

**501 LEONARD STREET
BROOKLYN, NEW YORK**

Remedial Action Work Plan

NYC VCP Site Number: 13CVCP128K

NYC E-Designation Site Number: 13EHAZ318K

Prepared for:

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REMEDIAL ACTION WORK PLAN

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LIST OF ACRONYMS

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

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

CERTIFICATION

I, Richard D. Galli, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the 501 Leonard Street Site, (NYC VCP Site No. 13CVCP121X).

I, Scott A. Yanuck am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the 501 Leonard Street Site, (NYC VCP Site No. 13CVCP128K).

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

Richard D. Galli

Name

59461
NYS License Number

Richard D. Galli
Signature

11-1-13

Date



Scott A. Yanuck

QEP Name

Scott A. Yanuck
QEP Signature

11-1-13

Date

EXECUTIVE SUMMARY

501 Leonard Realty, LLC has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 8,800-square feet (0.2-acre) Site located at 501 Leonard Street, in the Greenpoint Section of Brooklyn, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

Site Location and Current Usage

The Site is located at 501 Leonard Street in the Greenpoint section in Brooklyn, New York and is identified as Block 2697 and Lot 7 on the New York City Tax Map. Figure 1.0 shows the Site location. The Site is 8,800-square feet and is bounded by Leonard Street to the east, Manhattan Avenue to the west, an eight-story residential building to the north, and a 6-story residential building to the south. A map of the site boundary is shown in Figure 2.0. Currently, the Site is used for Auto Repair and Auto Body purposes and contains a single story brick building, with a partial basement in the northeast corner.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of a 3,753 square-foot, mixed-use, residential building, with two commercial units and parking garage on the first floor, and a basement for storage and mechanical housing. Layout of the proposed site development is presented in Figure 3.0. The current zoning designation is M1-2/R6, for mixed high performance light manufacturing and residential. The proposed use is consistent with existing zoning for the property.

The proposed building will have a full basement, and soils will be excavated to the bottom of the basement, to a depth of approximately 11' 6" below the current grade in the footprint of the building, 16' in the location of the elevator pit, and 2' below grade in the remainder of the property. The depth to groundwater at the property is approximately 8.4' to 9.5' below grade, and as such, may be encountered during the excavation of the basement. To this end, dewatering must be

established during excavation of the basement, and a means of waterproofing and a vapor barrier must be utilized in the construction of this area new building.

Prior to any excavation the current one-story brick building will be demolished.

Summary of the Remedy

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

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and Performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Unrestricted Use Track 1 Soil Cleanup Objectives (SCOs) within the footprint of the proposed building, and site specific Track 4 SCOs in the remainder of the property.
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Excavation and removal of soil/fill exceeding Track 1 SCOs within the footprint of the proposed building, and site specific Track 4 SCOs in the remainder of the property. Footprint of new building will be excavated to the depths of more than 11 feet and remainder of site will be excavated to the depths of two feet.
6. Implementation of dewatering methods during excavation due to penetration into groundwater.

7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
8. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.
9. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.
10. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
11. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
12. Installation of a vapor barrier and waterproofing beneath the building slab and behind the foundation walls of the proposed building.
13. Installation of a passive sub-slab depressurization system beneath the building slab.
14. Demarcation of residual soil/fill.
15. Construction and maintenance of an engineered composite cover consisting of 5-inch thick structural concrete slab beneath the building and 2 feet of imported backfill material in the eastern portion of the site to prevent human exposure to residual soil/fill remaining under the Site;
16. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
17. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.

18. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP.
19. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
20. Continued registration of the property with an E-Designation; establishment of Engineering Controls and Institutional Controls in this RAWP; a requirement that management of these controls must be in compliance with an approved SMP; and Institutional Controls including prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

COMMUNITY PROTECTION STATEMENT

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

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

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

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

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

people to come in contact with this contamination. All identified public exposures will be addressed under this cleanup plan.

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

Site Safety Coordinator. This project has a designated Site safety coordinator to implement the Health and Safety Plan. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is Christopher J. Connolly and can be reached at 631-673-0612 from 9:00 AM to 5:00 PM.

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

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

Odor, Dust and Noise Control. This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and includes steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also

required to comply with NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager Christopher J. Connolly at 631-673-0612 or NYC Office of Environmental Remediation Project Manager William Wong at 212-341-0659.

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

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

Hours of Operation. The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. For this cleanup project, the hours of operation are 7:00 AM to 5:00 PM from Monday to Friday.

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

Complaint Management. The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager Christopher J. Connolly at 631-673-0612 or cconnolly@laurelenv.com, the NYC Office of Environmental Remediation Project Manager William Wong at 212 341-0659 or Wiwong@dep.nyc.gov, or call 311 and mention the Site is in the NYC Brownfield Cleanup Program.

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

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

Soil Chemical Testing and Screening. All excavations will be supervised by a trained and properly qualified environmental professional. In addition to extensive sampling and chemical testing of soils on the Site, excavated soil will be screened continuously using hand-held instruments, by sight, and by smell to ensure proper material handling and management, and community protection.

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

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

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

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

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

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

Final Report. The results of all cleanup work will be fully documented in a final report (called a Remedial Action Report) that will be available for you to review in the public document repositories identified as Brooklyn Public Library - Greenpoint Branch Library located at 107 Norman Avenue, Brooklyn, New York 11222.

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

REMEDIAL ACTION WORK PLAN

1.0 SITE BACKGROUND

501 Leonard Realty, LLC has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 0.2-acre property located at 501 Leonard Street in the Greenpoint 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 remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 SITE LOCATION AND CURRENT USAGE

The Site is located at 501 Leonard Street in the Greenpoint section in Brooklyn, New York and is identified as Block 2697 and Lot 7 on the New York City Tax Map. Figure 1.0 shows the Site location. The Site is 8,800-square feet and is bounded by Leonard Street to the east, Manhattan Avenue to the west, an eight-story residential building to the north, and a 6-story residential building to the south. A map of the site boundary is shown in Figure 2.0. Currently, the Site is used for Auto Repair and Auto Body purposes and contains a single story brick building, with a partial basement in the northeast corner.

1.2 PROPOSED REDEVELOPMENT PLAN

The proposed future use of the Site will consist of a 3,753 square-foot, mixed-use, residential building, with two commercial units and parking garage on the first floor, and a partial basement for storage and mechanical housing. Layout of the proposed site development is presented in Figures 3.0. The current zoning designation is M1-2/R6, for mixed high performance light

manufacturing and residential. The proposed use is consistent with existing zoning for the property.

The proposed building will have a full basement, and soils will be excavated to the bottom of the basement, to a depth of approximately 11'-6" below the current grade in the footprint of the building, 16' in the location of the elevator pit, and 2' below grade in the remainder of the property. The depth to groundwater at the property is approximately 8.4' and 9.5', and as such may be encountered during excavation of the basement. To this end, dewatering must be established during excavation of the basement, and a means of waterproofing and a vapor barrier must be utilized in the construction of this area new building.

Prior to any excavation the current one-story brick building will be demolished.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The property lies within a mixed manufacturing, residential and commercial neighborhood, with a mixture of high-rise residential buildings, one two and three-story mixed-use buildings, and one-story warehouse and manufacturing buildings. To the east, beyond Leonard Street, lie a number of manufacturing buildings, each approximately 10,000 square-feet in area. Adjoining to the south is a six-story residential building, followed by the intersection of Leonard Street and Manhattan Avenue. Beyond Manhattan Avenue to the west lies McCarren Park, a New York City municipal park, and adjoining to the north is an eight-story residential building. According to the Office of Environmental Remediation Searchable Property Environmental E-Database (OER SPEED), there are no sensitive receptors within 500-feet of the Subject Site.

Figure 4.0 shows the surrounding land usage.

1.4 REMEDIAL INVESTIGATION

A remedial investigation was performed and the results are documented in a companion document called "*Remedial Investigation Report, 501 Leonard Street*", dated May 2013 (RIR).

Summary of Past Uses of Site and Areas of Concern

The Subject Property has been used for commercial purposes since construction circa 1931. According to Sanborn Fire Insurance Maps former occupants have included a 'Furniture

Assembling and Finishing' facility, a 'service station', and an outdoor drive-in movie theatre. The southern section of the building had most recently been occupied by a motorcycle fabrication company. The northern portion of the building is currently occupied by an auto repair and auto body shop.

The AOCs identified for this Site include:

1. Historical fill material across the entire site, and metals contamination in distinct areas down to 7 feet below grade.
2. The potential sub-grade contamination of the property, based on the following: current and former usage; onsite RCRA Hazardous Waste Generator listing; onsite little 'E' listing for Underground Gasoline Storage Tanks; and an active up-gradient spill.

Summary of the Work Performed under the Remedial Investigation

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed six soil borings across the entire project Site, and collected twelve soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed three groundwater monitoring wells throughout the Site to establish groundwater flow and collected four groundwater samples, from the three installed monitoring wells and one existing monitoring well, for chemical analysis to evaluate groundwater quality;
4. Surveyed the four sampled wells along with accurate depth to groundwater, in order to accurately determine the flow of groundwater beneath the Subject Site.
5. Installed four soil vapor probes around Site perimeter and collected four soil vapor and one indoor air samples for chemical analysis.

Summary of Environmental Findings

1. Elevation of the property is fifteen feet.

2. Depth to groundwater ranges from 8.4' to 9.5' feet at the Site.
3. Groundwater flow is generally from south-southwest to north-northeast beneath the Site.
4. Depth to bedrock is approximately 100 feet at the Site.
5. The known stratigraphy in the area of the site is considered to be ~6 feet of urban fill, followed by fine silty sand up to 12 feet and fine to medium grained sands to 32 feet and up to 100 feet of the Upper Glacial Aquifer, which is likely underlain directly by bedrock.
6. Soil/fill samples collected during the RI showed volatile organic compounds (VOCs) including 1,2-dichloroethane (max. of 0.028 ppm), 1,4-dioxane (max. of 0.15 ppm), acetone (max. of 0.085 ppm), and vinyl chloride (max. of 0.028 ppm) were detected at concentrations slightly exceeding the NYSDEC Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCO). Trace levels of chlorinated solvents (PCE, TCE, TCA or Carbon Tetrachloride) were also detected in the samples collected from the Site. Several Semi-Volatile Organic Compounds (SVOCs) including 1,2-dichlorobenzene (max. of 3.16 ppm), 1,4-dichlorobenzene (max. of 2.97 ppm), 2-methylphenol (max. of 1.83 ppm), benzo(a)anthracene (max of 13.9 ppm), benzo(b)fluoranthene (max of 12 ppm), benzo(k)fluoranthene (max of 11.8 ppm), dibenzo(a,h)anthracene (max of 4.13 ppm), hexachlorobenzene (max of 2.85 ppm), and indeno(1,2,3-cd)pyrene (max 9.96 ppm), chrysene (max of 14.3 ppm), pentachlorophenol (max of 3.64 ppm), and phenol (max of 2.09 ppm) exceeded their respective NYSDEC Track 1 Soil Cleanup Objectives, and of these benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, hexachlorobenzene, and indeno(1,2,3-cd)pyrene also exceeded their respective Track 2 Restricted Residential SCOs. Metals including arsenic (max. of 24.5 ppm), cadmium (5.59 ppm), copper (max. of 887 ppm), lead (maximum of 5,790 ppm), selenium (maximum of 11.3 ppm) and silver exceeded Track 1 SCOs and, of these arsenic, cadmium, copper and lead also exceeded Track 2 Restricted Residential SCOs.
7. Groundwater samples collected during the RI showed that pesticides and PCBs were not detected in any groundwater sample. Groundwater samples collected during the RI showed several VOCs at concentrations exceeding the New York State 6NYCRR Part 703.5 Class GA groundwater standards (GQS). These included; 1,1,2-trichloroethane, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, cis-1,3-dichloropropylene,

hexachlorobutadiene, and trans-1,3-dichloropropylene. Several SVOCs and metals including arsenic (32 ppb), magnesium, manganese, and selenium were detected at levels exceeding their respective GQS.

8. Soil vapor samples collected during the RI showed a wide variety of VOCs at low concentrations, consisting mainly of benzene, toluene, ethyl-benzene, xylenes (BTEX) and associated compounds at concentrations generally below 49 $\mu\text{g}/\text{m}^3$. Chlorinated VOCs were detected at trace levels. PCE was detected at a maximum concentration of 7 $\mu\text{g}/\text{m}^3$ in one of five samples. TCA, TCE and vinyl chloride were not detected in any sample.

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

2.0 REMEDIAL ACTION OBJECTIVES

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

Groundwater

- Prevent direct exposure to contaminated groundwater.
- Prevent exposure to contaminants volatilizing from contaminated groundwater.

Soil

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

Soil Vapor

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

3.0 REMEDIAL ALTERNATIVES ANALYSIS

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

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

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

- Alternative 1 involves:
 - Establishment of Unrestricted Use Track 1 SCOs for the Site;
 - Removal of all soil/ fill exceeding Unrestricted Use (Track 1) Soil Cleanup Objective (SCOs) throughout the Site. This alternative would require excavation to a depth of approximately 12 feet in the location of the future building, and approximately 7 feet below grade throughout the remainder property to remove all historic fill and confirmation that Track 1 SCOs have been achieved through post-excavation end point sampling; and

- No engineering or institutional controls are required for a Track 1 Unrestricted Use cleanup, but a vapor barrier and a passive sub-slab depressurization system (SSDS) would be installed beneath the basement foundation of the new building as part of development to prevent future exposures from off-Site soil vapor.
- Placement of a final cover over the entire Site as part of new development.
- Alternative 2 involves:
 - Establishment of site-specific Track 4 SCOs for the Site;
 - Removal of all soil/ fill exceeding Track 4 Site-Specific SCOs. For development purposes, the site would be excavated to a depth of approximately 12 feet below the sidewalk curb elevation in the western portion and 2 feet below site elevation in the eastern portions and confirmation that the site-specific Track 4 SCOs have been achieved through post-excavation end point sampling;
 - Placement of a final cover over the entire site to eliminate exposure to remaining soil/fill;
 - Placement of a vapor barrier beneath the building slab and along foundation side walls and installation of a passive sub-slab depressurization system beneath the foundation to prevent soil vapor entering the new building;
 - Establishment of use restrictions including prohibitions on the use of groundwater from the site and prohibitions on sensitive site uses, such as farming or vegetable gardening, to eliminate future exposure pathways.
 - Establishment of an approved Site Management Plan to ensure long-term management of these engineering and institutional controls including the performance of periodic inspections and certification that the controls are performing as they were intended; and
 - Continued registration as an E-designated property to memorialize the remedial action and the Engineering and Institutional Controls required by this RAWP.

