weight limitations on trucks, cranes slings		

Key Job Steps	Tools Used	Potential Health & Injury Hazard	Safe Practices, Apparel, and Equipment
		possible motor vehicle crash	and others
			B. Do not overload anything leave a safe margin
			C. Daily check all slings and hooks
		3. Trailer unhooking while in motion	A. Check trailer hitch before starting transport.
		4. Break failure occurs exposing employees	A Do daily safety inspection and take prompt corrective action
		5. Getting struck by heavy equipment	A. Stay out of the paths of heavy equipment
			B. Stay out of the paths of crane.
Fueling & Service checks On Equipment	Gasoline, oils and Petroleum Products	1. Over exposure to hazardous vapors	A. All fueling shall be done in a well ventilated area. DO NOT fuel in the vicinity of wetlands or streams
			B. Check levels with gauge not a finger.
			C. Clean dipstick with a cloth.
			D. Make sure that employees servicing equipment know how to do same.
		2. Burns from fire or explosion	A. Keep at least 20 ' from the source of ignition
			B. Do not smoke while fueling
		3. Slipping and falling due to spills.	A. Use proper funnels or sprouts to prevent spilling
			B. Be sure to clean –up all spills promptly and thoroughly. Every spill over 2 Gal. Must be reported see Environmental Work Plan.
Locate Under-Ground Utilities	Telephone	1. Shocks, burns, electro-cautions and overexposure to natural gas.	A. Request locations of utilities from UFPO and all municipalities that don't subscribe to UFPO to be done in a timely manner.
			B. Have someone designated to review the latest drawings.
			C. All utility lines should be visibly exposed by hand digging.
			D. If some utility lines can not be found call the appropriate company for a re- relocate
			E. Once underground lines have been located, verify the depth of the lines in case this as been altered during previous repair.
			F. Use potholing, probe, pits, etc. to determine the exact location of utility lines
		2. Dust/dirt in eyes, bruises	A. Wear safety glasses or goggles
		On hands, sprained ankles	B. Wear work gloves

Key Job Steps	Tools Used	Potential Health & Injury Hazard	Safe Practices, Apparel, and Equipment
			C. Wear work boots that cover the ankles.
Trenching	Backhoe	1. Cave-ins resulting in bruises, broken bones or death	A. Use sloping, shoring or trench boxes.
		2. Being struck or crushed by backhoe.	A. Be aware of surroundings at all Times
			B. Keep clear of equipment when Operating
			C. Make sure back alarm is working
			D. Stay out of the swing path of the bucket
	Trencher	1. Caught in moving parts/ pinch points	A. Stay away from moving parts
			B. Be familiar with operator's manual.
			C. Lockout / tag out machine during maintenance.
			D. Don't wear loose clothing or jewelry near machinery
		2. Flying debris	A. Wear safety glasses or goggles
			B. Wear hard hat at all times
		3. Shocks, burns and Electrocutions	A. Refer to excavating near utilities on page 6
Rock sawing	Rock saw	1. Getting struck by dust & rock particles or broken teeth from saw.	A. Only the operator should be allowed near the saw.
			B. The operator should be wearing safety glasses and goggles and a face shield as well as long sleeves shirt, long pants, and a hard hat.
			C. Lockout/Tag out while servicing
		2. Exposure to very high Noise Levels	A. Wear ear muffs, ear plugs or both
		3. Being pulled into machine by moving parts	A. Keep away from moving parts
			B. Keep guards on the moving parts
			C. Don't wear loose clothing or jewelry that could get caught in the machine
Cutting duct And Pipe	Hand saw, Circular saw and Utility knife	1. Cuts to hands, arms, etc.	A. Keep guard in place.
			B. Avoid distractions and concentrate on cutting.
			C. Always cut away from you, not towards you.
		2. Shock and electrocution	A. Keep electric cords out of the water
			B. Make sure that the prong to the ground is also used. If missing replace it or remove saw from service
Placing Manhole	Backhoe	1. Getting struck by or run over by backhoe	A. Be aware of surroundings at all times
			B. Ensure back-up alarm is working

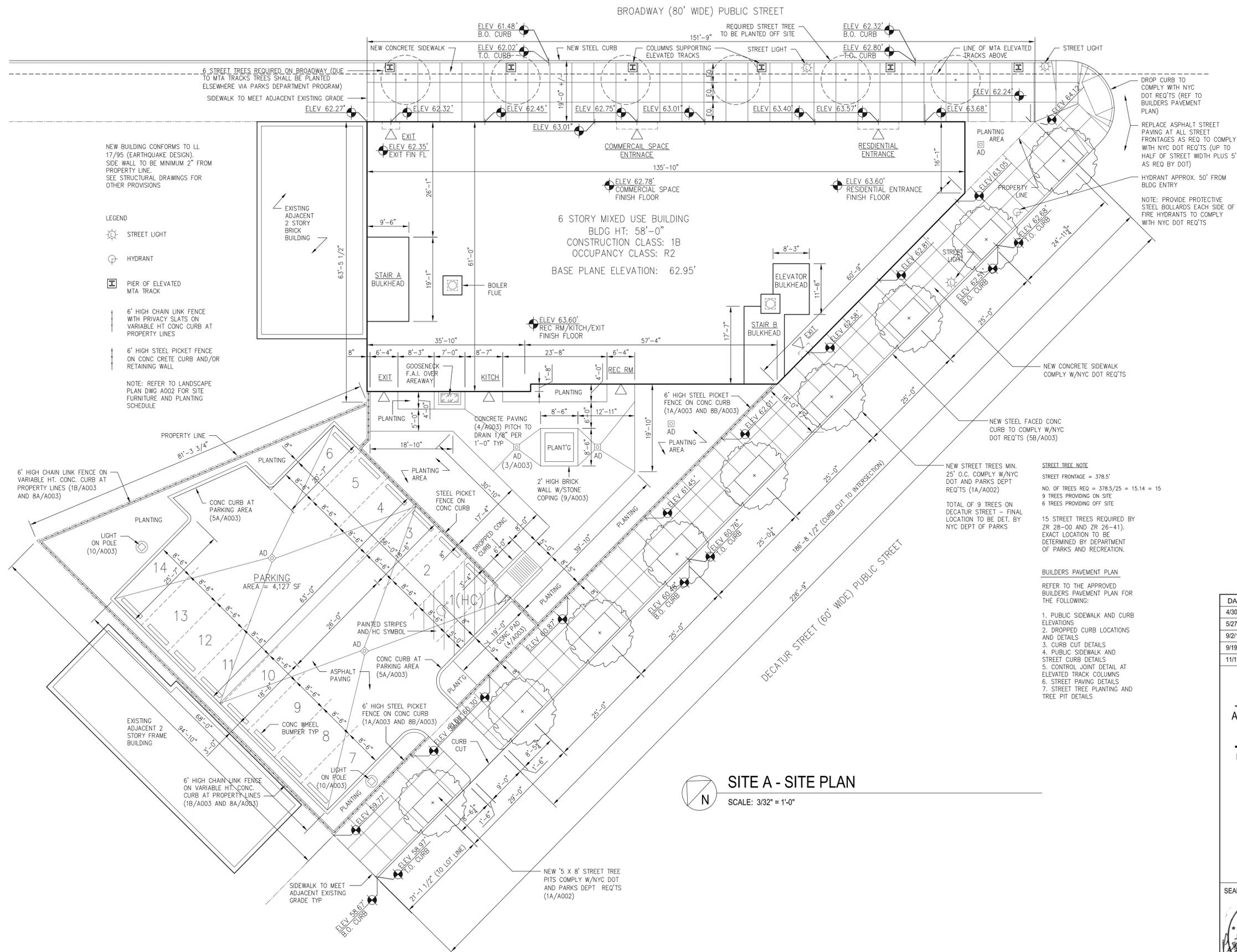
Key Job Steps	Tools Used	Potential Health & Injury Hazard	Safe Practices, Apparel, and Equipment
		2. Falling	A. Barricade around the perimeter of the manhole &or pit.
			B. Cover or plate over opening.
		3. Getting crushed by manhole	A. Stay out of trench or pit until
		When installed	manhole has been lowered into it
		4. Cave-ins resulting in bruises,	A.. Use of sloping, shoring or trench
		Broken bones or death	boxes to prevent cave-ins. Refer to OSHA standards for specifics
			B. The competent person for safe operations must be present when trenching is going on.
Clean-up	Loader	1. Struck by or run over by Loader.	A. Be aware of equipment location
			B. Wear reflective vest at all times
			C. Make sure back-up alarm is working.
Sampling,	Heavy	1. Struck by or caught in-	A. Controlled work areas.
Packaging,	Equipment	between	B. Qualified Operator
Shipment			C. Job Safety Analysis
		Lifting and Back strain	A. Proper Lifting Techniques
			B. Two person lifts
		Hazardous Noise Levels	A. Noise Survey and Hearing Protection
		Hazardous Contaminants	A. MSDS for Hazardous Contaminants
			B. Industrial Hygiene Monitoring

APPENDIX 5

PROPOSED DEVELOPMENT PLANS

APPENDIX 6

MANUFACTURER DESIGN DIAGRAMS AND SPECIFICATIONS
FOR THE VAPOR/MOISTURE BARRIER



NEW BUILDING CONFORMS TO LL 17/95 (EARTHQUAKE DESIGN). SIDE WALL TO BE MINIMUM 2" FROM PROPERTY LINE. SEE STRUCTURAL DRAWINGS FOR OTHER PROVISIONS

- LEGEND**
- ☀ STREET LIGHT
 - ⊕ HYDRANT
 - ⊠ PIER OF ELEVATED MTA TRACK
 - 6' HIGH CHAIN LINK FENCE WITH PRIVACY SLATS ON VARIABLE HT CONC CURB AT PROPERTY LINES
 - 6' HIGH STEEL PICKET FENCE ON CONC CRETE CURB AND/OR RETAINING WALL
- NOTE: REFER TO LANDSCAPE PLAN DWG A002 FOR SITE FURNITURE AND PLANTING SCHEDULE

DROP CURB TO COMPLY WITH NYC DOT REQ'TS (REF TO BUILDERS PAVEMENT PLAN)

REPLACE ASPHALT STREET FRONTAGES AS REQ TO COMPLY WITH NYC DOT REQ'TS (UP TO HALF OF STREET WIDTH PLUS 5' AS REQ BY DOT)

HYDRANT APPROX. 50' FROM BLDG ENTRY

NOTE: PROVIDE PROTECTIVE STEEL BOLLARDS EACH SIDE OF FIRE HYDRANTS TO COMPLY WITH NYC DOT REQ'TS

STREET TREE NOTE

STREET FRONTAGE = 378.5'

NO. OF TREES REQ = 378.5/25 = 15.14 = 15

9 TREES PROVIDING ON SITE

6 TREES PROVIDING OFF SITE

15 STREET TREES REQUIRED BY ZR 28-00 AND ZR 26-41). EXACT LOCATION TO BE DETERMINED BY DEPARTMENT OF PARKS AND RECREATION.

