

430-434 VAN BRUNT STREET
BROOKLYN, NEW YORK
Remedial Action Work Plan

NYC VCP Project Number 16CVCP058K
OER Project Number 15EHAZ292K

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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 and Demolition
CEQR	City Environmental Quality Review
CFR	Code of Federal Regulations
CHASP	Construction Health and Safety Plan
COC	Certificate of Completion
CQAP	Construction Quality Assurance Plan
CSOP	Contractors Site Operation Plan
DCR	Declaration of Covenants and Restrictions
ECs/ICs	Engineering Controls and Institutional Controls
ELAP	Environmental Laboratory Accreditation Program
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations Emergency Response
IRM	Interim Remedial Measure
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYS DEC	New York State Department of Environmental Conservation
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
NYC OER	New York City Office of Environmental Remediation
NYC VCP	New York City Voluntary Cleanup Program
NYCRR	New York Codes Rules and Regulations
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
PCBs	Polychlorinated Biphenyls
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
SSDS	Sub-Slab Depressurization System
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCL	Target Compound List
USGS	United States Geological Survey
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VOC	Volatile Organic Compound

CERTIFICATION

I, Gary R. Brown, 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 430-434 Van Brunt Street site, site number 16CVCP058K. I certify to the following:

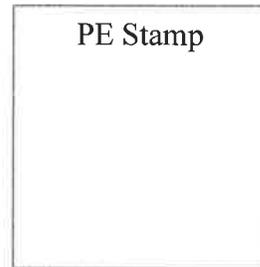
- I have reviewed this document and the Stipulation List, to which my signature and seal are affixed.
- Engineering Controls developed for this remedial action were designed by me or a person under my direct supervision and designed to achieve the goals established in this Remedial Action Work Plan for 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.

Name

PE License Number

Signature

Date



I, Brad Summerville am a qualified Environmental Professional. I will have primary direct responsibility for implementation of the remedial program for the 430-434 Van Brunt Street site, site number 16CVCP058K. 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.

QEP Name

QEP Signature

Date

Certification by a Professional Engineer is required. Certification by a Qualified Environmental Professional (QEP) is optional unless the PE and QEP work for separate firms.

EXECUTIVE SUMMARY

Strekte is working with the NYC Office of Environmental Remediation (OER) in the New York City Voluntary Cleanup Program to investigate and remediate a 5,850-square foot site located at 430-434 Van Brunt Street in the Red Hook neighborhood in Brooklyn, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

Site Location and Background

The Site is located at 430-434 Van Brunt Street in the Red Hook section of Brooklyn, New York and is identified as Block 603, Lots 23 & 24 on the New York City Tax Map. **Figure 1** shows the Site Location. The Site is 5,850-square feet and is bounded by a mixed commercial/residential building to the northeast, Van Brunt Street to the southeast, a mixed commercial/residential building to the southwest, and a mixed commercial/residential building to the northwest. A map of the site boundary is shown in **Figure 2**. Currently, the Site is used for the storage of construction equipment and trailers. It is currently undeveloped.

Lot 23 (430 Van Brunt Street) will remain as a single lot sized at 25 feet by 90 feet. Lot 24 (432 Van Brunt Street) will be subdivided into two (2) lots (Lot 24 and 25) sized at 20 feet by 90 feet each. The OER number assigned to the project is 15EHAZ292K. The CEQR number assigned to the project is 00DME013K. NYC Department of Buildings Job Number(s) 321049913 (Lot 23), 321049860 (Lot 24) & 321049879 (Lot 25) have been assigned to the project. The VCP number assigned to the project is 16CVCP058K.

Summary of Redevelopment Plan

The proposed use of the Site will consist of three (3), five-story mixed use buildings. The buildings will contain a garage and commercial space at the grade level (1st floor) and a single residential unit on the 2nd, 3rd, 4th and 5th floor. The proposed use will include a total of twelve (12) market-rate housing units. No subgrade level is proposed. The building foundation will be

on pile caps limiting planned soil disturbance. The grade level will be slab on grade for the interior garage and commercial space with a 10 foot (ft) rear yard area/ set back that is covered with concrete. The building at 430 Van Brunt Street will be approximately 5,090 square feet (sq ft) in gross area with a building footprint of approximately 1,890 sq ft. The 432 and 434 Van Brunt Street buildings will have a gross area of 3,380 sq ft and a building footprint of 1,180 sq ft each. The proposed building layouts are included in **Appendix 1**.

Layout of the proposed site development is presented in **Figure 2**. The current zoning designation for the property is mixed use and residential (M1-1/R5).

Foundation piles are planned to consist of helical piles or drilled caissons. A foundation plan is included as **Appendix 2**. Maximum length of the piles is expected to be 30 feet. Pile caps are expected to be approximately two feet deep. For the purpose of construction, approximately 260 cubic yards (yd³) will be excavated from the property which includes the proposed foundation walls, grade beams, and slab excavation. For the remedial action of removing site soils down to four (4) feet bgs approximately 866 cubic yards (1,299 tons) of material will be excavated from the property.

Depth to groundwater ranges from 8.13 to 8.20 feet at the Site. Therefore, the majority of the soil excavation will occur above the groundwater table. As the property is currently vacant of permanent structures, no demolition activities are planned.

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

Summary of Surrounding Property

PT utilized OER SPEED and NYC DCP ZoLa applications to obtain information regarding surrounding properties. Review of the applications indicated residential use to the north and east of the property. Van Brunt Street borders the property to the south, followed by mixed-use commercial and residential properties. Mixed-use properties border the site on the west. No sensitive receptors, including schools, hospitals, and day care facilities were identified within a 500 foot radius of the site. A map of surrounding land usage is provided in **Figure 3**.

Summary of Past Site Uses and Areas of Concern

PT's August 2014 Phase I Environmental Site Assessment identified the following Areas of Concern at the site:

- ▶ Historic Utilization/E-Designation (AOC-1): Review of historic records available for the subject property has indicated that the site was developed for mixed residential and commercial-type operations since as early as 1886 until sometime in the 1960's, when the site was cleared of structures and utilized for contractor storage. PT also notes that the subject property was identified within the E Designation program. According to information reviewed, application for development of the property was submitted to the New York City Environmental Quality Review Board and assigned number OODME013K from the application number 020047 ZMK, based on zoning map 16a. An E designation was assigned to the site on January 30, 2002 as E-110 (Red Hook Stores Redevelopment / Rezoning) for Hazmat/Underground Storage Tank(s) Testing Protocol.
- ▶ Historic Fill (AOC-2): PT observed two (2) small soil piles and test pit excavations situated along the center of the northern and southern property boundaries, respectively. Various layers of fill were observed throughout the soils piles as well as along the sidewalls of the excavated areas. Based on these observations, it is likely that fill material has been brought onto the subject property.
- ▶ Storage Container (AOC-3): A storage container, which is utilized for the housing of building materials, compressed gas cylinders, and one (1) 55-gallon polyethylene drum, was observed within the northern corner of the subject property. The contents of the drum are unknown and at the time in which the inspection was completed, the drum was noted as having been staged on its side allowing the contents of such to spill onto the wooden floor of the storage container. PT also noted several additional areas of staining along the wooden floor of the storage container.
- ▶ Material Staging Areas (AOC-4): Several staging areas consisting of trucks, trailers, miscellaneous building materials, solid waste debris were observed throughout the subject property during the site inspection. PT also observed a total of five (5) 5-gallon pails of mastic and hydraulic fluid situated at various locations throughout the subject property. No visual evidence of a release was noted with the exception of one (1) area of

minimally soil, which was located beneath the trucks staged within the northern portion of the property.

- ▶ Ruptured Drum (AOC-5): One (1) 55-gallon steel drum was observed within the northern portion of the property. The contents of the drum are unknown. PT noted the structural integrity of the drum appeared to have been compromised, causing it to rupture and discharge its contents onto the ground surface.
- ▶ Potential Off-Site Sources of Contamination (AOC-6): Several sites with potential sources of soil and groundwater contamination were identified in close proximity to the subject property. Identification of such sites was anticipated due to the urban setting of the subject area. Migration of contaminants from these sites to the subject property would most likely be via groundwater and/or vapor.

Summary of Work Performed under the Remedial Investigation

STREKTE performed the following scope of work, as reported in PT's August 2015 Remedial Investigation Report:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Conducted a Geophysical Survey of the property to determine the presence or absence of underground anomalies;
3. Installed six (6) soil borings across the entire project Site, and collected twelve (12) soil samples for chemical analysis from the soil borings to evaluate soil quality;
4. Installed three (3) groundwater monitoring wells throughout the Site to establish groundwater flow and collected three (3) groundwater samples for chemical analysis to evaluate groundwater quality;
5. Installed five (5) soil vapor probes around Site and collected five (5) samples for chemical analysis.

Summary of Findings of Remedial Investigation

1. Elevation of the property is approximately 10 feet above sea level.

2. Depth to groundwater ranges from 8.13 to 8.20 feet at the Site.
3. Groundwater flow is generally from east to west beneath the Site, toward the Red Hook Channel.
4. Depth to bedrock is approximately 150 feet at the Site.
5. The stratigraphy of the site, from the surface down, consists of four (4) feet of historic fill consisting mainly of black gravel underlain by four (4) feet of fine brown sand.
6. Soil/fill samples were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives and Restricted Residential Soil Cleanup Objectives as presented in 6NYCRR Part 375-6.8 and CP51. No PCBs were detected in any of the soil samples. Soil/fill samples collected during the RI showed trace concentrations of one VOC, acetone (maximum of 128 ug/kg) exceeding Unrestricted Use SCOs. Eight SVOCs consisting of the polycyclic aromatic hydrocarbons (PAHs), benz(a)anthracene (maximum of 27,300µg/kg), benzo(a)pyrene (maximum of 21,700 µg/kg), benzo(b)fluoranthene (maximum of 27,300 µg/kg), benzo(k)fluoranthene (maximum of 8,330 ug/kg), chrysene (maximum of 25,100 µg/kg), dibenzo(a,h)anthrecene (maximum of 3,680), indeno(1,2,3-cd)pyrene (10,500µg/kg), and 2-Methylnapthalene (maximum of 1,230 ug/kg) were found in four of the six shallow samples, all exceeding Restricted Residential SCOs. Five pesticides, alpha-chlordane (131 ug/kg), dieldrin (13.5 ug/kg), 4,4-DDD (maximum of 343 ug/kg), 4,4-DDE (maximum of 693 ug/kg), and 4,4-DDT (maximum of 3,030 ug/kg) were detected above Unrestricted Use SCOs in five shallow samples and one deep sample. 4,4-DDT also exceeded Restricted Residential SCOs in one shallow sample. Six metals including barium (1,890 mg/kg), copper (maximum of 112 mg/kg), lead (maximum of 3,150 mg/kg), mercury (maximum of 3.0 mg/kg), nickel (maximum of 148 mg/kg), and zinc (maximum of 960 mg/kg) were detected above Unrestricted Use SCOs in shallow and deep samples. Of these metals, barium, lead, mercury, and nickel also exceeded Restricted Residential SCOs.
7. Groundwater sample results were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater collected during the investigation showed no VOCs, SVOCs, pesticides, or PCBs above their respective GQS.

Four metals, iron (maximum of 6,160 ug/L), manganese (399 ug/L), selenium (10.6 ug/L), and sodium (maximum of 546,000 ug/L) exceeded their respective GQS. The groundwater samples were then filtered and re-analyzed by the laboratory. Three (3) metals, iron (maximum of 5,600 ug/L), manganese (322 ug/L), and sodium (maximum of 517,000 ug/L) exceeded their respective GQS. Selenium levels in the filtered samples were below GQS.

8. Soil vapor results collected during the RI were compared to compounds listed in Table 3.1 Air Guidance Values derived by the New York State Department of Health (NYSDOH) located in the NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion, dated October 2006. Soil vapor samples collected during the RI showed petroleum related VOCs present at low concentrations. Total concentrations of petroleum-related VOCs (BTEX) ranged from 134.3 $\mu\text{g}/\text{m}^3$ to 241 $\mu\text{g}/\text{m}^3$. Samples showed low levels of chlorinated VOCs including 1,1,1-trichloroethane (ranging from 27 $\mu\text{g}/\text{m}^3$ to 60 $\mu\text{g}/\text{m}^3$), tetrachloroethene (PCE) (ranging from 2.3 $\mu\text{g}/\text{m}^3$ to 6.8 $\mu\text{g}/\text{m}^3$), and trichloroethylene (TCE) (ranging from 0.81 $\mu\text{g}/\text{m}^3$ to 7.0 $\mu\text{g}/\text{m}^3$). Concentrations for TCE were above the monitoring range established within the State DOH soil vapor guidance matrix. Carbon tetrachloride and other compounds not included on the analytical summary tables were not detected in the soil vapor samples. Complete analytical results can be found in the laboratory analysis report.

Summary of the Remedial Action

The preferred remedy for the site is Alternative 1 as described in Section 3. Project developments requires excavations only to three feet depths. Excavation to four foot depths is proposed for the remedial action. Following excavation, post-excavation samples will confirm whether the Alternative 1 Track 1 SCOs have been achieved throughout the site.

If the Alternative 1 Track 1 SCOs have not been achieved, the Alternative 2 Site Specific Track 4 SCOs would be implemented for the site. Engineering Controls are required for a Site Specific Track 4 cleanup. A concrete slab covering the entire site and vapor barrier membrane would be installed as part of standard building development and would be considered an engineering control if Track 1 is not achieved. Additional soil vapor management would not be required. The Site would continue to be encumbered with an E-designation for hazardous material.

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

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Track 1 Unrestricted Use Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.

5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility(s).
6. Excavation and removal of soil/fill exceeding Track 1 Unrestricted Use SCOs. The entire footprint of the Site will be excavated to a depth of approximately 4 feet below grade for the remedial action. A small portion of property will be excavated to depths of up to 30 feet below grade for the installation of foundation supports (helical piles or drilled caissons).
7. 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.
8. 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.
9. Removal of all UST's that are encountered during soil/fill removal actions. A February 2015 Geophysical Report did not indicate the presence of USTs at the subject property.
10. Registration of tanks and reporting of any petroleum spills associated with UST's and appropriate closure of these petroleum spills in compliance with applicable local, State and Federal laws and regulations.
11. Transportation and off-Site disposal of all soil/fill material at licensed or permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site.
12. Collection and analysis of 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. Construction and maintenance of an engineered composite cover consisting of cover consisting of 4 feet of clean fill material to restore the site to grade and a six inch

concrete slab on grade to prevent human exposure to residual soil/fill remaining under the Site.

15. Installation of a vapor barrier system consisting of vapor barrier beneath the building slab and outside of sub-grade foundation sidewalls to mitigate soil vapor migration into the building. The vapor barrier system will consist of a Stego© Wrap 20-Mil Vapor Barrier below the slab throughout the full building area. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration. If Track 1 is not achieved, the vapor barrier system will serve as an Engineering Control for the remedial action. The remedial engineer will certify in the RAR that the vapor barrier system was designed and properly installed to mitigate soil vapor migration into the building.
16. Performance of all activities required for the remedial action, including acquisition of required permits and attainment of pretreatment requirements, in compliance with applicable laws and regulations.
17. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.
18. If Track 1 is 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.
If Track 1 is not achieved, the property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP 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 NYC Office of Environmental Remediation (OER) provides governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action Work Plan (“cleanup plan”) describes the findings of prior environmental studies, shows the location of identified 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.

Project Information:

- Site Address: 430-434 Van Brunt Street, Brooklyn, NY
- NYC Voluntary Cleanup Program Project Number: 16CVCP058K

Project Contacts:

- OER Project Manager: William H. Wong, 212-788-8841
- Site Project Manager: Paul Jensen, (718) 838-3250
- Site Safety Officer: Paul Jensen, (718) 838-3250
- Online Document Repository: <http://www.nyc.gov/html/oer/html/document-repository/document-repository.shtml>

Remedial Investigation and Cleanup Plan: Under the oversight of the NYC OER, a thorough 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 to 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 a study to find all of the ways that people might come in contact with contaminants at the Site now or in the future. This study is called a Qualitative Human Health Exposure Assessment (QHHEA). A QHHEA was performed for this project. This assessment has considered all known contamination at the Site and evaluated the potential for people to come in contact with this contamination. All identified public exposures will be addressed under this cleanup plan.

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

Site Safety Coordinator: This project has a designated Site safety coordinator to implement the CHASP. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is identified at the beginning of this Community Protection Statement.

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

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

Odor, Dust and Noise Control: This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and includes steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also required to comply with applicable NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager or NYC Office of Environmental Remediation Project Manager listed on the first page of this Community Protection Statement document.

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

Stormwater Management: To limit the potential for soil erosion and discharge, this cleanup plan has provisions for stormwater management. The main elements of the stormwater 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 will conform to requirements of the NYC Department of Buildings.

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 and provides project contact names and numbers, and a link to the document repository where 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 or the NYC Office of Environmental Remediation Project Manager listed on the first page of this Community Protection Statement document, 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, odor 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 applicable 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 the 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 the Remedial Action Report) that will be available for public review online. A link to the online document repository and the public library with Internet access nearest the Site are listed on the first page of this Community Protection Statement document

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 either in the property's deed or established through a city environmental designation registered with the Department of Buildings. 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 Project Background

Strekte is working with the NYC Office of Environmental Remediation (OER) in the New York City Voluntary Cleanup Program and/or in the “E” Designation Program to investigate and remediate a property located at 430-434 Van Brunt Street in the Red Hook section of Brooklyn, New York (the “Site”). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, and complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 Site Location and Background

The Site is located at 430-434 Van Brunt Street in the Red Hook section of Brooklyn, New York and is identified as Block 603, Lots 23 & 24 on the New York City Tax Map. **Figure 1** shows the Site Location. The Site is 5,850-square feet and is bounded by a mixed commercial/residential building to the northeast, Van Brunt Street to the southeast, a mixed commercial/residential building to the southwest, and a mixed commercial/residential building to the northwest. A map of the site boundary is shown in **Figure 2**. Currently, the Site is used for the storage of construction equipment and trailers. It is currently undeveloped.

Lot 23 (430 Van Brunt Street) will remain as a single lot sized at 25 feet by 90 feet. Lot 24 (432 Van Brunt Street) will be subdivided into two (2) lots (Lot 24 and 25) sized at 20 feet by 90 feet each. The OER number assigned to the project is 15EHAZ292K. The CEQR number assigned to the project is 00DME013K. NYC Department of Buildings Job Number(s) 321049913 (lot 23), 321049860 (Lot 24) & 321049879 (Lot 25) have been assigned to the project. The VCP number assigned to the project is 16CVCP058K..

1.2 Redevelopment Plan

The proposed use of the Site will consist of three (3), five-story mixed use buildings. The buildings will contain a garage and commercial space at the grade level (1st floor) and a single residential unit on the 2nd, 3rd, 4th and 5th floor. The proposed use will include a total of twelve (12) market-rate housing units. No subgrade level is proposed. The building foundation will be on pile caps limiting planned soil disturbance. The grade level will be slab on grade for the interior garage and commercial space with a 10 foot (ft) rear yard area/ set back that is covered with concrete. The building at 430 Van Brunt Street will be approximately 5,090 square feet (sq ft) in gross area with a building footprint of approximately 1,890 sq ft. The 432 and 434 Van Brunt Street buildings will have a gross area of 3,380 sq ft and a building footprint of 1,180 sq ft each. The proposed building layouts are included in **Appendix 1**.

Layout of the proposed site development is presented in **Figure 2**. The current zoning designation for the property is mixed use and residential (M1-1/R5).

Foundation piles are planned to consist of helical piles or drilled caissons. A foundation plan is included as **Appendix 2**. Maximum length of the piles is expected to be 30 feet. Pile caps are expected to be approximately two feet deep. For the purpose of construction, approximately 260 cubic yards (yd³) will be excavated from the property which includes the proposed foundation walls, grade beams, and slab excavation. For the remedial action of removing site soils down to four (4) feet bgs approximately 866 cubic yards (1,299 tons) of material will be excavated from the property.

Depth to groundwater ranges from 8.13 to 8.20 feet at the Site. Therefore, the majority of the soil excavation will occur above the groundwater table. As the property is currently vacant of permanent structures, no demolition activities are planned.

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

1.3 Description of Surrounding Property

PT utilized OER SPEED and NYC DCP ZoLa applications to obtain information regarding surrounding properties. Review of the applications indicated residential use to the north and east

of the property. Van Brunt Street borders the property to the south, followed by mixed-use commercial and residential properties. Mixed-use properties border the site on the west. No sensitive receptors, including schools, hospitals, and day care facilities were identified within a 500 foot radius of the site.

Figure 3 shows the surrounding land usage.

1.4 Summary of Past Site Uses and Areas of Concern

PT's August 2014 Phase I Environmental Site Assessment identified the following Areas of Concern at the site:

- ▶ Historic Utilization/E-Designation (AOC-1): Review of historic records available for the subject property has indicated that the site was developed for mixed residential and commercial-type operations since as early as 1886 until sometime in the 1960's, when the site was cleared of structures and utilized for contractor storage. PT also notes that the subject property was identified within the E Designation program. According to information reviewed, application for development of the property was submitted to the New York City Environmental Quality Review Board and assigned number OODME013K from the application number 020047 ZMK, based on zoning map 16a. An E designation was assigned to the site on January 30, 2002 as E-110 (Red Hook Stores Redevelopment / Rezoning) for Hazmat/Underground Storage Tank(s) Testing Protocol.
- ▶ Historic Fill (AOC-2): PT observed two (2) small soil piles and test pit excavations situated along the center of the northern and southern property boundaries, respectively. Various layers of fill were observed throughout the soils piles as well as along the sidewalls of the excavated areas. Based on these observations, it is likely that fill material has been brought onto the subject property.
- ▶ Storage Container (AOC-3): A storage container, which is utilized for the housing of building materials, compressed gas cylinders, and one (1) 55-gallon polyethylene drum, was observed within the northern corner of the subject property. The contents of the drum are unknown and at the time in which the inspection was completed, the drum was noted as having been staged on its side allowing the contents of such to spill onto the wooden floor of the storage container. PT also noted several additional areas of staining

along the wooden floor of the storage container.

- ▶ Material Staging Areas (AOC-4): Several staging areas consisting of trucks, trailers, miscellaneous building materials, solid waste debris were observed throughout the subject property during the site inspection. PT also observed a total of five (5) 5-gallon pails of mastic and hydraulic fluid situated at various locations throughout the subject property. No visual evidence of a release was noted with the exception of one (1) area of minimally soil, which was located beneath the trucks staged within the northern portion of the property.
- ▶ Ruptured Drum (AOC-5): One (1) 55-gallon steel drum was observed within the northern portion of the property. The contents of the drum are unknown. PT noted the structural integrity of the drum appeared to have been compromised, causing it to rupture and discharge its contents onto the ground surface.
- ▶ Potential Off-Site Sources of Contamination (AOC-6): Several sites with potential sources of soil and groundwater contamination were identified in close proximity to the subject property. Identification of such sites was anticipated due to the urban setting of the subject area. Migration of contaminants from these sites to the subject property would most likely be via groundwater and/or vapor.