3.1 THRESHOLD CRITERIA

Protection of Public Health and the Environment

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

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

Alternative 2 would achieve comparable protections of human health and the environment by excavating heavily impacted soil/fill at the Site and by ensuring that remaining soil/ fill on-Site meets Track 4 Site-Specific SCOs as well as by placement of institutional and engineering controls, including a composite cover system. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Implementing institutional controls including a site management plan would ensure that the composite cover system remains intact and protective. Establishment of Track 4 Site-Specific SCOs would minimize the risk of contamination leaching into groundwater. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Implementing Institutional Controls including a Site Management Plan and continued "E" designation of property would ensure that the composite cover system remains intact and protective.

For both Alternatives, potential exposure to contaminated soils 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. Installing a vapor barrier and passive sub-slab depressurization system as part of new construction would prevent potential migration of soil vapors into the new building.

3.2. BALANCING CRITERIA

Compliance with Standards, Criteria and Guidance (SCGs)

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

Alternative 1 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal to Track 1 Unrestricted Use SCOs and groundwater protection standards. Compliance with SCGs for soil vapor would also be achieved by installation of vapor barrier and passive sub-slab depressurization system as part of construction.

Alternative 2 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal to meet Track 4 Site Specific SCOs. Compliance with SCGs for soil vapor would also be achieved by installation of vapor barrier and passive sub-slab depressurization system. A Site Management Plan would ensure that these controls remained protective for the long term.

Health and safety measures contained in the CHASP and Community Air Monitoring Plan (CAMP) that comply with the applicable SCGs shall be implemented during Site redevelopment under this RAWP. 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 effects on public health and the environment during implementation of the remedial action, including protection of the community, environmental impacts, time until remedial response objectives are achieved, and protection of workers during remedial actions.

Both alternatives 1 and 2 have similar short-term effectiveness during their respective implementations, as each requires excavation of historic fill material. Both alternatives would result in short-term dust generation impacts associated with excavation, handling, load out of materials, and truck traffic. Short-term impacts would likely be higher for Alternative 1 due to excavation of greater amounts of historical fill material. However, focused attention to means and methods during the remedial action during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize or negate the overall impact of these activities and any differences between these alternatives.

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

Long-term effectiveness and permanence

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

Alternative 1 would achieve long-term effectiveness and permanence by permanently removing all impacted soil/ fill material and enabling unrestricted usage of the property. The

vapor barrier, waterproof membrane, and passive SSDS employed as part of new construction would provide permanent control for future off-site soil vapor management.

Alternative 2 would provide long-term effectiveness by removing most on-site contamination and attaining Track 4 Site-Specific SCOs, establishing Engineering Controls including a composite cover system across the Site, establishing Institutional Controls to ensure long-term management including use restrictions, a Site Management Plan, and continued 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 use restrictions continue to be in place and are functioning as they were intended assuring that protections designed into the remedy will provide continued high level of protection in perpetuity.

Reduction of toxicity, mobility, or volume of contaminated material

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

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

Alternative 2 would permanently remove most of the contaminated soil/fill at the Site, and any remaining soil/fill would meet Track 4 Site-Specific SCOs. Alternative 1 would eliminate a greater total mass of contaminants on Site.

Implementability

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

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

Cost effectiveness

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

Historic fill at the Site was found during the RI to extend to a depth of up to 7 feet below grade, and the new building requires excavation of the property Site to a depth of 11ft below the building footprint, and 2 feet in parking areas. Costs associated with Alternative 1 would significantly higher than Alternative 2 based on higher volume of soil removal. However, long-term costs would be higher for Alternative 2 than Alternative 1 based on implementation of a Site Management Plan. In both cases, appropriate public health and environmental protections are achieved.

Community Acceptance

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

Based on the overall goals of the remedial program and the intended Site use, it is anticipated that Alternatives 1 and 2 for the Site would be acceptable to the community. This RAWP will be subject to public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedial action. This public comment will be considered by OER prior to approval of this plan. The Citizen Participation Plan for the project is provided in Appendix I.

Land use

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

The proposed redevelopment of the Site is compatible with its current M1-1 and R7-2 zoning designation and is consistent with recent development patterns. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 4 Site-Specific SCOs, both of which are appropriate for its planned residential use. Improvements in the current environmental condition of the property achieved by both alternatives are also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse. Both alternatives are equally protective of natural resources and cultural resources.

Sustainability of the Remedial Action

This criterion evaluates the overall sustainability of the remedial action alternatives and the degree to which sustainable means are employed to implement the remedial action including those that take into consideration NYC's sustainability goals defined in *PlaNYC: A Greener, Greater New York*. Sustainability goals may include: maximizing the recycling and reuse of non-virgin materials; reducing the consumption of virgin and non-renewable resources; minimizing energy consumption and greenhouse gas emissions; improving energy efficiency; and promotion of the use of native vegetation and enhancing biodiversity during landscaping associated with Site development. A sustainability statement is provided in Appendix 2.

While Alternative 2 would potentially result in lower energy usage based on reducing the volume of material transported off-Site, both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action. The remedial plan would take into consideration the shortest trucking routes during off-Site disposal of historic fill and other soils, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. To the extent practicable, energy efficient building materials, appliances, and equipment will be utilized to complete the development. A complete list of green remedial activities considered as part of the NYC VCP is included in the Sustainability Statement, included as Appendix C.

4.0 REMEDIAL ACTION

4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

The preferred remedial action alternative is Alternative 1 in the vicinity of the building footprint and Alternative 2 in the remaining areas of the site. The preferred combination of remedial action alternatives achieves protection of public health and the environment for the intended use of the property. The preferred combination of remedial action alternatives will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred combination of remedial action alternatives is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants. The preferred combination of remedial action alternatives 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 Unrestricted Use Track 1 Soil Cleanup Objectives (SCOs) within the footprint of the proposed building, and site specific Track 4 SCOs in the remainder of the property.
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Excavation and removal of soil/fill exceeding Track 1 SCOs within the footprint of the proposed building, and site specific Track 4 SCOs in the remainder of the property. Footprint of new building will be excavated to the depths of more than 11 feet and remainder of site will be excavated to the depths of two feet.
6. Implementation of dewatering methods during excavation due to penetration into groundwater.
7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
8. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.
9. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.
10. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.

11. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
12. Installation of a vapor barrier and waterproofing beneath the building slab and behind the foundation walls of the proposed building.
13. Installation of a passive sub-slab depressurization system beneath the building slab.
14. Demarcation of residual soil/fill.
15. Construction and maintenance of an engineered composite cover consisting of 5-inch thick structural concrete slab beneath the building and 2 feet of imported backfill material in the eastern portion of the site to prevent human exposure to residual soil/fill remaining under the Site.
16. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
17. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
18. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP.
19. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
20. Continued registration of the property with an E-Designation; establishment of Engineering Controls and Institutional Controls in this RAWP; a requirement that management of these controls must be in compliance with an approved SMP; and Institutional Controls including prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use;

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

4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT

Track 1 Soil Cleanup Objectives (SCOs) are proposed for this project. If Track 1 is not achieved, then Track 4 Site-Specific SCOs will be used:

<u>Contaminant</u>	<u>Track 4 SCOs</u>
Total SVOCs	250 ppm
Arsenic	23 ppm
Lead	1,200 ppm
Copper	270 ppm

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

Estimated Soil/Fill Removal Quantities

The total quantity of soil/fill expected to be excavated and disposed off-Site is 2,200 tons. Disposal location(s) will be reported promptly to the OER Project Manager prior to the start of the remedial action.

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

<u>Disposal Facility</u>	<u>Waste Type</u>	<u>Estimated Quantities</u>
Permitted facility to be named	Historic Fill	1,055 tons

End-Point Sampling

Removal actions under this plan will be performed in conjunction with remedial end-point sampling. For assessment of attainment of Track 1 Unrestricted Use SCOs, the RI provided endpoint data meeting Unrestricted Use SCOs for soil collected beneath the proposed depth of excavation. Following the invasive excavation activities at the Site, endpoint sampling frequency will consist of four (4) bottom samples collected from the western, central and eastern portions of excavation bottom. To evaluate attainment of Track 1 Unrestricted Use SCOs, endpoint samples will be analyzed for the full list of VOCs, SVOCs, PCBs, Pesticides, and Metals. Where Track 4 Site Specific SCOs are being assessed, parameters with defined SCOs will be tested.

In addition, if non-impacted material is encountered that is proposed to be disposed of as clean material, post-removal end-point sampling and testing will be performed following removal of historic fill and prior to removal of remaining material that is anticipated to meet Track 1 Unrestricted Use SCOs to verify suitability for soil recycling.

If hot-spots are encountered during the remedial action, end-point sampling frequency will consist of the following:

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.
2. For excavations 20 to 300 feet in perimeter:
 - For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
 - For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
3. For sampling of volatile organics, bottom samples should be taken within 24 hours of excavation, and should be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours should be taken at six to twelve inches.

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

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

New York State ELAP certified labs will be used for all end-point sample analyses. Labs for 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. End-point samples will be analyzed for trigger analytes (those for which SCO exceedence are identified) utilizing the following methodology:

Soil analytical methods will include:

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

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

Quality Assurance/Quality Control

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

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

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

Field QA/QC will include the following procedures:

- Calibration of field equipment, including PID, on a daily basis;
- Analysis of field blanks and trip blanks
- Analysis of one (1) duplicate sample;
- Use of dedicated and/or disposable field sampling equipment;
- Proper sample handling and preservation;
- Proper sample chain of custody documentation; and
- Completion of report logs.

The above procedures will be executed as follows:

- One field blank for soil will be generated for each sampling event and will be analyzed for the same set of analytical parameters as the soil samples.
- One (1) duplicate end-point soil sample will be collected to evaluate field sampling precision or reproducibility of measurements of the same parameter under the given set of conditions;

- Disposable sampling equipment will be used to minimize cross-contamination between samples;
- For each of the parameters analyzed, a sufficient sample volume will be collected to adhere to the specific analytical protocol, and provide sufficient sample for reanalysis if necessary;
- Because plasticizers and other organic compounds inherent in plastic containers may contaminate samples requiring organic analysis, samples will be collected in glass containers;
- Appropriate sample preservation techniques, including cold temperature storage at 4° C, will be utilized to ensure that the analytical parameters concentrations do not change between the time of sample collection and analysis; and
- Samples will be analyzed prior to the expiration of the respective holding time for each analytical parameter to ensure the integrity of the analytical results.

Import and Reuse of Soils

Import of soils onto the property and reuse of soils already onsite will be performed in conformance with the Soil/Materials Management Plan in **Appendix C**. The estimated quantity of soil to be imported into the Site for backfill and cover soil is approximately 360 tons. The estimated quantity of onsite soil/fill expected to be reused/relocated on Site is zero tons.

4.3 ENGINEERING CONTROLS

The excavation required for the proposed Site development will achieve combination of Track 1 Unrestricted Use SCOs under building footprint and Track 2 Restricted Residential in the remaining property (parking area). No Engineering Controls are required to address residual contamination in Track 1 area below building footprint. However, Engineering Controls are required in the parking area. The following elements will be incorporated into the foundation design as part of the development: composite cover system, vapor barrier and SSDS. For building footprint, if Track 1 is not achieved, these three elements will also serve as Engineering Controls to address residual contamination remaining at the Site.

Composite Cover System

As part of new development, the entire property will be covered by an engineered permanent cover system. This cover system will be comprised of a 5 inch thick concrete-building slab beneath the area of the proposed building footprint. The remaining parking area will be backfilled with two feet of clean soil.

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

Vapor Barrier

Future migration of soil vapor from off-site will be mitigated with a combination of building slab, vapor barrier and sub-slab passive depressurization system. A vapor barrier system consisting of a geomembrane, with a minimum thickness of 20m as required by OER, will be installed beneath the building slab and up the sidewalls according to manufacturer specifications. The Vapor Barrier manufacturer and design sheets will be prepared and provided to OER under a separate cover, for their approval, prior to its installation.

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

Passive Sub-Slab Depressurization

Future migration of soil vapor from offsite will be mitigated with the construction of a passive sub-slab depressurization system. The passive SSDS will prevent soil gas from accumulating in the buildings by creating a negative pressure zone beneath the slab. To create this negative pressure zone, a 3-inch aggregate layer consisting of ASTM Class 5 aggregate will be constructed beneath the building slab, and sub-slab pits connected 4-inch PVC pipes and routed to the roof via a 4-inch schedule 40 PVC line.

A Vapor Barrier and a Passive Depressurization System Specifications Design is attached as an Appendix D. Figure 1, Figure 2 and Figure 3 of the Appendix shows the location of each cover type built at the Site and the typical design for each remedial cover type used on this Site.

4.4 INSTITUTIONAL CONTROLS

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

Institutional Controls for this remedial action are:

- The property will continue to be registered with an E-Designation at the NYC Buildings Department. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the Site Management Plan which will note that the property owner and property owner's successors and assigns must comply with the approved SMP;
- Site Management Plan approved by OER that provides procedures for appropriate operation, maintenance, monitoring, inspection, reporting and certification of ECs and ICs. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification shall be submitted a periodic basis and will comply with RCNY §43-1407(1)(3).
- Vegetable gardens and farming on the Site are prohibited;
- Use of groundwater underlying the Site is prohibited without treatment rendering it safe for its intended use;

- All future activities on the Site that will disturb residual material must be conducted pursuant to the soil management provisions in an approved SMP;
- The Site will be used for residential use and will not be used for a higher level of use without prior approval by OER.

4.5 SITE MANAGEMENT PLAN

Site Management is the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by the DCR and this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site Management responsibilities defined in the DCR and the Site Management Plan are implemented.

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

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

4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

The objective of the qualitative exposure assessment is to identify potential receptors to the contaminants of concern (COC) that are present at, or migrating from, the Site. The

identification of exposure pathways describes the route that the COC takes to travel from the source to the receptor. An identified pathway indicates that the potential for exposure exists; it does not imply that exposures actually occur.

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

Known and Potential Sources

Historic fill material is present at the Site at variable depths ranging in thickness from zero to 11 feet. Based on the results of the RIR, the contaminants of concern found are:

Soil

- VOCs including 1,2-dichloroethane, 1,4-dioxane, acetone, and vinyl chloride were detected at concentrations slightly exceeding the NYSDEC Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives;
- Several Semi-Volatile Organic Compounds (SVOCs) including benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, hexachlorobenzene, and indeno(1,2,3-cd)pyrene exceeded their respective Track 2 Restricted Residential SCOs;
- Several metals including arsenic, cadmium, copper and lead exceeded Track 2 Restricted Residential SCOs.

Groundwater

- VOCs including 1,1,2-trichloroethane, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, cis-1,3-dichloropropylene, hexachlorobutadiene, and trans-1,3-dichloropropylene exceeded GQS.

- Several SVOCs and metals including arsenic, magnesium, manganese, and selenium were detected at levels exceeding their respective GQS.