BUILDERS PAVEMENT PLAN

REFER TO THE APPROVED BUILDERS PAVEMENT PLAN FOR THE FOLLOWING:

1. PUBLIC SIDEWALK AND CURB ELEVATIONS
2. DROPPED CURB LOCATIONS AND DETAILS
3. CURB CUT DETAILS
4. PUBLIC SIDEWALK AND STREET CURB DETAILS
5. CONTROL JOINT DETAIL AT ELEVATED TRACK COLUMNS
6. STREET PAVING DETAILS
7. STREET TREE PLANTING AND TREE PIT DETAILS

DATE	REVISION	DATE	REVISION
4/30/14	PROGRESS SET	12/19/14	V.E./COORD
5/27/14	DOB	12/22/14	CONTRACT SET
9/2/14	HPD		
9/19/14	DOB		
11/11/14	DOB		

PETER L. WOLL ARCHITECT, PC
 367 1ST STREET, BROOKLYN, NY
 (718) 369-9150 peterwoll@gmail.com

ALEMEMBI COMMUNITY DEVELOPMENT
 11 Hanover Square Suite 701 New York, NY 10005
 (212) 566-8805

PROJECT
HENRY APARTMENTS
SITE A
 BROOKLYN, NY 11207

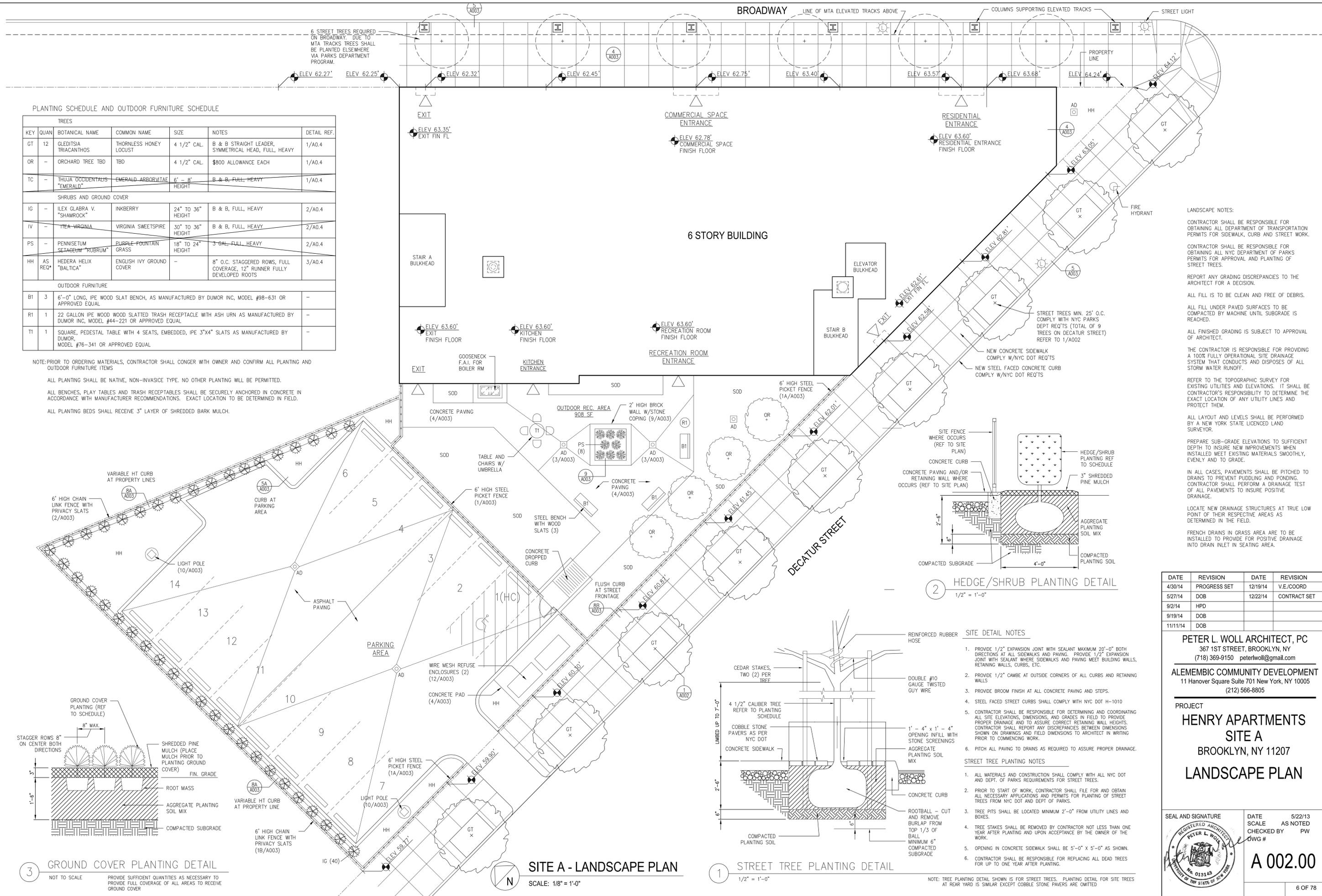
SITE PLAN

SEAL AND SIGNATURE

DATE 5/22/13
 SCALE 3/32" = 1'-0"
 CHECKED BY PW
 DWG #

A 001.00

5 OF 78



PLANTING SCHEDULE AND OUTDOOR FURNITURE SCHEDULE

TREES						
KEY	QUAN	BOTANICAL NAME	COMMON NAME	SIZE	NOTES	DETAIL REF.
GT	12	GLEDITSIA TRIACANTHOS	THORNLESS HONEY LOCUST	4 1/2" CAL.	B & B STRAIGHT LEADER, SYMMETRICAL HEAD, FULL, HEAVY	1/A0.4
OR	-	ORCHARD TREE TBD	TBD	4 1/2" CAL.	\$800 ALLOWANCE EACH	1/A0.4
TC	-	THUJA OCCIDENTALIS "EMERALD"	EMERALD ARBORVITAE	6' - 8' HEIGHT	B & B, FULL, HEAVY	1/A0.4
SHRUBS AND GROUND COVER						
IG	-	ILEX GLABRA V. "SHAMROCK"	INKBERRY	24" TO 36" HEIGHT	B & B, FULL, HEAVY	2/A0.4
IV	-	THEA VIRGINICA	VIRGINIA SWEETSPIRE	30" TO 36" HEIGHT	B & B, FULL, HEAVY	2/A0.4
PS	-	PENNISETUM SETACEUM "RUBRUM"	PURPLE FOUNTAIN GRASS	18" TO 24" HEIGHT	3 GAL, FULL, HEAVY	2/A0.4
HH	AS REQ	HEDERA HELIX "BALTICA"	ENGLISH IVY GROUND COVER	-	8" O.C. STAGGERED ROWS, FULL COVERAGE, 12" RUNNER FULLY DEVELOPED ROOTS	3/A0.4
OUTDOOR FURNITURE						
B1	3	6'-0" LONG, IPE WOOD SLAT BENCH, AS MANUFACTURED BY DUMOR INC, MODEL #98-631 OR APPROVED EQUAL				-
R1	2	22 GALLON IPE WOOD WOOD SLATTED TRASH RECEPTACLE WITH ASH URN AS MANUFACTURED BY DUMOR INC, MODEL #44-221 OR APPROVED EQUAL				-
T1	1	SQUARE, PEDESTAL TABLE WITH 4 SEATS, EMBEDDED, IPE 3"x4" SLATS AS MANUFACTURED BY DUMOR, MODEL #76-341 OR APPROVED EQUAL				-

NOTE: PRIOR TO ORDERING MATERIALS, CONTRACTOR SHALL CONFER WITH OWNER AND CONFIRM ALL PLANTING AND OUTDOOR FURNITURE ITEMS

ALL PLANTING SHALL BE NATIVE, NON-INVASIVE TYPE. NO OTHER PLANTING WILL BE PERMITTED.

ALL BENCHES, PLAY TABLES AND TRASH RECEPTACLES SHALL BE SECURELY ANCHORED IN CONCRETE IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. EXACT LOCATION TO BE DETERMINED IN FIELD.

ALL PLANTING BEDS SHALL RECEIVE 3" LAYER OF SHREDDED BARK MULCH.

LANDSCAPE NOTES:

CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL DEPARTMENT OF TRANSPORTATION PERMITS FOR SIDEWALK, CURB AND STREET WORK.

CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NYC DEPARTMENT OF PARKS PERMITS FOR APPROVAL AND PLANTING OF STREET TREES.

REPORT ANY GRADING DISCREPANCIES TO THE ARCHITECT FOR A DECISION.

ALL FILL IS TO BE CLEAN AND FREE OF DEBRIS.

ALL FILL UNDER PAVED SURFACES TO BE COMPACTED BY MACHINE UNTIL SUBGRADE IS REACHED.

ALL FINISHED GRADING IS SUBJECT TO APPROVAL OF ARCHITECT.

THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A 100% FULLY OPERATIONAL SITE DRAINAGE SYSTEM THAT CONDUCTS AND DISPOSES OF ALL STORM WATER RUNOFF.

REFER TO THE TOPOGRAPHIC SURVEY FOR EXISTING UTILITIES AND ELEVATIONS. IT SHALL BE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF ANY UTILITY LINES AND PROTECT THEM.

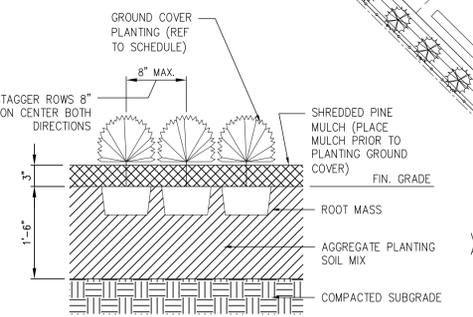
ALL LAYOUT AND LEVELS SHALL BE PERFORMED BY A NEW YORK STATE LICENCED LAND SURVEYOR.

PREPARE SUB-GRADE ELEVATIONS TO SUFFICIENT DEPTH TO INSURE NEW IMPROVEMENTS WHEN INSTALLED MEET EXISTING MATERIALS SMOOTHLY, EVENLY AND TO GRADE.

IN ALL CASES, PAVEMENTS SHALL BE PITCHED TO DRAINS TO PREVENT PUDDLING AND PONDING. CONTRACTOR SHALL PERFORM A DRAINAGE TEST OF ALL PAVEMENTS TO INSURE POSITIVE DRAINAGE.

LOCATE NEW DRAINAGE STRUCTURES AT TRUE LOW POINT OF THEIR RESPECTIVE AREAS AS DETERMINED IN THE FIELD.

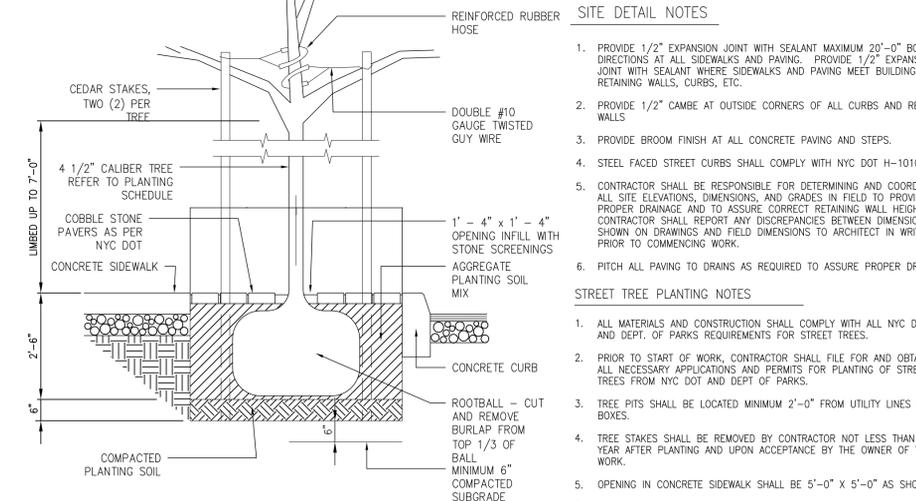
FRENCH DRAINS IN GRASS AREA ARE TO BE INSTALLED TO PROVIDE POSITIVE DRAINAGE INTO DRAIN INLET IN SEATING AREA.