The following environmental work plans and reports were developed for the Site:

- *Phase I Environmental Site Assessment*, August 2014, prepared by PT Consultants, Inc.
- *Phase II Work Plan*, March 2015, prepared by PT Consultants, Inc.
- *Geophysical Investigation Report*, February 20, 2015, prepared by Delta Geophysics, Inc.
- *Health and Safety Plan*, March 2015, prepared by PT Consultants, Inc.
- *Remedial Investigation Report*, August 2015, prepared by PT Consultants, Inc.

PT's August 2014 *Phase I Environmental Site Assessment* identified indicated that the site was developed for mixed residential and commercial-type operations since as early as 1886 until sometime in the 1960's, when the site was cleared of structures and utilized for contractor storage. Site use remained relatively unchanged through to the current day.

Digital (PDF) copies of the above referenced environmental work plans and reports have previously been submitted to the OER as part of the *Remedial Investigation Report*, August 2015 and are not included in this submission.

1.5 Summary of Work Performed under the Remedial Investigation

Strekte performed the following scope of work, as reported in PT's August 2015 Remedial Investigation Report.

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Conducted a Geophysical Survey of the property to determine the presence or absence of underground anomalies;
3. Installed six (6) soil borings across the entire project Site, and collected twelve (12) soil samples for chemical analysis from the soil borings to evaluate soil quality;
4. Installed three (3) groundwater monitoring wells throughout the Site to establish groundwater flow and collected three (3) groundwater samples for chemical analysis to evaluate groundwater quality;
5. Installed five (5) soil vapor probes around the Site and collected five (5) samples for chemical analysis.

1.6 Summary of Findings of Remedial Investigation

A remedial investigation was performed and the results are documented in a companion document called "Remedial Investigation Report, 430-434 Van Brunt Street", dated August 2015(RIR).

A summary of the findings of the RIR is below:

1. Elevation of the property is approximately 10 feet above sea level.
2. Depth to groundwater ranges from 8.13 to 8.20 feet at the Site.

3. Groundwater flow is generally from east to west beneath the Site, toward the Red Hook Channel.
4. Depth to bedrock is approximately 150 feet at the Site.
5. The stratigraphy of the site, from the surface down, consists of four (4) feet of historic fill consisting mainly of black gravel underlain by four (4) feet of fine brown sand.
6. Soil/fill samples were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives and Restricted Residential Soil Cleanup Objectives as presented in 6NYCRR Part 375-6.8 and CP51. No PCBs were detected in any of the soil samples. Soil/fill samples collected during the RI showed trace concentrations of one VOC, acetone (maximum of 128 ug/kg) exceeding Unrestricted Use SCOs. Eight SVOCs consisting of the polycyclic aromatic hydrocarbons (PAHs), benz(a)anthracene (maximum of 27,300µg/kg), benzo(a)pyrene (maximum of 21,700 µg/kg), benzo(b)fluoranthene (maximum of 27,300 µg/kg), benzo(k)fluoranthene (maximum of 8,330 ug/kg), chrysene (maximum of 25,100 µg/kg), dibenzo(a,h)anthracene (maximum of 3,680), indeno(1,2,3-cd)pyrene (10,500µg/kg), and 2-Methylnaphthalene (maximum of 1,230 ug/kg) were found in four of the six shallow samples, all exceeding Restricted Residential SCOs. Five pesticides, alpha-chlordane (131 ug/kg), dieldrin (13.5 ug/kg), 4,4-DDD (maximum of 343 ug/kg), 4,4-DDE (maximum of 693 ug/kg), and 4,4-DDT (maximum of 3,030 ug/kg) were detected above Unrestricted Use SCOs in five shallow samples and one deep sample. 4,4-DDT also exceeded Restricted Residential SCOs in one shallow sample. Six metals including barium (1,890 mg/kg), copper (maximum of 112 mg/kg), lead (maximum of 3,150 mg/kg), mercury (maximum of 3.0 mg/kg), nickel (maximum of 148 mg/kg), and zinc (maximum of 960 mg/kg) were detected above Unrestricted Use SCOs in shallow and deep samples. Of these metals, barium, lead, mercury, and nickel also exceeded Restricted Residential SCOs.
7. Groundwater sample results were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater collected during the investigation showed no VOCs, SVOCs, pesticides, or PCBs above their respective GQS. Four metals, iron (maximum of 6,160 ug/L), manganese (399 ug/L), selenium (10.6 ug/L), and sodium (maximum of 546,000 ug/L) exceeded their respective GQS. The

groundwater samples were then filtered and re-analyzed by the laboratory. Three (3) metals, iron (maximum of 5600 ug/L), manganese (322 ug/L), and sodium (maximum of 517,000 ug/L) exceeded their respective GQS. Selenium levels in the filtered samples were below GQS.

8. Soil vapor results collected during the RI were compared to compounds listed in Table 3.1 Air Guidance Values derived by the New York State Department of Health (NYSDOH) located in the NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion, dated October 2006. Soil vapor samples collected during the RI showed petroleum related VOCs present at low concentrations. Total concentrations of petroleum-related VOCs (BTEX) ranged from 134.3 $\mu\text{g}/\text{m}^3$ to 241 $\mu\text{g}/\text{m}^3$. Samples showed low levels of chlorinated VOCs including 1,1,1-trichloroethane (ranging from 27 $\mu\text{g}/\text{m}^3$ to 60 $\mu\text{g}/\text{m}^3$), tetrachloroethene (PCE) (ranging from 2.3 $\mu\text{g}/\text{m}^3$ to 6.8 $\mu\text{g}/\text{m}^3$), and trichloroethylene (TCE) (ranging from 0.81 $\mu\text{g}/\text{m}^3$ to 7.0 $\mu\text{g}/\text{m}^3$). Concentrations for TCE were above the monitoring range established within the State DOH soil vapor guidance matrix. Carbon tetrachloride and other compounds not included on the analytical summary tables were not detected in the soil vapor samples. Complete analytical results can be found in the laboratory analysis report.

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

2.0 Remedial Action Objectives

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

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.

Groundwater

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

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). Remedial alternatives are then developed and evaluated 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.

As required, a Track 1 Unrestricted Use scenario is evaluated for the remedial action. The following is a detailed description of the alternatives analyzed to address impacted media at the Site:

Alternative 1:

- Selection of NYSDEC 6NYCRR Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
- Removal of all soil/fill exceeding Track 1 Unrestricted Use SCOs throughout the Site and confirmation that Track 1 Unrestricted Use SCOs have been achieved with post-excavation endpoint sampling. Based on the results of the Remedial Investigation, it is expected that the majority of the impacted historic fill would be removed by excavating the first four feet of site soils. If soil/fill containing analytes at concentrations above Track 1 Unrestricted Use SCOs is still present at the base of the excavation, as

determined by post-excavation sampling, Track 4 Site-Specific SCOs would be implemented at the site.

- Placement of fill material meeting Track 1 SCOs across the site to return the site to grade. No Engineering or Institutional Controls are required for a Track 1 cleanup. As part of development, a vapor barrier would be installed to prevent potential exposures from soil vapor in the future.

Alternative 2:

- Establishment of Track 4 Site-specific SCOs.
- Removal of all soil/fill exceeding Track 4 Site-specific SCOs and confirmation that Track 4 Site-specific SCOs have been achieved with post-excavation end point sampling. Based on the results of the Remedial Investigation, it is expected that SCOs would be achieved by excavating site soils to 4 feet bgs. If soil/fill containing analytes at concentrations above Track 4 Site-Specific SCOs is still present at the base of the excavation, as determined by post-excavation sampling, additional excavation would be performed to meet Track 4 Site-Specific SCOs.
- Placement of a composite cover system over the entire Site to prevent exposure to remaining soil/fill;
- Installation of a vapor barrier system beneath the building slab to prevent potential exposures from soil vapor;
- Establishment of use restrictions including prohibitions on the use of groundwater from the Site; prohibitions of restricted 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
- The property will continue to be registered with an E-Designation at the NYC Buildings Department.

3.1 Threshold Criteria

Protection of Public Health and the Environment

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

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

Alternative 2 would achieve comparable protections of human health and the environment by excavation and removal of most of the historic fill at the Site and by ensuring that remaining soil/fill on-Site meets Track 4 Site-Specific SCO's, as well as by placement of Institutional and Engineering Controls, including a composite cover system. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Implementing Institutional Controls including a Site Management Plan and continuing the E-Designation would ensure that the composite cover system remains intact and protective of public health. Establishment of Track 4 Site-Specific SCO's would minimize the risk of contamination leaching into groundwater.

For both Alternatives, potential exposure to contaminated soils or groundwater during construction would be minimized by implementing a Construction Health and Safety Plan, an approved Soil/Materials Management Plan, and Community Air Monitoring Plan (CAMP). Potential contact with contaminated groundwater would be prevented as its use is prohibited by city laws and regulations. Potential future migration of off-Site soil vapors into the new building would be prevented by installing a vapor barrier below the building slab and outside foundations walls below grade.

3.2 Balancing Criteria

Compliance with Standards, Criteria and Guidance (SCGs)

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

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

Alternative 2 would achieve compliance with the remedial goals, chemical-specific SCG's and RAOs for soil through removal of soil to meet Track 4 Site-Specific SCO's. Compliance with SCG's for soil vapor would also be achieved by installing a vapor barrier system below the new building's foundation slab. 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) will be implemented during Site redevelopment under this RAWP. For both Alternatives, focused attention on means and methods employed during the remedial action would ensure that handling and management of contaminated material would be in compliance with applicable SCGs. These measures 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 short term effects during the remedial action on public health and the environment during implementation of the remedial action, including protection of the community, protection of onsite workers and environmental impacts.

Both Alternative 1 and 2 have similar short-term effectiveness during their implementation, 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 since excavation of greater amounts of historical fill and soil material would take place. However, focused attention to means and methods during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize the overall impact of these activities.

An additional short-term adverse impact and 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 flag persons will be used to protect pedestrians at Site entrances and exits.

The potential adverse impact to the community, workers and the environment for both alternatives would be minimized through implementation of 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 provide protection from on-Site contaminants by using 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 ECs.

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 SCO's. Removal of on-Site contaminant sources will also prevent future groundwater contamination.

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

Reduction of toxicity, mobility, or volume of contaminated material

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

Alternative 1 will permanently eliminate the toxicity, mobility, and volume of contaminants from on-Site soil by removing all soil in excess of Track 1 Unrestricted Use SCO's.

Alternative 2 would remove most of the historic fill at the Site, and all remaining on-Site soil/fill beneath the new building will meet Track 4 Site-Specific SCO's.

Alternative 1 would remove a greater total mass of contaminants from the Site.

Implementability

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

The techniques, materials and equipment to implement both Alternatives 1 and 2 are readily available and have been proven to be effective in remediating the contaminants present on the Site. They use standard equipment and technologies that are well established in the industry. 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 to extend to a depth of up to 6.5 feet below grade during the RI, there is a possibility that the cost to implement Alternative 1 will be greater than the cost of Alternative 2. Additional costs encountered if deeper excavation is required for Track 1 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.

Both remedial plans couple the remedial action with the redevelopment of the Site, lowering total costs. The remedial plan will also consider the selection of the most appropriate disposal facilities to reduce transportation and disposal costs during cleanup and 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.

This RAWP will be subject to a public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedy. This public comment will be considered by OER prior to approval of this plan. The Citizen Participation Plan for the project is provided in **Appendix 3**. Observations here will be supplemented by public comment received on the RAWP. Under both alternatives, the overall goals of the remedial program, to protect public health and the environment and eliminate potential contaminant exposures, have been broadly supported by citizens in NYC communities.

Land use

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

The current, intended, and reasonably anticipated future land use of the Site and its surroundings are compatible with the selected remedy of soil remediation. The proposed future use of the Site includes three five-story mixed use buildings with a garage and commercial space on the 1st floor and a single residential unit on the 2nd, 3rd, 4th, and 5th floor. The proposed use will include a total of twelve (12) market-rate housing units. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 4 Site-Specific SCOs, both of which are protective of public health and the environment for its planned commercial and residential use. The proposed use is compliant with the property's zoning and is consistent with recent development patterns. The areas surrounding the site to the north and east are residential, and mixed-use commercial and residential properties border the site to the south and west. The proposed development would clean up the property and make it safer, create new employment opportunities, and other economic benefits from land revitalization.

Temporary short-term project impacts are being mitigated through site management controls and truck traffic controls during remediation activities. Following remediation, the Site will meet either Track 1 Unrestricted Use SCOs or Track 4 Site-Specific SCOs, both of which are protective of public health and the environmental for its planned use.

The Site is not in close proximity to important cultural resources, including federal or state historic or heritage sites or Native American religious sites, natural resources, waterways, wildlife refuges, wetlands, or critical habitats of endangered or threatened species. The Site is located in an urban area and not in proximity to fish or wildlife and neither alternative would result in any potential exposure pathways of contaminant migration affecting fish or wildlife. The remedial action is also protective of groundwater natural resources. The Site does lie in the Federal Emergency Management Agency (FEMA)-designated 100 year flood plain. Both alternatives are equally protective of natural resources and cultural resources. Improvements in the current environmental condition of the property achieved by both alternatives considered in this plan are consistent with the City's goals for cleanup of contaminated land.

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 for either alternative 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 is available for reuse of any clean native soils under either alternative. A complete list of green remedial activities considered as part of the NYC VCP is included in a Sustainability Statement in **Appendix 4**.

SELECTION OF THE PREFERRED REMEDY

The preferred remedy for the site is Alternative 1. Project developments require excavations only to three foot depths. Excavation to four foot depths is proposed for the remedial action. Engineering Controls are not required for an Unrestricted Use Track 1 cleanup. A concrete slab covering the entire site and vapor barrier membrane would be installed as part of standard building development and are not considered part of the remedy. Additional soil vapor management would not be required. The site's E-Designation would be removed.

Post-excavation sampling will determine whether or not Track 1 has been achieved. If Track 1 is not achieved, Site Specific Track 4 SCOs will be implemented throughout the site. If soil/fill containing analytes at concentrations above Site Specific Track 4 SCOs is still present at the base or walls of the excavation after removal of all soil required for construction of the new building

and slab are complete, additional excavation would be performed to ensure complete removal of soil/ fill that does not meet Site Specific Track 4 SCOs.

Engineering Controls are required for a Site Specific Track 4 cleanup. A concrete slab covering the entire site and vapor barrier membrane would be installed as part of standard building development and are not considered part of the remedy. Additional soil vapor management would not be required. The Site would continue to be encumbered with an E-designation for hazardous material.

4.0 Remedial Action

4.1 Summary of Preferred Remedial Action

The preferred remedial action alternative is Alternative 1, the Track 1 remedial action. The preferred remedial action achieves protection of public health and the environment for the intended use of the property. The preferred remedial action will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action 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 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility(s).
6. Excavation and removal of soil/fill exceeding Unrestricted Use (Track 1) SCOs.
The entire footprint of the Site will be excavated to a depth of approximately four (4) feet below grade for the remedial action. A small portion of property will be excavated to depths of up to 30 feet below grade for the installation of foundation supports (helical piles or drilled caissons).
7. 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.

8. 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.
9. Removal of all UST's that are encountered during soil/fill removal actions. A February 2015 Geophysical Report did not indicate the presence of USTs at the subject property.
10. Registration of tanks and reporting of any petroleum spills associated with UST's and appropriate closure of these petroleum spills in compliance with applicable local, State and Federal laws and regulations.
11. Transportation and off-Site disposal of all soil/fill material at licensed or permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site.
12. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
13. 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. Construction and maintenance of an engineered composite cover consisting of cover consisting of 4 feet of clean fill material to restore the site to grade and a six inch concrete slab on grade to prevent human exposure to residual soil/fill remaining under the Site. If Track 1 Unrestricted Use SCOs are not achieved, the engineered composite cover will constitute an Engineering and Institutional Control for the site.
15. Installation of a vapor barrier system consisting of vapor barrier beneath the building slab and outside of sub-grade foundation sidewalls to mitigate soil vapor migration into the building. The vapor barrier system will consist of a Stego© Wrap 20-Mil Vapor Barrier below the slab throughout the full building area. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration. If Track 1 Unrestricted Use SCOs are not achieved, the vapor barrier system will serve as an Engineering Control for the remedial action. The remedial engineer will certify in the RAR that the vapor barrier system was designed and properly installed to mitigate soil vapor migration into the building.

16. Performance of all activities required for the remedial action, including acquisition of required permits and attainment of pretreatment requirements, in compliance with applicable laws and regulations.
17. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.
18. If Track 1 Unrestricted Use SCOs are not achieved: submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
19. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP 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 SCOs are proposed for this project and SCO's are defined in 6 NYCRR Part 375, Table 6.8(a) Track 1 Unrestricted Use. If Track 1 SCO's are not achieved, the following Track 4 Site-Specific SCO's are proposed:

<u>Contaminant</u>	<u>Site-Specific SCO's</u>
Total SVOCs	250 ppm
Lead	800 ppm
Mercury	1.5 ppm

Barium

600 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 5**. 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.

Soil/Fill Excavation and Removal

The plan for the remedial action is to excavate all site soils down to a depth of four feet below existing grade. Excavation is planned for the entire site except for a setback area in the rear of the property and as needed to support adjacent retaining walls. The site boundary is shown in **Figure 2**. The setback area is shown in the excavation plan in **Figure 4**. The total quantity of soil/fill expected to be excavated and disposed off-Site is 1,299 tons. For each disposal facility to be used in the remedial action, a letter from the developer/QEP to the receiving facility requesting approval for disposal and a letter back to the developer/QEP providing approval for disposal will be submitted to OER prior to any transport and disposal of soil at a facility.

The proposed disposal locations for Site-derived impacted materials are listed below. Additional disposal locations established at a later date will be reported promptly to the OER Project Manager.

Disposal Facility	Waste Type	Estimated Quantity
Bayshore Soil Management 75 Crows Mill Road, Keasbey, NJ	Soil with historic fill	1,299 tons

End-point Sampling

End-point samples will be analyzed for compounds and elements as described below utilizing the following methodology:

- 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.

New York State ELAP certified labs will be used for all end-point sample analyses. Labs performing end-point sample analyses will be reported in the RAR. The RAR will provide a tabular and map summary of all end-point sample results and will include all data including non-detects and applicable standards and/or guidance values.

Confirmation End-point Sampling

Removal actions for development purposes under this plan will be performed in conjunction with confirmation end-point soil sampling. Nine (9) confirmation samples will be collected from the base of the excavation at locations to be determined by OER. As Track 1 Unrestricted Use SCOs are the preferred alternative, samples will be analyzed for VOCs, SVOCs, pesticides, PCBs and metals according to analytical methods described above. Approximate locations of confirmatory end-point samples to evaluate the attainment of Track 1 SCOs are shown in **Figure 7**.

Hotspot End-point Sampling

End-point samples will be collected from the sidewalls and base of excavation at the hotspot location identified in the Remedial Investigation, according to the procedure listed below. A hotspot was identified at SB-4, as identified during the remedial investigation. SB-4 is considered hazardous for lead. However, the hotspot surrounding SB-4 will be excavated in the course of the remedial action, except possibly in the area of the setback in the rear of the property. Strecte will either:

- Complete the delineation of the hotspot in the direction of the setback to confirm that hotspot material does not remain in the setback.
- Take an additional endpoint sample, analyzed for lead, in the sidewall of the setback after the remedial action has been completed.

One (1) of the nine (9) planned post-excavation samples will be taken at the approximate location of SB-4.

If additional hotspots are identified, the following post-excavation sampling procedure will be followed.

For any hotspots identified during this remedial program, including any hotspots identified during the remedial action, hotspot removal actions will be performed to ensure that hotspots are fully removed and end-point samples will be collected at the following frequency:

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.

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

End point samples will be collected to ensure that the remedial action is effective in bringing site soils in compliance with the Restricted Residential SCOs for all contaminants of concern. The Quality Assurance Officer (QAO) directing the sampling and chemical analytical quality assurance for the project will be Brad Summerville, P.E. The QAO will perform the role described in NYSDEC DER-10 Technical Guidance for Site Investigation and Remedial Action Section 2.3 (2).

Samples will be collected from the floor and sidewalls of the excavation with the frequency and analyzed for the parameters described above. The selected NYSDOH ELAP Certified laboratory will follow all QA/QC procedures specified in the approved analytical methods.

Blind duplicate and matrix/matrix-spike duplicates are required at a frequency of 1 per 20 samples. Aqueous trip blanks are required at the same frequency for samples that are to be analyzed for volatiles.

If reusable sampling equipment is used (e.g. stainless steel scoop), field (rinsate) blanks will be required at the rate of 1 sample per every 8 samples collected. Sampling equipment will be decontaminated following the collection of each sample.

Samples will be collected in appropriate laboratory provided glassware. Upon collection, samples will be placed in chilled coolers, using ice to maintain a temperature of 4° C. Samples will be shipped via lab courier or direct delivery by field personnel to the analytical laboratory and analyzed within the appropriate holding time.

Import of Soils

Import of soils onto the property will be performed in conformance with the Soil/Materials Management Plan in **Appendix 5**. Imported soil will meet the lower of:

- Track 1 Unrestricted Use SCOs, and
- Groundwater Protection Standards in Part 375-6.8.

The estimated quantity of soil to be imported into the Site for backfill and cover soil is 1,299 tons.

If Track 1 Unrestricted Use SCOs are not achieved according to post-excavation sampling results and Track 4 Site Specific SCOs are implemented, imported soils will meet the lower of:

- Track 2 Restricted Residential SCO's, and
- Groundwater Protection Standards in Part 375-6.8.

Reuse of Onsite Soils

Soil reuse is not planned on this project.

4.3 Engineering Controls

The remedial action will achieve Track 1 Unrestricted Use SCOs and no Engineering Controls are required. However, the following design elements will be incorporated into the project as part of the development:

- (1) Composite Cover System
- (2) Soil Vapor Barrier System

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

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

- 4-feet of clean cover soil across the entire site;
- A 6 inch concrete slab across the entire site.

Figure 5 shows the design for the remedial cover type used on this Site. The composite cover system will be installed across the entire site. After the first four feet of contaminated soils are excavated and removed, the lot will be filled in with clean soil. Following the installation of the foundation and building support systems, the property will then be covered with an additional six inches of concrete.

If the remedial action does not achieve Track 1, this composite cover system will serve as a permanent engineering control for the Site.

If the project does not meet Track 1, the system will be inspected and its performance certified at specified intervals as required by this RAWP and the Site Management Plan. A Soil and Materials 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 Remedial Action Report.