Soil vapor

A wide variety of VOCs were found at low concentrations, consisting mainly of benzene, toluene, ethyl-benzene, xylenes (BTEX) and associated compounds. Chlorinated VOCs, PCE was detected at trace levels.

Nature, Extent, Fate and Transport of Contaminants

SVOCs, PCBs, pesticides and metals are present in the historic fill materials throughout the Site at shallow depths. One metal contaminant was found dissolved in on-Site groundwater and is linked to regional salinity impacts, as it was not found in deep onsite soil at levels exceeding groundwater protection standard. The VOCs that were identified in soil gas at low concentrations were not found in on-Site soil at appreciable concentrations and may be attributable to off-site sources.

Potential Routes of Exposure

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

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

Existence of Human Health Exposure

Existing – The potential for exposure to surficial historic fill exists under current conditions but is limited because the Site is undeveloped with the eastern portion partially capped with asphalt and the western portion is uncapped. Groundwater is not exposed at the Site, and because the Site is

served by the public water supply, groundwater is not used at the Site. There are no structures on Site where soil vapor could accumulate.

Construction/ Remediation Activities– Once redevelopment activities begin, construction workers will come into direct contact with surface and subsurface soils as a result of on-Site construction/excavation activities. Similarly, off-Site receptors could be exposed to dust from onsite activities. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through dust controls, and through the implementation of the Community Air Monitoring Plan and a Construction Health and Safety Plan. Groundwater is not anticipated to be encountered, and there will be no structures on site where soil vapor could accumulate.

Proposed Future Conditions – Once the remedial actions and redevelopment of the Site have been completed, there will be no potential onsite exposure pathways. Not only will most historic fill be removed, but the Site will also be fully capped with the 5-inch concrete building slab and other suitable cover materials which will prevent contact with any residual soils. Any exposures to vapors from off-site sources will be prevented by installation of a vapor barrier, passive SSDS, and building slab.

Receptor Populations

The immediate area is mixed use residential/commercial/light industrial, and is anticipated to remain as such. The new building at the site will be utilized as residential facility. Potential receptor populations are as follows:

On-Site Receptors - The Site is currently undeveloped and is occupied by a used car dealership. Therefore, the only potential on-Site receptors are Site representatives, customers and trespassers. During redevelopment of the Site, the on-Site potential receptors will include construction workers, site representatives, and visitors. Once the Site is redeveloped, the on-Site potential sensitive receptors will include adult and child building residents and visitors.

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

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

Overall Human Health Exposure Assessment

There are potential complete exposure pathways for the current site condition. There is a potential complete exposure pathway that requires mitigation during implementation of the remedy. There is no complete exposure pathway under future conditions after the site is developed. This assessment takes into consideration the reasonably anticipated use of the site, which includes a residential structure, site-wide impervious surface cover cap, and a subsurface vapor barrier system for the building. 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.

Based upon this analysis, complete on-site exposure pathways appear to be present only during the current unremediated phase and the remedial action phase. Under current conditions, on-Site exposure pathways could be minimized by preventing access to the Site. During the remedial action, on-site exposure pathways will be eliminated by preventing access to the Site, through implementation of soil/materials management, stormwater pollution prevention, dust controls, employment of a community air monitoring plan, and implementation of a Construction Health and Safety Plan. After the remedial action is complete, there will be no remaining exposure pathways to on-Site soil/ fill, as all soil that exceeds Track 1 Unrestricted Use SCOs will have been removed, and the vapor barrier, passive SSDS, and concrete building slab will interrupt potential for soil vapor intrusion.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 PROJECT ORGANIZATION AND OVERSIGHT

Principal personnel who will participate in the remedial action include Senior Hydrologist Scott A. Yanuck and Environmental Scientist Christopher J. Connolly. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Richard D. Gallian and Scott A. Yanuck, respectively.

5.2 SITE SECURITY

The Applicant will control site access of the fenced property through gated entrances. Barriers will be installed around work areas as needed to delineate and restrict access to the work area. For work areas of limited size, barrier tape will be sufficient to delineate and restrict access. For larger worker areas, temporary fencing will be provided.

5.3 WORK HOURS

The hours for operation of remedial construction will be from 8:00 AM to 4:00 PM. These hours conform to the New York City Department of Buildings construction code requirements.

5.4 CONSTRUCTION HEALTH AND SAFETY PLAN

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

All field personnel involved in remedial activities will participate in training required under 29 CFR 1910.120, including 40-hour hazardous waste operator training and annual 8-hour

refresher training. Site Safety Officer will be responsible for maintaining workers training records.

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

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

5.5 COMMUNITY AIR MONITORING PLAN

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

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

the Community Air Monitoring Plan (CAMP) will be reported to the OER Project Manager and included in the Daily Report.

VOC Monitoring, Response Levels, and Actions

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

5.6 AGENCY APPROVALS

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

5.7 SITE PREPARATION

Pre-Construction Meeting

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

Mobilization

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

Utility Marker Layouts, Easement Layouts

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

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

Equipment and Material Staging

Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations. The location of proposed equipment and material staging areas, truck inspection station, stockpile areas, and other pertinent remedial management features will be defined by construction managers during the Site preparation activities.

Stabilized Construction Entrance

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

Truck Inspection Station

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

Extreme Storm Preparedness and Response Contingency Plan

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

Storm Preparedness

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

Storm Response

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

property owners and OER will be notified and corrective measure plan designed to remove and clean dislocated material will be submitted to OER and implemented following approval by OER and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of OER. If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYS DEC's spill hotline at DEC 800-457-7362. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYS DEC.

Storm Response Reporting

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

5.8 TRAFFIC CONTROL

Drivers of trucks leaving the NYC BCP Site with soil/fill will be instructed to proceed without stopping in the vicinity of the site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site is presented in Figure 6.

5.9 DEMOBILIZATION

Demobilization will include:

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

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

5.10 REPORTING AND RECORD KEEPING

Daily Reports

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

- Project number and statement of the activities and an update of progress made and locations of work performed;
- Quantities of material imported and exported from the Site;

- Status of on-Site soil/fill stockpiles;
- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP excursions, if any;
- Photograph of notable Site conditions and activities.

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

An alpha-numeric site map will be used to identify locations described in reports submitted to OER and is shown in Figure 2.0.

Record Keeping and Photo-Documentation

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

5.11 COMPLAINT MANAGEMENT

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

5.12 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

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

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

6.0 REMEDIAL ACTION REPORT

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

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

Remedial Action Report Certification

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

I, Richard D. Galli, am currently a professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the 501 Leonard Street, Brooklyn site, NYCOER #13CVCP128K

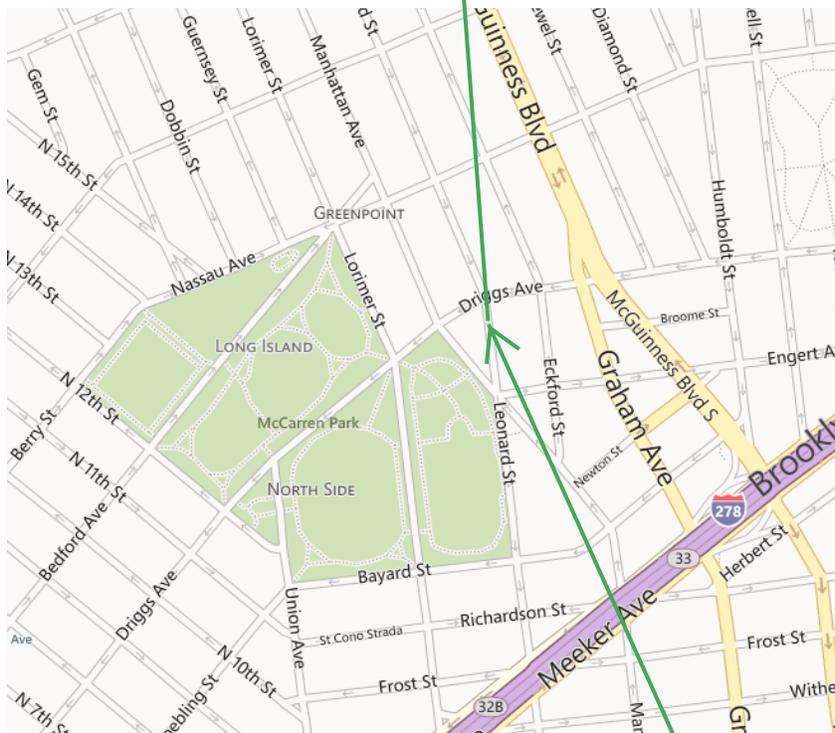
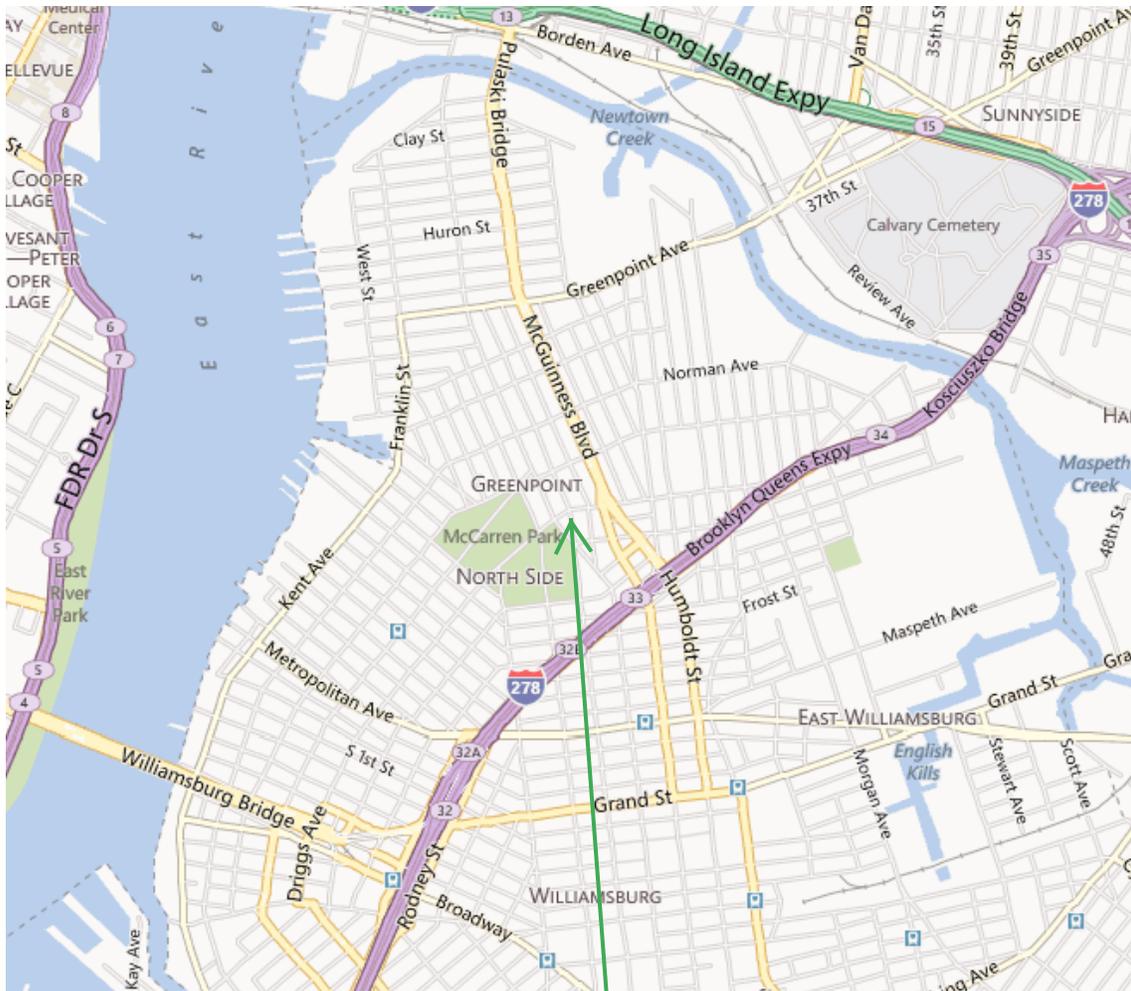
I, Scott A. Yanuck, am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the 501 Leonard Street, Brooklyn site, NYCOER #13CVCP128K

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

7.0 SCHEDULE

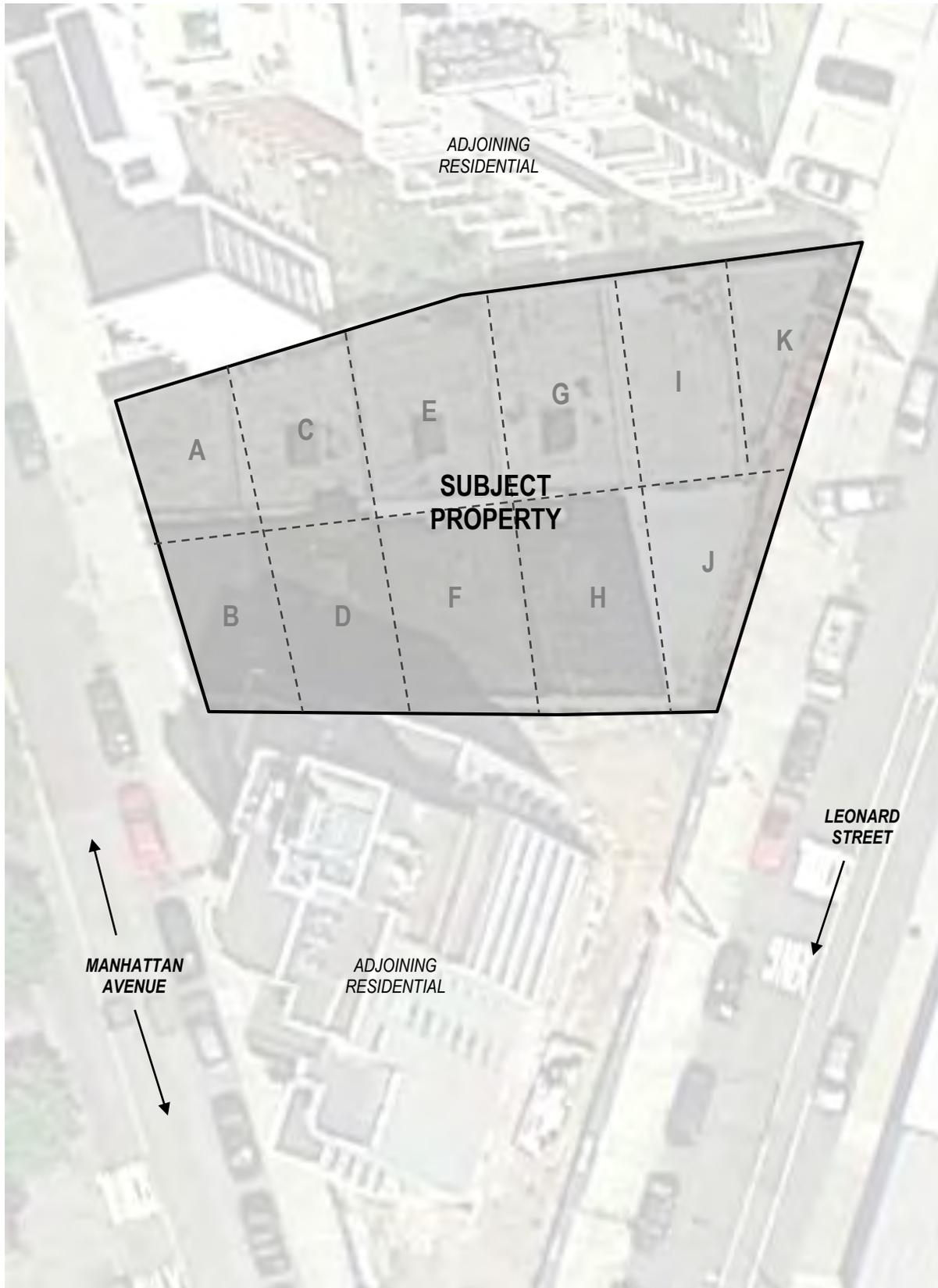
The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a 2-month remediation period is anticipated.