GROUND COVER PLANTING DETAIL
 NOT TO SCALE
 PROVIDE SUFFICIENT QUANTITIES AS NECESSARY TO PROVIDE FULL COVERAGE OF ALL AREAS TO RECEIVE GROUND COVER



HEDGE/SHRUB PLANTING DETAIL
 1/2" = 1'-0"



STREET TREE PLANTING DETAIL
 1/2" = 1'-0"

- SITE DETAIL NOTES**
- PROVIDE 1/2" EXPANSION JOINT WITH SEALANT MAXIMUM 20'-0" BOTH DIRECTIONS AT ALL SIDEWALKS AND PAVING. PROVIDE 1/2" EXPANSION JOINT WITH SEALANT WHERE SIDEWALKS AND PAVING MEET BUILDING WALLS, RETAINING WALLS, CURBS, ETC.
 - PROVIDE 1/2" CAMBE AT OUTSIDE CORNERS OF ALL CURBS AND RETAINING WALLS
 - PROVIDE BROOM FINISH AT ALL CONCRETE PAVING AND STEPS.
 - STEEL FACED STREET CURBS SHALL COMPLY WITH NYC DOT H-1010
 - CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING AND COORDINATING ALL SITE ELEVATIONS, DIMENSIONS, AND GRADES IN FIELD TO PROVIDE PROPER DRAINAGE AND TO ASSURE CORRECT RETAINING WALL HEIGHTS. CONTRACTOR SHALL REPORT ANY DISCREPANCIES BETWEEN DIMENSIONS SHOWN ON DRAWINGS AND FIELD DIMENSIONS TO ARCHITECT IN WRITING PRIOR TO COMMENCING WORK.
 - PITCH ALL PAVING TO DRAINS AS REQUIRED TO ASSURE PROPER DRAINAGE.
- STREET TREE PLANTING NOTES**
- ALL MATERIALS AND CONSTRUCTION SHALL COMPLY WITH ALL NYC DOT AND DEPT. OF PARKS REQUIREMENTS FOR STREET TREES.
 - PRIOR TO START OF WORK, CONTRACTOR SHALL FILE FOR AND OBTAIN ALL NECESSARY APPLICATIONS AND PERMITS FOR PLANTING OF STREET TREES FROM NYC DOT AND DEPT OF PARKS.
 - TREE PITS SHALL BE LOCATED MINIMUM 2'-0" FROM UTILITY LINES AND BOXES.
 - TREE STAKES SHALL BE REMOVED BY CONTRACTOR NOT LESS THAN ONE YEAR AFTER PLANTING AND UPON ACCEPTANCE BY THE OWNER OF THE WORK.
 - OPENING IN CONCRETE SIDEWALK SHALL BE 5'-0" X 5'-0" AS SHOWN.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ALL DEAD TREES FOR UP TO ONE YEAR AFTER PLANTING.

DATE	REVISION	DATE	REVISION
4/30/14	PROGRESS SET	12/19/14	V.E./COORD
5/27/14	DOB	12/22/14	CONTRACT SET
9/2/14	HPD		
9/19/14	DOB		
11/11/14	DOB		

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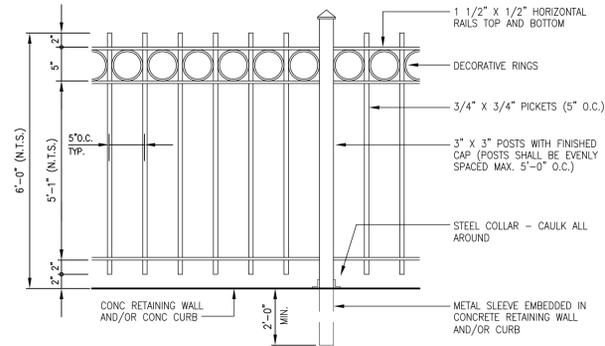
PROJECT
HENRY APARTMENTS
SITE A
BROOKLYN, NY 11207
LANDSCAPE PLAN

SEAL AND SIGNATURE

DATE 5/22/13
SCALE AS NOTED
CHECKED BY PW
DWG # A 002.00

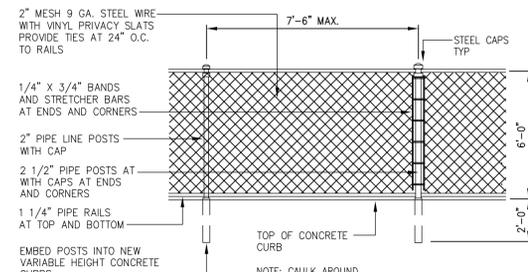
6 OF 78

SITE A - LANDSCAPE PLAN
 SCALE: 1/8" = 1'-0"



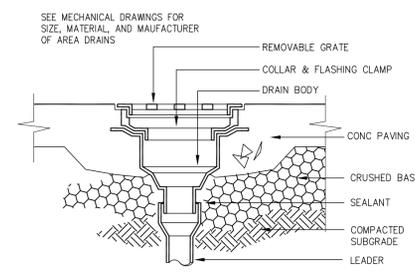
TYPICAL FENCE ELEVATION

1 STEEL PICKET FENCE
SCALE: 1" = 1'-0"

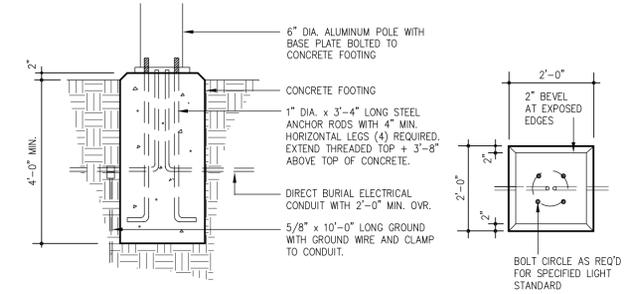


TYPICAL CHAIN LINK FENCE ELEVATION

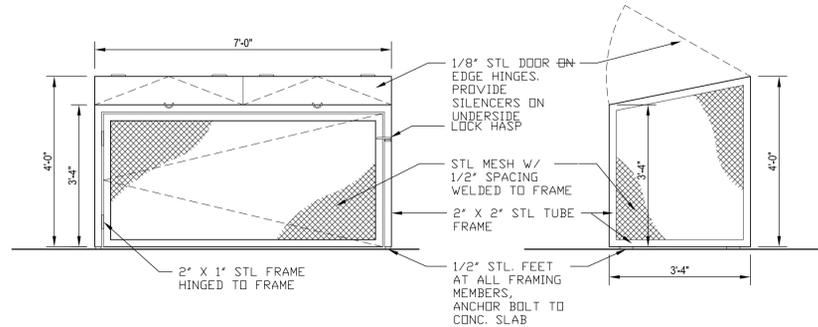
2 CHAIN LINK FENCE AT PROPERTY LINES
SCALE 1/4" = 1'-0"



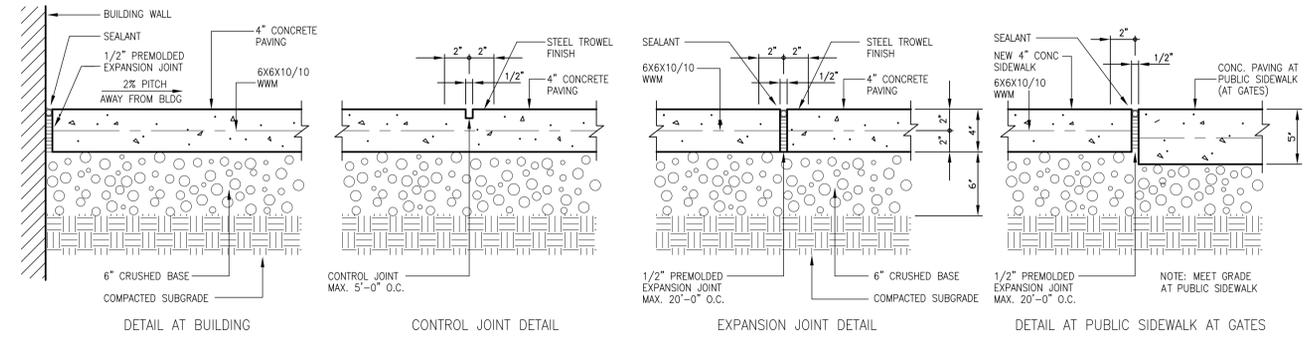
3 DRAIN IN WALKING SURFACE
SCALE 1-1/2" = 1'-0"
REFER TO MECH DWGS



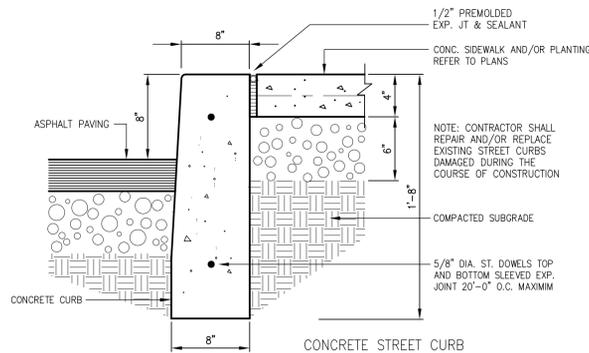
10 POLE AND FOOTING FOR LIGHT POLE IN REAR YARD
SCALE 1/2" = 1'-0"



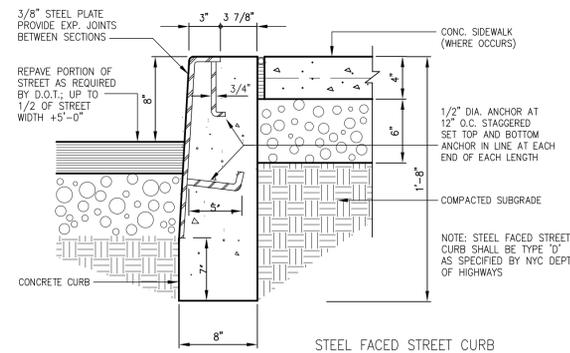
12 REFUSE AND RECYCLING ENCLOSURE (SEE SITE PLAN)
SCALE 1/2" = 1'-0"



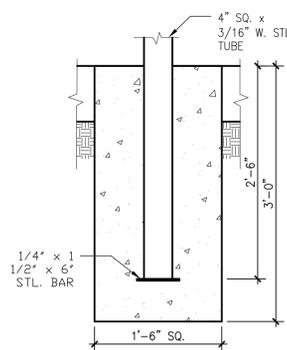
4 CONCRETE PAVING AND PUBLIC SIDEWALK
SCALE 1 1/2" = 1'-0"
NOTES: 1. SIDEWALK TO COMPLY WITH ALL NYC DEPT. OF TRANSPORTATION AND NYC BUILDING CODE REQUIREMENTS
2. PITCH PAVING AND BRICK PAVERS AWAY FROM BUILDING AND TOWARD AREA DRAINS, 1/8" PER 1'-0" MIN.



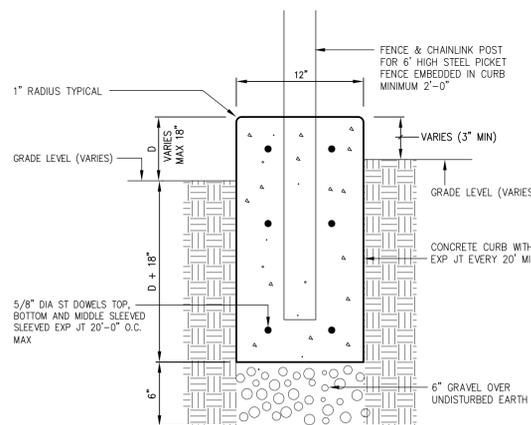
5A CONCRETE CURB AT PARKING AREA (SITE A)
SCALE 1 1/2" = 1'-0"



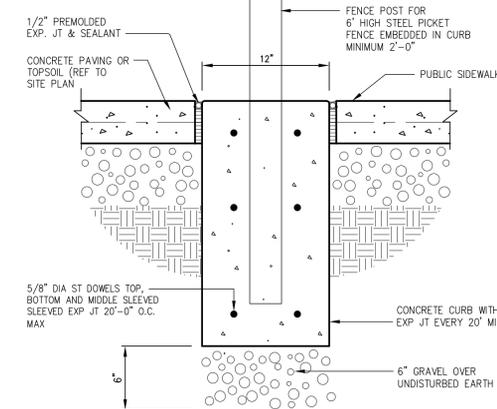
5B STEEL FACE CURB AS REQ'D BY D.O.T.
NOTE: SIDEWALK, CURB, AND STREET PAVING TO COMPLY WITH ALL NYC DEPT. OF TRANSPORTATION AND NYC BUILDING CODE REQUIREMENTS