Vapor Barrier System

Migration of soil vapor from onsite or offsite sources into the building will be mitigated with a combination of building slab and vapor barrier. The vapor barrier will consist of the Stego© Wrap 20-Mil Vapor Barrier supplied by Stego© Industries, LLC, which is ASTM E 1745 Class A-B-C Compliant. This vapor barrier is rated below 0.01 perms and has an extremely low permeance to prevent the infiltration of water vapor and soil gases. The vapor barrier will be installed over the entire area over which the building foundation slab is to be laid as shown in **Figure 5**. This area is 1,890 sq ft for 430 Van Brunt Street, and 1,180 sq feet at 432 and at 434 Van Brunt Street. The vapor barrier is installed by unrolling the Stego© Wrap over the earthen base, and overlapping seams as frequently as needed by a minimum of six inches. Seams must be taped together using Stego Tape or Crete Claw© Tape. The vapor barrier is designed to resist damage from construction-related activity and requires no maintenance after it is installed. Supporting documentation, including design specifications and installation directions, are included in **Appendix 6**.

The vapor barrier will extend throughout the area occupied by the footprint of the new building and will be installed in accordance with manufacturer specifications.

A plan view showing the location of the proposed vapor barrier system is provided in **Figure 5**. Typical design sections for the vapor barrier on slabs are provided in **Figure 6**. Product specification sheets are provided in **Appendix 6**. The Remedial Action Report will include as-built drawings and diagrams; manufacturer documentation; and photographs.

The Remedial Action Report will include a PE-certified letter (on company letterhead) from the primary contractor responsible for installation oversight and field inspections and a copy of the manufacturer's certificate of warranty.

If the remedial action fails to achieve Track 1 Unrestricted Use SCOs, the Vapor Barrier System will serve as a permanent engineering control and will be inspected and its performance certified at specified intervals as required by this RAWP and the Site Management Plan. A Soil and Materials 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 vapor barrier system is disturbed after the remedial action is complete. Maintenance of these systems will be described in the Site Management Plan in the Remedial Action Report.

4.4 Institutional Controls

A Track 1 remedial action is proposed and Institutional Controls are not required. If a Track 1 remedial action is not achieved, Institutional Controls (IC's) will be incorporated in this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. These IC's define the program to operate, maintain, inspect and certify the performance of Engineering Controls and Institutional Controls on this property. Institutional Controls would be implemented in accordance with a Site Management Plan included in the final Remedial Action Report (RAR). Institutional Controls would be:

- Continued registration of the E-Designation for the property. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the SMP which will note that the property owner and property owner's successors and assigns must comply with the approved SMP;
- Submittal of a SMP in the RAR for approval by OER that provides procedures for appropriate operation, maintenance, inspection, and certification of ECs and IC's. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure

to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification shall be submitted at a frequency to be determined by OER in the SMP and will comply with RCNY §43-1407(1)(3).

- Vegetable gardens and farming on the Site are prohibited in contact with residual soil materials;
- Use of groundwater underlying the Site is prohibited without treatment rendering it safe for its intended use;
- All future activities on the Site that will disturb residual material must be conducted pursuant to the soil management provisions in an approved SMP;
- The Site will be used for mixed use commercial and residential and will not be used for a higher level of use without prior approval by OER.

4.5 Site Management Plan

A Track 1 remedial action is proposed and Site Management is not required. If a Track 1 remedial action is not achieved, Site Management will be required and will be the last phase of remediation. Site Management will begin 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) operation and maintenance of EC's; (3) inspection and certification of IC's and EC's.

Site management activities and EC/IC certification will be scheduled by OER on a periodic basis to be established in the RAR and 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.

Data and information reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA) for this project. 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 under current and future conditions 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 Contaminant Sources

Based on the results of the RIR, the contaminants of concern are:

Soil:

- SVOCs consisting of the polycyclic aromatic hydrocarbons (PAHs), benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and 2-Methylnaphthalene exceeded Restricted Residential SCOs.
- One pesticide, 4,4-DDT (maximum of 3,030 ug/kg) exceeded Restricted Residential SCOs.

- Metals including barium, lead, mercury, and nickel were detected above Restricted Residential SCO's.

Groundwater:

- Metals including iron, manganese, selenium, and sodium exceeded GQS.

Soil Vapor:

- Petroleum related and chlorinated VOCs were detected at low levels.

Nature, Extent, Fate and Transport of Contaminants

Based on the results of the RIR, the extent and potential transport of the contaminants of concern are:

Soil: The eight SVOCs, one pesticide, and four metals exceeding Restricted Residential SCO's were found in shallow samples, taken between 0 and 2 feet bgs. Deep samples taken from the same boring (at depths ranging from 6 to 8 feet) did not contain these compounds in exceedance of NY SCO's.

Groundwater: Iron and sodium were detected above their respective GWC in all three samples.

Manganese and selenium were detected above their GWQC in one sample each. These locations do not correlate with soil sampling results and may be from offsite sources or be background concentrations.

Soil Vapor: Concentrations for TCE were above the monitoring range established within the State DOH soil vapor guidance matrix in one soil sample. TCE was not detected in site soils or in groundwater above GWS.

Receptor Populations

On-Site Receptors: The site is currently vacant and undeveloped and access to the Site is restricted by an 8 foot high, chained and locked, perimeter fence. Onsite receptors are limited to trespassers, site representatives and visitors granted access to the property. During construction, potential on-site receptors include construction workers, site representatives, and visitors. Under proposed future conditions, potential on-site receptors include commercial enterprise employees, adult and child building residents, workers and visitors.

Off-Site Receptors: Potential off-site receptors within a 500 foot radius of the Site include adult and child residents; commercial and construction workers; pedestrians; and trespassers based on the following land uses within 500 feet of the Site:

1. Commercial Businesses – existing and future
2. Residential Buildings – existing and future
3. Building Construction/ Renovation – existing and future
4. Pedestrians, Trespassers, Cyclists – existing and future
5. Schools – future

Potential Routes of Exposure

Three potential primary routes exist by which chemicals can enter the body: ingestion, inhalation, and dermal absorption. Exposure can occur based on the following potential media:

- Ingestion of groundwater or fill/ soil;
- Inhalation of vapors or particulates; and
- Dermal absorption of groundwater or fill/ soil.

Potential Exposure Points

Current Conditions: The site is currently partially capped with asphalt. In the areas with asphalt there are no potential exposure pathways from ingestion, inhalation, or dermal absorption of soil/ fill. However, the majority of the site is uncapped and humans could come into contact with site soils. Groundwater is not exposed at the site. The site is served by the public water supply and groundwater is not used at the site for potable supply and there is no potential for exposure. Because the site is currently undeveloped, there is no potential for soil vapor to accumulate on site.

Construction/ Remediation Conditions: During the remedial action, onsite workers will come into direct contact with surface and subsurface soils as a result of on-Site construction and excavation activities. On-Site construction workers potentially could ingest, inhale or have dermal contact with exposed impacted soil and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. Due to the depth of groundwater, direct contact with groundwater is expected during the construction of building foundation supports. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be

addressed through the Soil/Materials Management Plan, dust controls, and through the implementation of the Community Air-Monitoring Program and a Construction Health and Safety Plan.

Proposed Future Conditions: Under future remediated conditions, all soils in excess of Track 1 SCOs will be removed. The site will be fully capped, preventing potential direct exposure to soil and groundwater remaining in place, and the engineering control (vapor barrier) will prevent any potential exposure due to inhalation by preventing soil vapor intrusion. The site is served by the public water supply, and groundwater is not used at the site. There are no plausible off-site pathways for oral, inhalation, or dermal exposure to contaminants derived from the site.

Overall Human Health Exposure Assessment

There are potential complete exposure pathways for the current site condition. There are potential complete exposure pathways that require mitigation during implementation of the remedy. There are no complete exposure pathways under future conditions after the site is developed. This assessment takes into consideration the reasonably anticipated use of the site, which includes a residential structure, site-wide surface cover, and a subsurface vapor barrier system for the building. Under current conditions, on-Site exposure pathways exist for those with access to the Site and trespassers. During remedial construction, on-Site and off-Site exposures to contaminated dust from historic fill material will be addressed through dust controls, and through the implementation of the Community Air Monitoring Program, the Soil/Materials Management Plan, and a Construction Health and Safety Plan. 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 Paul Jensen (Site Project Manager, Site Safety Officer). The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Gary R. Brown and Brad Summerville, respectively.

5.2 Site Security

Site access will be controlled during the remedial action by a gated entry to the fenced property.

5.3 Work Hours

The hours for operation of the remedial action and subsequent construction activities will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. The hours of operation will be conveyed to OER during the pre-construction meeting.

5.4 Construction Health and Safety Plan

The Health and Safety Plan is included in **Appendix 7**. The Site Safety Coordinator will be Paul Jensen. 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, such as 40-hour hazardous waste operator training and annual 8-hour refresher training. The 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 will comply with all requirements of 29 CFR 1910.120. Site-specific training will be provided to

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

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

5.5 Community Air Monitoring Plan

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

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

VOC Monitoring, Response Levels, and Actions

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

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

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

All 15-minute readings must be recorded and be available for OER personnel to review.

Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels, and Actions

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

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

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m³) 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 mcg/m³ 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 mcg/m³ 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 mcg/m³ 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 including NYC Building Code to assure safety. Utility companies and other responsible authorities will be contacted to locate and mark the locations, and a copy of the Mark-Out Ticket will be retained by the contractor prior to the start of drilling, excavation or other invasive subsurface operations. Overhead utilities may also be present within the anticipated work zones. Electrical hazards associated with drilling in the vicinity of overhead utilities will be prevented by maintaining a safe distance between overhead power lines and drill rig masts.

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

Dewatering

Dewatering is not anticipated during remediation and construction.

Equipment and Material Staging

Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations. The location of proposed equipment and material staging areas, truck inspection station, stockpile areas, and other pertinent remedial management features are as follows:

During the remedial action, all stored materials will be removed from the site. Trucks loaded with excavated soil material will enter and exit the site through the Van Brunt Street Gate and

stabilized construction entrance, as described in the following section. Stockpiling will not be necessary during excavation as trucks will be loaded directly with excavated material.

During construction, materials will be staged in the rear yard portion of the property. Approximately 10 feet of sidewalk in front of the site will be occupied and fenced off with an NYC DOT permitted construction fence during construction. One 8 foot parking lane will be occupied for material storage purposes under an NYC DOT permit.

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 pads 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 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 clean 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 excavated areas, 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, hay bales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to OER at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911. Petroleum spills will be reported to NYS DEC within 2 hours of identification and consistent with State regulations. Emergency and spill conditions will also be reported to OER. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed. Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Stormwater 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 within statutory defined timelines. 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 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 included in **Appendix 8**.

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 business day. Those reports will include:

- Project number and statement of the activities and an update of progress made and locations of excavation and other remedial 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 results noting all excursions. CAMP data may be reported;
- 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, and approved by, 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 with basis 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;
- Text description with thorough detail of all engineering and institutional controls (if Track 1 remedial action is not achieved)
- As-built drawings for all constructed remedial elements;
- Manifests for all soil or fill disposal;
- Photographic documentation of remedial work performed under this remedy;
- Site Management Plan (if Track 1 remedial action 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 (including all soil test results from the remedial investigation for soil that will remain on site) and all soil/fill waste characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action;
- Test results or other evidence demonstrating that remedial systems are functioning properly;
- Account of the source area locations and characteristics of all soil or fill material removed from the Site including a map showing the location of these excavations and hotspots, tanks or other contaminant source areas;
- Full accounting of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material;

- Account of the origin and required chemical quality testing for material imported onto the Site;
- Continue registration of the property with an E-Designation by the NYC Department of Buildings (if Track 1 remedial action is not achieved);
- The RAWP and Remedial Investigation Report will be included as appendices to the RAR;
- Reports and supporting material will be submitted in digital form and final PDF's will include bookmarks for each appendix.

Remedial Action Report Certification

I, Gary Brown am currently a registered professional engineer licensed by the State of New York. I performed professional engineering services and had primary direct responsibility for implementation of the remedial program for the 430-434 Van Brunt Street site, site number 16CVCP058K. I certify to the following:

- I have reviewed this document, to which my signature and seal are affixed.
- Engineering Controls implemented during this remedial action were designed by me or a person under my direct supervision and achieve the goals established in the Remedial Action Work Plan for this site.
- The Engineering Controls constructed during this remedial action were professionally observed by me or by a person under my direct supervision and (1) are consistent with the Engineering Control design established in the Remedial action Work Plan and (2) are accurately reflected in the text and drawings for as-built design reported in this Remedial Action Report.
- The OER-approved Remedial Action Work Plan dated [date] and Stipulations in a letter dated [date] were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

Name

PE License Number

Signature

Date

PE Stamp

I, Brad Summerville, am a Qualified Environmental Professional. I had primary direct responsibility for implementation of the remedial program for the 430-434 Van Brunt Street site, site number 16CVCP058K. I certify to the following:

- The OER-approved Remedial Action Work Plan dated [date] and Stipulations in a letter dated [date] 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.

QEP Name

QEP Signature

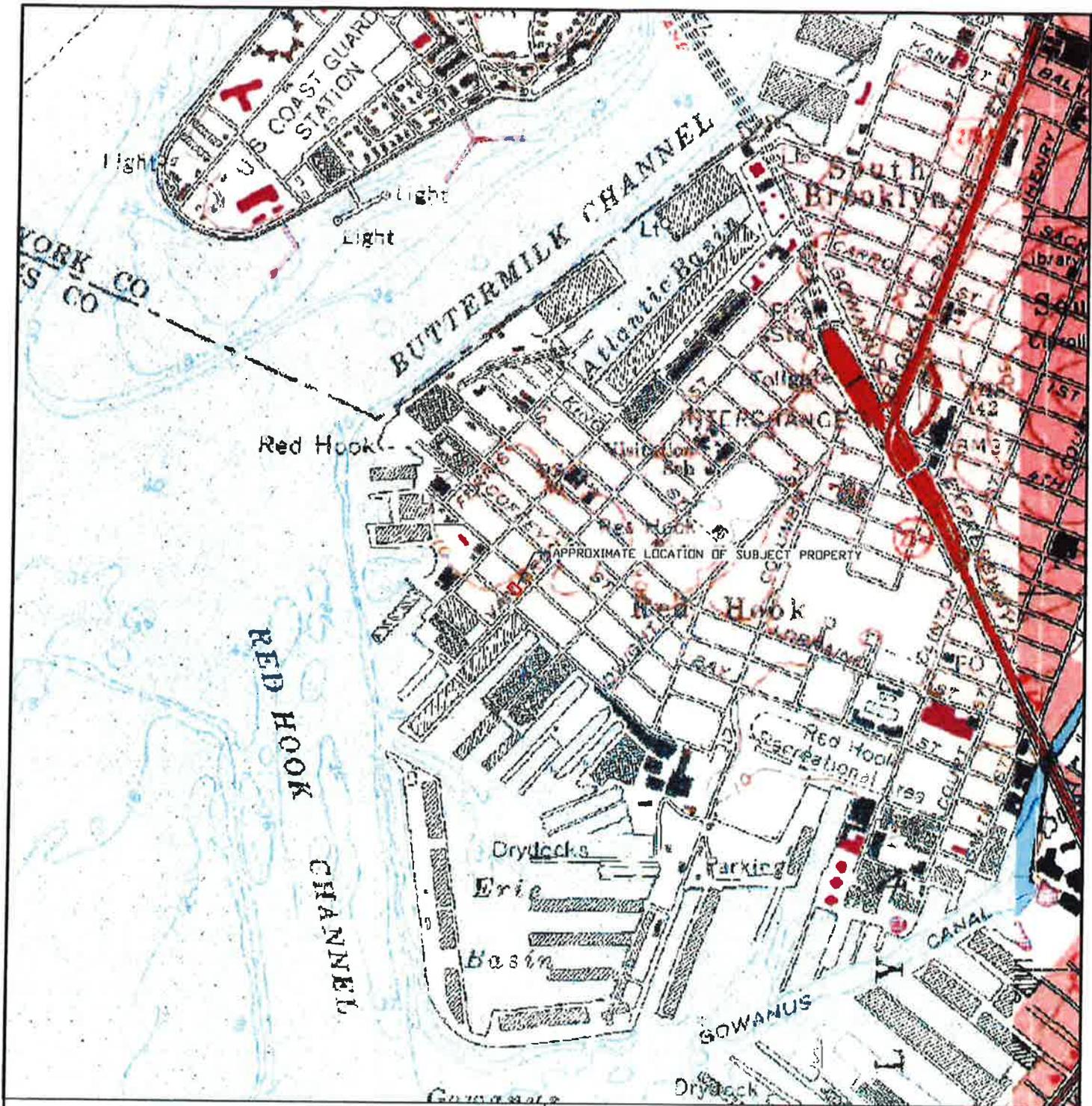
Date

7.0 Schedule

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a four (4) 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	1	1
Mobilization	1	1
Remedial Excavation of Site Soils and Post Excavation Sampling	2	2
Remedial Construction and Foundation Work, including Importation of Clean Soil and Installation of Vapor Barrier	4	10
Demobilization	14	1
Submit Remedial Action Report	15	4

FIGURES



430-434 VAN BRUNT STREET
 BROOKLYN, NEW YORK 11231
 BLOCK 603, LOTS 23 AND 24

DER PROJECT # 15EHAZ292K
 CEQR # 00DME013K



FIGURE 1
 SITE LOCATION MAP

PREPARED FOR:
 STREKTE
 P.O. BOX 21041
 BROOKLYN, NEW YORK 11202

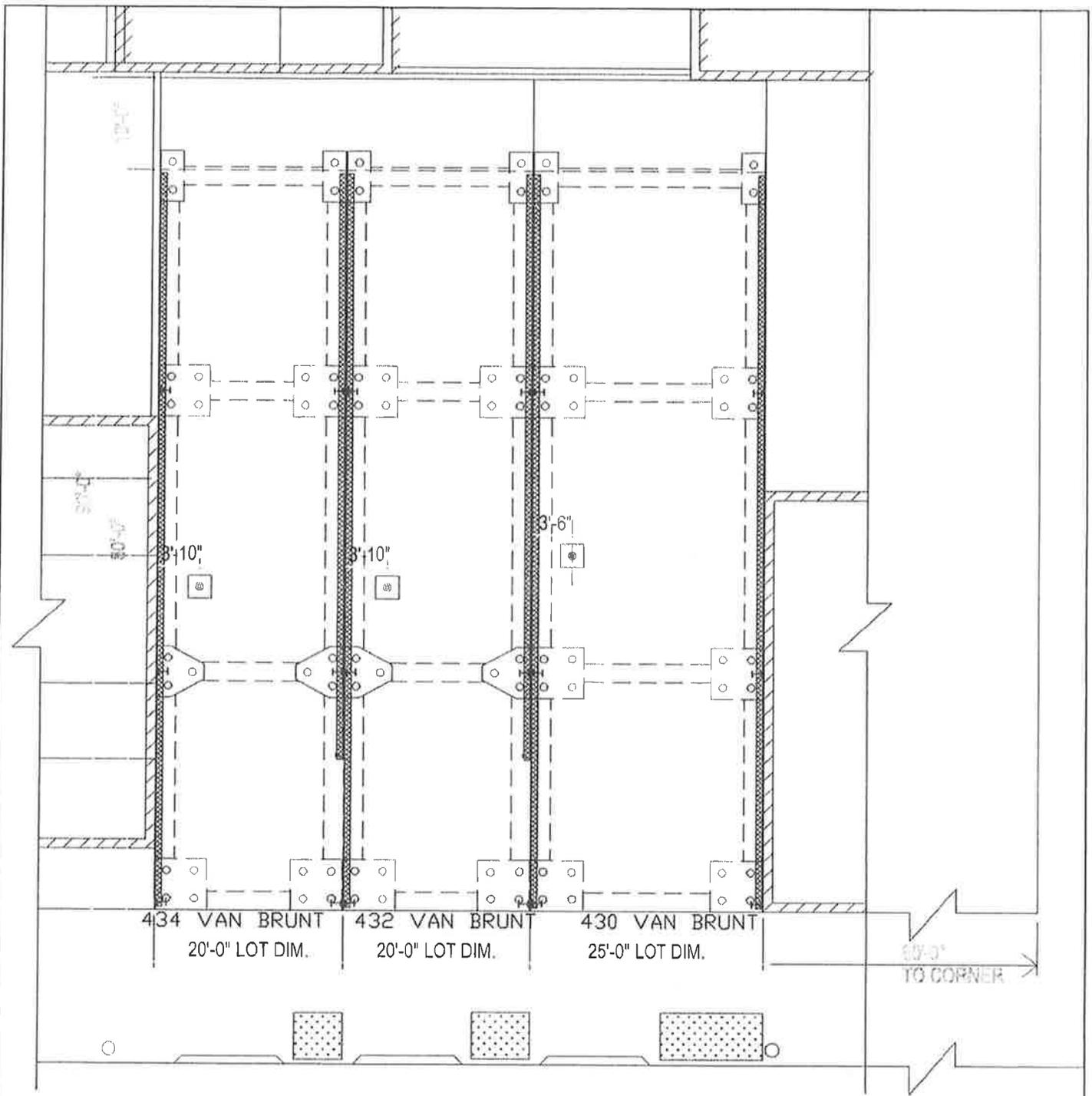
PREPARED BY:
 PT CONSULTANTS, INC.
 629 CREEK ROAD
 BELLMAWR, NEW JERSEY 08031

PT PROJECT # 12090-04

DRAFTSMAN: DSL

DATE: DECEMBER 22, 2015

SCALE: 1" = 2000'



430-434 VAN BRUNT STREET
 BROOKLYN, NEW YORK 11231
 BLOCK 603, LOTS 23 AND 24

DER PROJECT # 15EHAZ292K
 CEQR # 00DME013K



FIGURE 2
 SITE BOUNDARY

PREPARED FOR:
 STREKTE
 P.O. BOX 21041
 BROOKLYN, NEW YORK 11202

PREPARED BY:
 PT CONSULTANTS, INC.
 629 CREEK ROAD
 BELLMAWR, NEW JERSEY 08031

PT PROJECT # 12090-04	DRAWN BY: DSL	CHECKED BY: BJS
DATE: DECEMBER 22, 2015	SIZE: LETTER	SCALE: AS SHOWN

Figure 3- Surrounding Land Uses



Zoning

Commercial Overlay

-  C1-1
-  C1-2
-  C1-3
-  C1-4
-  C1-5
-  C2-1
-  C2-2



C2-3

C2-4

C2-5

R2 Zoning Districts

Zoning Districts Thematic

Residence District (Medium and Higher Density)

Residence District (Lower Density)

Commercial District

Mixed Use District

Manufacturing District

Battery Park City

Park

E Environmental Designation

Primary Land Use

One & Two Family Residence

 Multi-Family Residence (Walkup)

 Multi-Family Residence (Elevator)

 Mixed Residential & Commercial

 Commercial Use

 Industrial / Manufacturing

Transportation / Utility

 Public Facilities and Institutions

 Open Space & Recreation

Parking

 Vacant Land

 Education

434 VAN BRUNT STREET, BROOKLYN 11231

- Zoning

Zoning Information:

Borough: Brooklyn **Block:** 603 **Lot:** 24

Zoning: [M1-1/R5](#)

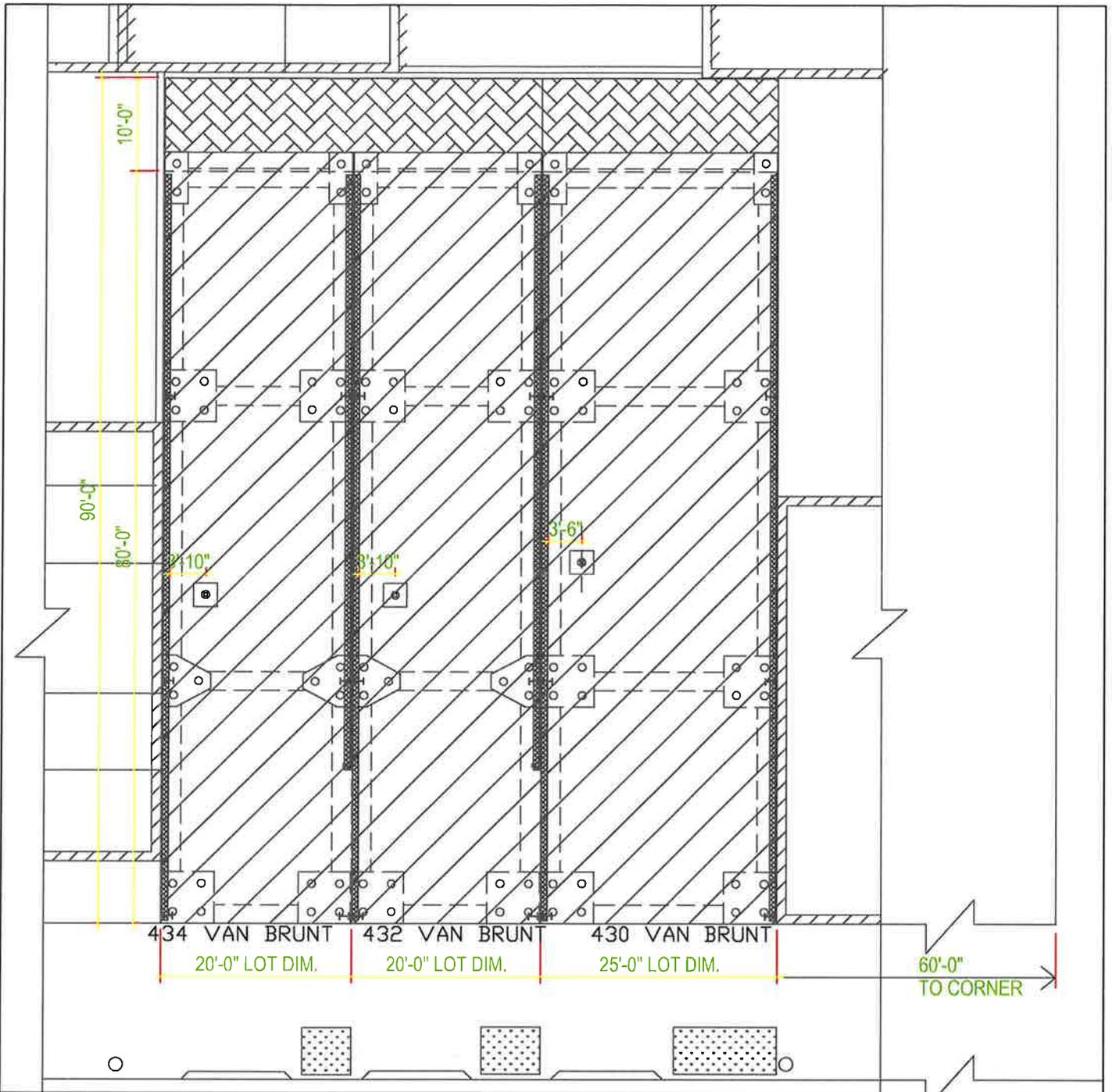
Special Purpose District:

[Special Mixed Use District \(MX-5\)](#)

Zoning Map: [16a](#)

Historical Zoning Maps: [16a](#)

Department of City Planning, Zoning Database (updated monthly)



LEGEND: PROPOSED EXCAVATION TO 4 FEET BGS PROPOSED AREA OF 1:1 SLOPE TO 10' SETBACK

430-434 VAN BRUNT STREET
 BROOKLYN, NEW YORK 11231
 BLOCK 603, LOTS 23 AND 24

DER PROJECT # 15EHAZ292K
 CEQR # 00DME013K

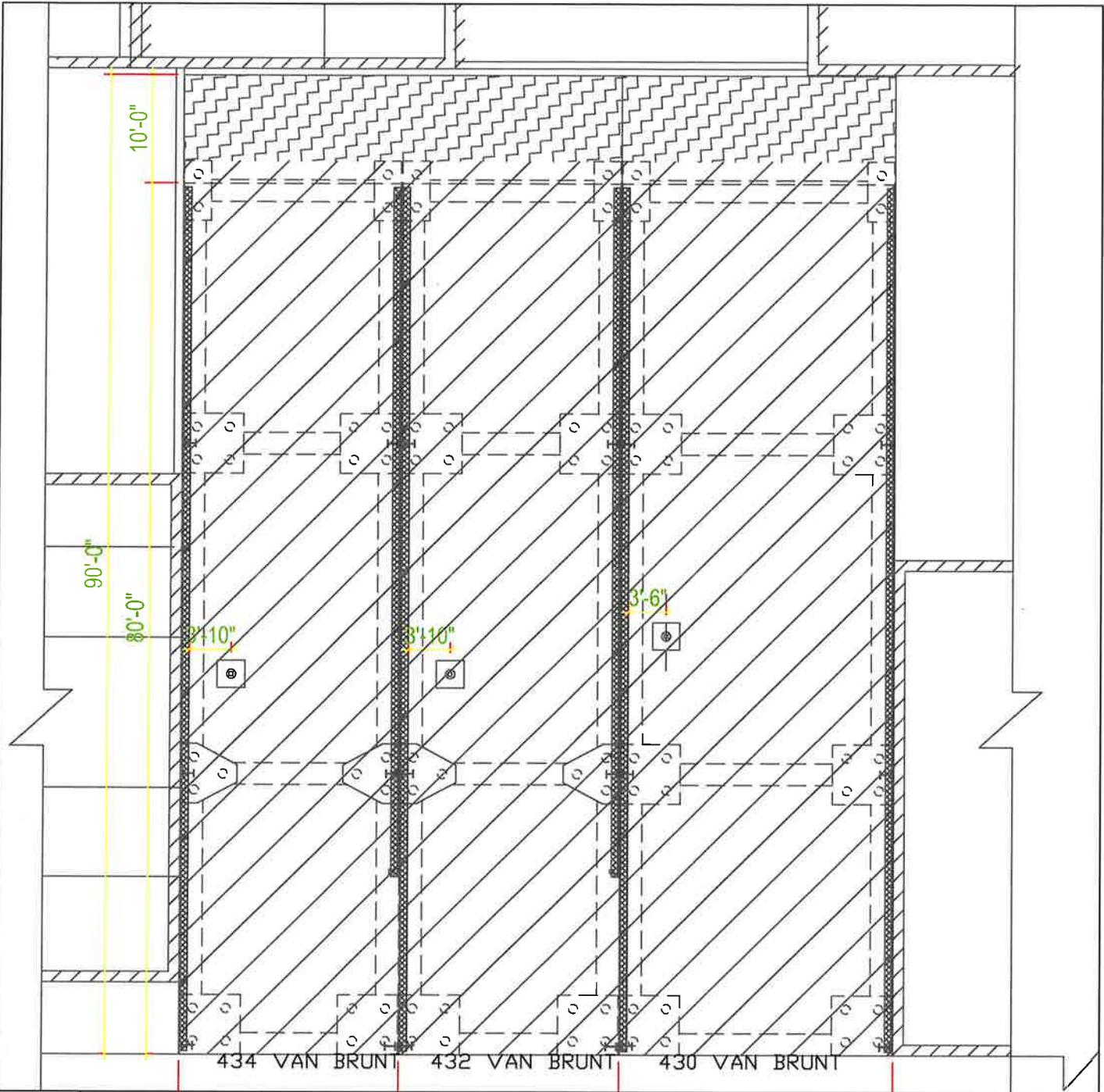


FIGURE 4
 EXCAVATION PLAN

PREPARED FOR:
 STREKTE
 P.O. BOX 21041
 BROOKLYN, NEW YORK 11202

PREPARED BY:
 PT CONSULTANTS, INC.
 629 CREEK ROAD
 BELLMAWR, NEW JERSEY 08031

PT PROJECT # 12090-04	DRAWN BY: DSL	CHECKED BY: BJS
DATE: DECEMBER 28, 2015	SIZE: LETTER	SCALE: AS SHOWN



LEGEND: REMEDIAL COVER INCLUDING VAPOR BARRIER CONCRETE COMPOSITE COVER

430-434 VAN BRUNT STREET
 BROOKLYN, NEW YORK 11231
 BLOCK 603, LOTS 23 AND 24

DER PROJECT # 15EHAZ292K
 CEQR # 00DME013K



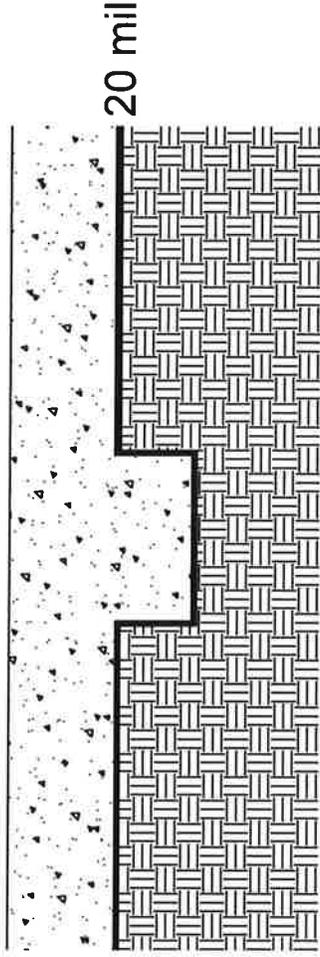
FIGURE 5
 REMEDIAL COVER MAP

PREPARED FOR:
 STREKTE
 P.O. BOX 21041
 BROOKLYN, NEW YORK 11202

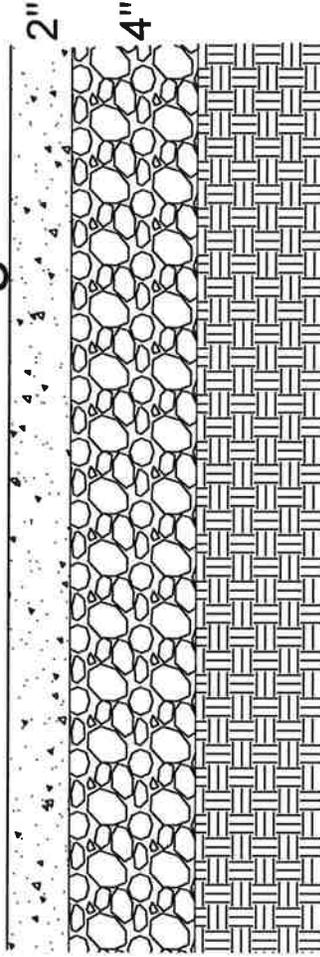
PREPARED BY:
 PT CONSULTANTS, INC.
 629 CREEK ROAD
 BELLMAWR, NEW JERSEY 08031

PT PROJECT # 12090-04	DRAWN BY: DSL	CHECKED BY: BJS
DATE: DECEMBER 28, 2015	SIZE: LETTER	SCALE: AS SHOWN

Building Foundation with Vapor Barrier



Concrete Paving



LEGEND

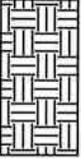
-  Concrete
-  20 mil Vapor Barrier
-  Crushed Stone Base
-  Subgrade Fill

FIGURE 6

TYPICAL REMEDIAL COVER DESIGN

430-434 VAN BRUNT STREET
BROOKLYN, NEW YORK
BLOCK 603, LOTS 23 AND 24

OER PROJECT # 15EHAZ292K
CEQR # 00DME013K

PREPARED FOR:

STREKTE

P.O. BOX 21041

BROOKLYN, NEW YORK 11202

DATE: 12/22/2015

PROJECT NUMBER:
12090-04

DRAWN BY:
D.S.L.

PREPARED BY:

PT CONSULTANTS, INC.

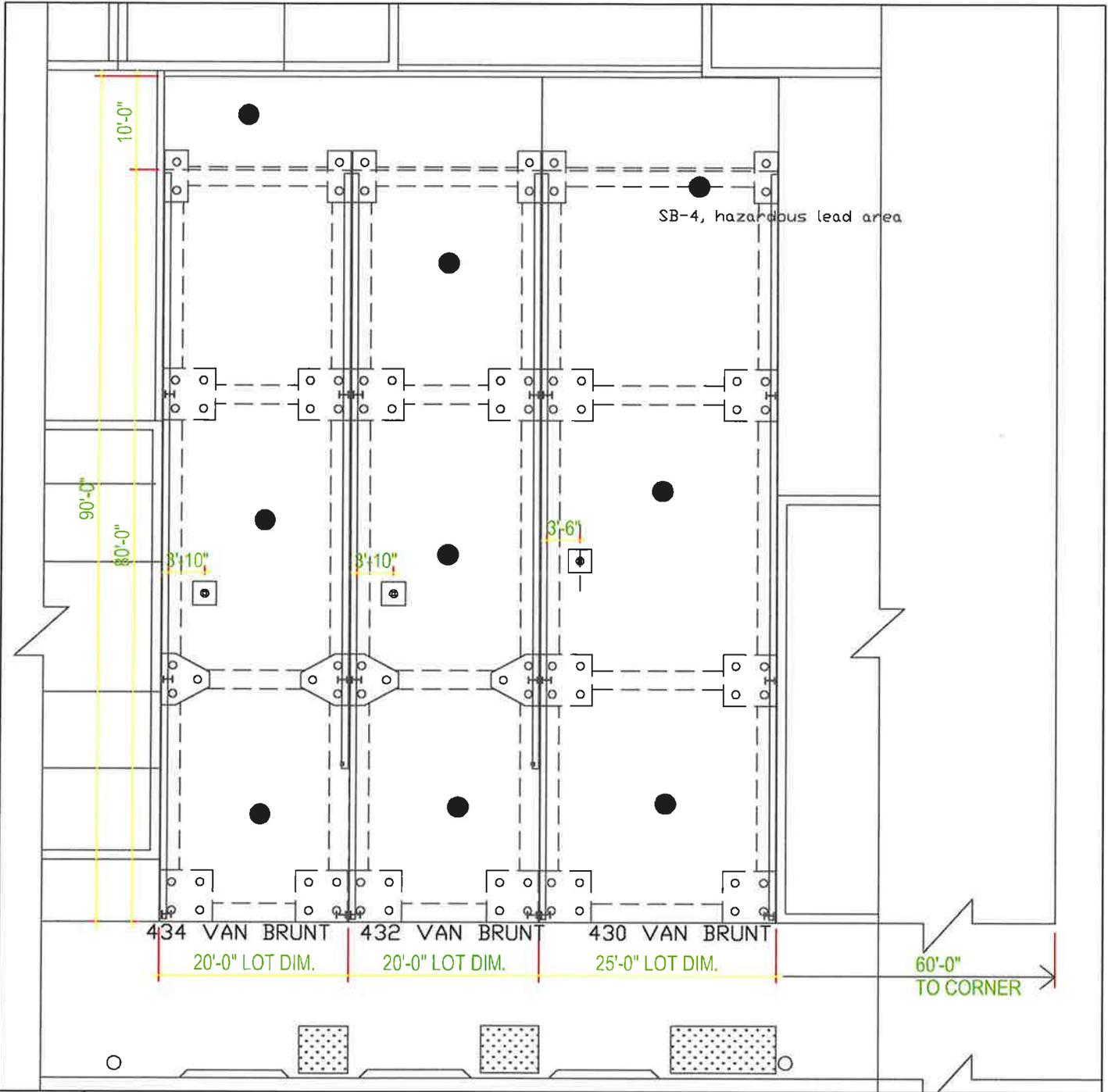
629 CREEK ROAD

BELLMAWR, NEW JERSEY 08031

CHECKED BY:
B.J.S.

SCALE: N.T.S.
SIZE: LTR

PAGE NO.
1



LEGEND: ● Approximate Post-excitation sampling location

430-434 VAN BRUNT STREET
 BROOKLYN, NEW YORK 11231
 BLOCK 603, LOTS 23 AND 24

DER PROJECT # 15EHAZ292K
 CEQR # 00DME013K



FIGURE 7
 POST EXCAVATION SAMPLING LOCATIONS

PREPARED FOR:
 STREKTE
 P.O. BOX 21041
 BROOKLYN, NEW YORK 11202

PREPARED BY:
 PT CONSULTANTS, INC.
 629 CREEK ROAD
 BELLMAWR, NEW JERSEY 08031

PT PROJECT # 12090-04	DRAWN BY: BNS	CHECKED BY: BJS
DATE: FEBRUARY 23, 2016	SIZE: LETTER	SCALE: AS SHOWN

APPENDIX 1

**PROPOSED DEVELOPMENT PLANS AND PROPOSED BUILDING
LAYOUT**

Eric Salyan / Architect P.C.
 540 President Street / 3rd Fl
 Brooklyn, NY 11215
 Tel: 718 508 9889
 Fax: 718 508 4927
 es-architect.com

- LEGEND**
- NEW BUILDING PARTITION
 - NEW INTERIOR PARTITION
 - WALL TYPE A301.01
 - WALL TYPE A301.02
 - WALL TYPE A301.03
 - WALL TYPE A301.04
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 - WALL TYPE A301.100

NO.	DATE	DESCRIPTION
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3	02.15.15	ISSUED FOR PERMITS
4	03.15.15	ISSUED FOR PERMITS
5	04.15.15	ISSUED FOR PERMITS
6	05.15.15	ISSUED FOR PERMITS
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8	07.15.15	ISSUED FOR PERMITS
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83	10.15.21	ISSUED FOR PERMITS
84	11.15.21	ISSUED FOR PERMITS
85	12.15.21	ISSUED FOR PERMITS
86	01.15.22	ISSUED FOR PERMITS
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88	03.15.22	ISSUED FOR PERMITS
89	04.15.22	ISSUED FOR PERMITS
90	05.15.22	ISSUED FOR PERMITS
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97	12.15.22	ISSUED FOR PERMITS
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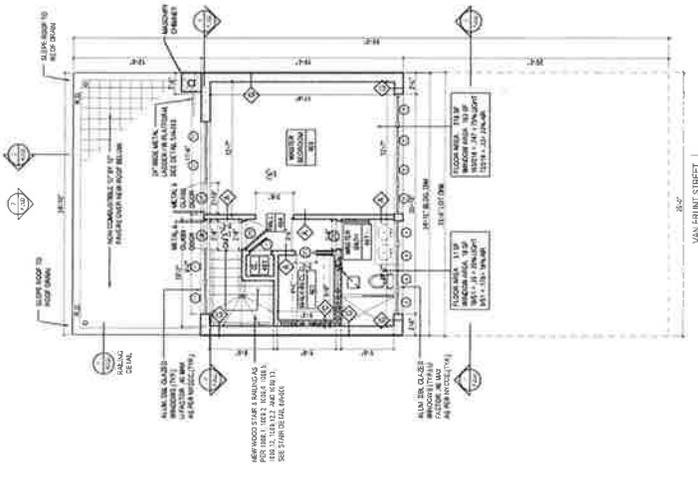
Project
 430 Van Brunt St
 Brooklyn, NY 11231

Sheet Title
 3RD FLOOR PLAN
 4TH FLOOR PLAN
 5TH FLOOR PLAN

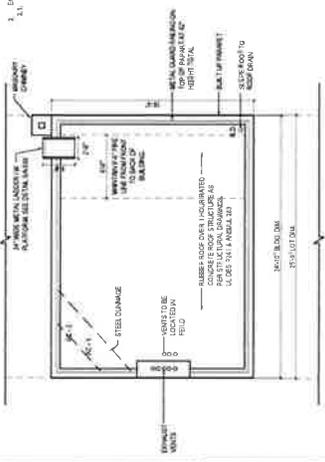
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Drawn ES, KK
Date 12.15.14

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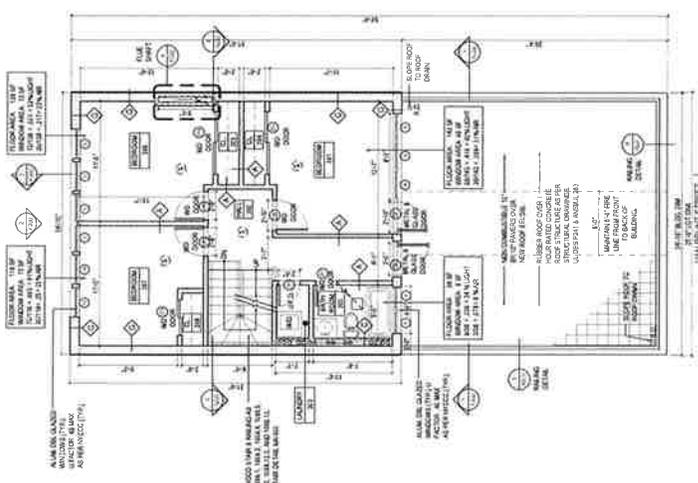
Drawing No.
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 07 OF 11



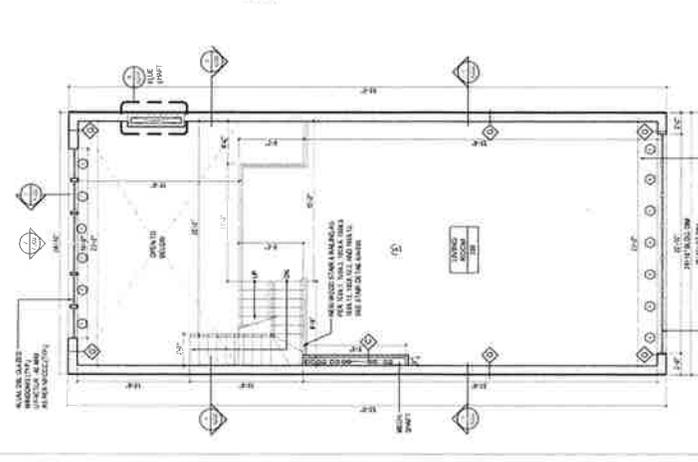
4 4TH FLOOR PLAN
 SCALE 3/8" = 1'-0"



5 ROOF PLAN
 SCALE 3/8" = 1'-0"



3 3RD FLOOR PLAN
 SCALE 3/8" = 1'-0"



2 2ND FLOOR PLAN
 SCALE 3/8" = 1'-0"

DOOR SCHEDULE

NO.	TYPE	FINISH	SWING	GLASS	REMARKS
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Eric Safyan / Architect P.C.
 540 President Street / 3rd Fl
 Brooklyn, NY 11215
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 es@ericsafyan.com

Project
432 Van Brunt St
 Brooklyn, NY 11231

Sheet Title
3RD FLOOR PLAN, & 4TH FLOOR PLAN, & 5TH FLOOR PLAN

Job No. 0143100
 Scale AS SHOWN
 Drawn ES, KK
 Date 03.14.15

Architect Label
A-101.00

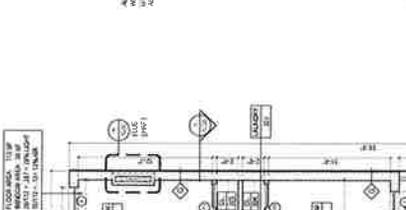
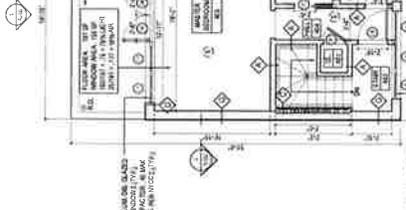
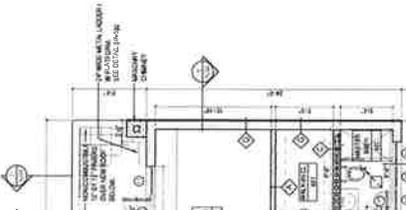
07 OF 11

- LEGEND**
- NEW EXTERIOR PARTITION
 - NEW INTERIOR PARTITION/USE
 - WALL TYPE A-101
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 - WALL TYPE A-104
 - WALL TYPE A-105
 - WALL TYPE A-106
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 - WALL TYPE A-199
 - WALL TYPE A-200

- SECTION
- ELEVATION
- DETAIL
- WALL TYPE
- CEILING
- FLOOR
- DOOR
- WINDOW
- STAIR
- ELEVATION MARKERS
- DOOR SCHEDULE
- WINDOW SCHEDULE
- WALL TYPE
- CEILING
- FLOOR
- DOOR
- WINDOW
- STAIR
- ELEVATION MARKERS
- DOOR SCHEDULE
- WINDOW SCHEDULE

NOTES

1. MAINTAIN THE USE SPECIFIED AT ALL PARTITIONS & DELINEATE WHEN CHANGES ARE MADE.
2. ALL WALLS SHALL BE CONSTRUCTED AS PER THE SPECIFICATIONS AND SHALL BE FINISHED WITH THE FINISH SPECIFIED IN THE SCHEDULES.
3. ALL INTERIOR WALLS SHALL BE FINISHED WITH THE FINISH SPECIFIED IN THE SCHEDULES.
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20. ALL INTERIOR WALLS SHALL BE FINISHED WITH THE FINISH SPECIFIED IN THE SCHEDULES.