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAWP	0	4
Fact Sheet 2 announcing start of remedy	0	1
Mobilization	2	2
Remedial Excavation	6	4
Demobilization	8	2
Submit Remedial Action Report	12	3



LEA, 53 West Hills Road, Suite 1, Huntington Station, New York 11746

Figure 1.0 Site Location
501 Leonard Street
Brooklyn, New York



53 West Hills Road, Suite 1
Huntington Station, NY 11746

PHONE: 631-673-0612
FAX: 631-427-5323

WWW.LAUREL ENV.COM

FIGURE 2.0
ALPHA-NUMERIC SITE
BOUNDARY MAP

501 LEONARD STREET
GREENPOINT
BROOKLYN, NEW YORK

PROJECT #: 12-361

DRAWING DATE: 5-17-2013

DRAWN BY: CJC

CHECKED BY: TJ



NOT TO SCALE

LEA makes no guarantees as to the accuracy of this drawing and it should only be used for informational purposes.



Industrial/Manufacturing Properties	Mixed-use Properties
Transportation and Utility	Residential Properties



53 West Hills Road, Suite 1
 Huntington Station, NY 11746
 PHONE: 631-673-0612
 FAX: 631-427-5323
 WWW.LAURELNV.COM

FIGURE 4.0
 MAP OF SURROUNDING
 PROPERTY USAGE
 501 LEONARD STREET
 BROOKLYN, NEW YORK

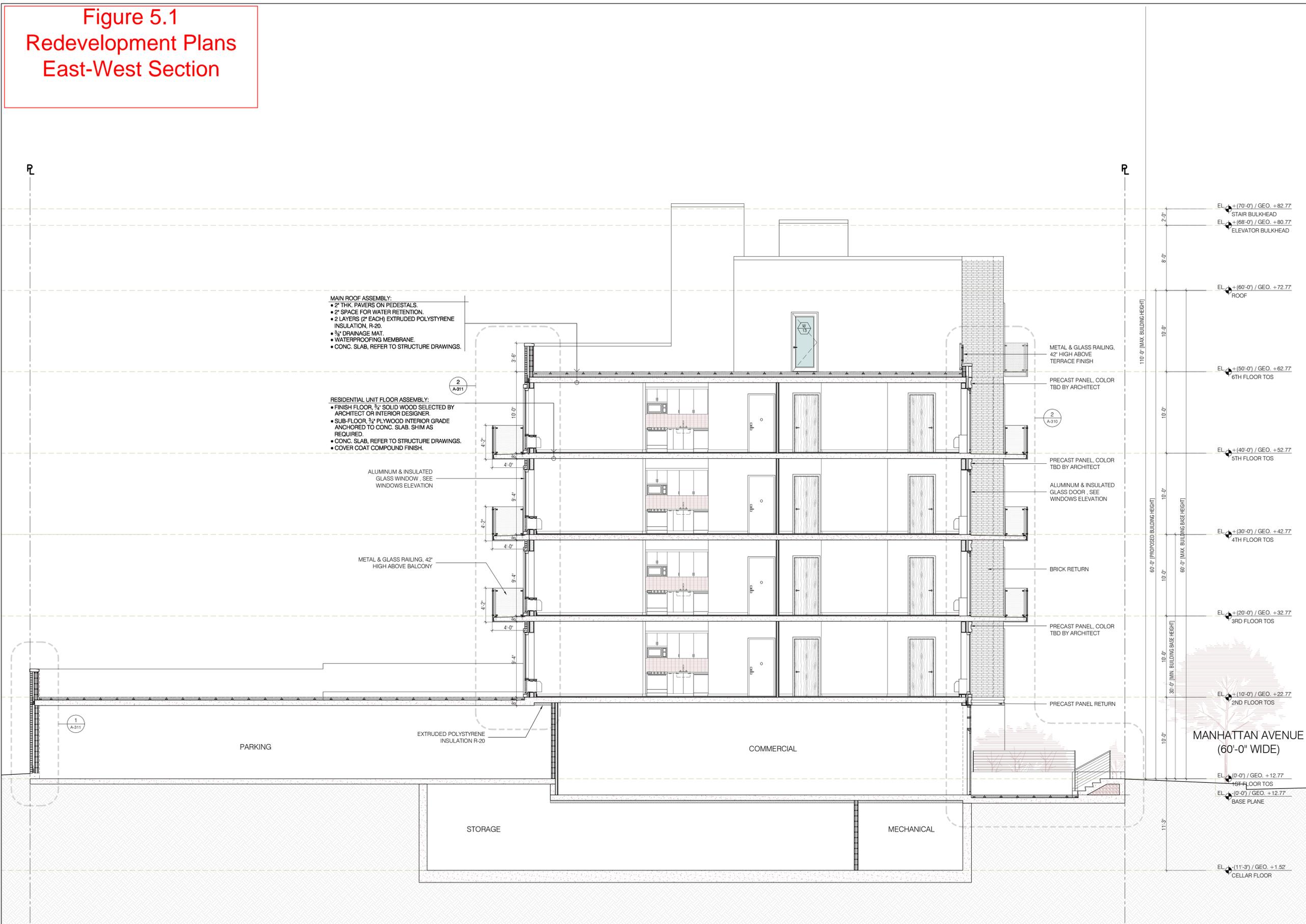
PROJECT #: 12-361
 DRAWING DATE: 4-1-2013
 DRAWN BY: CJC
 CHECKED BY: TJ



NOT TO SCALE

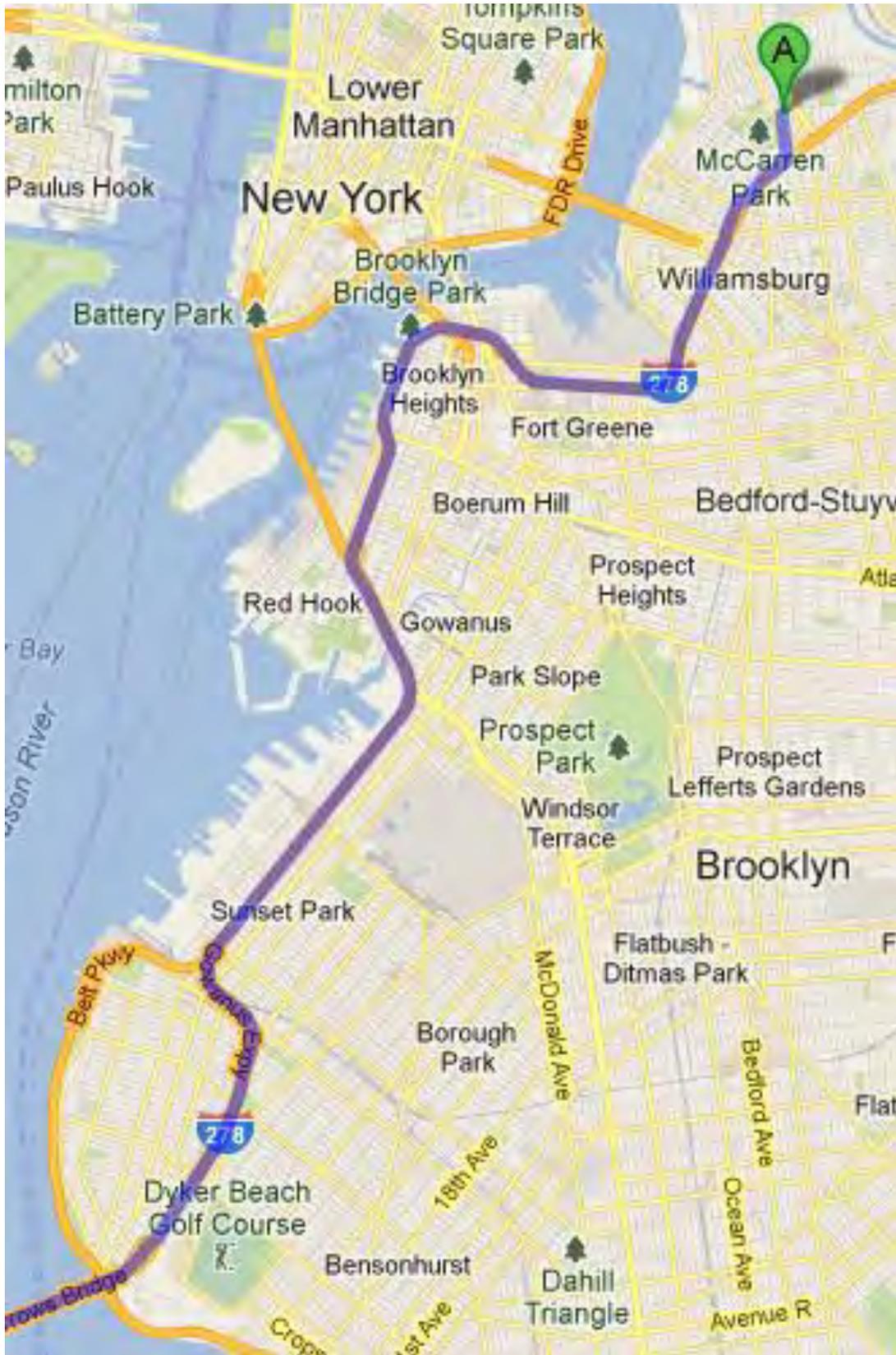
LEA makes no guarantees as to the accuracy of this drawing and it should only be used for informational purposes.

Figure 5.1
Redevelopment Plans
East-West Section



1 EAST-WEST SECTION
 A-300.00 3/16" = 1'-0"

KEY PLAN			
BLOCK 2697 LOT 7			
issue	rev	date	description
ISSUES/REVISIONS			
INTERIOR DESIGNER:			
STRUCTURAL ENGINEER:			
MEP ENGINEER:			
CLIENT:			
KARL FISCHER ARCHITECT CHIO OVA RAIC AIA 530 BROADWAY, 9TH FLOOR, NEW YORK, NY 10012 TEL: (212) 219-9733 FAX: (212) 219-8980 1420 NOTRE-DAME WEST, MONTREAL, QC H3C 1K9 TEL: (514) 933-4137 FAX: (514) 933-0479 WEB SITE: WWW.KFARCHITECT.COM E-MAIL: KARL@KFARCHITECT.COM			SEAL
project title			
MIXED-USE DEVELOPMENT			
501 LEONARD STREET, BROOKLYN, NY 11222			
drawing title			
EAST-WEST BUILDING SECTION			
dwb no			
scale	3/16" = 1'-0"	project no.	12-39
date	DEC 2012	sheet no.	----
drawn		drawing no.	
checked	KF	A-300.00	



53 West Hills Road, Suite 1
Huntington Station, NY 11746

PHONE: 631-673-0612
FAX: 631-427-5323

WWW.LAUREL ENV.COM

FIGURE 6.0
WASTE VEHICLES TRANSPORT
ROUTE

501 LEONARD STREET
BROOKLYN, NEW YORK

PROJECT #: 12-361

DRAWING DATE: 5-17-2013

DRAWN BY: CJC

CHECKED BY: TJ

N



NOT TO SCALE

LEA makes no guarantees as to the accuracy of this drawing and it should only be used for informational purposes.

APPENDIX A

Elk gp'Rct vkr cvkp'Rrp

APPENDIX A

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and 3361 Third Avenue Acquisition, LLC have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Voluntary Cleanup Program. This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYC VCP, 3361 Third Avenue Acquisition, LLC will maintain a repository for project documents and provide public notice at specified times throughout the remedial program. This Plan also takes into account potential environmental justice concerns in the community that surrounds the project Site. Under this Citizen Participation Plan, project documents and work plans are made available to the public in a timely manner. Public comment on work plans is strongly encouraged during public comment periods. Work plans are not approved by the NYC Office of Environmental Remediation (OER) until public comment periods have expired and all comments are formally reviewed. An explanation of cleanup plans in the form of a public meeting or informational session is available upon request to OER's project manager assigned to this Site, Jennifer Pati, who can be contacted about these issues or any other questions, comments or concerns that arise during the remedial process at (212) 788-8841

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

Repositories.

A document repository is maintained in the nearest public library that maintains evening and weekend hours. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project. 3361 Third Avenue Acquisition, LLC. will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

[Brooklyn Public Library](#)

[Greenpoint Branch Library](#)

[107 Norman Avenue](#)

Brooklyn, New York 11222

(718)-349-8504

Monday and Tuesday: 10:00 AM to 6:00 PM

Wednesday: 10:00 AM to 8:00 PM

Thursday: 1:00 PM to 8:00 PM

Friday: 10:00 AM to 6:00 PM

Saturday: 10:00 AM to 5:00 PM

Sunday Closed

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

Public Notice and Public Comment. Public notice to all members of the Project Contact List is required at three major steps during the performance of the cleanup program (listed below) and at other points that may be required by OER. Notices will include Fact Sheets with descriptive project summaries, updates on recent and upcoming project activities, repository information, and

important phone and email contact information. All notices will be prepared by 3361 Third Avenue Acquisition, LLC., reviewed and approved by OER prior to distribution and mailed by 3361 Third Avenue Acquisition, LLC. Public comment is solicited in public notices for all work plans developed under the NYC Brownfield Cleanup Program. Final review of all work plans by OER will consider all public comments. Approval will not be granted until the public comment period has been completed.

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

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

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

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

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

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

PUBLIC NOTICE IN THE FORM OF A FACT SHEET IS SENT TO ALL PARTIES LISTED ON THE SITE CONTACT LIST ANNOUNCING THE COMPLETION OF REMEDIATION, PROVIDING A LIST OF ALL INSTITUTIONAL AND ENGINEERING CONTROLS IMPLEMENTED FOR TO THE SITE AND ANNOUNCING THE ISSUANCE OF THE NOTICE OF COMPLETION.