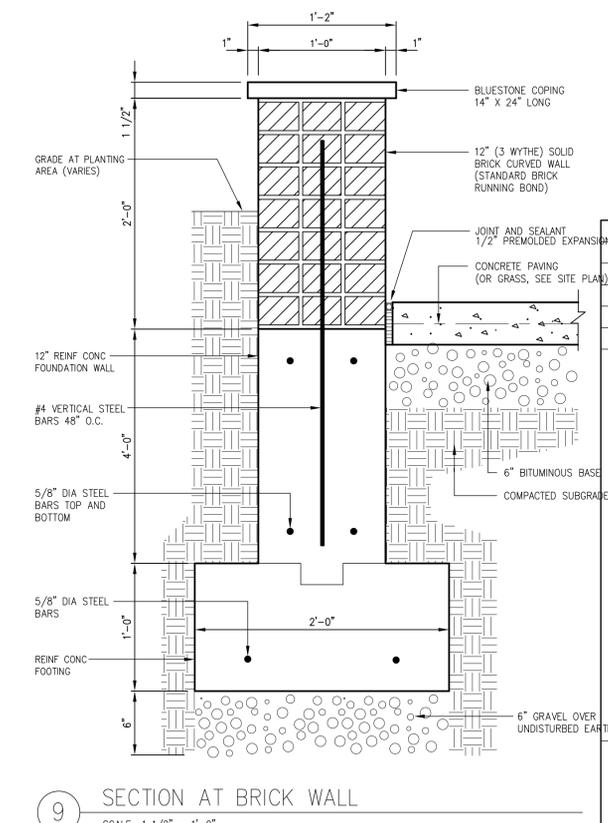
11 SITE FURNITURE EMBEDMENT DET.
SCALE 1" = 1'-0"



8A VARIABLE HEIGHT CONCRETE CURB AT PROPERTY LINE
SCALE 1 1/2" = 1'-0"



8B FLUSH CONCRETE CURB AT STREET FRONTAGE
SCALE 1 1/2" = 1'-0"



9 SECTION AT BRICK WALL
SCALE 1 1/2" = 1'-0"

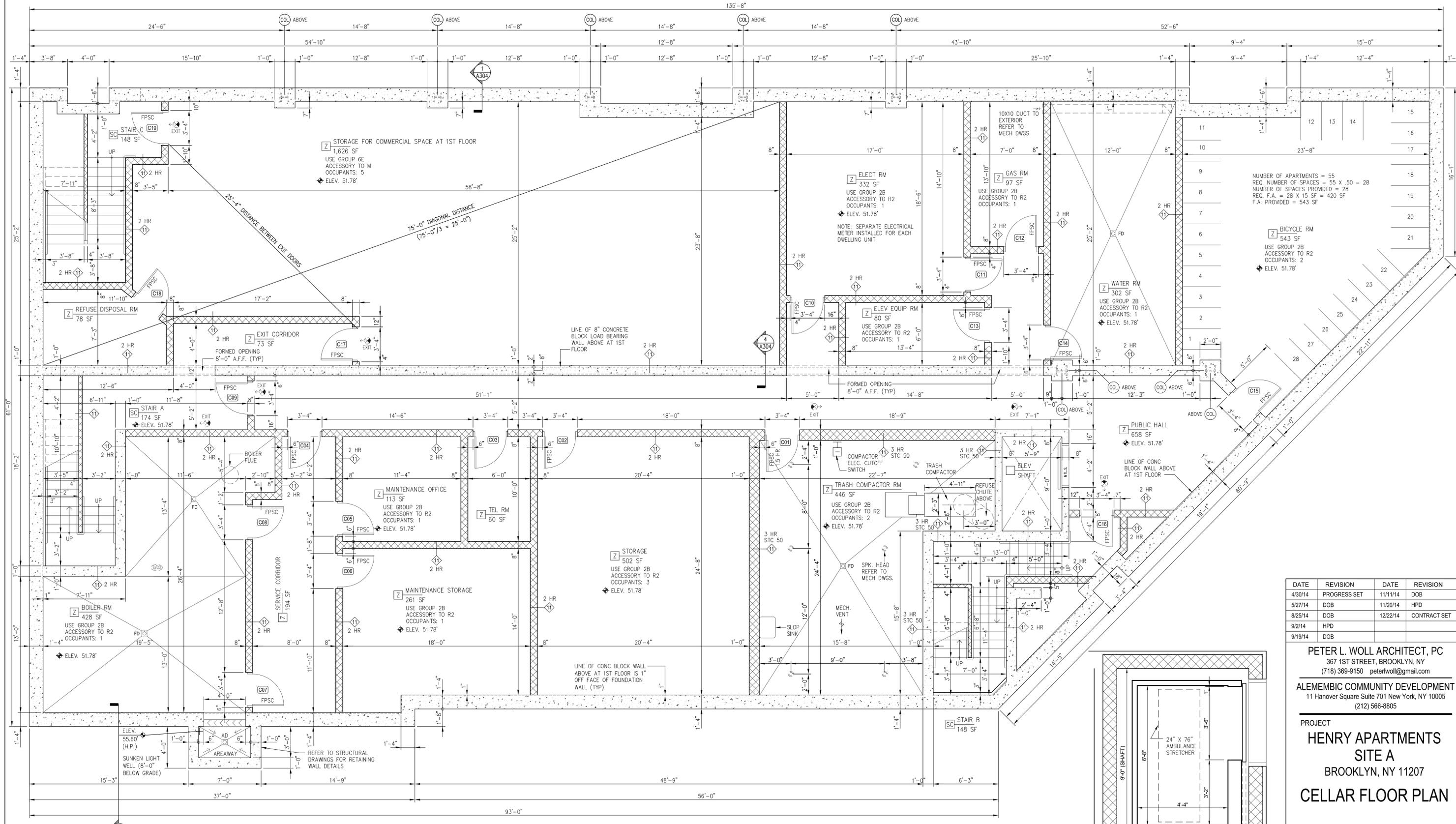
SEE STRUCTURAL DRAWINGS FOR RETAINING WALL DETAILS

DATE	REVISION	DATE	REVISION
4/30/14	PROGRESS SET		
5/27/14	DOB		
9/2/14	HPD		
11/11/14	DOB		
12/22/14	CONTRACT SET		

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PROJECT
HENRY APARTMENTS
SITE A
BROOKLYN, NY 11207
SITE DETAILS

SEAL AND SIGNATURE 	DATE 5/22/13
	SCALE AS NOTED
	CHECKED BY PW
	DWG # A 003.00



NUMBER OF APARTMENTS = 55
 REQ. NUMBER OF SPACES = 55 X .50 = 28
 NUMBER OF SPACES PROVIDED = 28
 REQ. F.A. = 28 X 15 SF = 420 SF
 F.A. PROVIDED = 543 SF

DATE	REVISION	DATE	REVISION
4/30/14	PROGRESS SET	11/11/14	DOB
5/27/14	DOB	11/20/14	HPD
8/25/14	DOB	12/22/14	CONTRACT SET
9/2/14	HPD		
9/19/14	DOB		

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PROJECT
HENRY APARTMENTS
SITE A
 BROOKLYN, NY 11207
CELLAR FLOOR PLAN

NOTE: OCCUPANCY CLASSIFICATION: R2 AND M (FULLY SPRINKLERED)
 NOTE: ALL WINDOWS IN RESIDENTIAL PORTION OF BUILDING ARE DOUBLE GLAZED AS PER ZR 28-22

SMOKE/CO DETECTOR
 EXIT LIGHT
 EXIT

NOTE: THIS BUILDING IS NOT A PREFABRICATED BUILDING
 NOTE: THIS BUILDING IS PROTECTED BY AN AUTOMATIC SPRINKLER SYSTEM
 NOTE: THIS BUILDING CONTAINS A SMOKE DETECTION AND ALARM SYSTEM

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

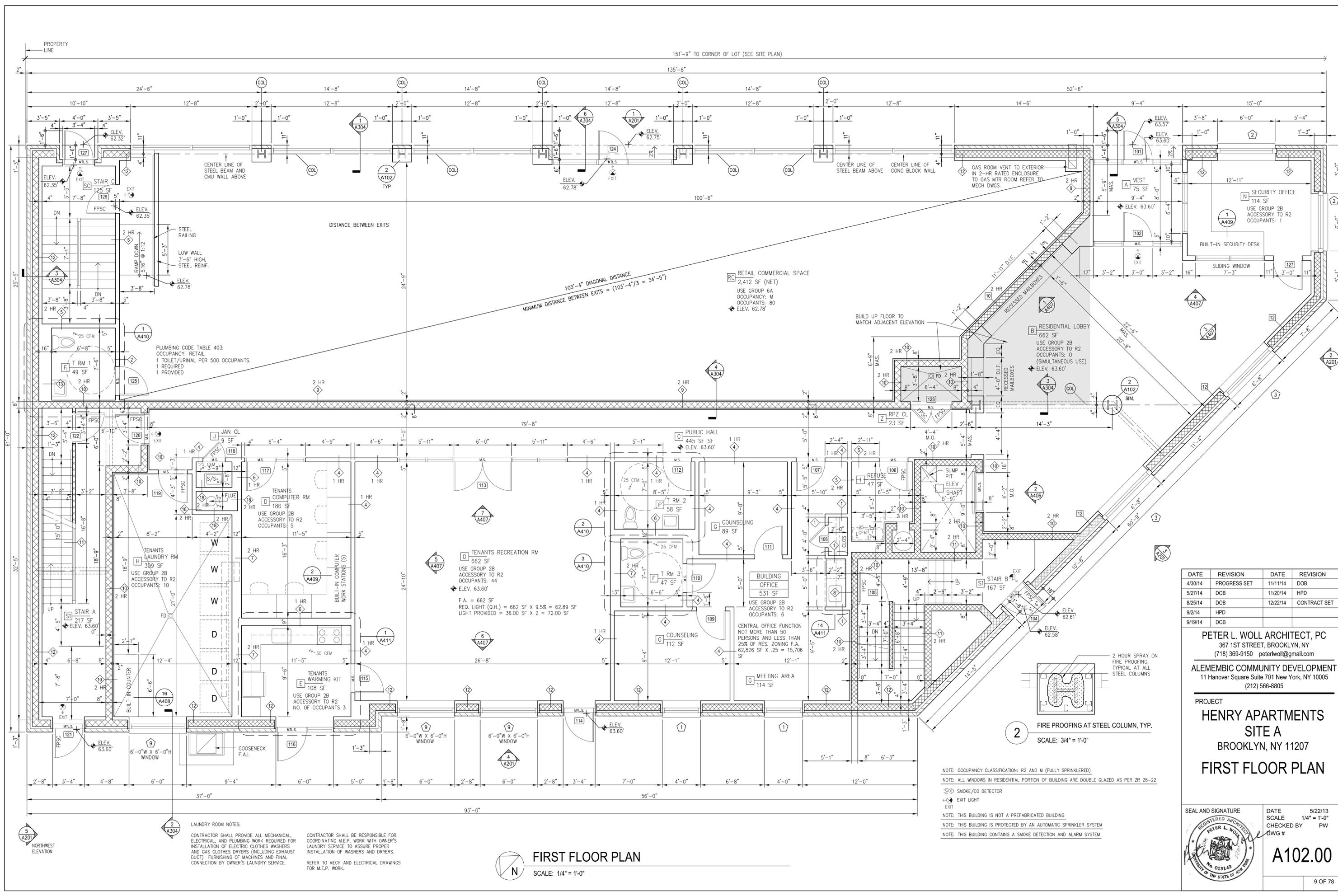
2 ELEVATOR CAB
 SCALE: 1/2" = 1'-0"

SEAL AND SIGNATURE

DATE: 5/22/13
 SCALE: 1/4" = 1'-0"
 CHECKED BY: PW
 DWG #

A101.00

8 OF 78



103'-4" DIAGONAL DISTANCE
 MINIMUM DISTANCE BETWEEN EXITS = (103'-4"/3 = 34'-5")

RETAIL COMMERCIAL SPACE
 2,412 SF (NET)
 USE GROUP 6A
 OCCUPANCY: M
 OCCUPANTS: 80
 ELEV. 62.78'

D TENANTS RECREATION RM
 662 SF
 USE GROUP 2B
 ACCESSORY TO R2
 OCCUPANTS: 44
 ELEV. 63.60'
 F.A. = 662 SF
 REQ. LIGHT (Q.H.) = 662 SF X 9.5% = 62.89 SF
 LIGHT PROVIDED = 36.00 SF X 2 = 72.00 SF

2 FIRE PROOFING AT STEEL COLUMN, TYP.
 SCALE: 3/4" = 1'-0"

NOTE: OCCUPANCY CLASSIFICATION: R2 AND M (FULLY SPRINKLERED)
 NOTE: ALL WINDOWS IN RESIDENTIAL PORTION OF BUILDING ARE DOUBLE GLAZED AS PER ZR 28-22
 SMOKE/CO DETECTOR
 EXIT LIGHT
 EXIT
 NOTE: THIS BUILDING IS NOT A PREFABRICATED BUILDING
 NOTE: THIS BUILDING IS PROTECTED BY AN AUTOMATIC SPRINKLER SYSTEM
 NOTE: THIS BUILDING CONTAINS A SMOKE DETECTION AND ALARM SYSTEM