DOOR SCHEDULE

NO.	TYPE	FINISH	SWING	OPERATION	REMARKS
101	SWING	WOOD	IN	STANDARD	...
102	SLIDING	WOOD	IN	STANDARD	...
103	SWING	WOOD	OUT	STANDARD	...
104	SWING	WOOD	IN	STANDARD	...
105	SWING	WOOD	OUT	STANDARD	...
106	SWING	WOOD	IN	STANDARD	...
107	SWING	WOOD	OUT	STANDARD	...
108	SWING	WOOD	IN	STANDARD	...
109	SWING	WOOD	OUT	STANDARD	...
110	SWING	WOOD	IN	STANDARD	...
111	SWING	WOOD	OUT	STANDARD	...
112	SWING	WOOD	IN	STANDARD	...
113	SWING	WOOD	OUT	STANDARD	...
114	SWING	WOOD	IN	STANDARD	...
115	SWING	WOOD	OUT	STANDARD	...
116	SWING	WOOD	IN	STANDARD	...
117	SWING	WOOD	OUT	STANDARD	...
118	SWING	WOOD	IN	STANDARD	...
119	SWING	WOOD	OUT	STANDARD	...
120	SWING	WOOD	IN	STANDARD	...

WINDOW SCHEDULE

NO.	TYPE	FINISH	OPERATION	REMARKS
201	DOUBLE GLAZED	WOOD	STANDARD	...
202	TRIPLE GLAZED	WOOD	STANDARD	...
203	DOUBLE GLAZED	WOOD	STANDARD	...
204	TRIPLE GLAZED	WOOD	STANDARD	...
205	DOUBLE GLAZED	WOOD	STANDARD	...
206	TRIPLE GLAZED	WOOD	STANDARD	...
207	DOUBLE GLAZED	WOOD	STANDARD	...
208	TRIPLE GLAZED	WOOD	STANDARD	...
209	DOUBLE GLAZED	WOOD	STANDARD	...
210	TRIPLE GLAZED	WOOD	STANDARD	...
211	DOUBLE GLAZED	WOOD	STANDARD	...
212	TRIPLE GLAZED	WOOD	STANDARD	...
213	DOUBLE GLAZED	WOOD	STANDARD	...
214	TRIPLE GLAZED	WOOD	STANDARD	...
215	DOUBLE GLAZED	WOOD	STANDARD	...
216	TRIPLE GLAZED	WOOD	STANDARD	...
217	DOUBLE GLAZED	WOOD	STANDARD	...
218	TRIPLE GLAZED	WOOD	STANDARD	...
219	DOUBLE GLAZED	WOOD	STANDARD	...
220	TRIPLE GLAZED	WOOD	STANDARD	...

GENERAL NOTES

1. MAINTAIN THE USE SPECIFIED AT ALL PARTITIONS & DELINEATE WHEN CHANGES ARE MADE.
2. ALL WALLS SHALL BE CONSTRUCTED AS PER THE SPECIFICATIONS AND SHALL BE FINISHED WITH THE FINISH SPECIFIED IN THE SCHEDULES.
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19. ALL INTERIOR WALLS SHALL BE FINISHED WITH THE FINISH SPECIFIED IN THE SCHEDULES.
20. ALL INTERIOR WALLS SHALL BE FINISHED WITH THE FINISH SPECIFIED IN THE SCHEDULES.

Project
432 Van Brunt St
 Brooklyn, NY 11231

Sheet Title
3RD FLOOR PLAN, & 4TH FLOOR PLAN, & 5TH FLOOR PLAN

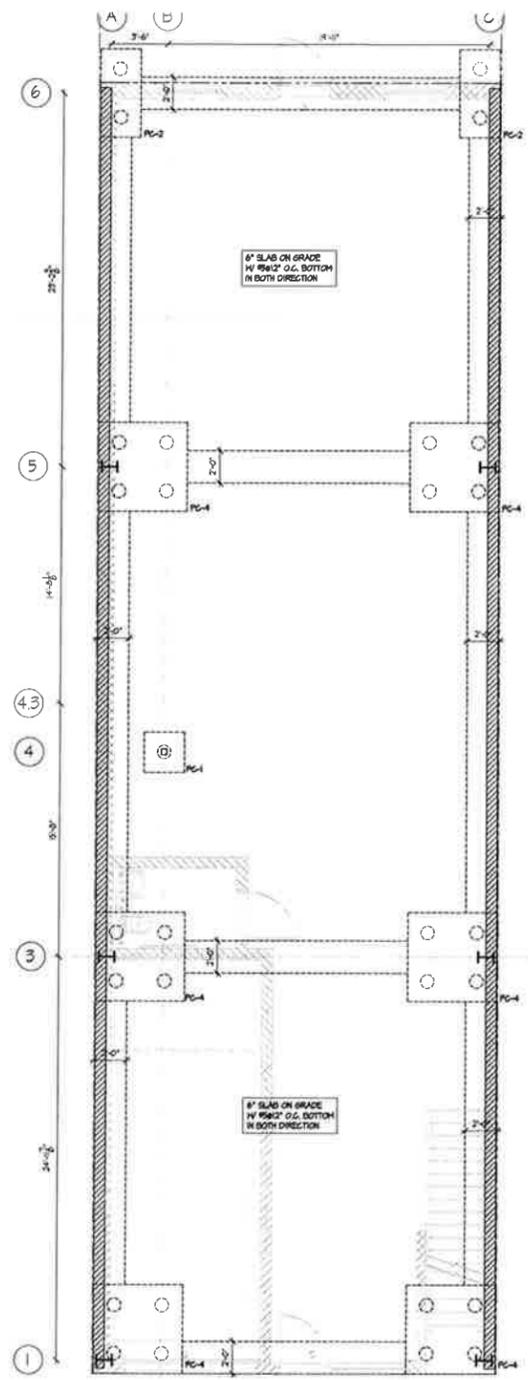
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 Date 03.14.15

Architect Label
A-101.00

07 OF 11

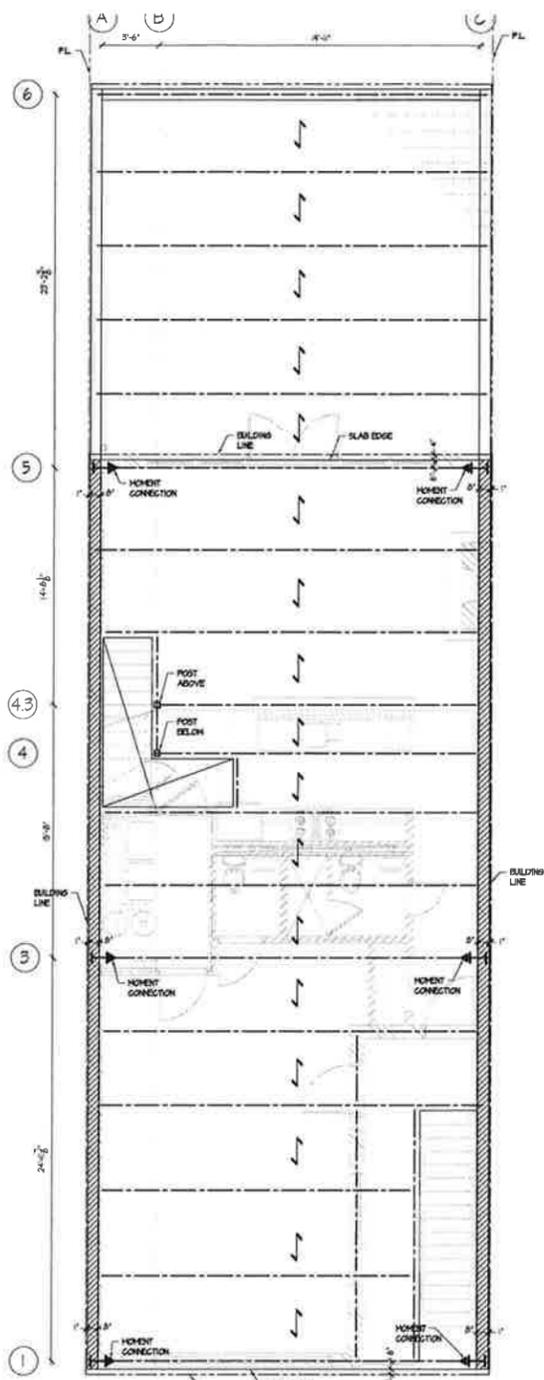
APPENDIX 2

FOUNDATION PLAN



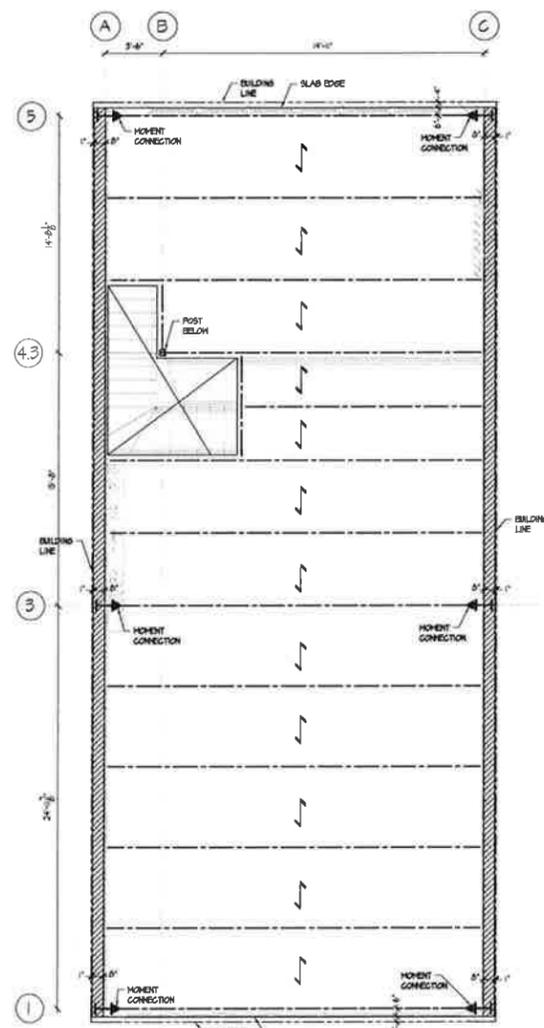
FOUNDATION PLAN

- NOTE: SCALE: 3/16" = 1'-0"
- REFER TO GEOTECHNICAL REPORT FOR PILING TYPES & REQUIREMENTS. FILE CONTRACTOR'S PROFESSIONAL ENGINEERING TO SIGN OFF PILE DESIGN & CONSTRUCTION & CONTROL INSPECTION FOR PILE SHEET SHOP DRAWINGS TO ARCHITECTS FOR REVIEW PRIOR TO CONSTRUCTION.
 - REFER TO SOIL REPORT BY OTHER CONSULTANT FOR ALL OTHER REQUIREMENT & PRE-CAUTION.
 - DENOTES PILES WITH MINIMUM ALLOWABLE VERTICAL CAPACITY OF 30 TONS.
 - ALL PILES SHALL BE DESIGNED BY PILES CONSULTANT / CONTRACTOR, SIGNED & SEALED BY THEIR PROFESSIONAL ENGINEER & SUBMIT TO BUILDING DEPARTMENT. REFER TO RELEVANT DRAWINGS FOR ADDITIONAL INFORMATION & REQUIREMENT.
 - AVOID EXCESSIVE VIBRATION DURING CONSTRUCTION. VELOCITY METERS SHALL BE INSTALLED AT ADJACENT BUILDINGS TO MONITOR INDUCE VIBRATIONS DURING CONSTRUCTION. STOP CONSTRUCTION AND NOTIFY ENGINEER AND ARCHITECT IMMEDIATELY IF VALUES EXCEEDING THE LEVEL ALLOWED BY NYC CODE AND BUILDING CODE. CONTROL INSPECTION ENGINEER SHALL REPORT ANY UNSAFE CONDITION TO THE DEPARTMENT OF BUILDING & ALL RELEVANT PARTIES ONCE UNSAFE CONDITION ENCOUNTERED.
 - MONITOR POINTS SHALL BE SET UP AT ADJACENT BUILDINGS PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR SHALL MONITOR ANY MOVEMENT IN BOTH VERTICAL & HORIZONTAL DIRECTIONS REGULARLY & FREQUENTLY. IN CASE ANY MOVEMENT OCCUR, STOP ALL WORKS & NOTIFY ALL PARTIES IMMEDIATELY.
 - SEE ARCH DWG FOR ALL FIREPROOFING & WATERPROOFING REQUIREMENTS & DETAILS.
 - TEMPORARY SHORE EXISTING STRUCTURES FULLY AT HERE NEEDED PRIOR TO ANY WORK.
 - TOP FC DENOTES TOP OF PILE CAP.



1ST FLOOR FRAMING PLAN

SCALE: 3/16" = 1'-0"
 SEE ARCH DWG FOR ALL FIREPROOFING & WATERPROOFING REQUIREMENTS & DETAILS.



2ND FLOOR FRAMING PLAN

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

F?? INDICATES CONCRETE ISOLATED FOOTING, SEE SCHEDULE FOR SIZE.

- DO NOT SCALE. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO START OF CONSTRUCTION.
- SCHEDULED MARK DESIGNATIONS ARE TYPICAL TO THE PROJECT AND MAY NOT NECESSARILY BE FOUND ON THIS PLAN.
- UNLESS NOTED OTHERWISE ON PLANS AND/OR DETAILS, DEPTH OF FOOTING DIMENSIONS INDICATED IN THE G.S.N. ARE MINIMUMS. FOUNDATION CONTRACTOR SHALL COORDINATE WITH SOIL REPORT AND ALL TRADES TO INSURE THAT THESE MINIMUMS ARE SUFFICIENT FOR THE WORK. SEE TYPICAL DETAILS FOR ADDITIONAL REQUIREMENTS.
- BUILDING CONCRETE SLAB ON GRADE SHALL BE AS NOTED ON PLAN. VERIFY EXACT SIZE AND LOCATION OF DEPRESSED AND/OR RAISED SLABS WITH ARCHIT. DRAWINGS. FOR SIDEWALK LOCATION SEE ARCHIT. DRAWINGS. FOR ADDITIONAL INFORMATION, SEE G.S.N. AND TYPICAL DETAILS.
- PROVIDE CONTROL JOINTS IN CONCRETE SLAB ON GRADE. SEE TYPICAL DETAIL AND GENERAL NOTE FOR REQUIREMENT, AND SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS.
- PROVIDE CONTROL JOINTS IN MASONRY WALL. SEE G.S.N. AND TYPICAL DETAILS FOR REQUIREMENT, AND SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS.

FLOOR PLAN LEGEND AND NOTES

- DENOTES MOMENT CONNECTION
- W-7 INDICATES LOAD BEARING MASONRY WALL. SEE MASONRY WALL SCHEDULE AND GENERAL NOTE FOR REBARS.
- INDICATES LOAD BEARING MASONRY WALL. SEE MASONRY WALL SCHEDULE AND GENERAL NOTE FOR REBARS.

- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS.
- SCHEDULED MARK DESIGNATIONS ARE TYPICAL TO THE PROJECT AND MAY NOT NECESSARILY BE FOUND ON THIS PLAN.
- PROVIDE CONTROL JOINTS IN MASONRY WALL. SEE G.S.N. AND TYPICAL DETAILS FOR REQUIREMENT, AND SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS.
- FOR CLARITY, DETAILS MAY SHOW ONLY ONE SIDE OF FRAMING CONDITIONS.
- FOR CLARITY, ALL FLOOR OPENINGS MAY NOT BE SHOWN ON FLOOR FRAMING PLAN. FOR EXACT SIZE, NUMBER AND LOCATION OF OPENINGS, SEE ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS. FOR FRAMING AT OPENINGS, SEE TYPICAL DETAILS.
- CONTRACTOR TO VERIFY AND BE RESPONSIBLE FOR VARIATIONS IN CONCRETE QUANTITY DUE TO CAMBER, CONSTRUCTION DEAD LOAD DEFLECTIONS AND/OR TOLERANCES OF STRUCTURAL STEEL ELEMENTS (i.e. BEAMS, STEEL DECK, ETC.) AND PRECAST CONCRETE ELEMENTS.

PROJECT ADDRESS

430 VAN BRUNT
 BROOKLYN, NY

DRAWING CONTENT

FOUNDATION PLAN AND
 1ST FLOOR FRAMING PLAN AND
 2ND FLOOR FRAMING PLAN

SEAL & SIGNATURE



DATE: 11/14/14
 PROJECT #: 14-041
 DRAWING BY: JH
 CHECKED BY: MC
 SCALE: AS SHOWN
 DRAWING #: 5-021.00

PROGRESS SET
 NOT FOR CONSTRUCTION

APPENDIX 3

CITIZEN PARTICIPATION PLAN

APPENDIX 3

CITIZEN PARTICIPATION PLAN

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

Project Contact List: OER has established a Site Contact List for this project to provide public notices in the form of fact sheets to interested members of the Community.

Communications will include updates on important information relating to the progress of the cleanup program at the Site as well as to request public comments on the cleanup plan. The Project Contact List includes owners and occupants of adjacent buildings and homes, principal administrators of nearby schools, hospitals and day care centers, the public water supplier that serves the area, established document repositories, the representative Community Board, City Council members, other elected representatives and any local Brownfield Opportunity Area (BOA) grantee organizations. Any member of the public or organization will be added to the

Site Contact List on request. A copy of the Site Contact List is maintained by OER's project manager. If you would like to be added to the Project Contact List, contact NYC OER at (212) 788-8841 or by email at brownfields@cityhall.nyc.gov.

Repositories: A document repository is maintained online. Internet access to view OER's document repositories is available at public libraries. 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. The library nearest the Site is:

Red Hook Library

7 Wolcott Street

Brooklyn, NY 11231

(718) 935-0203 Open 10AM-6PM Mo,Th,Fr

Open 1PM-8 PM Tu

Open 10AM-8PM We

Open 10AM-5 PM Sa

Closed Su

Digital Documentation: NYC OER requires the use of digital documents in our repository as a means of minimizing paper use while also increasing convenience in access and ease of use.

Issues of Public Concern: There are no issues of public concern anticipated for 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 reviewed

and approved by OER prior to distribution and mailed by the Enrollee. 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. 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 4

SUSTAINABILITY STATEMENT

APPENDIX 4

SUSTAINABILITY STATEMENT

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

Reuse of Clean, Recyclable Materials and Reduced Consumption of Non-

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

Strekte anticipates the use of recycled finishes and recycled thermal insulation products. When possible, the site will be backfilled using milling products provided by the NYC Department of Transportation (DOT) or clean soil available for reuse from the NYC Clean Soil Bank.

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

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.

The backfilling of the site following the remedial action will require the trucking in of foreign materials. As available, Strekte will utilize locally available backfill materials as provided by the NYCDEP Clean Soil Bank and milling products provided by the NYC DOT, in order to minimize the distance required to transport the backfilled material.

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.

Natural gas will be utilized for fuel in the new building. An estimate of the volume of clean fuels used during remedial activities will be quantified and reported in the RAR.

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

The concrete slab and building covering the entire site will protect recontamination from infiltrating storm water and from surface spills.

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

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

430-434 Van Brunt Street will incorporate rooftop storm retention and/or reduced flow drains to reduce the influx of storm water into the storm sewer system.

An estimate of the enhanced stormwater 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.

Strecke is exploring the possibility of achieving passive house certification at all three buildings at 430-434 Van Brunt Street. Passive house certification considers energy usage, efficiency, and thermal comfort.

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

Low-Energy Project Management Program: Strekte 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. The 10 foot wide rear yard portion of the yard will be covered in a composite cover consisting of 4 feet of clean material with a six inch concrete slab. Where possible, landscaping with native plant species will be incorporated into the rear yard area for the enjoyment of the residents. Three 3 inch caliper trees will be planted along the sidewalk after construction is completed. Native species of hardy tree will be selected. 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 5

SOIL/MATERIALS MANAGEMENT PLAN

APPENDIX 5

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 final remedial report. Soil screening will be performed during invasive work performed during the remedy and development phases prior to issuance of final signoff by OER.

1.2 Stockpile Methods

Excavated soil from suspected areas of contamination (e.g., hot spots, USTs, drains, etc.) will be stockpiled separately and will be segregated from clean soil and construction materials.