APPENDIX B

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APPENDIX B

SUSTAINABILITY STATEMENT

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Paperless Voluntary Cleanup Program. 501 Leonard Realty, LLC is participating in OER's Paperless Brownfield Cleanup Program. Under this program, submission of electronic documents will replace submission of hard copies for the review of project documents, communications and milestone reports.

Low-Energy Project Management Program. 501 Leonard Realty, LLC is participating in OER's low-energy project management program. Under this program, whenever possible, meetings are held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation.

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

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

APPENDIX C

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APPENDIX C

SOIL/MATERIALS MANAGEMENT PLAN

1.1 SOIL SCREENING METHODS

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

1.2 STOCKPILE METHODS

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

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

1.3 CHARACTERIZATION OF EXCAVATED MATERIALS

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

1.4 MATERIALS EXCAVATION, LOAD-OUT AND DEPARTURE

The PE/QEP overseeing the remedial action will:

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

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

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

1.5 OFF-SITE MATERIALS TRANSPORT

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

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

1.6 MATERIALS DISPOSAL OFF-SITE

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

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

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

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

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

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

1.7 MATERIALS REUSE ON-SITE

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site. The soil cleanup objectives for on-Site reuse are the Track 1 Unrestricted Use SCOs. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to the NYC BCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed. The expected location for placement of reused material will be provided in the RAR.

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

1.8 DEMARCATION

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

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

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

1.9 IMPORT OF BACKFILL SOIL FROM OFF-SITE SOURCES

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives are Track 1 Unrestricted Use SCOs.

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

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

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

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

Source Screening and Testing

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

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

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

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

1.10 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable laws and regulations. Liquids discharged

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

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

1.11 STORM-WATER POLLUTION PREVENTION

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

1.12 CONTINGENCY PLAN

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to OER's

Project Manager. Petroleum spills will be reported to the NYS DEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

1.13 ODOR, DUST AND NUISANCE CONTROL

Odor Control

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

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

Dust Control

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

- Use of a dedicated water spray methodology for roads, excavation areas and stockpiles.
- Use of properly anchored tarps to cover stockpiles.
- Exercise extra care during dry and high-wind periods.

- Use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface.

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

Other Nuisances

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

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

APPENDIX D

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CONSTRUCTION
HEALTH AND SAFETY PLAN

NYC VOLUNTARY CLEANUP SITE
501 Leonard Street, Brooklyn
NEW YORK 11222

August 2013
LEA PROJECT # 12-361.2

Sheila Bubka, CIH

Sheila Bubka, CIH
Health and Safety Officer
AIHA Certification Number 6111

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HEALTH AND SAFETY PLAN FOR USE DURING REMEDIAL ACTION AND CONSTRUCTION

1.0 PURPOSE

The purpose of this Construction Health and Safety Plan (CHASP) is to assign responsibilities, establish minimum personnel protection standards and operating procedures and provide for contingencies that may arise while operations are being performed at the subject site, 501 Leonard Street, Brooklyn, New York. The proposed Remedial Action will include the removal of historic fill from the site.

Laurel Environmental Associates, Ltd. (LEA) and its subcontractors will be responsible for providing materials, equipment and labor required by the CHASP. The protocols of the CHASP will be followed by all personnel involved in the work, including employees and agents of Contractors, Subcontractors and Owner. Mr. Scott Yanuck, *LEA* Hydrogeologist, and Mr. Christopher J. Connolly, *LEA* Environmental Scientist, are the Project Managers, Sheila Bubka is the Health and Safety Officer, and Carla Sullivan is the Quality Assurance/Quality Control Officer for the project.

This CHASP establishes the minimum level of personnel protection. Additional measures will be implemented if necessary to protect personnel involved in the work and the public at large.

Conditions at the site are not expected to warrant either Level B or Level C protection during the investigation based on known site conditions. Regardless, all workers present on site will be familiar with proper protection procedures and the CHASP. All personnel scheduled to work at the site are 40-hour OSHA HAZWOPER CFR 1910.120 trained, with 8-hour refreshers up to date.

Given the scope of the work, and the type of contaminants on-site, there is a low potential of the surrounding community being negatively impacted by activities which will be conducted during this investigation. *Laurel Environmental Associates, Ltd.* will take every possible step to avoid any type of negative impact.

The Site is currently a vacant fenced lot. Soils will be field screened with a Photoionization Detector (PID) to determine the presence of organic contamination. If an emergency occurs during the measures, which in any event may impact the surrounding community, all appropriate emergency resources listed under the Emergency Contingency Plan Section of this plan will be immediately notified.

2.0 HAZARD EVALUATION

Elevated levels of volatile organic compounds (VOCs) in the atmosphere are not expected to occur during on-site activities. However, the presence of VOCs will be evaluated using a Photoionization Detector (PID). Results from the air monitoring will determine if Level D personnel protection of workers is appropriate or a higher level of protection is required.

During all activities, *LEA* personnel will monitor the area around the excavation using a PID to ensure that the appropriate worker protection is maintained for the level of pollutants found. If air monitoring indicates contaminant concentrations pose a risk to workers, the area will be immediately evacuated. Guidelines that will be followed before continuing are noted in Table 1 on the following page. If conditions warrant, Level B and C protection will be worn.

Table 1
Atmospheric Hazard Guidelines

<u>Hazard</u>	<u>Monitoring Equipment</u>	<u>Measured Level</u>	<u>Action</u>
Explosive Atmosphere	Combustible Gas Indicator	<10% LEL	Continue investigation.
		10%-20% LEL	Continue on-site monitoring with extreme caution as higher levels are encountered.
		>20% LEL	Explosion hazard. Withdraw from area immediately.
Oxygen	Multi RAE	Oxygen conc. <19.5%	Withdraw from area. NOTE: Combustible gas readings are not valid in atmosphere with oxygen levels of less than 19.5%
		19.5% - 23.5%	Continue investigation with caution.
		>23.5%	Fire hazard potential. Discontinue investigation. Withdraw from area.
Organic gases and vapors	PID	Background	Continue work
		5 ppm	Temporarily halt work until average readings drop below 5 ppm
		5 - 25 ppm	Halt work, identify and remedy or abate source
		Above 15 ppm	Continue work once average readings drop below 5 ppm Work must be shut down. Evaluate alternative approaches

Notes:

1. LEL = Lower Explosive Limit

3.0 SITE CONTROL

3.1 Site Work Locations:

Activities involving soil, groundwater and soil vapor sampling will be performed within the fenced boundaries of the property. The work areas are the locations in which the actual activities will occur. Workers entering these areas are required to be protected as defined below. Only authorized personnel, including personnel conducting the work activities involved, and specialized personnel such as subcontractors engaged in well installation and operation of heavy equipment, will be allowed in the work areas. Within the work areas, the levels of protection will be determined based on the degree of hazard present, as detected by the measurements obtained with the PID, and/or other activity-specific monitoring equipment. As an engineering control, a regenerative air blower may be used to reduce the potential for dangerous concentrations of VOCs in the breathing zone near the excavation, if warranted.

3.2 Work Zones:

Work zones will be defined prior to the commencement of work activities. These work zones will limit equipment, operations and personnel in the areas as defined below:

Exclusion Zone - This shall include all areas where potential environmental monitoring has shown or is suspected that a potential chemical hazard may exist to workers. This will include down-wind locations. If a chemical hazard exists at downwind locations, the exclusion zone will be expanded as necessary. The level of PPE required in these areas shall be determined by the Site HSO after air monitoring and on-Site inspection has been conducted. The area shall be clearly delineated from the decontamination area. As work proceeds, the delineation boundary shall be relocated as necessary to prevent the accidental contamination of nearby people and equipment.

Contamination Reduction Zone - This zone will occur at the interface between the Exclusion Zone ("Hot Zone") and Support Zone ("Clean Zone") and shall provide a transfer of personnel and equipment to and from the Support Zone to the Exclusion Zone. This zone is for the decontamination of personnel and equipment prior to entering the Support Zone, and for the physical segregation of the Support Zone and Exclusion Zone. The contamination reduction zone will be placed along the front of the Site. Access to the Site by the public will be restricted during the Remedial Action and Construction.

Support Zone - This area is the remainder of the work Site and project Site. The support zone will be staged near company vehicles on Union Street. The function of the Support Zone includes:

- A. An entry area for personnel, material and equipment to the Exclusion Zone of site operations through the Contamination Reduction Zone
- B. An Exit for decontamination personnel, materials and equipment from the "Decon" area of Site operations
- C. The Housing of Site special services
- D. A storage area for clean safety and work equipment

Small decontamination areas may be set up adjacent to the work area to facilitate decontamination of equipment that is reused throughout the field activity.

3.3 Dust and Odors:

If during sampling, dust or odors emanating from contaminated soils are deemed excessive at adjoining properties and commercial businesses, the sampling process will include misting with water to keep dust levels to a minimum.

3.4 Security:

Periodic security patrols will be conducted to ensure that adequate security is being maintained. Only workers authorized by the field manager may be allowed to enter the Site. Warning signs will be posted to discourage entry by unauthorized personnel. The HSO will brief all visitors of all security and safety plans.

At the end of each work day, the site will be secured with a locked gate and 6 foot chain link fencing.

3.5 Site Communications:

Communications on-Site will be conducted through verbal communications. When out of audible range, verbal communications may be assisted using mobile telephones and two-way radios.

4.0 PERSONAL PROTECTIVE EQUIPMENT

All on-site workers will be familiar with proper protection procedures and this Health and Safety Plan. Level D personal protective clothing will be worn at the outset.

As stated above Level B or C protection will be worn as required. General descriptions of Level C and B protection are presented in Tables 2 and 3 on the following page, respectively. If it is necessary to wear Level B or C protection, the work area shall be separated into three Zones: an Exclusion Zone, a Contamination Reduction Zone, and a Support Zone. No one but protected personnel shall be in the Exclusion and Contamination Reduction Zones. An entrance and exit point shall be designated and monitored to ensure that no unauthorized personnel enter the area. Everyone that enters the area shall log in the field note book with the length of time spent in the area and the task performed noted.

All workers shall wear gloves when handling soil/sludge and apparatus. Gloves shall also be worn while cleaning the sampling equipment.

If any personnel must be lowered into a confined spaces additional procedures must be followed. *LEA* will provide the confined space procedures. *LEA* will monitor the confined space prior to entry and complete the confined space permit. If needed, dilution or exhaust ventilation will be provided to lower contaminant levels.

All persons working in the confined space must have confined space awareness training and a confined space supervisor must be present. *LEA* will perform continuous air monitoring for oxygen, flammability and toxins. At a minimum, carbon monoxide and hydrogen sulfide will be monitored in addition to other site-specific chemicals determined to be a hazard. All personnel working in or monitoring the confined space activities must be properly OSHA confined space entry trained. An approved safety harness and tripod will be employed. Personnel at grade will be constantly monitoring the worker in the pool for signs of fatigue, heat stress or behavior change.

Table 2
LEVEL C PROTECTION

1. Full-face or half-mask, air purifying, canister equipped respirators (NIOSH approved) for those contaminants present.
2. Hooded chemical resistant clothing: (overalls; two-piece chemical-splash-suit; disposable chemical-resistant overalls).
3. Coveralls*
4. Gloves, outer, chemical-resistant
5. Gloves, inner, chemical-resistant
6. Boots (outer), chemical-resistant, steel toe and shank
7. Boot-covers, outer, chemical-resistant, (disposable)*
8. Hard hat
9. Escape mask*
10. Two-way radios (worn under outside protective clothing)
11. Face shield*

*Optional, as applicable.

Table 3
LEVEL B PROTECTION

1. Pressure-demand, full-faceplate self-contained breathing apparatus (SCBA), or pressure demand supplied air respirator with escape SCBA (NIOSH approved)
2. Hooded chemical-resistant clothing (overalls and long-sleeved shirts) jacket; coveralls; one or two-piece chemical-splash suit; disposable chemical-resistant overalls).
3. Coveralls*
4. Gloves, outer chemical-resistant
5. Gloves, inner, chemical-resistant.
6. Boots, outer, chemical resistant steel toe and shank
7. Boot-covers, outer, chemical-resistant (disposable)
8. Hard hat
9. Two-way radios (worn inside encapsulating suit)
10. Face shield*

* Optional, as applicable

5.0 PERSONNEL SAFETY/HYGIENE

The safety practices to be followed by all on-site personnel include:

1. If Level B or C protection must be worn, eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited in the Exclusion and Contamination Reduction Zones. All workers must be trained, medically qualified and fit tested in the use of respirators.
2. Hands and face must be thoroughly washed before eating, drinking or any other personal hygiene activities.
3. No excessive facial hair, which interferes with a satisfactory fit of the mask to face seal, is allowed for personnel to wear respiratory protective equipment.

6.0 PERSONNEL TRAINING

At the start of the job before engaging in any work, all personnel will be briefed on the following:

1. The person in charge as safety officer
2. Boundaries, entry and exit point locations of the work zones, if established
3. Use of personnel protection equipment
4. Principles of personnel hygiene
5. Location of first-aid equipment
6. Evacuation procedures to be followed in case of emergencies
7. Heat stress symptoms. All personnel will be advised to watch for signs of heat stress.

New personnel will be briefed on the same points prior to starting work at the site.

7.0 DECONTAMINATION PROCEDURES

If Level B or C protection is worn, decontamination procedures shall be performed in the Contamination Reduction Zone. All disposable garments and spent cartridges/canisters from respiratory equipment will be stored, transported, and properly disposed of in DOT approved 55-gallon drums. Potentially contaminated equipment will be cleaned before leaving the site.

8.0 EMERGENCY CONTINGENCY PLAN

In the event of physical injury, the safety officer or any other qualified person will initiate first aid and, if necessary, call the ambulance. If a chemical exposure is encountered, a physician will be informed, as specifically as possible, of the chemical(s) to which the person had been exposed and the toxicological properties of the chemical(s).