DATE	REVISION	DATE	REVISION
4/30/14	PROGRESS SET	11/11/14	DOB
5/27/14	DOB	11/20/14	HPD
8/25/14	DOB	12/22/14	CONTRACT SET
9/2/14	HPD		
9/19/14	DOB		

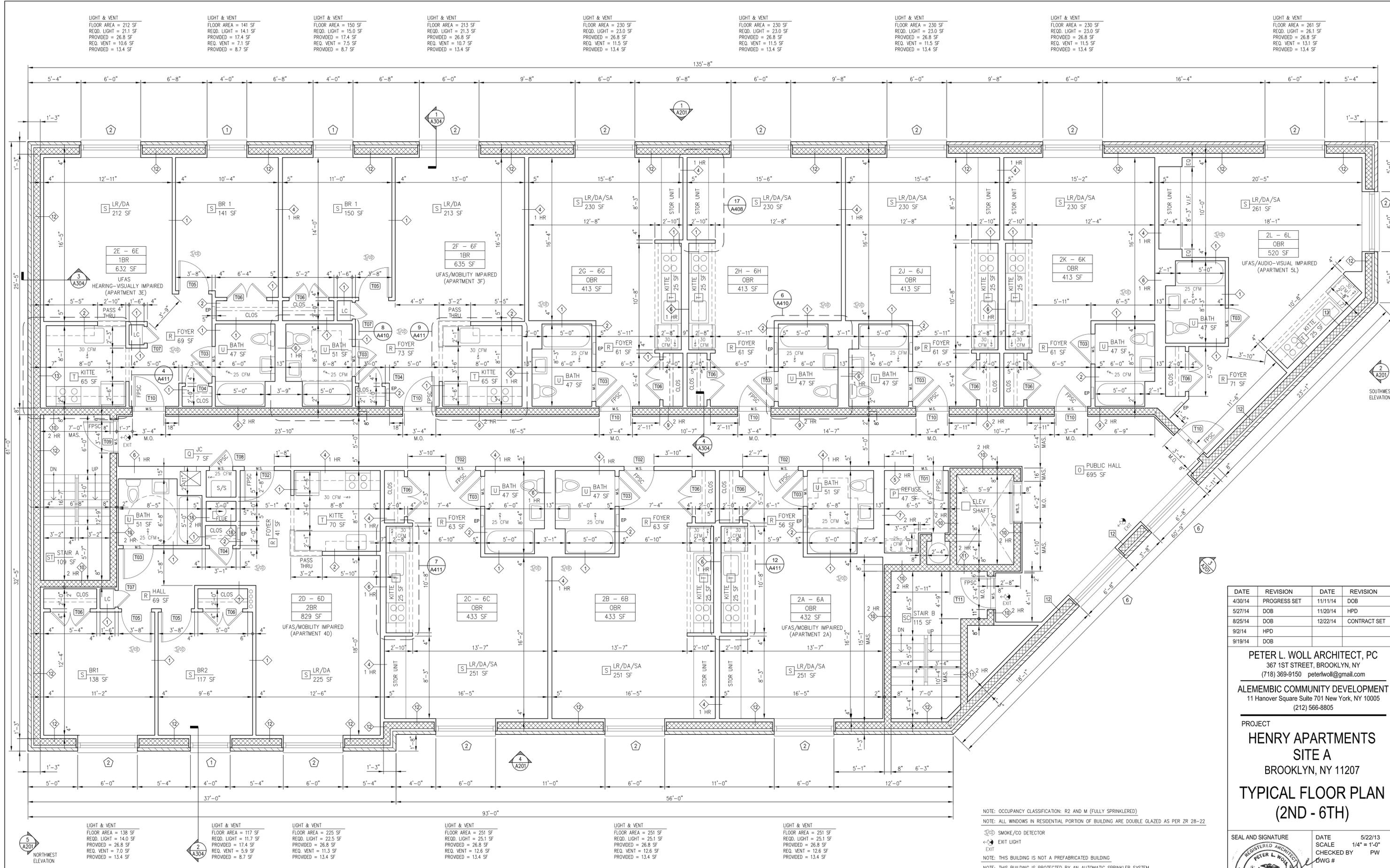
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PROJECT
HENRY APARTMENTS
SITE A
 BROOKLYN, NY 11207
FIRST FLOOR PLAN

SEAL AND SIGNATURE

 DATE 5/22/13
 SCALE 1/4" = 1'-0"
 CHECKED BY PW
 DWG # **A102.00**

FIRST FLOOR PLAN
 SCALE: 1/4" = 1'-0"



LIGHT & VENT
 FLOOR AREA = 212 SF
 REQ. LIGHT = 21.1 SF
 PROVIDED = 26.8 SF
 REQ. VENT = 10.6 SF
 PROVIDED = 13.4 SF

LIGHT & VENT
 FLOOR AREA = 141 SF
 REQ. LIGHT = 14.1 SF
 PROVIDED = 17.4 SF
 REQ. VENT = 7.1 SF
 PROVIDED = 8.7 SF

LIGHT & VENT
 FLOOR AREA = 150 SF
 REQ. LIGHT = 15.0 SF
 PROVIDED = 17.4 SF
 REQ. VENT = 7.5 SF
 PROVIDED = 8.7 SF

LIGHT & VENT
 FLOOR AREA = 213 SF
 REQ. LIGHT = 21.3 SF
 PROVIDED = 26.8 SF
 REQ. VENT = 10.7 SF
 PROVIDED = 13.4 SF

LIGHT & VENT
 FLOOR AREA = 230 SF
 REQ. LIGHT = 23.0 SF
 PROVIDED = 26.8 SF
 REQ. VENT = 11.5 SF
 PROVIDED = 13.4 SF

LIGHT & VENT
 FLOOR AREA = 230 SF
 REQ. LIGHT = 23.0 SF
 PROVIDED = 26.8 SF
 REQ. VENT = 11.5 SF
 PROVIDED = 13.4 SF

LIGHT & VENT
 FLOOR AREA = 230 SF
 REQ. LIGHT = 23.0 SF
 PROVIDED = 26.8 SF
 REQ. VENT = 11.5 SF
 PROVIDED = 13.4 SF

LIGHT & VENT
 FLOOR AREA = 230 SF
 REQ. LIGHT = 23.0 SF
 PROVIDED = 26.8 SF
 REQ. VENT = 11.5 SF
 PROVIDED = 13.4 SF

LIGHT & VENT
 FLOOR AREA = 261 SF
 REQ. LIGHT = 26.1 SF
 PROVIDED = 26.8 SF
 REQ. VENT = 13.1 SF
 PROVIDED = 13.4 SF

LIGHT & VENT
 FLOOR AREA = 138 SF
 REQ. LIGHT = 14.0 SF
 PROVIDED = 26.8 SF
 REQ. VENT = 7.0 SF
 PROVIDED = 13.4 SF

LIGHT & VENT
 FLOOR AREA = 117 SF
 REQ. LIGHT = 11.7 SF
 PROVIDED = 17.4 SF
 REQ. VENT = 5.9 SF
 PROVIDED = 8.7 SF

LIGHT & VENT
 FLOOR AREA = 225 SF
 REQ. LIGHT = 22.5 SF
 PROVIDED = 26.8 SF
 REQ. VENT = 11.3 SF
 PROVIDED = 13.4 SF

LIGHT & VENT
 FLOOR AREA = 251 SF
 REQ. LIGHT = 25.1 SF
 PROVIDED = 26.8 SF
 REQ. VENT = 12.6 SF
 PROVIDED = 13.4 SF

LIGHT & VENT
 FLOOR AREA = 251 SF
 REQ. LIGHT = 25.1 SF
 PROVIDED = 26.8 SF
 REQ. VENT = 12.6 SF
 PROVIDED = 13.4 SF

LIGHT & VENT
 FLOOR AREA = 251 SF
 REQ. LIGHT = 25.1 SF
 PROVIDED = 26.8 SF
 REQ. VENT = 12.6 SF
 PROVIDED = 13.4 SF

NOTE: OCCUPANCY CLASSIFICATION: R2 AND M (FULLY SPRINKLERED)
 NOTE: ALL WINDOWS IN RESIDENTIAL PORTION OF BUILDING ARE DOUBLE GLAZED AS PER ZR 28-22
 SMOKE/CO DETECTOR
 EXIT LIGHT
 EXIT
 NOTE: THIS BUILDING IS NOT A PREFABRICATED BUILDING
 NOTE: THIS BUILDING IS PROTECTED BY AN AUTOMATIC SPRINKLER SYSTEM
 NOTE: THIS BUILDING CONTAINS A SMOKE DETECTION AND ALARM SYSTEM

TYPICAL FLOOR PLAN (2ND THROUGH 6TH)
 SCALE: 1/4" = 1'-0"

DATE	REVISION	DATE	REVISION
4/30/14	PROGRESS SET	11/11/14	DOB
5/27/14	DOB	11/20/14	HPD
8/25/14	DOB	12/22/14	CONTRACT SET
9/2/14	HPD		
9/19/14	DOB		

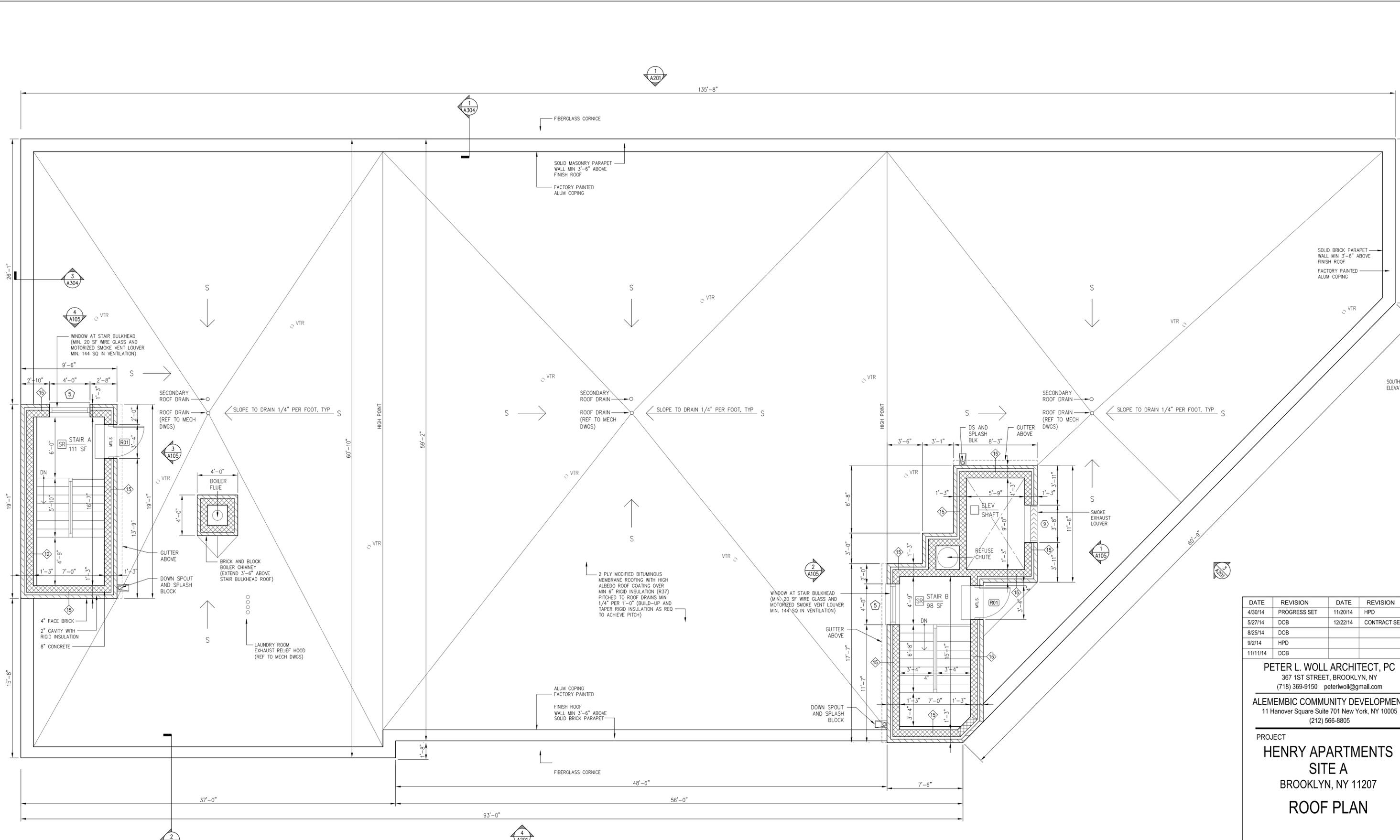
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 (212) 566-8805