Stockpiles will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, and before and after every storm event.

Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. Excavated soils will be stockpiled on, at minimum, double layers of 8-mil minimum sheeting, will be kept covered at all times with appropriately anchored plastic tarps, and will be routinely inspected. Broken or ripped tarps will be promptly replaced.

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

1.3 Characterization of Excavated Materials

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

1.4 Materials Excavation, Load-Out, and Departure

The PE/QEP overseeing the remedial action will:

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

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

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

1.5 Off-Site Materials Transport

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

Outbound truck transport routes are described in the remedial report. 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 New York City 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 final remedial report.

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 final remedial report.

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

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

1.7 Materials Reuse On-Site

Soil and fill that is derived from the property that meets the Soil Cleanup Objectives (SCOs) established in this plan may be reused on-Site. The SCOs for on-Site reuse are listed in Section 4.2 of this cleanup plan. '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 land with comparable levels of contaminants in soil/fill material, compliant with applicable laws and regulations, 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 remedial plan are followed. The expected location for placement of reused material is shown in Section 4.2.

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. Imported soils will not exceed groundwater protection standards established in Part 375. Imported soils for Track 1 remedial action projects will not exceed Track 1 SCO's.

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 remedial plan. The final remedial report 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.
- All material will be subject to source screening and chemical 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 final remedial report. 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 Stormwater Pollution Prevention

Applicable laws and regulations pertaining to stormwater pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this remedial plan (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 for Unknown Contamination Sources

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 this remedial plan.

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 this remedial plan.

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 6

STEGO® VAPOR BARRIER SPECIFICATIONS



Stego® Wrap 20-Mil Vapor Barrier

STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00, 03 30 00

1. Product Name

Stego Wrap 20-Mil Vapor Barrier

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 20-Mil Vapor Barrier is used as a below-slab vapor barrier, and as a protection course for below grade waterproofing applications.
COMPOSITION: Stego Wrap 20-Mil Vapor Barrier is a multi-layer plastic extrusion manufactured with only the highest grade of prime, virgin, polyolefin resins.
ENVIRONMENTAL FACTORS: Stego Wrap 20-Mil Vapor Barrier 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 20-Mil Vapor Barrier 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 20-Mil Vapor Barrier 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, IMPLIED OR STATUTORY, IS GIVEN AS TO THE MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE WITH RESPECT TO THE PRODUCTS REFERRED TO. Please see www.stegoindustries.com/legal.

8. Maintenance

None required.

9. 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

• www.stegoindustries.com



4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGO WRAP 20-MIL VAPOR BARRIER

PROPERTY	TEST	RESULTS
Under Slab Vapor Retarders	ASTM E1745 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 F1249 - Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor	0.0071 perms
Puncture Resistance	ASTM D1709 - Test Methods for Impact Resistance of Plastic Film by Free-Falling Dart Method	3500+ grams*
Tensile Strength	ASTM D882 - Test Method for Tensile Properties of Thin Plastic Sheeting	97.7 lbf/in.
Permeance After Conditioning (ASTM E1745 Sections 7.1.2 - 7.1.5)	ASTM E154 Section 8, F1249 - Permeance after wetting, drying, and soaking ASTM E154 Section 11, F1249 - Permeance after heat conditioning ASTM E154 Section 12, F1249 - Permeance after low temperature conditioning ASTM E154 Section 13, F1249 - Permeance after soil organism exposure	0.0088 perms 0.0081 perms 0.0084 perms 0.0077 perms
Radon Diffusion Coefficient	K124/02/95	9.9 x 10 ⁻¹² m ² /second
Thickness		20 mils
Roll Dimensions		14 ft. wide x 105 ft. long or 1,470 ft ²
Roll Weight		140 lbs.

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

* The material maxed out the testing equipment and did not fail at 3746 grams.





Stego® Mastic

STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00, 03 30 00

1. Product Name
Stego Mastic

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 Mastic is designed to be used as a waterproofing and vapor retardant membrane for use in conjunction with Stego Wrap 10-mil and 15-mil Vapor Retarder/Barrier. Stego Mastic can be used as an alternate to boots for pipe penetrations in Stego Wrap Vapor Barrier.

COMPOSITION: Stego Mastic is a medium-viscosity, water-based, polymer-modified anionic bituminous/asphalt emulsion.

SIZE: Stego Mastic comes in two-gallon and five-gallon buckets.

4. Technical Data

APPLICABLE STANDARDS:

American Society for Testing and Materials (ASTM)

- ASTM D412 Standard Test Method for Vulcanized Rubber and Thermoplastic Elastomers - Tension
- ASTM E154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth under Concrete Slabs, on Walls, or as Ground Cover
- ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials
- ASTM D751 Standard Test Methods for Coated Fabrics
- ASTM D1434 Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting
- ASTM C836 Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Water-proofing Membrane for Use with Separate Wearing Course.
- ASTM E1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.

5. Installation

PREPARATION:

- A test application simulating the project environment should always be done prior to final usage of Stego Mastic.
- All Surfaces should be dry and free of loose materials, oils and other contaminants. The surfaces should be cleaned in the same fashion as the test surface in order to ensure proper results.
- Store above 40°F, and apply above 40°F and below 100°F.

PENETRATIONS:

To repair penetrations in Stego Wrap, cut Stego Wrap just big enough to fit over and around the penetration so as to minimize void space. Liberally apply Stego Mastic around the penetration to keep the integrity of the membrane intact. Stego Mastic can be applied by brush, roller, or trowel.

NOTES: 1) For larger penetrations or wide cut-outs of Stego Wrap, use Stego Wrap and Stego Tape to repair and seal. 2) Solvent-based products should not be applied over this product. 3) Clean all tools with kerosene and/or oil-based cleaners.

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

6. Availability & Cost

Stego Mastic is available nationally via building supply distributors. For current cost information, contact your local Stego 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, IMPLIED OR STATUTORY, IS GIVEN AS TO THE MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE WITH RESPECT TO THE PRODUCTS REFERRED TO. Please see www.stegoindustries.com/legal.

8. Maintenance

None required.

9. Technical Services

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

10. Filing Systems

- Stego Industries' website
- Buildsite

TABLE 1: PHYSICAL PROPERTIES OF STEGO MASTIC	
Property and Test	Stego Mastic
Tensile/Elongation, ASTM D412	32 psi / 3860%
Resistance to Decay, ASTM E154	10% perm loss
Permeance, ASTM E96	0.17 Perms
Hydrostatic Water Pressure, ASTM D751	28 psi
Adhesion to Concrete & Masonry, ASTM C836	7 lbf./in.
Hardness, ASTM C836	75
Crack Bridging, ASTM C836	No Cracking
Low Temp Flexibility, ASTM C836	No Cracking

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





Stego® Tape
STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00, 03 30 00

1. Product Name
Stego Tape

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 Tape is a low permeance tape designed for protective sealing, hanging, seaming, splicing, and patching applications where a highly conformable material is required. It has been engineered to bond specifically to Stego Wrap, making it ideal for sealing Stego Wrap seams and penetrations.

COMPOSITION: Stego Tape is composed of polyethylene film and an acrylic, pressure-sensitive adhesive.

SIZE: Stego Tape is 3.75" wide and 180' long. Stego Tape ships 12 rolls in a case.

4. Technical Data

APPLICABLE STANDARDS:

Pressure Sensitive Tape Council (PSTC)

- PSTC 101 – International Standard for Peel Adhesion of Pressure Sensitive Tape

American Society for Testing & Materials (ASTM)

- ASTM E 1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs

5. Installation

SEAMS:

Overlap Stego Wrap six inches and seal with Stego Tape. Make sure the area of adhesion is free from dust, dirt, moisture and frost to allow maximum adhesion of the pressure sensitive tape.

PIPE PENETRATION SEALING

- 1) Install Stego Wrap around pipe by slitting/cutting material
- 2) If void space around pipe is minimal, seal around base of pipe with Stego Tape (Stego Mastic can be used for additional coverage)

DETAIL PATCH FOR PIPE PENETRATION SEALING

- 1) Cut a piece of Stego Wrap that creates a six inch overlap around all edges of the void space
- 2) Cut an "X" in the center of the detail patch
- 3) Slide detail patch over pipe, secure tightly
- 4) Tape down all sides of detail patch with Stego Tape
- 5) Seal around base of pipe with Stego Tape (Stego Mastic can be used for additional coverage)

Stego Tape should be installed above 40°F. In temperatures below 40°F, take extra care to remove moisture or frost from the area of adhesion.

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



6. Availability & Cost

Stego Tape is available nationally via building supply distributors. For current cost information, contact your local Stego 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.

8. Maintenance

None required.

9. Technical Services

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

10. Filing Systems

- Stego Industries' website
- Buildsite

TABLE 1: PHYSICAL PROPERTIES OF STEGO TAPE

PROPERTY	RESULTS
Total Thickness	6 mils
Permeance	0.03 perms
Tensile Strength	17 lbs./in. width
Elongation (at break) MD	1060%
Adhesion (20 min dwell ss, PSTC 101)	95-oz./in. width
Ultraviolet Resistance	Excellent





Stego® Crete Claw® Tape

STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00

1. Product Name

Stego® Crete Claw® Tape

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 Crete Claw Tape is a multi-layered tape that is used to seal Stego Wrap to concrete while the concrete is still wet. Crete Claw allows wet concrete to cast into the textured top surface to form a mechanical bond/seal.
COMPOSITION: Stego Crete Claw is composed of polyethylene film, aperture film, and an acrylic, pressure sensitive adhesive.
SIZE: Stego Crete Claw is 6" wide by 180' long. Stego Crete Claw ships 8 rolls in a case.

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGO CRETE CLAW

PROPERTY	RESULTS
Dimensions	6" x 180'
Total Thickness	26 mils
Permeance: ASTM F 1249	0.03 perms
180° Adhesion Peel Strength: ASTM D 903	17.6 lbf/in.
Shear Adhesion Strength: 1 in ² shear test using an Instron 3345 Machine	>49 lbf/in ² *

* Specimens failed by stretching vapor barrier to failure before pulling Crete Claw from concrete.

5. Installation

SECURING STEGO WRAP TO SLAB: Clean the surface of Stego Wrap to ensure that it is free of moisture, frost, dirt, and debris prior to the installation of Stego Crete Claw. When ready to apply Crete Claw, peel back the release liner and apply to Stego Wrap. Stego Crete Claw should be completely on Stego Wrap.

Install Crete Claw Tape on all seams and around the entire perimeter of the Stego Wrap installation.

To detail, cut Stego Crete Claw with a box knife or scissors. Crete Claw should be installed above 40°F for maximum adhesion. For additional information, please refer to Stego's complete installation instructions.

TIP: Wrap the release liner back over the entire roll while unrolling Crete Claw. This technique will allow the release liner to pull off easily and keep it out of the way.

6. Availability & Cost

Stego Crete Claw is available nationally through our network of building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' Sales Representative.

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.

8. Maintenance

Store Stego Crete Claw in a dry and temperate area.

9. Technical Services

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

10. Filing Systems

www.stegoindustries.com
Buildsite



APPENDIX 7

CONSTRUCTION HEALTH AND SAFETY PLAN

CONTRACTOR HEALTH AND SAFETY PLAN

**RED HOOK STORES REDEVELOPMENT / REZONING
430-434 VAN BRUNT STREET
BROOKLYN, NY 11231
BLOCK 603, LOTS 23 & 24
OER PROJECT NUMBER 15EHAZ292K**

**E-DESIGNATION E-110
CEQR NUMBER 00DME013K**

PT PROJECT # 12090-04

**PREPARED FOR:
STREKTE
P.O. BOX 21041
BROOKLYN, NEW YORK 11202
PAUL@STREKTE.COM**

**PREPARED BY:
PT CONSULTANTS, INC.
121 WEST 27TH STREET, SUITE 1004
NEW YORK, NEW YORK 10001
(917) 338-3086/ FAX (856) 931-1849**

DECEMBER 2015

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HEALTH AND SAFETY PLAN SUMMARY

Site specific Hazards and Training

The Field Safety Officer (FSO) will be responsible for providing Site - Specific training to all personnel that work at the site. This training will cover the following topics:

- Names of personnel responsible for Site Safety and Health;
- Hazards potentially present at the Site;
- Proper use of personal protective equipment (PPE);
- Work Practices by which the employee can minimize risk from hazards; and,
- Site Specific Hazards are described in Section 3.0.General Health and Safety Requirements

STREKTE personnel will be required to sign and date the Safety Briefing Form provided in **Attachment A** prior to working at the site.

Personal Protective Equipment

Level D protection will be worn for initial entry on-site and for all activities, except as noted in Section 6.2. Level D protection will consist of:

- Standard work clothes;
- Steel-toe safety boots;
- Safety glasses
- Nitrile outer gloves and polyvinyl chloride (PVC) or nitrile inner gloves (to be used during soil sampling activities); and
- Hard hat

Modified Level D protection may be required under conditions where potential contact of the skin or clothes with significant contamination occurs, (significant contamination is

not anticipated as part of site activities). Modified Level D is the same as Level D, but includes Tyvek coveralls and disposable polyethylene over boots.

Level C PPE may be required should elevated concentrations of volatile organic compounds be detected within the work area. Level C PPE is similar to modified Level D, but with the addition of air purifying respirators equipped with volatile organic cartridges.

The need for higher levels of PPE is not anticipated as part of site activities. Other PPE to be used at the site, as necessary, is described in Section 7.0.

Air Monitoring

Air monitoring and response procedures are discussed in Section 6.0. Elevated concentrations of volatile organic vapors may be encountered during the project. Air monitoring will be conducted with a photo ionization detector within the work zone. Fugitive dust generation that could affect Site workers, Site occupants, or the public is not expected. The criteria for stopping work will be (1) sustained visible emissions of dust and (2) at the FSO's discretion, based on field observations (e.g., suspect odors, etc.). The FSO will keep the Health and Safety Manager (HSM) aware of any extraordinary situations and conditions that may occur.

Emergency Contacts

In the event of any situation or unplanned occurrence requiring assistance, the appropriate contact(s) should be made from the list below. For emergency personnel, who will then contact the appropriate response teams. This emergency contacts list must be in an easily accessible location at the site.

Emergency Contacts

Phone Number

Fire Department	911
Police	911
New York City/Long Island One Call Center	(800) 272-4480
Poison Control Center	(800) 222-1222
Pollution Toxic Chemical/Oil Spills	(800) 424-8802

Medical Emergency Information

Ambulance Service	911
Hospital Name	New York Methodist Hospital
Hospital Phone Number	(718) 780-3000
Hospital Address	506 Sixth Street Brooklyn, NY 11215
Route to Hospital	(See Page 4 and 5)

Project Team Contacts for CMHP

Contact Information

Project Manager	Brad Summerville (856) 625-9229 (C) (856) 251-9980 (O) 105 Harmony Road Mickleton, NJ 08056
Site Safety Coordinator	Bethany Schneider (856) 264-9485 (C) (856) 251-9980 (O) 137 Fellowship Lane Mullica Hill, NJ 08062

Emergency Procedures

Emergency procedures are described in Section 9.0.

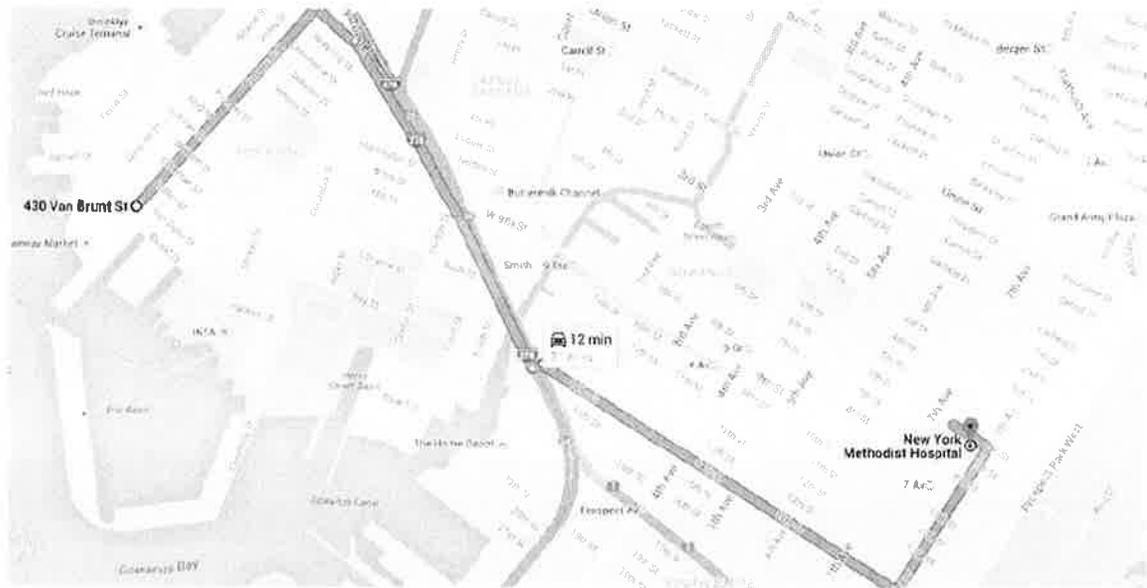
In case of personal injury at the Site, the victim should be transported to the nearest hospital or medical center if deemed necessary. If necessary, an ambulance should be called to transport the victim. The hospital route plan is displayed below:

Site Location: 430-434 Van Brunt Street

Hospital Location: 506 Sixth Street, Brooklyn, NY 11215

Hospital Information Line: (718) 780-3000

FIGURE 1 - HOSPITAL PLAN ROUTE



Route to Hospital

From the Site to New York Methodist Hospital:

- | | |
|--|--------|
| 1. Head northeast on Van Brunt St toward Van Dyke St | 0.6 mi |
| 2. Turn right onto Bowne St | 0.1 mi |
| 3. Slight right onto Hamilton Ave | 0.9 mi |
| 4. Turn left onto 14 th St | 121 ft |
| 5. Turn right to stay on 14 th St | 1.0 mi |
| 6. Turn left onto 8 th St | 0.4 mi |
| 7. Turn left onto 6 th St. Destination will be on left. | 0.1 mi |

Total Distance: 3.1 miles

Total Estimated Time: 15 minutes

1.0 INTRODUCTION

1.1 Purpose and Policy

The purpose of this Health and Safety Plan (HASP) is to establish personnel protection standards and mandatory safety practices and procedures for the excavation and disposal of soils generated during the remedial action and construction activities associated with the Red Hook Stores Redevelopment/Rezoning project located at 430-434 Van Brunt Street, Brooklyn, New York 11231. This plan assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise while operations are being conducted during the excavation or handling of materials at the subject site. This HASP is supplemental to the existing site wide HASP established by the contractor and exists on-site.

Any supplemental plans used by subcontractors shall conform to this plan, at a minimum. All personnel who engage in project activities must be familiar with this plan, comply with its requirements, and sign the Safety Briefing Form (provided in **Attachment A**). In addition to this plan, all work shall be performed in accordance with all applicable federal, state, and local regulations.

The content of the HASP may change or undergo revision based upon additional information made available to health and safety personnel, monitoring results, or changes in the scope of work. Any changes proposed must be reviewed and approved by the HSM, Environmental Consultants, Hauler, and FSO.

1.2 Site Description

The project Site is located in the Red Hook section of Brooklyn, New York and is identified as Block 603, Lots 23 & 24 on the New York City Tax Map. The site is 5,850 square feet (sq ft) and is bounded by mixed-use residential and commercial properties to

the north, east, and west. Site is bounded by Van Brunt Street to the south. The site is currently undeveloped and used for the storage of construction equipment and trailers.

In August 2014, PT completed a Remedial Investigation based on a Phase II Environmental Site Assessment Work Plan for STREKTE. The purpose of the Phase II ESA was to identify impacts to site soils, groundwater, and soil vapor on the property. The Assessment revealed that the following impacts existed on-site:

- Soil/fill samples collected during the Phase II Investigation were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives and Restricted Residential Soil Cleanup Objectives as presented in 6NYCRR Part 375-6.8 and CP51. No PCBs were detected in any of the soil samples. Soil/fill samples collected during the RI showed trace concentrations of one VOC, acetone (maximum of 128 ug/kg) exceeding Unrestricted Use SCOs. Eight SVOCs consisting of the polycyclic aromatic hydrocarbons (PAHs), benz(a)anthracene (maximum of 27,300µg/kg), benzo(a)pyrene (maximum of 21,700 µg/kg), benzo(b)fluoranthene (maximum of 27,300 µg/kg), benzo(k)fluoranthene (maximum of 8,330 ug/kg), chrysene (maximum of 25,100 µg/kg), dibenzo(a,h)anthracene (maximum of 3,680), indeno(1,2,3-cd)pyrene (10,500µg/kg), and 2-Methylnaphthalene (maximum of 1,230 ug/kg) were found in four of the six shallow samples, all exceeding Restricted Residential SCOs. Five pesticides, alpha-chlordane (131 ug/kg), dieldrin (13.5 ug/kg), 4,4-DDD (maximum of 343 ug/kg), 4,4-DDE (maximum of 693 ug/kg), and 4,4-DDT (maximum of 3,030 ug/kg) were detected above Unrestricted Use SCOs in five shallow samples and one deep sample. 4,4-DDT also exceeded Restricted Residential SCOs in one shallow sample. Six metals including barium (1,890 mg/kg), copper (maximum of 112 mg/kg), lead (maximum of 3,150 mg/kg), mercury (maximum of 3.0 mg/kg), nickel (maximum of 148 mg/kg), and zinc (maximum of 960 mg/kg) were detected above Unrestricted Use SCOs in shallow and deep samples. Of these metals, barium, lead, mercury, and nickel also exceeded Restricted Residential SCOs.

- Groundwater samples collected during the Phase II Investigation were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater collected during the investigation showed no VOCs, SVOCs, pesticides, or PCBs above their respective GQS. Four metals, iron (maximum of 6,160 ug/L), manganese (399 ug/L), selenium (10.6 ug/L), and sodium (maximum of 546,000 ug/L) exceeded their respective GQS. The groundwater samples were then filtered and re-analyzed by the laboratory. Three (3) metals, iron (maximum of 5600 ug/L), manganese (322 ug/L), and sodium (maximum of 517,000 ug/L) exceeded their respective GQS. Selenium levels in the filtered samples were below GQS.
- Soil vapor samples collected during the Phase II Investigation were compared to compounds listed in Table 3.1 Air Guidance Values derived by the New York State Department of Health (NYSDOH) located in the NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion, dated October 2006. Soil vapor samples collected during the RI showed petroleum related VOCs present at low concentrations. Total concentrations of petroleum-related VOCs (BTEX) ranged from 134.3 $\mu\text{g}/\text{m}^3$ to 241 $\mu\text{g}/\text{m}^3$. Samples showed low levels of chlorinated VOCs including 1,1,1-trichloroethane (ranging from 27 $\mu\text{g}/\text{m}^3$ to 60 $\mu\text{g}/\text{m}^3$), tetrachloroethene (PCE) (ranging from 2.3 $\mu\text{g}/\text{m}^3$ to 6.8 $\mu\text{g}/\text{m}^3$), and trichloroethylene (TCE) (ranging from 0.81 $\mu\text{g}/\text{m}^3$ to 7.0 $\mu\text{g}/\text{m}^3$). Concentrations for TCE were above the monitoring range established within the State DOH soil vapor guidance matrix. Carbon tetrachloride and other compounds not included on the analytical summary tables were not detected in the soil vapor samples. Complete analytical results can be found in the laboratory analysis report.