In case of any emergency, the following resources might need to be contacted:

A. Local Resource

Fire Department: **911**

Police Department: **911**

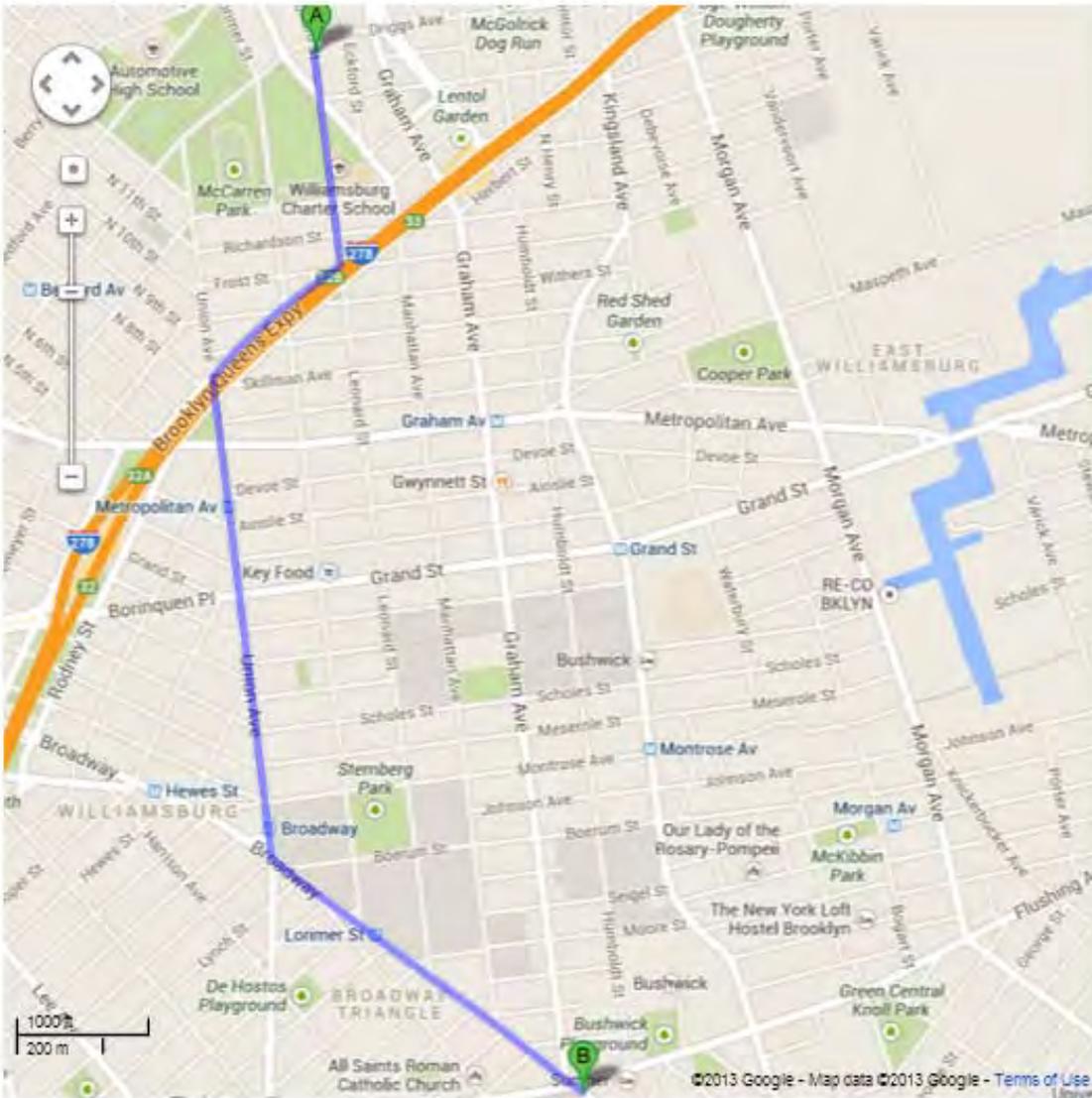
B. Hazardous Waste Spills

New York State Department of Environmental Conservation **1-800-457-7362**

New York City Health, **212-788-5099**

Laurel Environmental Associates, Ltd.: Nights and Weekend Emergencies **516-971-6332**

C. Hospital



A 501 Leonard St, Brooklyn, NY 11222

- | | | |
|----|--|---------------------------|
| 1. | Head south on Leonard St toward Engert Ave
About 2 mins | go 0.3 mi
total 0.3 mi |
| ➤ | 2. Turn right onto Meeker Ave
About 52 secs | go 0.2 mi
total 0.6 mi |
| ⬅ | 3. Turn left onto Union Ave
About 4 mins | go 0.7 mi
total 1.3 mi |
| ↙ | 4. Slight left onto Broadway
Destination will be on the right
About 2 mins | go 0.6 mi
total 1.8 mi |

B Woodhull Medical Center
760 Broadway, Brooklyn, NY 11206

9.0 HEAT STRESS CASUALTY PREVENTION PLAN

A. Identification and Treatment

1) HEAT EXHAUSTION

Symptoms: Usually begins with muscular weakness, dizziness and a staggering gait. Vomiting is frequent. The bowels may move involuntarily. The victim is very pale, his/her skin is clammy and he/she may perspire profusely. The pulse is weak and fast, breathing is shallow. He/she may faint unless he/she lies down. This may pass, but sometimes it remains and death could occur.

First Aid: Immediately remove the victim to a shady or cool area with good air circulation. Remove all protective outerwear. Call a physician. Treat the victim for shock. (Make him lie down, raise his feet 6-12 inches, and keep him warm but loosen all clothing). If the victim is conscious, it may be helpful to give him sips of a salt water solution (1 teaspoon of salt to 1 glass of water). Transport victim to a medical facility.

2) HEAT STROKE

Symptoms: This is the most serious of heat casualties due to the fact that the body excessively overheats. Body temperatures are often are between 107°-110°F. There is often pain in the head, dizziness, nausea, oppression, and a dryness of the skin and mouth. Unconsciousness follows quickly and death is imminent if exposure continues. The attack will usually occur suddenly.

First Aid: Immediately evacuate the victim to a cool and shady area. Remove all protective outer wear and all personal clothing. Lay him on his back with the head and shoulders slightly elevated. It is imperative that the body temperature be lowered immediately. This can be accomplished by applying cold wet towels, ice bags, etc., to the head. Sponge off the bare skin with cool water or rubbing alcohol, if available, or even place him in a tub of cool water. The main objective is to cool him without chilling him. Give no stimulants. Transport the victim to a medical facility as soon as possible.

B. Prevention of Heat Stress

- 1) One of the major causes of heat casualties is the depletion of body fluids. On-site there will be plenty of fluids available. Personnel should replace water and salts lost from perspiration. Salts can be replaced by either a 0.1% salt solution, more heavily salted foods, or commercial mixes such as Gatorade®.
- 2) A work schedule will be established so that the majority of the work day will be during the morning hours of the day before ambient air temperature levels reach their highs if high air temperatures are anticipated.
- 3) A work/rest guideline will be implemented for personnel required to wear Level B protection, if this situation arises. This guideline is as follows:

<u>Ambient Temperatures</u>	<u>Maximum Working Time</u>
Above 90°F	< 1 hour
80° - 90° F	1 hour
70 °- 80° F	2 hours
60 °- 70° F	3 hours
50 °- 60° F	4 hours
40° - 50°F	5 hours
30° - 40° F	6 hours
Below 30° F	8 hours

A sufficient period will be allowed for personnel to "cool down". This may require separate shifts of workers during operations.

LOG FOR ALL PERSONNEL ENTERING THE SUBJECT PROPERTY

SITE:

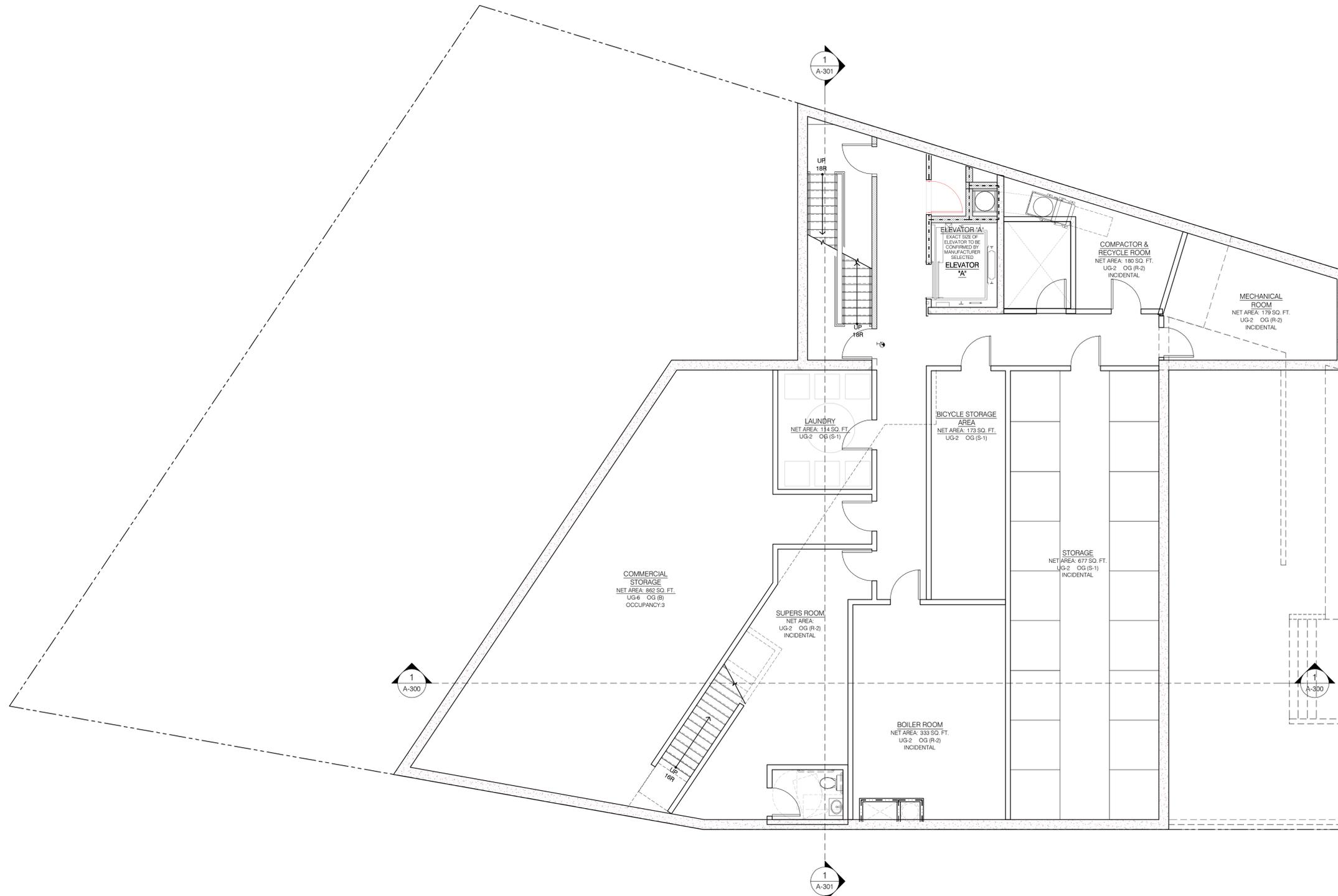
LOCATION:

The undersigned certify that they have read this Health and Safety Plan document, understand it, and will comply with its provisions.

Name (Please Print)	Affiliation	Date	Time
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

APPENDIX E

Tgf g_xg_mr o gpv'Rrc pu



CELLAR FLOOR GROSS AREA: 4007.9

PLAN SYMBOLS - LEGEND

	GYPHUM BOARD WALL (GWB) NOT FIRE RATED SEE WALL TYPES		EXIT SIGN		BATH ROOM MECH. VENTILATION		WINDOW TAG		DETAIL NUMBER ENLARGE DETAIL SHEET NUMBER
	1 HR. FIRE RATED WALL SEE WALL TYPES		EXIT SIGN W/DIRECTION		NON-FREEZE WALL HOSE BIB 'RECESSED'		DOOR TAG		ELEVATION NUMBER BUILDING ELEVATION SHEET NUMBER
	2 HR. FIRE RATED WALL SEE WALL TYPES		REVISED AREA & REVISION NUMBER		COMBINATION SMOKE & CARBON MONOXIDE DETECTOR: HARDWIRED SMOKE & CARBON MONOXIDE DETECTORS SHALL COMPLY WITH NYC 907.2.9.1.3 & 908.7 AND SHALL BE PROVIDED ON THE CEILING OR WALL OUTSIDE OF EACH ROOM USED FOR SLEEPING PURPOSES WITHIN 15 FEET OF THE DOOR TO SUCH ROOM; IN EACH ROOM USED FOR SLEEPING PURPOSES; OR IN EACH STORY OF A DWELLING UNIT		WALL TAG		SECTION NUMBER BUILDING SECTION SHEET NUMBER
	3 HR. FIRE RATED WALL SEE WALL TYPES		C.M.U. WALL SEE WALL TYPES FOR FIRE RATING		FIRE ALARM REMOTE ANNUNCIATOR PANEL		FIRE ALARM MANUAL PULL STATION		SECTION NUMBER DETAIL SECTION SHEET NUMBER
	POURED IN PLACE CONCRETE WALL REFER TO STRUCTURAL DRAWINGS		SMOKE DETECTOR: "e" DENOTES ELEVATOR RECALL		FIRE ALARM PANEL		ELECTRIC PANEL		CARBON MONOXIDE SENSOR
	FUTURE OUTWARD DOOR SWING OF ADAPTABLE BATH ROOM ONCE THE DWELLING UNIT IS OCCUPIED BY PERSON W/ PHYSICAL DISABILITY.		HEAT DETECTOR		T.D. = X'X" - ACTUAL T.D. (TRAVEL DISTANCE) MAX. = X'X" - MAX. T.D. (TRAVEL DISTANCE) ALLOWED		CARBON MONOXIDE SENSOR		HEAT DETECTOR

1 CELLAR FLOOR PLAN
A-100.00 3/16" = 1'-0"



KEY PLAN

BLOCK 2697 LOT 7

ISSUES/REVISIONS

INTERIOR DESIGNER:

STRUCTURAL ENGINEER:

MEP ENGINEER:

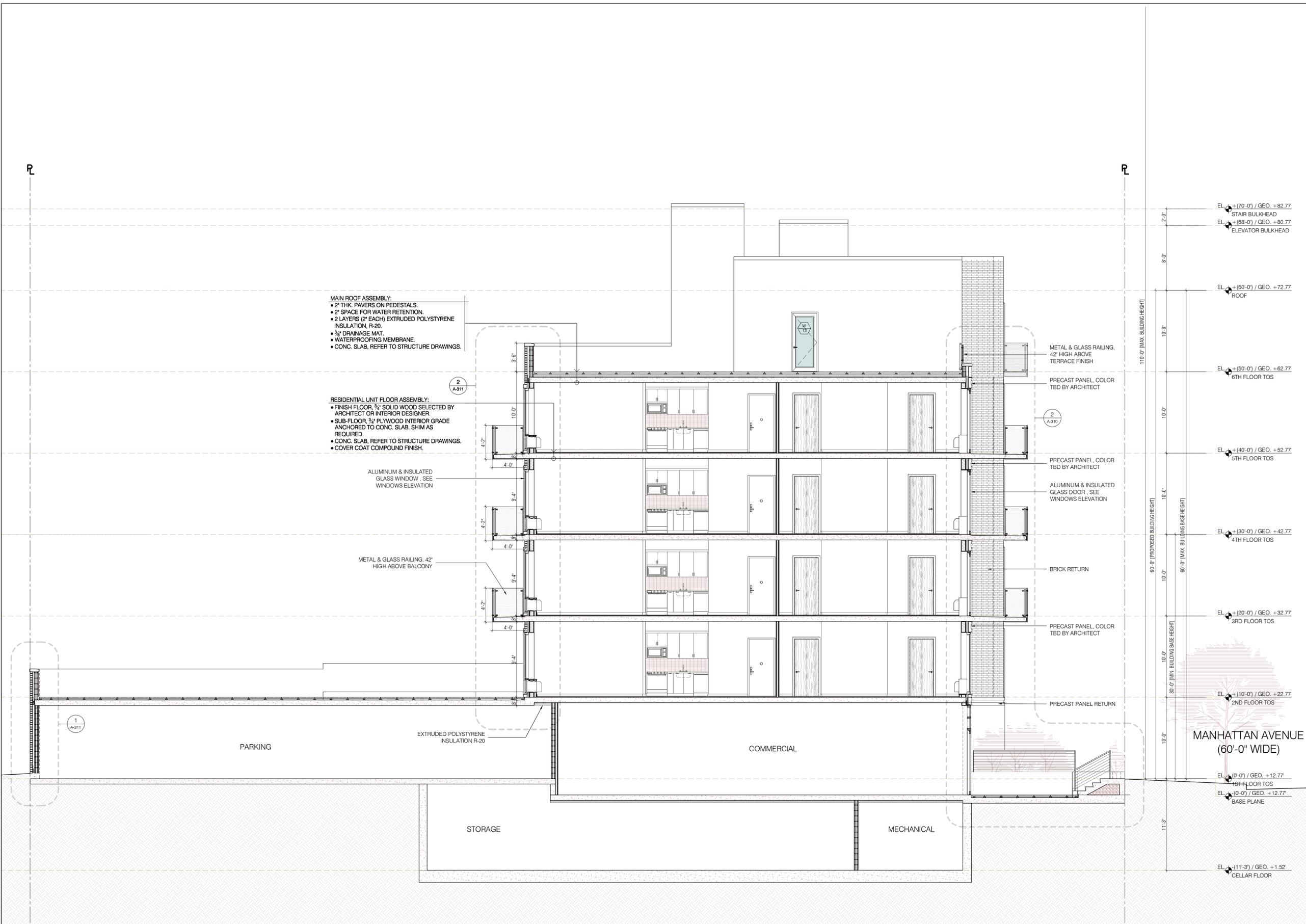
CLIENT

KARL FISCHER ARCHITECT
530 BROADWAY, 9th FLOOR, NEW YORK, NY 10012
 TEL: (212) 219-9733 FAX: (212) 219-8980
 1420 NOTRE-DAME WEST, MONTREAL, QC H3C 1K9
 TEL: (514) 933-4137 FAX: (514) 933-0479
 WEB SITE: WWW.KFARCHITECT.COM
 E-MAIL: KFA@KFARCHITECT.COM

project title
MIXED-USE DEVELOPMENT
501 LEONARD STREET, BROOKLYN, NY 11222

drawing title
CELLAR FLOOR PLAN

scale	3/16" = 1'-0"	project no.	12-39
date	DEC 2012	sheet no.	----
drawn		drawing no.	A-100.00
checked	KF		



MAIN ROOF ASSEMBLY:

- 2" THK. PAVERS ON PEDESTALS.
- 2" SPACE FOR WATER RETENTION.
- 2 LAYERS (2" EACH) EXTRUDED POLYSTYRENE INSULATION, R-20.
- 3/8" DRAINAGE MAT.
- WATERPROOFING MEMBRANE.
- CONC. SLAB, REFER TO STRUCTURE DRAWINGS.

RESIDENTIAL UNIT FLOOR ASSEMBLY:

- FINISH FLOOR, 3/4" SOLID WOOD SELECTED BY ARCHITECT OR INTERIOR DESIGNER.
- SUB-FLOOR, 3/4" PLYWOOD INTERIOR GRADE ANCHORED TO CONC. SLAB. SHIM AS REQUIRED.
- CONC. SLAB, REFER TO STRUCTURE DRAWINGS.
- COVER COAT COMPOUND FINISH.

ALUMINUM & INSULATED GLASS WINDOW, SEE WINDOWS ELEVATION

METAL & GLASS RAILING, 42" HIGH ABOVE BALCONY

EXTRUDED POLYSTYRENE INSULATION R-20

METAL & GLASS RAILING, 42" HIGH ABOVE TERRACE FINISH

PRECAST PANEL, COLOR TBD BY ARCHITECT

PRECAST PANEL, COLOR TBD BY ARCHITECT

ALUMINUM & INSULATED GLASS WINDOW, SEE WINDOWS ELEVATION

BRICK RETURN

PRECAST PANEL, COLOR TBD BY ARCHITECT

PRECAST PANEL RETURN

EL. +170'-0" / GEO. +82.77 STAIR BULK-HEAD
 EL. +168'-0" / GEO. +80.77 ELEVATOR BULK-HEAD

EL. +160'-0" / GEO. +72.77 ROOF

EL. +150'-0" / GEO. +62.77 6TH FLOOR TOS

EL. +140'-0" / GEO. +52.77 5TH FLOOR TOS

EL. +130'-0" / GEO. +42.77 4TH FLOOR TOS

EL. +120'-0" / GEO. +32.77 3RD FLOOR TOS

EL. +110'-0" / GEO. +22.77 2ND FLOOR TOS

EL. +10'-0" / GEO. +12.77 1ST FLOOR TOS
 EL. +10'-0" / GEO. +12.77 BASE PLANE

EL. +11'-3" / GEO. +1.52' CELLAR FLOOR

110'-0" [MAX BUILDING HEIGHT]

60'-0" [PROPOSED BUILDING HEIGHT]

60'-0" [MAX BUILDING BASE HEIGHT]

30'-0" [MIN. BUILDING BASE HEIGHT]

11'-3"

MANHATTAN AVENUE (60'-0" WIDE)

PARKING

COMMERCIAL

STORAGE

MECHANICAL

KEY PLAN

BLOCK 2697 LOT 7

issue	rev	date	description
ISSUES/REVISIONS			

INTERIOR DESIGNER:

STRUCTURAL ENGINEER:

MEP ENGINEER:

CLIENT:

KARL FISCHER ARCHITECT
 CHIO OVA RAIC AIA
 530 BROADWAY, 9TH FLOOR, NEW YORK, NY 10012
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 WEB SITE: WWW.KFARCHITECT.COM
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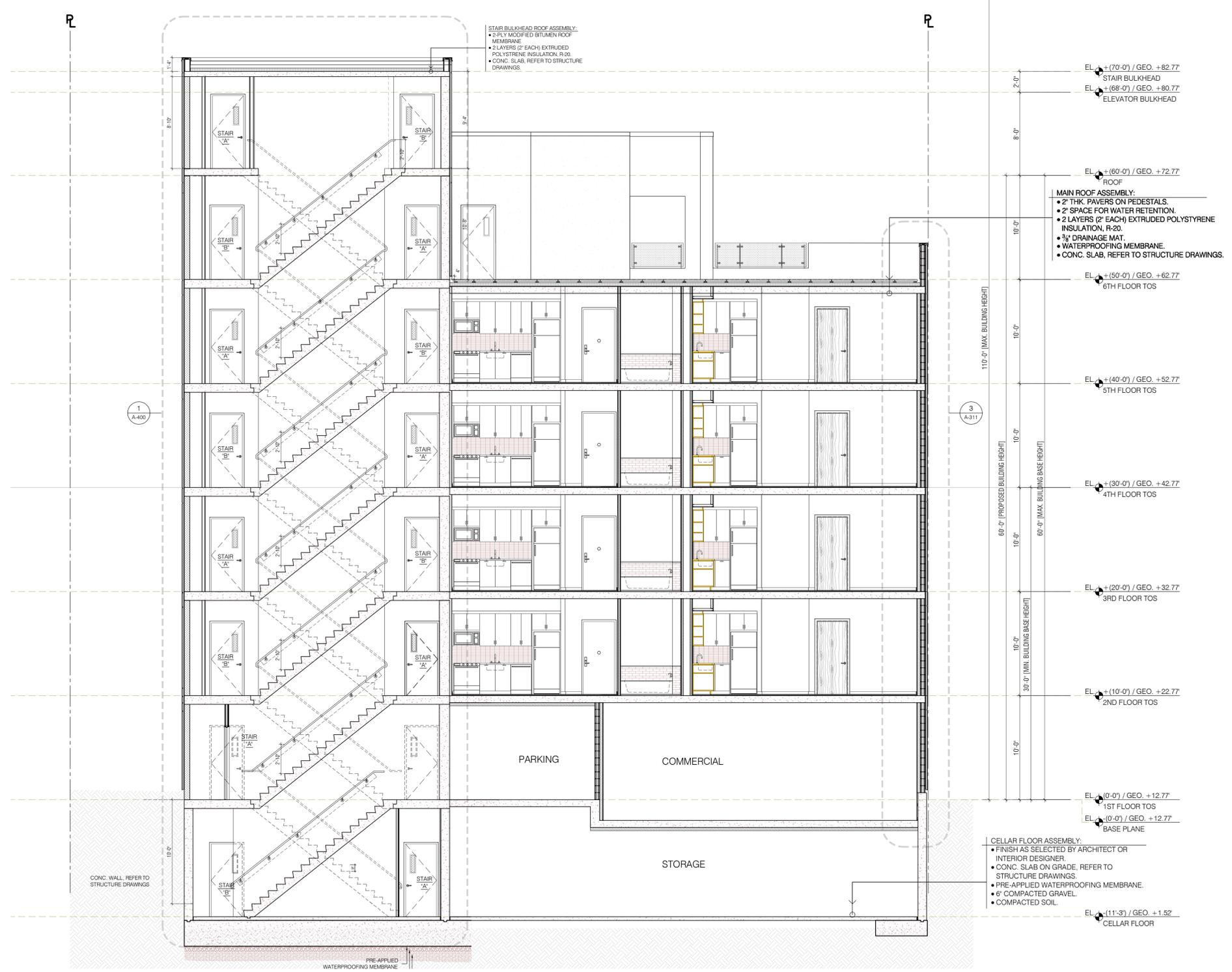
project title
MIXED-USE DEVELOPMENT
 501 LEONARD STREET, BROOKLYN, NY 11222

drawing title
EAST-WEST BUILDING SECTION

dwb no

scale	3/16" = 1'-0"	project no.	12-39
date	DEC 2012	sheet no.	----
drawn		drawing no.	A-300.00
checked	KF		

1 EAST-WEST SECTION
 A-300.00 3/16" = 1'-0"



1 WEST ELEVATION - MANHATTAN AVENUE
 A-301.00 3/16" = 1'-0"

KEY PLAN			
BLOCK 2697 LOT 7			
Issue	rev	date	description
ISSUES/REVISIONS			
INTERIOR DESIGNER:			
STRUCTURAL ENGINEER:			
MEP ENGINEER:			
CLIENT:			
KARL FISCHER ARCHITECT <small>ONIA, RAIC, AIA</small> 530 BROADWAY, 9TH FLOOR, NEW YORK, NY 10012 TEL: (212) 219-9733 FAX: (212) 219-8980 1420 NOTRE-DAME WEST, MONTREAL, QC H3C 1K9 TEL: (514) 933-4137 FAX: (514) 933-0479 WEB SITE: WWW.KFARCHITECT.COM E-MAIL: KARB@KFARCHITECT.COM			SEAL
project title			
MIXED-USE DEVELOPMENT			
501 LEONARD STREET, BROOKLYN, NY 11222			
drawing title			
SOUTH-NORTH BUILDING SECTION MANHATTAN AVENUE			
dob no			
scale	3/16" = 1'-0"	project no.	12-39
date	DEC 2012	sheet no.	----
drawn		drawing no.	
checked	KF	A-301.00	