PROJECT
HENRY APARTMENTS
SITE A
 BROOKLYN, NY 11207
TYPICAL FLOOR PLAN
(2ND - 6TH)

SEAL AND SIGNATURE

 DATE: 5/22/13
 SCALE: 1/4" = 1'-0"
 CHECKED BY: PW
 DWG #
A103.00



DATE	REVISION	DATE	REVISION
4/30/14	PROGRESS SET	11/20/14	HPD
5/27/14	DOB	12/22/14	CONTRACT SET
8/25/14	DOB		
9/2/14	HPD		
11/11/14	DOB		

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 11 Hanover Square Suite 701 New York, NY 10005
 (212) 566-8805

PROJECT
HENRY APARTMENTS
SITE A
 BROOKLYN, NY 11207
ROOF PLAN

SEAL AND SIGNATURE 	DATE 5/22/13
CHECKED BY PW	SCALE 1/4" = 1'-0"
DWG # A104.00	

ROOF PLAN
 SCALE: 1/4" = 1'-0"

NOTE: OCCUPANCY CLASSIFICATION: R2 AND M (FULLY SPRINKLERED)
 NOTE: ALL WINDOWS IN RESIDENTIAL PORTION OF BUILDING ARE DOUBLE GLAZED AS PER ZR 28-22

SMOKE/CO DETECTOR
 EXIT LIGHT
 EXIT

NOTE: THIS BUILDING IS NOT A PREFABRICATED BUILDING
 NOTE: THIS BUILDING IS PROTECTED BY AN AUTOMATIC SPRINKLER SYSTEM
 NOTE: THIS BUILDING CONTAINS A SMOKE DETECTION AND ALARM SYSTEM

83AF Fibered Dampproofing (brush or spray)

DESCRIPTION:

Karnak #83AF Fibered Dampproofing is a solvent based asphalt compound, manufactured with selected asphalts, mineral fibers, stabilizers and mineral spirits. Karnak #83AF Fibered Dampproofing is prepared to the proper consistency for easy application, by brush, spray or roller. This material is a multi purpose, cold applied protective dampproofing that dries to a tough, durable and flexible coating that gives excellent performance over a wide range of temperature and conditions. This product exhibits excellent resistance to acids and alkalis in the soils and in the environment.

USES:

Karnak #83AF Fibered Dampproofing is designed to dampproof masonry and concrete exterior surfaces below grade and interior surfaces above grade. This product is also suitable as a general protective coating for wood, steel and for all backup materials for masonry such as stone, brick and concrete.

SPECIFICATIONS:

ASTM D-4479 Type I
SSA-694d

SURFACE PREPARATION:

Surfaces must be clean, dry and free from oil, grease, release agents, laitance, dirt, dust and debris. All cracks and pin holes should be repaired and filled with Karnak #86AF Trowel Mastic prior to coating. If the surface is very porous, it is recommended that Karnak #108 Asphalt Primer be utilized to provide a firm film base prior to coating with Karnak #83AF Fibered Dampproofing.

BRUSH APPLICATION:

Apply with a wide, fiber brush at the rate of 4 gallons per 100 sq. ft.

SPRAY APPLICATION:

Utilize a standard heavy duty airless spray pump using heavy duty guns and nozzles. Equipment manufacturers should be consulted for more complete information. Apply at the rate of 4 gallons per 100 sq. ft.

NOTE: Allow the film to cure for at least 24 to 48 hours prior to backfilling. Care should be taken during filling not to puncture or damage the coating. A protection board is highly recommended to protect the film prior to backfilling. Backfilling should take place within 7 days in areas where hydrostatic pressure is known to occur. Contact Karnak Corporation for alternate product suggestions.

Reviewed <input checked="" type="checkbox"/>	
Resubmittal Not Required <input type="checkbox"/>	
Reviewed As Noted <input type="checkbox"/>	
Resubmittal Required <input type="checkbox"/>	
DATE: 2/10/15	BY: P.W.



83AF Fibered Dampproofing (brush or spray)

COVERAGE RATE:

Apply at the rate of 4 gallons per 100 square feet.

CARE OF TOOLS:

Tools and other equipment should be thoroughly cleaned with mineral spirits, taking necessary precautions when handling combustible materials.

PHYSICAL PROPERTIES:

Weight per Gallon:	8.4 lbs.
Solids by Weight:	72%
Solids by Volume:	65%
Color:	Black
Permeability:	.25 metric perms
Cure Time:	24 to 48 hours @ 77°F @ 50% Relative Humidity
Application:	Brush or Spray
Service Temperature Range:	40°F to 150°F

CHEMICAL RESISTANCE:

Acids	Excellent
Alkaline	Excellent
Salts	Excellent

CAUTION:

Do not use near open flame. Avoid breathing solvent fumes and prolonged contact with skin. Do not take internally. If swallowed, **do not induce vomiting**. Call a physician immediately. Keep out of reach of children. Keep container covered when not in use. **Do not thin**. Dispose of in an environmentally safe manner. Cover air intakes during application and while drying.

PACKAGING:

Available in 5 gallon pails and 55 gallon drums.

If further information is needed, contact Karnak Technical Services at 1-800-526-4236.

KARNAK

330 CENTRAL AVENUE, CLARK, NJ 07066
732-388-0300 • 800-526-4236 • FAX: 732-388-9422
WEB: <http://www.karnakcorp.com>

METRO-DADE
APPROVED

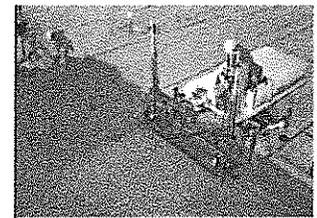
FM0601

101



Stego® Wrap Class A Vapor Retarder

STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00, 03 30 00

1. Product Name

Stego Wrap Class A
Vapor Retarder

2. Manufacturer

Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description

USES: Stego Wrap Class A is used as an exceptional vapor retarder.
COMPOSITION: Stego Wrap Class A is a multi-layer plastic extrusion manufactured with only high grade prime, virgin, polyolefin resins.
ENVIRONMENTAL FACTORS: Stego Wrap Class A can be used in systems for the control of soil gases (radon, methane), soil poisons (oil by-products) and sulfates.

5. Installation

UNDER SLAB: Unroll Stego Wrap Class A over an aggregate, sand or tamped earth base. Overlap all seams a minimum of six inches and tape using Stego Tape or Crete Claw® Tape. All penetrations must be sealed using a combination of Stego Wrap and Stego accessories.

For additional information, please refer to Stego's complete installation instructions.

6. Availability & Cost

Stego Wrap Class A is available nationally via building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' sales department.

7. Warranty

Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are

accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

9. Maintenance

None required.

8. Technical Services

Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or via the website.

10. Filing Systems

- Stego Industries' website
- Buildsite
- 4Specs

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGO WRAP CLASS A VAPOR RETARDER

PROPERTY	TEST	RESULTS
Under Slab Vapor Retarders	ASTM E 1745 Class A, B & C – Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs	Exceeds Class A, B & C
Water Vapor Permeance	ASTM F 1249 – Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor	0.0254 perms
Puncture Resistance	ASTM D 1709 – Test Methods for Impact Resistance of Plastic Film by Free-Falling Dart Method	3466 grams
Tensile Strength	ASTM D 882 – Test Method for Tensile Properties of Thin Plastic Sheeting	50.60 lbf/in.
Permeance After Conditioning (ASTM E 1745 Sections 7.1.2 - 7.1.5)	ASTM E 154 Section 8, F 1249 – Permeance after wetting, drying, and soaking ASTM E 154 Section 11, F 1249 – Permeance after heat conditioning ASTM E 154 Section 12, F 1249 – Permeance after low temperature conditioning ASTM E 154 Section 13, F 1249 – Permeance after soil organism exposure	0.0258 perms 0.0259 perms 0.0241 perms 0.0245 perms
Thickness	ACI 302.1R-04 – Minimum Thickness {10 mils}	10 mils
Roll Dimensions		14 ft. wide x 210 ft. long or 2,940 ft ²
Roll Weight		140 lbs.

Note: perm unit = grains/(ft² *hr* in.Hg)

Test results above are for Stego Wrap products made as of March 15, 2013. If you have product made prior to March 15, 2013 please refer to Stego literature dated 10/12 for representative test results or call your local Stego Representative with questions.



**FIGURE 1
LOCATION MAP**

Source: ESRI Web Mapping Service
Scale: 1 inch = 50 feet



**The Henry Apartments
Site A
Brooklyn**

**Remediation Action
Work Plan**



**FIGURE 4
LAND USE**

**The Henry Apartments
Site A
Brooklyn**

**Remediation Action
Work Plan**

Source: NYC Oasis landuse map

Scale: 1 inch = 100 feet



NELSON, POPE & VOORHIS, LLC
ENVIRONMENTAL • PLANNING • CONSULTING



Ecosystems Strategies, Inc.

24 Davis Avenue, Poughkeepsie, NY 12603

phone 845.452.1658 | fax 845.485.7083 | ecosystemsstrategies.com

Sub-slab Depressurization System Design
1674 – 1684 Broadway
Borough of Brooklyn, New York
ESI File: AB14144A.30
October 2014

REVIEWED

By Angelos Georgopoulos at 2:44 pm, Jan 09, 2015

This document, prepared by Ecosystems Strategies, Inc. (ESI) in conjunction with Jansen Engineering LLC (JE), details the proposed passive sub-slab depressurization system (SSDS) for the above-referenced property. The passive SSDS is a system intended to achieve lower sub-slab air pressure relative to indoor air pressure by use of system piping connecting the sub-slab area to the outdoor air, and relies on the upward convective flow of warm air in the vent stack (riser) to draw air from beneath the slab. A discharge point will be properly located above the roofline to minimize the likelihood of air emissions deleteriously affecting indoor air quality.

The locations of all system piping, discharge point and the SSDS Schematic are shown on Attachments 1 through 4. All locations are approximate and subject to modification.

System Components

The SSDS will consist of a network of sub-slab 4" ID Schedule 40 PVC piping connected to a riser pipe (via a vertical suction point pipe penetrating the building slab) that leads to a discharge point located above the roof-line. The riser pipe will consist of a 4" ID cast iron pipe¹ with fire stops as required. All sub-slab piping joints will be sealed with plumber's cement (or similar product) to be applied according to the manufacturer's specifications. The riser pipe joints will consist of cast iron¹, no-hub couplers in accordance with applicable building code. All piping joints will be inspected once the system is installed. Temporary monitoring points will be located throughout the building slab to confirm adequate vacuum and system connectivity.

System Design: General Layout and Details

The SSDS will be installed within the proposed building. Installation of the SSDS within the proposed building area will adhere to the following procedures:

1. All sub-slab piping will be perforated Schedule 40 PVC under the proposed concrete slab and vapor barrier. Piping diameter will be four inches (4") and all joints will be sealed with plumber's cement (or similar product) to be applied according to the manufacturer's specifications. The ends of the sub-slab piping will not be capped or plugged.

¹ Schedule 40 PVC may be substituted if permission is secured from the New York City Department of Buildings. If PVC piping is permitted, appropriate fire stop details will be installed at any location in which the riser pipe penetrates a fire rated wall and all joints will be sealed with plumber's cement (or similar product) to be applied according to the manufacturer's specifications.