Based on the identification of compounds in soils, groundwater, and soil vapor in exceedance of regulatory standards, STREKTE retained PT to prepare a Remedial Action Work Plan to prepare the site for redevelopment. The Remedial Action Work Plan includes a Health and Safety Plan for the project which outlines procedures for protecting project workers and the community from exposure to contamination during remedial

activities and construction, such as air monitoring protocols, action levels, and response procedures if action levels are exceeded. The remedial action will include the excavation to a depth of four feet or more contaminated site-soils and the construction of building foundations, the placement of a demarcation layer, the installation of clean soil fill material, the installation of a vapor barrier beneath the building footprints, and the laying of a 6 inch slab of concrete across the entire site.

2.0 IDENTIFICATION OF KEY PERSONNEL

2.1 Health and Safety Personnel

The following briefly describes the health and safety designations and general responsibilities which may be employed for the project. The titles have been established to accommodate the Site needs and requirements in order to insure the safe conduct of on-site work. **An emergency contact list is identified in the HASP Summary on Page 3.**

2.1.1 Project Health and Safety Manager

The HSM will be determined before the start of Site operations. The HSM's responsibilities include:

- Ensuring that this HASP is developed and approved prior to Site Activities.
- Monitoring project tasks for performance in a manner consistent with this HASP and resolving any discrepancies that arise;
- Updating this HASP as dictated by the availability of more recent and detailed plans, changing job conditions, Jobsite Safety Inspection Results, and for other relevant reasons that come up during the course of the project.
- Coordinating with the FSO to ensure that health and safety requirements are met;
- Reviewing results of Jobsite Safety Inspections; and
- Providing guidance and serving as a resource to the FSO.

2.1.2 Field Safety Officer

The FSO will be determined before the start of Site operations. The FSO is directly responsible for the field team and the safety of operations. The FSO's responsibilities include:

- Assisting HSM with updating the HASP;

- Conducting Jobsite Safety Inspections and correcting any short comings in a timely manner;
- Helping to select PPE and periodically inspecting the PPE;
- Ensuring that PPE is properly stored and maintained;
- Monitoring the work parties for signs of stress, such as heat stress, fatigue, and cold exposure;
- Monitoring Site hazards and conditions;
- Informing all Site personnel of emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire department, and police department;
- Resolving conflicting situations, in consultation with the HSM, that may arise concerning safety requirements and working conditions;
- Maintaining field records;
- Implementing the HASP; and
- Notifying emergency response personnel by telephone or radio in the event of an emergency and advising medical personnel of potential exposures and consequences.

2.1.3 Work Team

The Work Team will be determined before the start of Site operations. The Work Team responsibilities include:

- Safely completing the on-site tasks;
- Complying with this HASP; and
- Notifying the FSO or supervisor of suspected unsafe conditions.

2.2 Subcontractor Responsibilities

All subcontractors involved with the excavation must adhere to applicable Occupational Safety and Health Administration (OSHA) Regulations and shall develop and comply

with their own HASP which shall incorporate, at a minimum, the elements identified in this HASP.

3.0 RISK ANALYSIS

3.1 Task Hazard Analysis

The following hazards are associated with the removal of non-hazardous excavated material:

- Heavy excavation equipment (impact hazard to on foot workers);
- Open excavations (fall and cave in hazard);
- Uneven land surface (slip and trip hazard); and
- Potential presence of contaminated media (chemical exposure hazard).

Table 1 provides a summary of these potential hazards.

3.2 Chemical Hazards

Elevated levels of VOCs, SVOCs, metals, and pesticides in project soils were identified at the site. Elevated levels of metals were identified in project groundwater. VOCs were identified in soil vapors sampled at the site.

3.3 Radiation Hazards

No radiation hazards are known or expected at the site.

3.4 Biological Hazards

3.4.1 Animals

During Site operations, animals such as dogs, pigeons, sea gulls, mice, and rats may be encountered. Workers will use discretion and avoid contact with animals. Bites and scratches from dogs can be painful and if the animal is rabid, the potential for contracting

rabies exists. Contact with rat and mice droppings may lead to contracting Hantavirus. Inhalation of dried pigeon droppings may lead to psittacosis; cryptococcosis, and histoplasmosis are also diseases associated with exposure to dried bird droppings, but these are less likely to occur in this occupational setting.

3.4.2 Insects

Insects, including bees, wasps, hornets, mosquitoes, and spiders, may be present at this Site. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition. In addition, mosquito bites may lead to St Louis encephalitis or West Nile Virus. Personnel that have been bitten or stung by an insect at the Site should notify the FSO of such immediately. The following is a list of preventive measures:

- Apply insect repellent prior to fieldwork and or as often as needed throughout the shift;
- Wear protective clothing (e.g., work boots, socks, and light colored pants).
- When walking in wooded areas, to the extent possible, avoid contact with bushes, tall grass, or brush; and
- Field personnel who may have an insect allergy (e.g. bee sting) should provide this information to the FSO prior to commencing work and must have allergy medication on-site.

The FSO will instruct the project personnel in the recognition and procedures for encountering potentially hazardous insects at the Site.

Lyme disease is caused by an infection from a deer tick that carries a spirochete. During the painless tick bite, the spirochete may be transmitted into the bloodstream, which could lead to the worker contracting Lyme disease. This flu like illness occurs out of season, commonly happening between May and October when ticks are more active. Symptoms can include a stiff neck, chills, fever, sore throat, headache, fatigue, and joint pain. If left untreated, Lyme disease causes serious nerve or heart problems as well as a

disabling type of arthritis. If personnel feel sick or have signs similar to those above, they should notify the FSO immediately.

It is recommended that personnel check themselves when in areas that could harbor deer ticks, wear light clothing, and visually check themselves and their buddy when coming from wooded or vegetation covered areas. If a tick is found biting an individual, the FSO should be contacted immediately. The tick can be removed by pulling gently at the head with tweezers. The affected area should then be disinfected with an antiseptic wipe.

3.5 Physical Hazards

3.5.1 Explosion

No explosion hazards are expected for the scope of work at this Site.

3.5.2 Heat Stress

The use of Level C protective equipment, or greater, may create heat stress. Monitoring of personnel wearing personal protective clothing should commence when the ambient temperature is 72 degrees F or above. **Table 2** presents the suggested frequency for such monitoring. Monitoring frequency should increase as ambient temperature increases or as slow recovery rates are observed. Refer to **Table 3** to assist in assessing when the risk for heat related illness is likely. To use this table, the ambient temperature and relative humidity must be obtained. Heat stress monitoring should be performed by the FSO, who shall be able to recognize symptoms related to heat stress.

To monitor the workers, be familiar with the following heat related disorders and their symptoms:

- Prickly Heat (Heat rash): Painful, itchy red rash. Occurs during sweating, on skin covered by clothing.
- Heat Cramps: Painful spasm of arm, leg, or abdominal muscles, during or after work.

- Heat Exhaustion: Headache, nausea, dizziness. Cool, clammy, moist skin, heavy sweating. Weak, fast pulse. Shallow respiration, normal temperature.
- Heat Fatigue: Weariness, irritability, loss of skill for fine or precision work. Decreased ability to concentrate. No loss of temperature control.
- Heat Stroke: Headache, nausea, weakness, hot dry skin, fever, rapid strong pulse, rapid deep respirations, loss of consciousness, convulsions, coma. This is a life threatening condition.

Do not permit a worker to wear a semi-permeable or impermeable garment when they are showing signs or symptoms of heat-related illness.

To monitor the worker, measure:

Heart Rate: Count the radial pulse during a 30 second period,

If the heart rate exceeds 100 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.

If the heart rate still exceeds 100 beats per minute at the next rest period, shorten the following work cycle by one-third. A worker cannot return to work after a rest period until the heart rate is below 100 beats per minute.

Oral Temperature: Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).

If the oral temperature exceeds 99.6 degrees F, shorten the next work cycle by one-third without changing the rest period. A worker cannot return to work after a rest period until the oral temperature is below 99.6 degrees F.

If the oral temperature still exceeds 99.6 degrees F at the beginning of the next rest period, shorten the following cycle by one-third.

Do not permit a worker to wear a semi-permeable or impermeable garment when oral temperature exceeds 100.6 degrees F.

Proper training and preventive measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once the person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress the following steps should be taken:

- Adjust work schedules;
- Mandate work slowdowns as needed;
- Perform work during cooler hours of the day if possible, or at night if adequate lighting can be provided;
- Provide shelter (air conditioned, if possible) or shaded areas to protect personnel during rest periods;
- Maintain workers body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must be approximately equal to the amount of water lost in sweat, i.e. 8 fluid ounces of water must be ingested for approximately every 8 ounces of weight loss. The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:
 - Maintain water temperature between 50 and 60 degrees F.
 - Provide small disposal cups that hold about four 4 ounces.
 - Have workers drink 16 ounces of fluid before beginning work.
 - Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons of fluid per day are recommended, but more may be necessary to maintain body weight.
 - Train workers to recognize the symptoms of heat related illness.

3.5.3 Cold -Related Illness

If the work on this project begins in the winter months, thermal injury due to cold exposure can become a problem for field personnel. Systemic cold exposure is referred to as hypothermia. Local cold exposure is generally called frostbite. To monitor the workers, be familiar with the following cold related illnesses and their symptoms.

- Hypothermia: Hypothermia is defined as a decrease in the patient core temperature to below 96.5 Degrees F. The body temperature is normally maintained by a combination of central (brain and spinal cord) and peripheral (skin and muscle) activity. Interference with any of these mechanisms can result in hypothermia, even in the absence of what normally is considered a “cold” ambient air temperature. Symptoms of hypothermia include shivering, apathy, listlessness, sleepiness, and unconsciousness.
- Frostbite: Frostbite is both a general and medical term given to areas of local cold injury. Unlike systemic hypothermia, frostbite rarely occurs unless the ambient air temperatures are less than freezing and usually less than 20 degrees F. Symptoms of frostbite include a sudden blanching or whitening of the skin; the skin has a waxy or white appearance and is firm to the touch; and tissues are cold, pale, and solid.

To prevent cold-related illness:

- Educate workers to recognize the symptoms of frostbite and hypothermia;
- Identify and limit known risk factors;
- Assure the availability of enclosed, heated environment on or adjacent to the Site;
- Assure the availability of warm drinks;
- Start oral temperature recording at the Site:
 - At the FSO’s discretion, when suspicion is based on changes in a worker’s performance or mental status.
 - At worker’s request.

- As a screening measure, two (2) times per shift, under unusually hazardous conditions (i.e., wind chill less than 20 degrees F, or wind chill less than 30 degrees F with precipitation).
- As a screening measure if any one (1) worker on the Site develops hypothermia.

Any person developing moderate hypothermia (a core temperature of 92 degrees F) cannot return to work for 48 hours.

3.5.4 Noise

Work activities during the proposed excavation and sampling activities may be conducted at locations with high noise levels from the operation of equipment. Hearing protection will be used as necessary.

3.5.5 Hand and Power Tools

In order to complete the various tasks for the project, personnel may utilize hand and power tools. The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut or struck by the tool, fire, and electrocution. Ground Fault Circuit Interrupters (GFCIs) are required for all portable tools.

3.5.6 Slips, Trips, and Fall Hazards

Care should be exercised when walking at the Site, especially when carrying equipment. The presence of surface debris, uneven surfaces, pits, and soil piles contribute to tripping hazards and fall hazards. To the extent possible, all hazards should be identified and marked on the Site, with hazard communicated to all workers in the area.

3.5.7 Utilities (Electrocution and Fire Hazards)

The possibility of encountering underground utilities presents a fire, explosion, and electrocution hazard. All work will be preceded by review of available utility drawings and by notification of the subsurface work to the New York One Call Center. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death.

3.5.8 Heavy Machinery

Care should be exercised when working near heavy machinery such as the excavators. Workers should always stay in view of the equipment operator; give equipment wide berth, clear communications signals, including hand signals, should be established prior to commencement of work and the equipment should have a back up alarm.

3.5.9 Lifting

Improper lifting and carrying of equipment and materials and shoveling soil may cause strains. Safe lifting and general material handling techniques should be exercised.

3.5.10 Falling Hazards

Soil material, crushed stone, tools, etc. may fall from power shovels, front end loaders, etc. Hard hats are to be worn at all times while in work zones.

3.5.11 Vehicle Hazards

Trucks and other work vehicles will be entering and leaving the Site nearly continuously during work hours. In addition, hydraulic excavators, dump trucks, and other construction vehicles will be working across the Site. Care should be taken when working on the Site and workers should be aware of surroundings at all times. When

working near vehicular traffic or work zones, attempt to keep eye contact with the machine operators.

3.6 Safe Work Practices

The standing orders (safe work practices that shall be followed while on-site) are listed in **Table 4**. Many are common sense in nature. The FSO has the responsibility for enforcing these practices which are to be posted prominently at the Site, or made available to personnel. Actions not in accordance with the standing order shall be corrected.

4.0 PERSONNEL TRAINING

4.1 Site Specific Training

Training will be provided that will specifically address the activities, procedures, monitoring and equipment for the Site operations. It will include Site and facility layout, hazards, and emergency services at the Site, and will detail all the provisions contained within the HASP. Specific issues that will be addressed include the hazards described in Section 3.0.

4.2 Safety Briefings

Project personnel will be given briefings by the FSO on a daily or as needed, basis, to further assist Site personnel in conducting their activities safely. Briefings will be provided when new activities are to be conducted. Changes in work practices must be implemented due to new information made available, or if the Site or environmental conditions change. Briefings will also be given to facilitate conformance with prescribed safe practices when performance deficiencies are identified during routine daily activities or as a result of the Jobsite Safety Inspections. A Jobsite Safety Inspection Check list is included in **Attachment B**.

4.3 Cardiopulmonary Resuscitation and Basic First Aid Training

The HSM will endeavor to have at least one (1) individual on-site, trained and certified to administer cardiopulmonary resuscitation (CPR) and basic first aid. This training will be consistent with the requirements of the National Safety Council. Copies of training certificates will be maintained by the HSM.

4.4 Confined Space Entry Training

It is not anticipated that confined space entries will be required as part of Site activities. Confined space work that may be performed shall be in accordance with a plan outlining controls and methods consistent with federal, state, and local regulation. Training consistent with OSHA 29 Code of Federal Regulations (CFR) 1910.146(g-j), "Permit required Confined Spaces", is required of all personnel before engaging in permit required confined space entry operations. Copies of training certifications are to be maintained by the HSM.

4.5 OSHA Training

It is not anticipated that the handling of hazardous materials will be required as part of Site activities. Completion of an initial 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training program (or its equivalent) as detailed in OSHA's 29 CFR 1910.120(e) is required for all employees who will perform work in areas where the potential for hazardous exposure exists. Annual 8 hour refresher training is also required to maintain competencies and to ensure a safe work environment. In addition to these training requirements, supervisory personnel must also receive 8 additional hours of specialized training. Training records will be maintained by the HSM.

5.0 MEDICAL SURVEILLANCE

It is not anticipated that the handling of hazardous materials will be required as part of the Site activities. All personnel who will be performing field work involving potential exposure to toxic and hazardous substances will be required to have passed an initial baseline medical examination, with annual follow-up medical exams thereafter, consistent with OSHA regulations. Medical Evaluations will be performed by, or under the direction of, a physician board certified in occupational medicine. Results of the evaluations will be maintained by the HSM.

Those personnel who may be required to perform work while wearing a respirator must receive medical clearance to do so, consistent with 29 CFR 1910.134(e), Respiratory Protection. Again, medical evaluations will be performed by, or under the direction of, a physician board certified in occupational medicine. If respiratory protection is required, the contractor must develop and implement a Written Respiratory Protection Program.

6.0 AIR MONITORING AND RESPONSE

6.1 General

Fugitive dust generation that could affect Site workers, Site occupants, or the public is not expected. Soil that is not moist will be wet down with water as appropriate to minimize visible dust emissions.

Dust or particulate concentrations should be monitored continuously at the Site. The criteria for stopping work and implementing engineering controls and additional monitoring requirements will be (1) sustained visible emissions of dust, and (2) at the FSO's discretion, and based on field observations (e.g., suspect odors, etc.).

6.2 Site Worker Operating Conditions

At the FSO's discretion, when conditions warrant an increase in protection, all personnel will stop working and immediately leave the Hot Zone (work zones defined in Section 8.2). They will then don the appropriate safety equipment necessary and return to their current workstation. All of this activity will be monitored by the FSO. The FSO will keep the HSM aware of any extraordinary situations and conditions that may occur. Verbal reports will be given to the HSM when there is a change in the PPE level.

6.2.1 Level D

Engineering controls will be used to keep working conditions at this level.

6.2.2 Level C

Level C conditions are possible during the project. If Level C conditions are encountered (e.g., elevated concentrations of volatile organic compounds in the work zone), at the FSO's discretion, work will stop, engineering controls implemented, and work methods

will be altered to resume work under Level D Conditions. If this is not feasible, the level of PPE will be upgraded to Level C. All field personnel in the Hot Zone will leave the Hot Zone, don air purifying respirators or equivalent respiratory protection devices, and return to their current work stations. AT this point the FSO will consult with the HSM to discuss appropriate actions.

6.2.3 Level B (Retreat)

Level B conditions are not anticipated. If Level B conditions are encountered (e.g., if sustained visible fugitive dust emissions from Site activities that disturb contaminated soil cloud the surrounding air) at the FSO's discretion all field personnel associated with the project will immediately retreat to a location up-wind of the source of contamination and don supplied air respiratory protection. At this point the FSO will consult with the HSM to discuss appropriate actions.

7.0 PERSONAL PROTECTIVE EQUIPMENT

All PPE used during the course of work at the Site must meet the following OSHA standards:

<u>Type of Protection</u>	<u>Regulation</u>	<u>Source</u>
Eye and Face	29 CFR 1910.133 & 29 CFR 1926.102	ANSI Z87.1-1968
Respiratory	29 CFR 1910.134 & 29 CFR 1926.103	ANSI Z88.1-1980
Head	29 CFR 1910.135 & 29 CFR 1926.100	ANSI Z89.1-1969
Foot	29 CFR 1910.136 & 29 CFR 1926.96	ANSI Z41.1-1967

PPE must protect workers from the specific hazards they are likely to encounter on-site. Selection of the appropriate PPE must take into consideration: (1) identification of the hazards or suspected hazards; (2) potential exposure routes; and (3) the performance of the PPE construction (materials and seams) in providing a barrier to these hazards. Based on the anticipated Site conditions and the proposed work activities to be performed at the Site, Level D protection should be used. The decision to modify standard PPE will be made by the HSM and FSO. The levels of protection are described below.

7.1 Level D Protection

Level D protection will be worn for initial entry on-site and initially for all activities. Level D protection will consist of:

- Standard work clothes;
- Steel-toe safety boots;
- Safety glasses (goggles must be worn when splash hazard is present)
- Nitrile outer gloves and PVC or nitrile inner gloves (to be used during soil handling activities); and
- Hard hat (must be worn during all Site activities)

Modified Level D protection may be required under conditions where potential contact of the skin or clothes with significant contamination occurs (significant contamination is not anticipated as part of Site activities). Modified Level D is the same as Level D, but includes Tyvek coveralls and disposable polyethylene over boots. The need for Modified Level D protection is not anticipated.

7.2 Level C Protection

The need for Level C Protection is not anticipated during the project. If Level C conditions are encountered, the FSO must consult with the HSM to discuss appropriate actions (see Section 6.2.2). If the level of PPE is to be upgraded to Level C, Level C Protection will consist of the following equipment:

- Full-Face or half-faced air purifying respirator (APR) or powered air purifier (PAPR), depending on the presence and abundance of airborne toxic constituents of concern;
- Combination high efficiency particulate air (HEPA) filter/organic vapor cartridges (cartridges will be disposed at the end of each day's use);
- Tyvek coveralls must be worn if particulate hazard is present;
- Polyethylene coated Tyvek coveralls if liquid contamination is present;
- Steel-toe safety boots;
- Nitrile outer gloves and PVC or nitrile inner gloves (to be used during soil handling activities); and
- Hard hat (must be worn during all site activities).

Both the respirator and cartridges specified for use in Level C protection must be fit tested prior to use in accordance with OSHA regulations 29 CFR 1910.1025 and 29 CFR 1910.134.

Based on the performance criteria of air purifying respirators, they cannot be worn under the following conditions:

- Oxygen deficiency;

- Immediate dangerous to life and health (IDLH) concentrations;
- High relative humidity; and
- If contaminant levels exceed designated use concentrations.

8.0 SITE CONTROL

8.1 Site Communication

Verbal communication will be the primary method of communication used at the Site during the Site activities. Cell phones shall be used to the extent practical by field teams for communication between downrange operations and the command post base station. The FSO's cell phone number shall be made available to all Site workers. In instances where verbal communication cannot be used, hand signals will be used. It may also be necessary to use these signals when working around noisy heavy equipment. Hand signals and their meanings include:

Hand Signal	Meaning
Hand gripping throat	Out of air; cannot breathe
Grip partners wrist or place both hands around waist	Leave immediately without debate
Hands on top of head	Need assistance
Thumbs up	OK; I'm alright; I understand
Thumbs down	No; Negative
Simulated "stick" break with fists	Take a break; stop work

8.2 Work Zones

The need to formerly establish work zones during Site activities shall be determined by the HSM.

8.2.1 Hot Zone

Hot Zones will be established 25 feet from each planned excavation extent. All personnel within the hot zone must don the appropriate levels of protection as set forth by the FSO. It is not anticipated that Level C or higher will be required for this Site. All

personnel within the Hot Zones will be required to use the specified level of protection. No food, drink, or smoking will be allowed in the Hot or Warm Zones (described below).

8.2.2 Warm Zone

A Warm Zone will be established and utilized during the field activities. This zone will be established between the Hot Zone and the Cold Zone. Personnel and equipment in the Hot Zone must pass through this zone before entering the Cold Zone. Appropriate decontamination procedures will be conducted in the Warm Zone. This zone will be located upwind of the Hot Zone.

8.2.3 Cold Zone

The Cold Zone will include the remaining areas of the job Site. Break areas and support facilities (include equipment storage and maintenance areas) will be located in this zone. No equipment or personnel will be permitted to enter the Cold Zone from the Hot Zone without passing through the Warm Zone. Eating, smoking, and drinking will be allowed only in this area.