ZONING ANALYSIS				
ADDRESS:	501 LEONARD STREET, BROOKLYN, NY 11222			
Block:	2697			
Lot(s):	7			
Zoning District(s):	MX-8, M 1-2 (Equivalent R6)			
Inclusionary Housing District	Brooklyn Community District 1			
Zoning Map:	13a			
Lot Area:	7,918 s.f.			
E-Designation	E-138: Underground Gasoline Storage Tanks Testing Protocol			
Applicable ZR Section	Item	Required/Permitted	Proposed	Compliance
Use Regulations				
22-00	General Provisions, Uses Permitted	UG 1, 2: Residential UG 4: Community Facility UG 5-11: Commercial and Retail UG 17: Manufacturing	UG: 2 (Quality Housing) UG: 6 (eating and drinking establishment)	Complies
22-12	Use Group 2	All residential uses and accessory uses	Proposed multiple dwelling units and accessory uses	Complies
Bulk Regulations for residential Buildings in Residence Districts				
123-63	Maximum Floor Area in Mixed Use Building in an inclusionary housing district	The max FAR in a Mixed Use building in an inclusionary housing district shall be 2.20 (without inclusionary housing) and 2.42 (With inclusionary housing)	Max FAR: 2.20	Complies
123-64	Residential Floor Area Ratio	The max. FAR permitted in R6 is 2.20.	Proposed Residential FAR is: 15608.7 sf = 1.97 FAR	Complies
123-64	Commercial Floor Area Ratio	The max. FAR permitted in R6 is 2.00	Proposed Residential FAR is: 1808.0 sf = 0.23 FAR	Complies
123-64	Community Facility Floor Area Ratio	The max. FAR permitted in R6 is 2.20	Proposed Residential FAR is: 17416.7 sf = 2.2 FAR	Complies
123-64	Maximum Floor Area in Mixed Use Building	The max FAR in a Mixed Use building shall be the the greatest floor area permitted by commercial, community facility or residential use. Max FAR = Base FAR = 2.20	Proposed Mixed Use FAR is: xxx sf = xx FAR	Complies
123-64 (b)	Lot Coverage	Lot coverage requirements shall not apply	Lot coverage requirements do not apply	Complies
23-22	Maximum Number of Dwelling Units	Max. permitted no. of DU = 17419 s.f./680 = 25.6 DU = 26 DU	20 DU are proposed	Complies
23-30	Lot Area and Lot Width Regulations			
23-32	Minimum Lot Area or Lot Width for Residences	In R6A, Min lot area = 1,700 s.f., Min lot Width = 18 ft.	Lot Area = 7,918 s.f., Lot width = 56'-1.5" (min) See Lot Diagram (Z-002)	Complies
123-651	Yard Regulations			
123-652	Minimum Required Front Yard	No front yard is required	A front yard of 15'-0" is provided	Complies
23-331	Minimum Required Side Yards	No side yard is required or min. of 8 ft. if provided	No side yard is provided	Complies
23-332	Minimum Required Rear Yard Equivalent for through lot	Min. of 60'-0" rear yard equivalent is required at residential portion of building where the through lot is greater than 110' in depth street to street	Min. of 60'-0" rear yard equivalent is provided where the through lot is greater than 110' in depth street to street	Complies
Height And Set Back Regulations				
123-60	Permitted Obstructions	The following shall not be considered obstructions and may thus penetrate a maximum height limit or front or rear sky exposure planes: (a) Balconies, unenclosed subject to the provisions of ZR (23-13) (b) Chimneys or flues, with a total width not exceeding 10% of the aggregate width of street walls of a building at any given level (c) Elevator or stair bulkheads, each having an aggregate width of street walls equal to not more than 30 feet. However, the product, in square feet, of the aggregate width of street walls of such obstructions facing each street frontage, times their average height, in feet, shall not exceed a figure equal to four times the width, in feet, of the street wall of the building facing such frontage (f) Parapet walls, not more than 4 ft. high	Proposed stair bulkhead are complying, see (Z-001) Proposed parapet walls are 4 ft. max. above roof	Complies
23-621	Permitted Obstructions in Certain Districts	The permitted obstructions set forth in ZR 23-62 shall apply to any building or other structure in addition, a dormer may be allowed as a permitted obstruction within a required setback area. Such dormer may exceed a maximum base height provided that on any street frontage, the aggregate width of all dormers at the maximum base height does not exceed 60 percent of the length of the street wall of the highest story entirely below the maximum base height. For each foot of height above the maximum base height, the aggregate width of all dormers shall be decreased by one percent of the street wall width of the highest story entirely below the maximum base height.	See (Z-001) Zoning Diagram	Complies
Accessory Off-Street Parking and Loading Regulations				
25-23	Accessory Off-Street Parking Spaces	Off-Street Parking Spaces in R6 - 50% of dwelling units is required min. 5% of the total parking spaces shall be for handicap use. 50% of 20 units = 10 parking spaces required, 5% of 10 parking spaces = 0.5 handicap use parking spaces required	10 parking spaces are provided, 1 handicap use parking spaces is provided	Complies
44-23	Accessory Off-Street Parking for Commercial Uses in a Manufacturing district	Waiver of requirements for spaces below minimum number - commercial in M1, waiver for less than 15 spaces 1 space per 300 sf for service uses	1808sf/ 300sf = 6.03 = 6 Spaces < 15 spaces Parking waived for commercial for small number of spaces	Complies
44-42	Size of Spaces	Size of spaces required - 300 sf unobstructed maneuvering area. 10 parking spaces x 300 sf = 3000 sf	Proposed parking area : 3600 sf	Complies
44-42	Size of Spaces	Required parking space size - 18'-0" x 8'-6"	18'-0" x 8'-6" proposed parking space size	Complies
25-811	Enclosed Bicycle Parking Spaces	1 bicycle parking for each 2 dwelling units is required Required no. of spaces = 20/2 = 10 bicycle spaces	10 bicycle parking spaces are provided for 20 dwelling units. See (A-100)	Complies
25-83	Restrictions on Operations, Size and Location of Bicycle Parking spaces	All enclosed bicycle parking spaces shall be provided on the same zoning lot as the building. All enclosed bicycle parking's spaces shall be surrounded on all sides by solid enclosure, except where a parking garage is open at the sides, and covered by a roof for weather protection. Each bicycle space shall adjoin a rack or similar system for securing the bicycle. 15 s.f. of area shall be provided for each bicycle space. A plaque shall be placed at the exterior of the entry to the bicycle parking area with lettering at least 3/4 in. in height stating "Bicycle Parking". Spaces provided for enclosed Bicycle Parking Spaces shall be excluded from the definition of floor area provided that: (a) Each space does not exceed 15 s.f. (b) the Bicycle Parking space provided meet the requirements of ZR (25-83) Required spaces = 17 x 15 sf = 255 s.f.	All Bicycle Parking spaces are enclosed with the signage as required. See first floor plan (A-100). Proposed Bicycle Parking area 152 sf = 10 spaces	Complies
25-85	Floor Area Exemption		Bicycle parking spaces are located at cellar level; no exemption taken	Complies

ZONING ANALYSIS				
23-60	Height And Set Back Regulations			
123-62	Permitted Obstructions	The following shall not be considered obstructions and may thus penetrate a maximum height limit or front or rear sky exposure planes: (a) Balconies, unenclosed subject to the provisions of ZR (23-13) (b) Chimneys or flues, with a total width not exceeding 10% of the aggregate width of street walls of a building at any given level (c) Elevator or stair bulkheads, each having an aggregate width of street walls equal to not more than 30 feet. However, the product, in square feet, of the aggregate width of street walls of such obstructions facing each street frontage, times their average height, in feet, shall not exceed a figure equal to four times the width, in feet, of the street wall of the building facing such frontage (f) Parapet walls, not more than 4 ft. high	Proposed stair bulkhead are complying, see (Z-001) Proposed parapet walls are 4 ft. max. above roof	Complies
23-621	Permitted Obstructions in Certain Districts	The permitted obstructions set forth in ZR 23-62 shall apply to any building or other structure in addition, a dormer may be allowed as a permitted obstruction within a required setback area. Such dormer may exceed a maximum base height provided that on any street frontage, the aggregate width of all dormers at the maximum base height does not exceed 60 percent of the length of the street wall of the highest story entirely below the maximum base height. For each foot of height above the maximum base height, the aggregate width of all dormers shall be decreased by one percent of the street wall width of the highest story entirely below the maximum base height.	See (Z-001) Zoning Diagram	Complies
Height And Setback Regulations				
123-66	Setback Regulations	Setbacks above max base height: 15'-0" along narrow street	Proposed Building does not exceed base height, no set back required	Complies
123-662	Maximum Building Height	Min. base height = 30'-0" Max base height = 60'-0" Max. building height = 110'-0"	Proposed max base height = 60'-0" Proposed max building height = xx'-x"	Complies
Street Tree Planting and planting Strip requirements				
26-40	Street Tree Planting Requirements	1 tree shall be provided for every 25' of street frontage of the zoning lot; such trees shall be planted along the entire length of the curb of the street adjacent to the zoning lot. The species and caliper of all street trees shall be determined by Department of Parks & Recreation.	Manhattan Avenue - 56'-1.5' / 25' = 2 Trees Required, 1 tree proposed, based on existing utility restriction. 1 not provided - Fee shall be paid to the parks department or trees shall be planted in alternate location as approved by the Parks Department. Leonard Street - 85' / 25' = 3 Trees Required, 2 trees proposed, based on existing utility installation. 1 not provided - Fee shall be paid to the parks department or trees shall be planted in alternate location as approved by the Parks Department.	Complies
123-81	Planting Strips		No planting strip provided	Complies
Accessory Off-Street Parking and Loading Regulations				
25-23	Accessory Off-Street Parking Spaces	Off-Street Parking Spaces in R6 - 50% of dwelling units is required min. 5% of the total parking spaces shall be for handicap use. 50% of 20 units = 10 parking spaces required, 5% of 10 parking spaces = 0.5 handicap use parking spaces required	10 parking spaces are provided, 1 handicap use parking spaces is provided	Complies
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44-42	Size of Spaces	Size of spaces required - 300 sf unobstructed maneuvering area. 10 parking spaces x 300 sf = 3000 sf	Proposed parking area : 3600 sf	Complies
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25-85	Floor Area Exemption		Bicycle parking spaces are located at cellar level; no exemption taken	Complies

KEY PLAN	
BLOCK 2697	LOT 7

Issue	Rev	Date	Description
ISSUES/REVISIONS			

INTERIOR DESIGNER:
STRUCTURAL ENGINEER:
MEP ENGINEER:
CLIENT:

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 1420 NOTRE-DAME WEST, MONTREAL, QC H3C 1K9
 TEL: (514) 933-4137 FAX: (514) 933-0409
 WEB SITE: WWW.KARLFISCHERARCHITECT.COM

project title	MIXED-USE DEVELOPMENT
501 LEONARD STREET, BROOKLYN, NY 11222	

drawing title	ZONING ANALYSIS
---------------	-----------------

scale	project no.	12-39
date	sheet no.	----
drawn	drawing no.	Z-001.00
checked	KF	

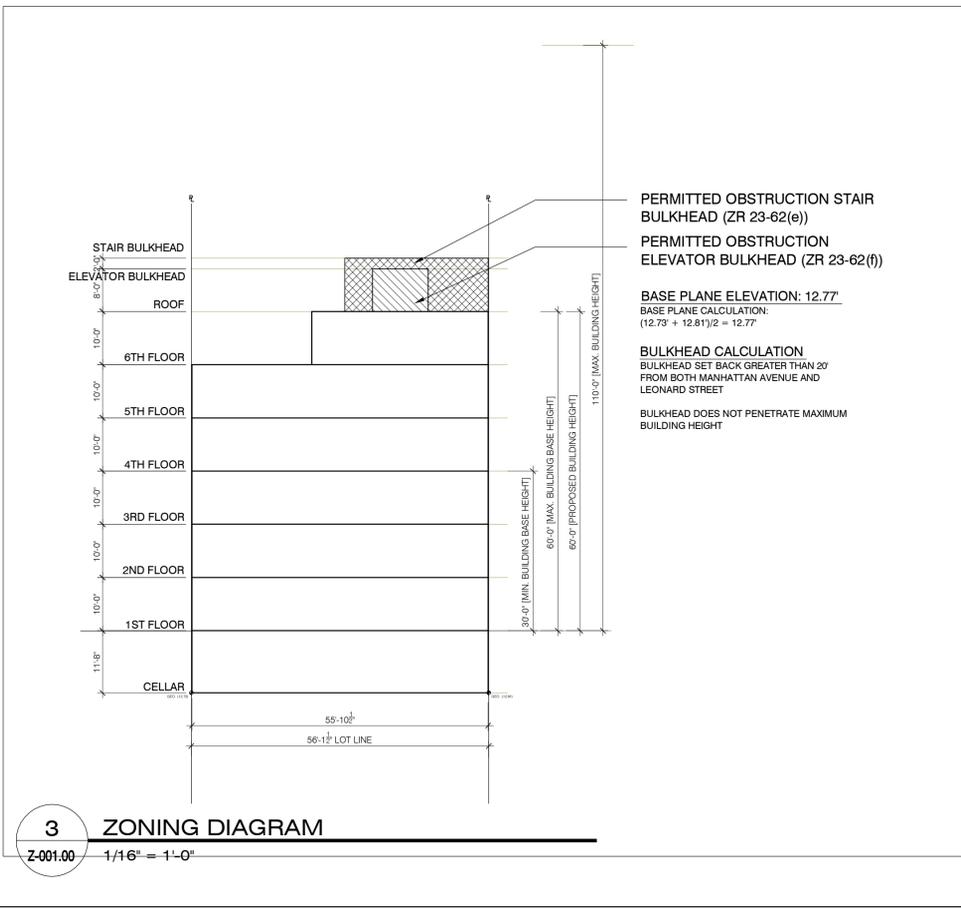
501 LEONARD STREET , BROOKLYN 11222

BUILDING AREA CHART (A)													
Floor	Gross Floor Area S.F. Commercial	Gross Floor Area S.F. Residential	Total Gross Floor Area (S.F.)	Mech. Deduction	Bicycle Parking	Laundry Room	Bulkhead	Parking	Total Floor Area Deduction (S.F.)	Zoning Floor Area S.F. Commercial	Zoning Floor Area S.F. Residential	Total Zoning Floor Area (S.F.)	F.A.R.
CELLAR		4,083.8	4,083.8		152.0	241.0							
1ST	1,808.0	4,591.4	6,399.4		0.0	0.0	0.0	3,538.7	3,538.7	1,808.0	1,052.7	2,860.7	0.36
2ND		3,376.5	3,376.5	54.1	0.0	0.0	0.0	0.0	54.1	0.0	3,322.4	3,322.4	0.42
3RD		3,376.5	3,376.5	54.1	0.0	0.0	0.0	0.0	54.1	0.0	3,322.4	3,322.4	0.42
4TH		3,376.5	3,376.5	54.1	0.0	0.0	0.0	0.0	54.1	0.0	3,322.4	3,322.4	0.42
5TH		3,376.5	3,376.5	54.1	0.0	0.0	0.0	0.0	54.1	0.0	3,322.4	3,322.4	0.42
6TH		1,285.2	1,285.2	18.8	0.0	0.0	0.0	0.0	18.8	0.0	1,266.4	1,266.4	0.16
ROOF		381.5	381.5				381.5		381.5	0.0	0.0	0.0	0.00
TOTAL (above grade)	1,808.0	19,764.1	21,572.1	235.2	0.0	0.0	381.5	3,538.7	4,155.4	1,808.0	15,608.7	17,416.7	2.2
TOTAL	1,808.0	23,847.9	25,655.9	235.2	152.0	241.0	381.5	3,538.7	4,155.4	1,808.0	15,608.7	17,416.7	2.2

BUILDING AREA CHART (B)	
LOT AREA	7,918.0 S.F.
MAX. PERMITTED F.A.R.	2.2
MAX. ALLOWABLE FLOOR AREA =	7,918.0 X 2.2 = 17,419.6 S.F.
Proposed Commercial Gross Floor Area	1,808.0 S.F.
Proposed Residential Gross Floor Area	19,764.1 S.F.
PROPOSED TOTAL GROSS FLOOR AREA	21,572.1 S.F.
PROPOSED TOTAL FLOOR AREA DEDUCTION	4,155.4 S.F.
Proposed Commercial Zoning Floor Area	1,808.0 S.F.
Proposed Residential Zoning Floor Area	15,608.7 S.F.
PROPOSED TOTAL ZONING FLOOR AREA	17,416.7 S.F.
PROPOSED F.A.R.	2.20
UNDERDEVELOPED ZONING FLOOR AREA	2.9 S.F.

UNIT CHART						
Dwelling Units Sellable Area (S.F.)						
Floor	A	B	C	D	No. of Units Per Floor	Residential Sellable Gross Floor Area
CELLAR					0	
1ST						
2ND	794	819	670	479	4	2,762
3RD	794	819	670	479	4	2,762
4TH	794	819	670	479	4	2,762
5TH	794	819	670	479	4	2,762
6TH	776				1	776
ROOF						
TOTAL					17	11,824

UNIT MIXTURE COUNT		
UNIT TYPE	COUNT	%
STUDIO	0	0%
1 BEDROOM	8	47%
2 BEDROOM	9	53%
3 BEDROOM	0	0%
1 BEDROOM + H.O.	0	0%
TOTAL NUMBER OF UNITS	17	100%
MAX. ALLOWABLE NUMBER OF UNITS: 26		



3 ZONING DIAGRAM
 Z-001.00 1/16" = 1'-0"