2. All sub-slab piping will be laid in and covered with a gas-permeable layer with a minimum of three inches (3") sub-grade material beneath system piping. The sub-grade material will consist of one to one and a half inch (1-1 ½") clean crushed stone. All sub-grade and horizontal piping will be positively sloped to the riser pipe (high point). All sub-slab piping will be wrapped in a filter fabric (or comparable product) covered by at least two inches (2") of sub-grade material. A sub-slab cross section detail and the layout of the sub-slab piping network are presented as Attachments 1 to 3.
3. All sub-slab piping will be installed at least two inches (2") below the vapor barrier and twelve inches (12") inside the perimeter of the structure. Relocation to accommodate other piping is acceptable, subject to review and approval by ESI/JE. It is anticipated that the sub-slab piping will penetrate grade beams with the use of reserved sleeves as presented in Attachment 2. The structural engineer is advised to evaluate these penetrations.

Note: Horizontal runs of utility pipes and conduit will be installed below the gas-permeable layer. Pipes and conduits passing through the gas-permeable layer will be airtight after installation. Heating ducts passing through the gas-permeable layer should be avoided. All penetrations extending through the slab will be sealed with caulk or sealant to prevent air leakage into the gas-permeable layer.

4. The vertical suction point pipe penetrating the slab and connecting the sub-slab piping to the riser pipe will be non-perforated, four inch (4") ID Schedule 40 PVC.
5. All riser piping above the slab will be no-hub, four inch (4") ID cast iron¹ with corresponding no-hub iron couplers at the piping joints, as required by Fire Code. The riser will extend upward via a pipe chase identified by the project architect, Alphonse Diaz, and can be relocated so long as the eventual location of the riser is vertical throughout all floors.
6. The riser pipe will be rerouted after exiting the building at the roof level to run along the exterior wall of the Stair B bulkhead to the discharge point. Stabilizing straps will be used to secure riser pipe and discharge point to the exterior wall of the Stair B bulkhead. The discharge point will be properly located above the roofline, at least ten feet (10') from any air intake and at least twelve inches (12") above the highest point in the roof to minimize the likelihood of air emissions entering interior portions of the building. The location of the riser pipe route after exiting the building and discharge point is presented in Attachment 4. A four inch (4") diameter roof turbine ventilator will be installed at the discharge pipe terminus as a passive ventilation device to enhance air flow in the riser.

An SSDS Schematic indicating all relevant design features is presented as Attachment 1.

¹ Schedule 40 PVC may be substituted if permission is secured from the New York City Department of Buildings. If PVC piping is permitted, appropriate fire stop details will be installed at any location in which the riser pipe penetrates a fire rated wall and all joints will be sealed with plumber's cement (or similar product) to be applied according to the manufacturer's specifications.



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System Installation Testing

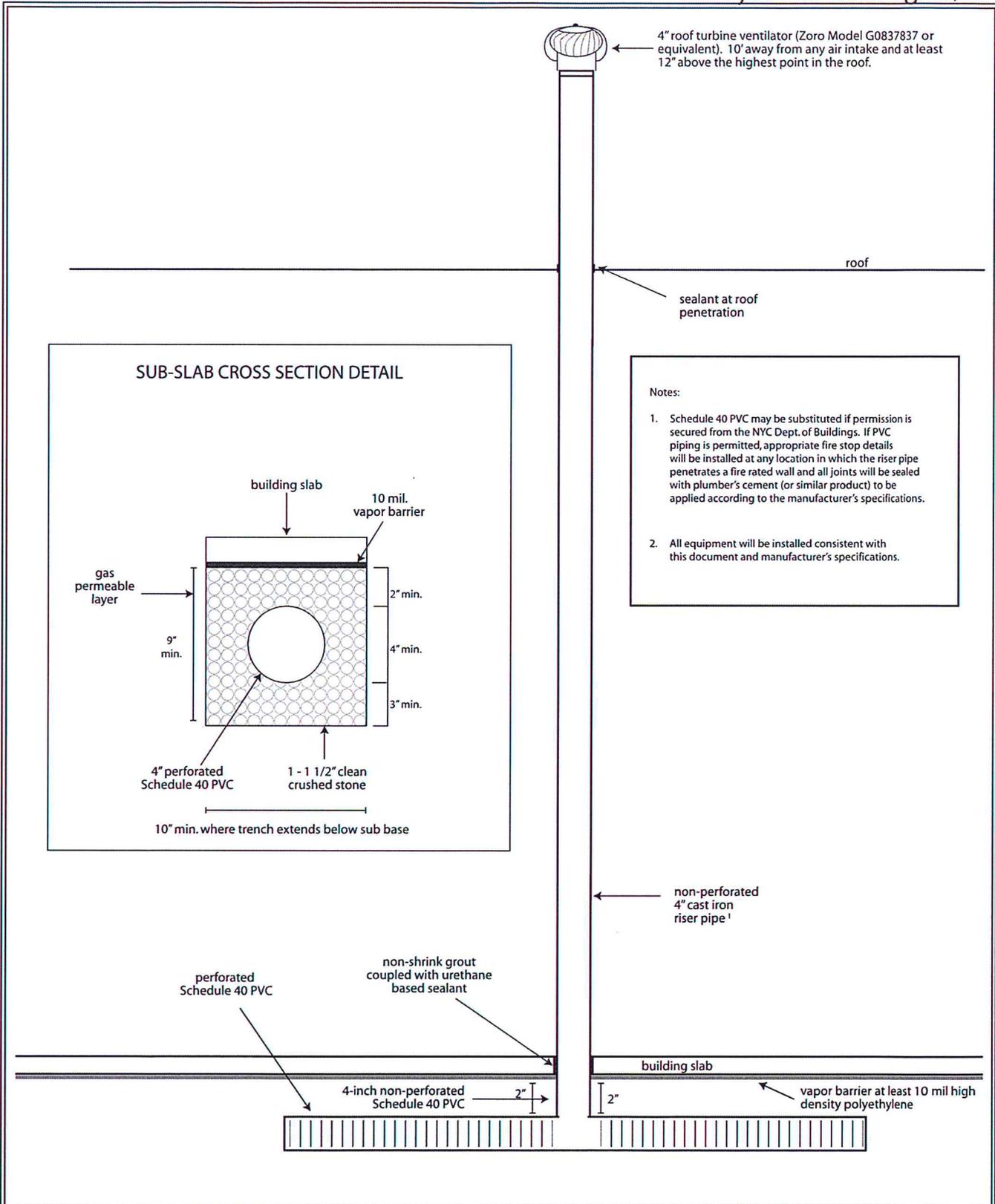
Initial system testing will occur after installation of sub-slab piping, the vapor barrier, and the system's vertical suction point pipe penetrating the building slab. System testing will be conducted as follows:

1. The system will be visually inspected and documentation of existing conditions will be recorded.
2. A vacuum will be connected to the vertical suction point pipe in order to create a negative pressure field within the system piping, and pressure levels will be recorded at the temporary monitoring points. Vacuum data (as measured in inches of water) will be collected from each monitoring point using a digital manometer. Sufficient vacuum will be achieved if negative pressure readings are documented at each monitoring point at less than - 0.02 inches of water column. Pressure readings will be documented in a Remedial Action Report to be prepared for the Site.
3. The temporary monitoring points will be removed after vacuum testing activities are complete.

Project Reporting

Upon completion of all work, a summary letter will be prepared inclusive of as-built drawings and operations/maintenance instructions. This document will be available for inclusion in the Remedial Action Report



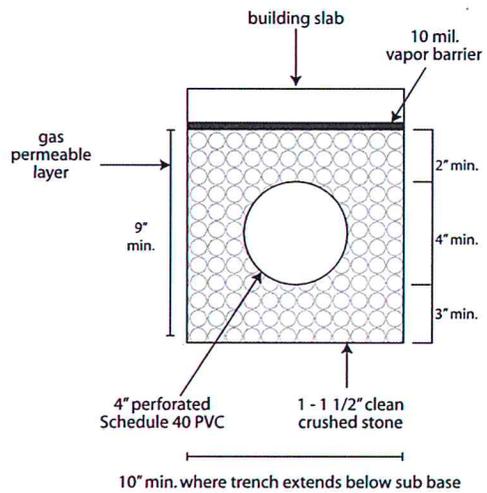


4" roof turbine ventilator (Zoro Model G0837837 or equivalent). 10' away from any air intake and at least 12" above the highest point in the roof.

roof

sealant at roof penetration

SUB-SLAB CROSS SECTION DETAIL



Notes:

1. Schedule 40 PVC may be substituted if permission is secured from the NYC Dept. of Buildings. If PVC piping is permitted, appropriate fire stop details will be installed at any location in which the riser pipe penetrates a fire rated wall and all joints will be sealed with plumber's cement (or similar product) to be applied according to the manufacturer's specifications.
2. All equipment will be installed consistent with this document and manufacturer's specifications.

non-perforated 4" cast iron riser pipe¹

perforated Schedule 40 PVC

non-shrink grout coupled with urethane based sealant

building slab

4-inch non-perforated Schedule 40 PVC

vapor barrier at least 10 mil high density polyethylene

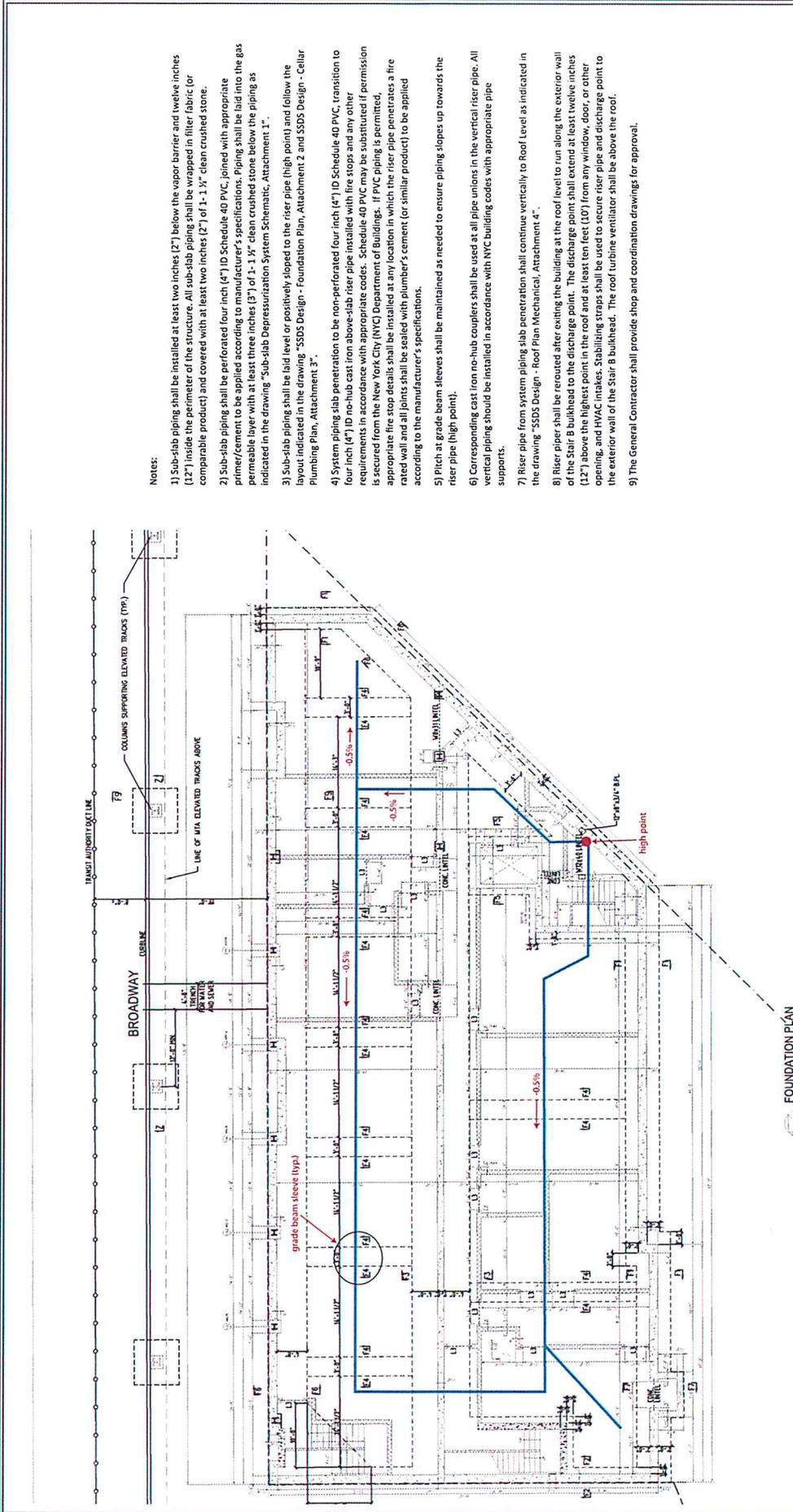
Sub-slab Depressurization System Schematic