8.3 Buddy System

When working in teams of two (2) or more, workers will use the “buddy system” for all work activities, particularly for work performed in the Hot Zones, to ensure rapid assistance can be provided in the event of an emergency. This requires work groups to be organized such that workers can remain close together and maintain visual contact with each other. Workers using the “buddy system” have the following responsibilities:

- Provide his or her partner with assistance when needed;
- Observe his or her partner for signs of chemical or heat exposure;
- Periodically check the integrity of his or her partner’s PPE; and
- Notify the FSO or other Site personnel if emergency service is needed.

8.4 Site Security

General Site security and control measures (e.g., Site access, gates, etc.) will be implemented to:

- Prevent unauthorized entry to the Site; and
- Deter vandalism and theft.

9.0 EMERGENCY RESPONSE

9.1 General

Because of the hazards that may be present at the Site, and the conditions under which operations are conducted, it is possible that an emergency situation might develop. Emergency situations can be characterized as injury or chemical exposure to personnel; fire or explosion; environmental release, or serious weather conditions.

9.2 Responsibilities

The FSO, or other appropriate person as designated by the HSM, will serve as the Site Emergency Coordinator and shall implement emergency procedures whenever conditions warrant such action. The Site Emergency Coordinator will be responsible for assuring the evacuation, emergency treatment, emergency transport of Site personnel, and notification of emergency units and the appropriate management staff. Emergency response instructions will be provided by the FSO as part of every employee's training prior to the start of work.

All workers who are contracted to work on the Site must become familiar with emergency response procedures for the Site.

9.3 Evacuation

In the event of an emergency situation, an air horn or vehicle horn will be sounded three (3) times indicating the initiation of evacuation procedures. All personnel will evacuate and assemble outside the nearest Site access gate. No one, except the emergency responders, will be allowed to proceed into the area once the emergency signal has been given. The Site Emergency Coordinator will ensure that access for emergency equipment is provided and that all sources of combustion (e.g., operation of machinery, etc.) have been shut down once the alarm has sounded. Wind direction will be taken into

consideration for emergency plans. Evacuation plans will be discussed at the initial Site Specific training and as needed at the regular safety briefings.

In all situations, when an on-site emergency results in an evacuation, personnel shall not re-enter until:

- The conditions resulting from the emergency have been corrected;
- The hazards have been re-evaluated;
- This HASP has been reviewed; and
- Site personnel have been briefed on any changes to the HASP.

9.4 Emergency Contacts/Notification System

The fire department and other emergency response groups will be notified by telephone of the emergency as soon as possible. An emergency telephone numbers list is found at the beginning of this HASP. The list will also be posted prominently at the Site, or made readily available to all personnel at all times.

9.5 Personal Injury

In case of personal injury at the Site, the following procedures should be followed:

1. Another team member should signal the FSO that an injury has occurred.
2. A field team member trained in first aid should administer treatment to the injured worker.
3. If necessary, the victim should then be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim.
4. For less severe cases, the individual can be treated with contents of the first aid kit.

The FSO is responsible for verifying that an Employee Exposure and Injury Incident Report (Provided as **Attachment C**) is completed. This form is to be submitted to the HSM. Follow-up action should be taken to correct the situation that caused the accident.

Any incident (e.g., near miss, property damage, first aid, medical treatment, etc.) must be reported and evaluated. A first aid kit will be kept on-site during the field activities.

9.6 Personnel Exposure

General emergency first aid procedures to be followed are:

- Skin Contact: Use copious amounts of soap and water. Wash/rinse affected areas thoroughly, and then provide appropriate medical attention. Rinse eyes with water for at least 15 minutes.
- Inhalation: Move to fresh air and/or, if necessary, decontaminate and transport to hospital.
- Ingestion: Decontaminate and transport to emergency medical facility.
- Puncture/Laceration: Decontaminate, if possible, and transport to emergency medical facility.

9.7 Fire or Explosion

Appropriate fire extinguishers will be made available at the Site for trained personnel to use on insipient stage fires without endangering the safety and health of those nearby. If the use of fire extinguishers will not extinguish the fire, immediately notify the fire department, sound the evacuation alarm, and then evacuate the area, assembling outside a Site access gate to be accounted for and to receive further instructions.

9.8 Spills and Leaks

Control or stop the spread of minor chemical spills utilizing the appropriate materials (i.e., absorbents, etc.), if possible. If the release is significant, or highly hazardous, immediately notify the appropriate response groups, sound the evacuation signal, evacuate the area, and assemble outside a Site access gate to be accounted for and to receive further instructions.

9.9 Adverse Weather Conditions

In the event of heavy precipitation, conditions will be assessed on-site by the FSO to determine if the work can proceed safely. If it is determined that the weather poses a significant hazard, site operations will be stopped and rescheduled. Some of the items to be considered prior to determining if work should continue include:

- Potential for heat stress and heat related injuries;
- Potential for cold stress related injuries;
- Treacherous weather related working conditions; and
- Limited visibility.

9.10 Documentation

For emergencies involving personnel injury and/or exposure, the FSO will complete and submit the Employee Exposure and Injury Incident Report within 48 hours of the incident. The form is attached in **Attachment C**.

TABLES

TABLE 1
TASK RISK ANALYSIS

TASK RISK ANALYSIS

A. PHYSICAL HAZARD OF CONCERN

Hazard	Description	Control Measures	First Aid
Skin Contact	Contact with potentially contaminated soils, dust in eyes.	Wear proper PPE, follow safe practices	Eyes: Irrigate immediately Skin: Soap wash promptly
Lacerations, abrasions, punctures	Using tools in tight spaces, etc.	Wear proper PPE, follow safe practices	See NSC "First Aid and CPR Standard" manual
Lifting	Improper lifting/carrying of equipment and materials causing strains	Follow safe lifting techniques	Follow the RICE procedures (p.99 in National Safety Council [NSC] manual
Slips, trips, and falls	Any number of injuries could occur from slips, trips, and falls in carrying out tasks	Good housekeeping a site, constant awareness and focus on the task	See NSC "First Aid and CPR Standard" manual
Noise	Excavation equipment	Wear hearing protection	See NSC "First Aid and CPR Standard" manual
Falling Objects	Soil material, tools, etc. dropping from front-end loaders, etc.	Hard hats to be worn at all times while in work zones	See NSC "First Aid and CPR Standard" manual
Underground/overhead utilities	Excavators and demolition equipment making contact with utilities	"One Call" before dig, follow safe practices	See NSC "First Aid and CPR Standard" manual

B. TASK-BY-TASK RISK ANALYSIS

Task	Hazard	Description	Control Measures	First Aid
Excavation and Sampling Activities	Heavy Machinery	Demolition and excavation with hydraulic equipment	Wear proper PPE, follow safe practices	See NSC "First Aid and CPR Standard" manual
	Building Demolition	Demolition with hydraulic equipment, falling building material	Wear proper PPE, follow safe practices	See NSC "First Aid and CPR Standard" manual
	Working and Sampling within the Excavations	Surveying size of excavation, screening and sampling end-point (is sampling conducted)	Wear proper PPE, follow safe practices	See NSC "First Aid and CPR Standard" manual

TABLE 2
HEAT STRESS MONITORING FREQUENCY

HEAT STRESS MONITORING FREQUENCY

Heat Index Temperature	Normal Work Clothing	Impermeable Clothing
90° F or above (32.2°C or above)	After each 45 minutes of work	After each 15 minutes of work
87.5 °F (30.8°-32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5°-87.5°F (28.1°-30.1°C)	After each 90 minutes of work	After each 60 minutes of work
77.5°-82.5°F (25.3°-28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5°-77.5°F (22.5°-25.3°C)	After each 150 minutes of work	After each 120 minutes of work

TABLE 3
HEAT INDEX

HEAT INDEX

RELATIVE HUMIDITY	ENVIRONMENTAL TEMPERATURE (Fahrenheit)										
	70	75	80	85	90	95	100	105	110	115	120
0%	64	69	75	78	83	87	81	95	99	103	107
10%	65	70	75	80	85	90	95	100	105	111	115
20%	66	72	77	82	87	93	99	105	112	120	130
30%	67	73	78	84	90	96	104	113	123	135	148
40%	68	74	79	86	93	101	110	123	137	151	
50%	69	75	81	88	96	107	120	135	150		
60%	70	76	82	90	100	114	132	149			
70%	70	77	85	93	106	124	144				
80%	71	78	86	97	113	135					
90%	71	79	88	102	122						
100%	72	80	91	108							

*Combined Index of Heat and Humidity...what it "feels like" to the body
 Source: National Oceanic and Atmospheric Administration

How to use Heat Index

1. Across top locate Environmental Temperature
2. Down left side locate Relative Humidity
3. Follow across and down to find Apparent Temperature
4. Determine Heat Stress Risk on chart at right

Note: Exposure to full sunshine can increase Heat Index values by up to 15 degrees F.

Apparent Temperature	Heat Stress Risk with Physical Activity and/or Prolonged Exposure
90-105	Heat Cramps or Heat Exhaustion Possible
105-130	Heat Cramps or Heat Exhaustion Likely, Heat Stroke Possible
>130	Heatstroke Highly Likely

TABLE 4
STANDING ORDERS

STANDING ORDERS

GENERAL

- No smoking, eating, or drinking in this work zone.
- Upon leaving the work zone, personnel will thoroughly wash their hands and face. Minimize contact with contaminated materials, if encountered, through proper planning of work areas and decontamination areas, and by following proper procedures.
- Do not place equipment on the ground. Do not sit on contaminated materials, if encountered.
- No open flames in the work zone.
- Only properly trained and equipped personnel are permitted to work in potentially contaminated areas.
- Always use the appropriate level of personal protective equipment (PPE). Maintain close contact with your buddy in the work zone.
- Contaminated material, if encountered, will be contained in the Hot Zone. Report any unusual conditions.
- Work areas will be kept clear and uncluttered. Debris and other slip, trip, and fall hazards will be removed as frequently as possible.
- The number of personnel and equipment in the work zone will be kept to an essential minimum.
- Be alert to the symptoms of fatigue and heat/cold stress, and their effects on the normal caution and judgment of personnel.
- Conflicting situations which may arise concerning safety requirements and working conditions must be addressed and resolved quickly by the Field Safety Officer (FSO).

TOOLS AND HEAVY EQUIPMENT

- Do not, under any circumstances, enter or ride in or on any backhoe bucket, materials hoist, or any other device not specifically designed to carrying passengers.
- Loose-fitting clothing or loose long hair is prohibited around moving machinery. Ensure that heavy equipment operators and all other personnel in the work zone are using the same hand signals to communicate.
- Drilling/excavating within 20 feet in any direction of overhead power lines is prohibited. The locations of all underground utilities must be identified and marked out prior to initiating any subsurface activities.
- Check to insure that the equipment operator has lowered all blades and buckets to the ground before shutting off the vehicle.
- If the equipment has an emergency stop device, have the operator show all personnel its location and how to activate it.
- Help the operator ensure adequate clearances when the equipment must negotiate in tight quarters; serve as a signalman to direct backing as necessary.
- Ensure that all heavy equipment that is used in the Hot Zone is kept in that zone until the job is done, and that such equipment is completely decontaminated before moving it into the clean area of the work zone.

- **Samplers must not reach into or get near rotating equipment such as a drill rig. If personnel must work near any tools that could rotate, the equipment operator must completely shut down the rig prior to initiating such work. It may be necessary to use a remote sampling device.**

FIGURES

FIGURE 1 - HOSPITAL PLAN ROUTE



Route to Hospital

From the Site to New York Methodist Hospital:

- | | |
|---|--------|
| 8. Head northeast on Van Brunt St toward Van Dyke St | 0.6 mi |
| 9. Turn right onto Bowne St | 0.1 mi |
| 10. Slight right onto Hamilton Ave | 0.9 mi |
| 11. Turn left onto 14 th St | 121 ft |
| 12. Turn right to stay on 14 th St | 1.0 mi |
| 13. Turn left onto 8 th St | 0.4 mi |
| 14. Turn left onto 6 th St. Destination will be on left. | 0.1 mi |

Total Distance: 3.1 miles

Total Estimated Time: 15 minutes

ATTACHMENTS

ATTACHMENT A
SAFETY BRIEFING FORM

SAFETY BRIEFING

Date: _____

Time: _____ FSL: _____ Location: _____

Work Task: _____

SAFETY TOPICS (provide some detail of discussion points)

Chemical Exposure Hazards and Control: _____

Physical Hazards and Control: _____

Air Monitoring: _____

PPE: _____

Communications: _____

Safe Work Practices: _____

Emergency Response: 911 _____

Hospital/Medical Center Location: _____

Phone Nos.: _____

Other: _____

FOR FOLLOW-UP (issues, responsibility, due date)

ATTENDEES

PRINT NAME	COMPANY	SIGNATURE

Briefing Conducted By: _____

ATTACHMENT B

JOBSITE SAFETY INSPECTION CHECKLIST

JOB SAFETY INSPECTION CHECKLIST

Client: _____ Inspection Date: _____
 Site: _____ Inspector: _____
 Project Number: _____

Check one of the following: **A: Acceptable** **NA: Not Applicable** **D: Deficiency**

	A	NA	D	REMARKS
1. HASP available on-site for inspection?				
2. Health and Safety Compliance agreement (in HASP) appropriately signed on-site personnel?				
3. Hospital route map with directions posted on-site?				
4. Emergency Notification List posted on-site?				
5. First Aid kit available and properly stocked?				
6. Personnel trained in CPR/First Aid on-site?				
7. MSDSs readily available, and all workers knowledgeable about the specific chemicals and compounds to which they may be exposed?				
8. Appropriate PPE being worn by on-site personnel?				
9. Project site safe practices ("Standing Orders") posted?				
10. Health & Safety incident Report forms available?				
11. Mark out of underground utilities done properly to initiating any subsurface activities?				
12. Are tools in good condition and properly used?				
13. Excavation performed in areas free from underground objects including utilities?				
14. Adequate size/ type fire extinguisher supplied?				
15. Equipment at least 20 feet from overhead power lines?				
16. Evidence that all operators are responsible for the safety of his/her equipment?				
17. Trench sides shored, layer back, or boxed?				
18. Underground utilities located and authorities contacted before digging?				
19. Ladders in trench (25-foot spacing, extend 3-feet above landing surface)?				

20. Excavated material placed more than 2 feet away from excavating edge?				
21. Public protected from exposure to open excavation?				
22. People entering the excavation regarding it as a permit required confined space and following appropriate procedures?				
23. Confined space entry permit is completed and posted?				
24. All persons knowledgeable about the conditions and characteristics of the confined space?				
25. All persons engaged in confined space operations have been trained in safe entry and rescue (non-entry)?				
26. Pull body harnesses, lifelines, and hoisting apparatus available for rescue needs?				
27. Attendant and/or supervisor certifies in basic first aid and CPR?				
28. Evidence of coordination with off-site rescue services to perform entry rescue, if needed?				
29. Are extension cords rated for work being used and they properly maintained?				
30. Are GFCIs provided and being used?				

JOB SAFETY INSPECTION CHECKLIST

Unsafe acts observed?

Additional remarks:

ATTACHMENT C

EMPLOYEE EXPOSURE AND INJURY INCIDENT REPORT

EMPLOYEE EXPOSURE AND INJURY INCIDENT REPORT

(Submit a Separate Report for Each Employee and/or Incident)

Date: _____

Employee Name: _____ Employee No: _____

Sex: M _____ F _____ Age: _____

Region: _____

Location: _____

Project: _____ Project No: _____

Incident: _____

Type: Possible Exposure _____ Exposure _____ Physical Injury _____

Location: _____

Date of Incident: _____ Time of Incident: _____

Date of Report Incident: _____

Person(s) to Whom Incident was Reported: _____

Weather Conditions during Incident: Temperature _____ Humidity _____

Wind Speed and Direction: _____

Cloud Cover: _____ Clear: _____

Precipitation: _____

Materials Potentially Encountered: _____

Chemical (give name of description - liquid, solid, gas, vapor, fume, mist):

Radiological:

Other:

Nature of the Exposure/Injury (State the nature of the exposure/injury in detail and list the parts of the body affected. Attach extra sheets if necessary):

Did you receive medical care? Yes _____ No _____

If so, when? _____

Where? On-site _____ Off-site _____

By Whom: Name of Paramedic: _____

Name of Physician: _____

Other: _____

If Off-site, name facility (hospital, clinic, etc.):

Length of stay at the facility? _____

Was the Site Safety Officer contacted? Yes _____ No _____ When? _____

Was the Corporate Health and Safety Officer contacted? Yes _____ No _____

If so, who was the contact? _____

Did the exposure/injury result in permanent disability? Yes _____ No _____

If so, explain: _____

Has the employee returned to work? Yes _____ No _____

List the names of other persons affected during this incident:

List the names of persons who witnessed the exposure/injury incident:

Possible cause of the exposure/injury incident:

What was the name and title of the field team leader or immediate supervisor at the site of the incident?

Was the operation being conducted under an established Health and Safety Plan?

Yes _____ No _____ If yes, attach a copy. If no, explain

Describe protective equipment and clothing used by the employee:

Did any limitations in safety equipment or protective clothing contribute to or affect exposure? If so, explain:

What was the employee doing when the exposure/injury occurred? (Describe briefly):

Where exactly on-site or off-site did the exposure/injury occur?

How did the exposure/injury occur? (Describe fully what factors led up to and/or contributed to the incident):

Name of person(s) initiating report, job title, phone number:

Employee Signature

Date

Field Safety Officer Signature

Date

APPENDIX 8

PROPOSED TRUCK ROUTE



434 Van Brunt St, Brooklyn, NY 11231 to Bayshore Recycling

Drive 27.9 miles, 55 min



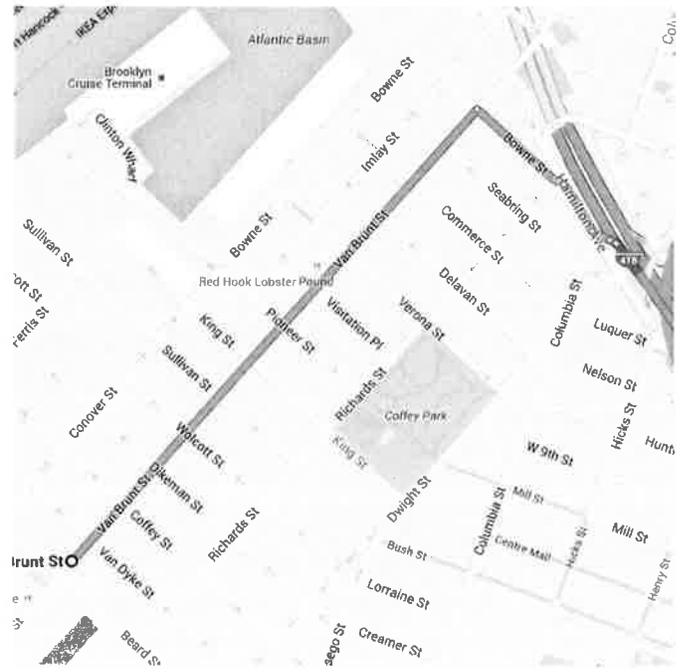
Map data ©2015 Google 2 mi

434 Van Brunt St

Brooklyn, NY 11231

Get on I-478 S from Van Brunt St

- ↑ 1. Head northeast on Van Brunt St toward Van Dyke St 3 min (0.8 mi)
- ↘ 2. Turn right onto Bowne St 0.6 mi
- ↘ 3. Slight right onto Hamilton Ave 0.1 mi
- ↙ 4. Slight left onto the Route 278 E ramp to Hamilton Ave 299 ft
- ↘ 5. Keep left and merge onto I-478 S 105 ft



Take I-278 W, NY-440 S and NJ-440 S to Industrial Ave/Riverside Dr in Woodbridge

Township. Take the Industrial Ave exit from NJ-440 S

33 min (26.2 mi)

- ⤴ 6. Merge onto I-478 S 0.4 mi
- ⤴ 7. Merge onto I-278 W 2.5 mi
- ⤵ 8. Keep right at the fork to stay on I-278 W, follow signs for Belt Pkwy
⚠ Partial toll road 4.7 mi
- ⤵ 9. Keep left to stay on I-278 W
⚠ Partial toll road 5.9 mi
- ⤴ 10. Use the right 2 lanes to take exit 5 for NY-440 S toward Outerbridge Cr 0.5 mi
- ⤴ 11. Continue onto NY-440 S 7.0 mi
- ⤴ 12. Use the right 2 lanes to take exit 1 for New York 440 S/Outerbridge Crossing toward New Jersey/1 0.6 mi
- ⤵ 13. Keep left, follow signs for New Jersey 440/Outerbridge Cr 259 ft
- ⤴ 14. Continue onto NY-440 S/Outerbridge Crossing
ⓘ Entering New Jersey 0.8 mi
- ⤴ 15. Continue onto NJ-440 S 2.8 mi
- ⤴ 16. Take the Industrial Ave exit toward Raritan Centre 0.5 mi
- ⤴ 17. Keep right, follow signs for Riverside Dr and merge onto Industrial Ave/Riverside Dr 0.3 mi



Continue on Industrial Ave/Riverside Dr. Drive to Crows Mill Rd

2 min (0.9 mi)

18. Merge onto Industrial Ave/Riverside Dr

0.3 mi

19. Make a U-turn

335 ft

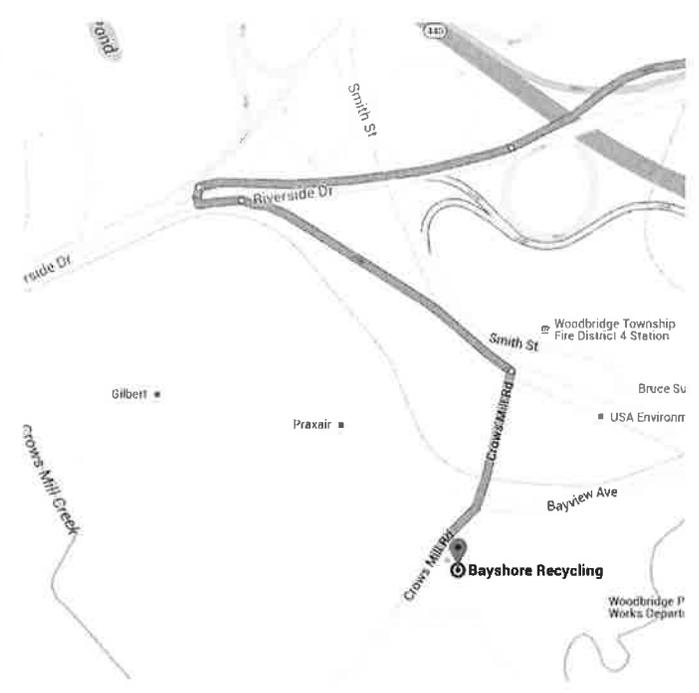
20. Use the right lane to merge onto Smith St via the ramp to US-9 N/NJ-440 N

0.3 mi

21. Turn right onto Crows Mill Rd

i Destination will be on the left

0.2 mi



Bayshore Recycling

75 Crows Mill Road, Keasbey, NJ 08832

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