1674 - 1684 Broadway
Borough of Brooklyn, New York

ESI File: AB14144A.30

October 2014

Attachment 1



SSDS Design - Structural Foundation Plan

1674 - 1684 Broadway
Borough of Brooklyn, New York

ESI File: AB14144A.30
Scale: 1" = 10'
October 2014 Attachment 2

Legend:

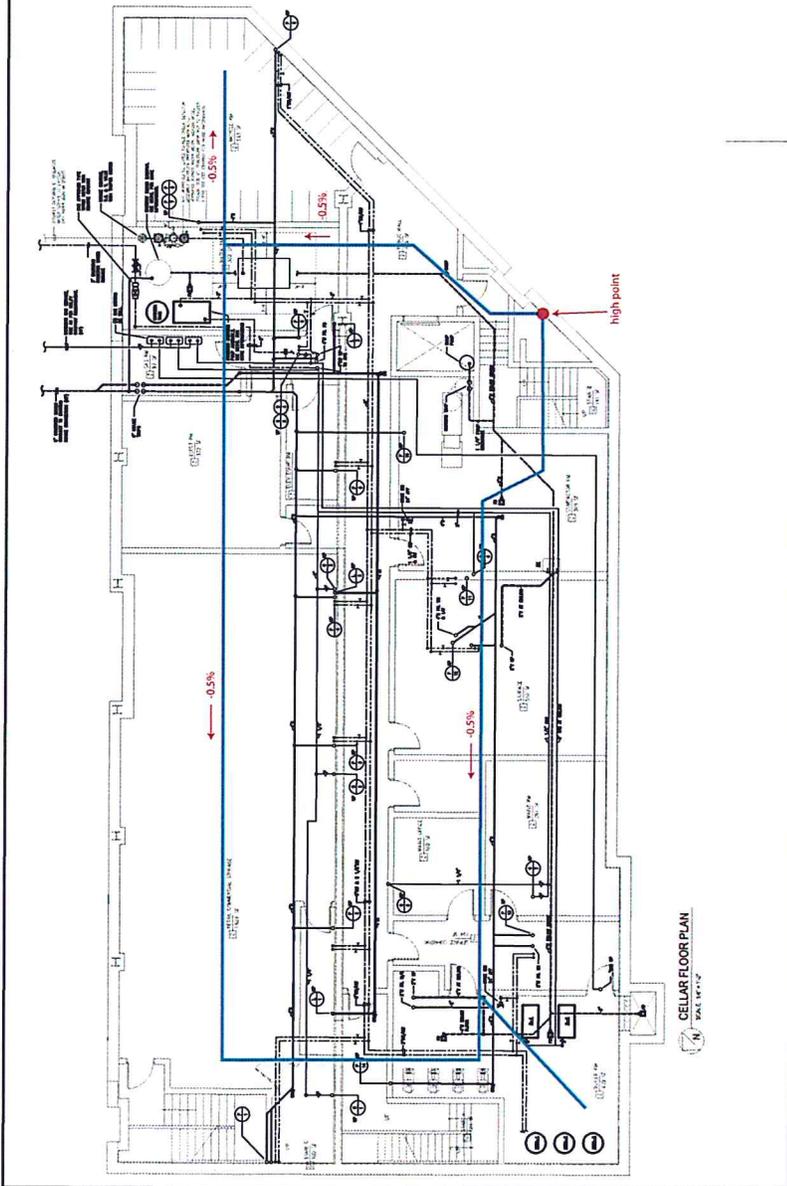
- SSDS piping
- Riser 4" Ø

FOUNDATION PLAN
SCALE: 3/8" = 1'-0"

Base map provided by Peter L. Wool Architect PC, Foundation Plan dated 9/2/14.

Notes:

- 1) Sub-slab piping shall be installed at least two inches (2") below the vapor barrier and twelve inches (12") inside the perimeter of the structure. All sub-slab piping shall be wrapped in filter fabric (or comparable product) and covered with at least two inches (2") of 1-1/2" clean crushed stone.
- 2) Sub-slab piping shall be perforated four inch (4") ID Schedule 40 PVC, joined with appropriate primer/cement to be applied according to manufacturer's specifications. Piping shall be laid into the gas permeable layer with at least three inches (3") of 1-1/2" clean crushed stone below the piping as indicated in the drawing, "Sub-slab depressurization System Schematic, Attachment 1".
- 3) Sub-slab piping shall be laid level or positively sloped to the riser pipe (high point) and follow the layout indicated in the drawing "SSDS Design - Foundation Plan, Attachment 2 and SSDS Design - Cellar Plumbing Plan, Attachment 3".
- 4) System piping slab penetration to be non-perforated four inch (4") ID Schedule 40 PVC, transition to four inch (4") ID no-hub cast iron above-slab riser pipe installed with fire stops and any other requirements in accordance with appropriate codes. Schedule 40 PVC may be substituted if permission is secured from the New York City (NYC) Department of Buildings. If PVC piping is permitted, appropriate fire stop details shall be installed at any location in which the riser pipe penetrates a fire rated wall and all joints shall be sealed with plumber's cement (or similar product) to be applied according to the manufacturer's specifications.
- 5) Pitch at grade beam sleeves shall be maintained as needed to ensure piping slopes up towards the riser pipe (high point).
- 6) Corresponding cast iron no-hub couplers shall be used at all pipe unions in the vertical riser pipe. All vertical piping should be installed in accordance with NYC building codes with appropriate pipe supports.
- 7) Riser pipe from system piping slab penetration shall continue vertically to Roof Level as indicated in the drawing, "SSDS Design - Roof Plan Mechanical, Attachment 4".
- 8) Riser pipes shall be rerouted after exiting the building at the roof level to run along the exterior wall of the Stair B bulkhead to the discharge point. The discharge point shall extend at least twelve inches (12") above the highest point in the roof and at least ten feet (10') from any window, door, or other opening, and HVAC intakes. Stabilizing straps shall be used to secure riser pipe and discharge point to the exterior wall of the Stair B bulkhead. The roof turbine ventilator shall be above the roof.
- 9) The General Contractor shall provide shop and coordination drawings for approval.



Notes:

- 1) Sub-slab piping shall be installed at least two inches (2") below the vapor barrier and twelve inches (12") inside the perimeter of the structure. All sub-slab piping shall be wrapped in filter fabric (or comparable product) and covered with at least two inches (2") of 1-1/2" clean crushed stone.
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- 5) Pitch at grade beam sleeves shall be maintained as needed to ensure piping slopes up towards the riser pipe (high point).
- 6) Corresponding cast iron no-hub couplers shall be used at all pipe unions in the vertical riser pipe. All vertical piping should be installed in accordance with NYC building codes with appropriate pipe supports.
- 7) Riser pipe from system piping slab penetration shall continue vertically to Roof level as indicated in the drawing "SSDS Design - Roof Plan Mechanical, Attachment 4".
- 8) Riser pipes shall be routed after exiting the building at the roof level to run along the exterior wall of the Stair B bulkhead to the discharge point. The discharge point shall extend at least twelve inches (12") above the highest point in the roof and at least ten feet (10') from any window, door, or other opening, and HVAC intakes. Stabilizing straps shall be used to secure riser pipe and discharge point to the exterior wall of the Stair B bulkhead. The roof turbine ventilator shall be above the roof.
- 9) The General Contractor shall provide shop and coordination drawings for approval.

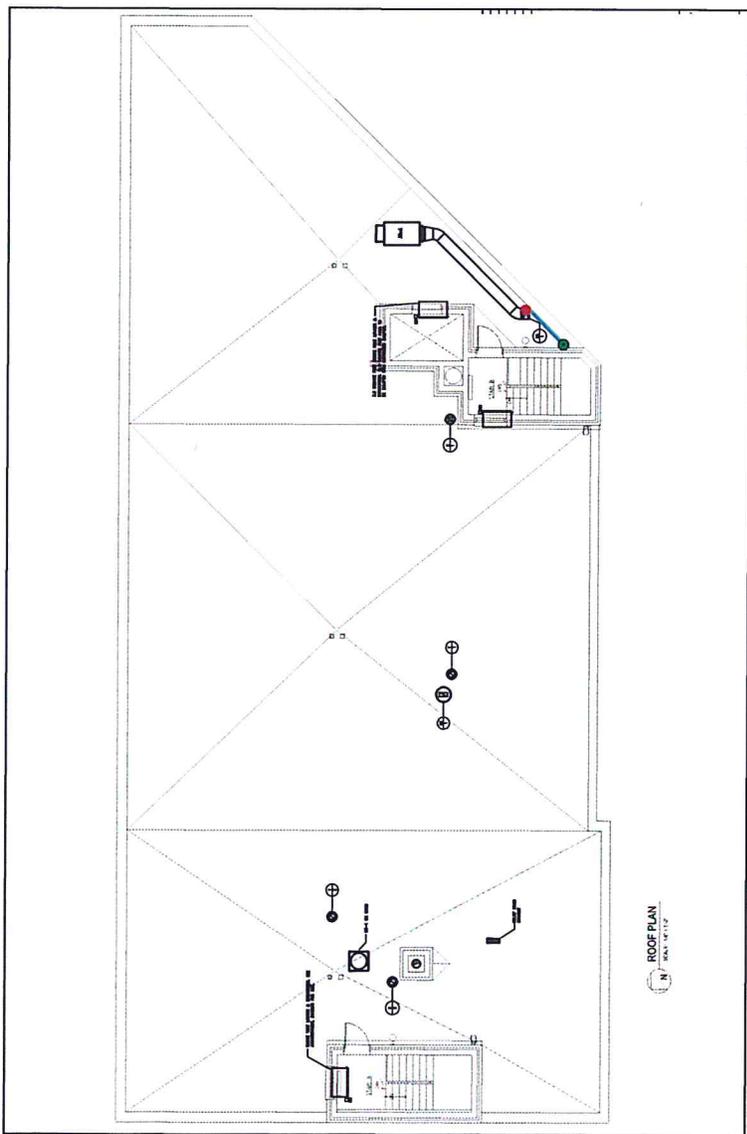
Legend:

- SSSD piping
- Riser 4" ∅

SSDS Design - Cellar Plumbing Plan

1674 - 1684 Broadway
Borough of Brooklyn, New York

ESI File: AB14144A.30
Scale: 10'
October 2014
Attachment 3



Notes:

- 1) Sub-slab piping shall be installed at least two inches (2") below the vapor barrier and twelve inches (12") inside the perimeter of the structure. All sub-slab piping shall be wrapped in filter fabric (or comparable product) and covered with at least two inches (2") of 1-1/2" clean crushed stone.
- 2) Sub-slab piping shall be perforated four inch (4") ID Schedule 40 PVC, joined with appropriate primer/cement to be applied according to manufacturer's specifications. Piping shall be laid into the gas permeable layer with at least three inches (3") of 1-1/2" clean crushed stone below the piping as indicated in the drawing "Sub-slab Depressurization System Schematic, Attachment 1".
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- 8) Riser pipe shall be rerouted after exiting the building at the roof level to run along the exterior wall of the Stair B bulkhead to the discharge point. The discharge point shall extend at least twelve inches (12") above the highest point in the roof and at least ten feet (10') from any window, door, or other opening, and HVAC intakes. Stabilizing straps shall be used to secure riser pipe and discharge point to the exterior wall of the Stair B bulkhead. The roof turbine ventilator shall be above the roof.
- 9) The General Contractor shall provide shop and coordination drawings for approval.

Legend:

- SSSD piping
- Riser 4" Ø
- Discharge point

SSDS Design - Roof Plan Mechanical

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Borough of Brooklyn, New York

ESI File: AB14144A.30
Scale: 1" = 8'
October 2014

Attachment 4