

88-96 WITHERS STREET

BROOKLYN, NEW YORK

Remedial Action Work Plan

NYC VCP Project Number: 15CVCP158K

OER Project Number: 15HAZ069K

Prepared for:

Caro Enterprises

33 East 20th Street – Suite 400

New York, New York 10003-1349

Prepared by:

Nelson, Pope & Voorhis

572 Walt Whitman Road

Melville, New York 11747-2188

SMcGinn@nelsonpoppe.com

(631) 427-5665

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REMEDIAL ACTION WORK PLAN

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LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AS/SVE	Air Sparging/Soil Vapor Extraction
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
C&D	Construction and Demolition
CEQR	City Environmental Quality Review
CFR	Code of Federal Regulations
CHASP	Construction Health and Safety Plan
COC	Certificate of Completion
CQAP	Construction Quality Assurance Plan
CSOP	Contractors Site Operation Plan
DCR	Declaration of Covenants and Restrictions
ECs/ICs	Engineering Controls and Institutional Controls
ELAP	Environmental Laboratory Accreditation Program
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations Emergency Response
IRM	Interim Remedial Measure
BCA	Brownfield Cleanup Agreement
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYS DEC	New York State Department of Environmental Conservation
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
NYC OER	New York City Office of Environmental Remediation
NYC VCP	New York City Voluntary Cleanup Program
NYCRR	New York Codes Rules and Regulations
NYS DEC	New York State Department of Environmental Conservation

NYS DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
ORC	Oxygen-Release Compound
OSHA	United States Occupational Health and Safety Administration
PCBs	Professional Engineer Polychlorinated Biphenyls
PE	Professional Engineer
PID	Photo Ionization Detector
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan or Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design
RI	Remedial Investigation
RMZ	Residual Management Zone
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SSDS	Sub-Slab Depressurization System
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCL	Target Compound List
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

CERTIFICATION

I, **Thomas F. Lembo, P.E.**, am currently a registered professional engineer licensed by the State of New York. I performed professional engineering services and had primary direct responsibility for designing the remedial program for the **88-96 Withers Street** site, site number 15CVCP158K. I certify to the following:

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

T. F. LEMBO

Name

074701

PE License Number

[Handwritten Signature]

Signature

6.15.15

Date



I, **Eric C. Arnesen, LPG**, am a qualified Environmental Professional. I will have primary direct responsibility for implementation of the remedial program for the **88-96 Withers Street**, site number 15CVCP158K. I certify to the following:

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

ERIC C. ARNESEN

QEP Name

[Handwritten Signature]

QEP Signature

6/15/15

Date

EXECUTIVE SUMMARY

Nelson, Pope & Voorhis (NP&V) is working with the NYC Office of Environmental Remediation (OER) to investigate and remediate a 12,500-square foot site located at 88-96 Withers Street in Brooklyn, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

Site Location and Current Usage

The Site is located in Brooklyn, New York City and is identified as Block 2742 and Lots 17 & 20 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 12,500-square feet and is bounded by Withers Street to the north, commercial and residential development to the south, Leonard Street to the east, and commercial and residential development to the west. A map of the site boundary is shown in Figure 2. Currently, the Site is occupied by a vacant commercial building.

Summary of Proposed Redevelopment Plan

The development project consists of a nine (9) story commercial and residential building. The building will have commercial retail unit and lobby on the first floor, mechanical facilities on the second floor and a total of thirty-three residential units on the third through ninth floors. The building will be situated on a concrete slab foundation and a poured concrete foundation that forms a partial basement. Parking will be provided on the west side of the building and will consist of partially covered ground level parking which can accommodate seventeen automobiles. As part of this development, the referenced lot(s) are expected to be merged into a single lot. Current zoning designation is C 8-1 (Commercial District). The proposed site use is consistent with existing zoning for the property.

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

Summary of Environmental Findings

1. Elevation of the property is approximately fifteen feet.
2. Depth to groundwater is approximately ten feet at the Site.
3. Groundwater flow is generally from east to west beneath the Site.
4. Depth to bedrock is approximately 800 feet at the Site.
5. The stratigraphy of the site, from the surface down, consists of eight feet of fill underlain by silty sand down to at least twelve feet.
6. Soil/fill samples collected during the RI were compared to NYSDEC Part 375-6 Unrestricted Use (Track 1) and Restricted Residential Use (Track 2) Soil Cleanup Objectives (SCOs). Soil/fill samples results showed the presence of several volatile and semi-volatile organic compounds as well as pesticides and metals. No PCBs were detected in any of the samples submitted for laboratory analysis. One VOC, acetone (maximum of 198 ug/kg) exceeded its respective Track 1 Unrestricted Use SCOs in three shallow soil samples. Several SVOCs were detected above their Restricted Residential SCOs and included benzo(a)anthracene (max of 6080 ug/kg), benzo(b)fluoranthene (max of 7730 ug/kg), benzo(a)pyrene (max of 5630 ug/kg), benzo(k)fluoranthene (max of 2810 ug/kg), chrysene (max of 5660 ug/kg), dibenzo(a,h)anthracene (max of 851 ug/kg), and indeno(1,2,3-cd)pyrene (max of 4670 ug/kg) were identified in shallow soil sample (B-5) indicating a shallow hotspot. SVOCs were all below Restricted Residential SCOS in all other soil borings. Four pesticide, 4,4-DDD (max of 22.4 ug/kg), 4,4-DDE (max of 25.5 ug/kg), 4,4-DDT (max of 159 ug/kg) and dieldrin (max of 13.8 ug/kg) were detected above their Unrestricted Use SCOs in two shallow sample. Metals including arsenic (max of 21.3 mg/kg), barium (max of 576 mg/kg), copper (max of 485 mg/kg), lead (max of 1410 mg/kg), and mercury (max of 5.88 mg/kg), were detected above Restricted Residential Use SCOs. All metal exceedances were detected in shallow soils. Overall,

the findings were consistent with observations for historical fill sites in areas throughout NYC.

7. Groundwater samples collected in the RI were compared to NYSDEC 6NYCRR Part 703.5 Groundwater Quality Standards (GQS). Groundwater samples collected during the RI did not detect the presence of pesticides or PCBs in any of the samples collected. One VOC, trichloroethylene (TCE) was detected in one of three groundwater samples at a concentration of 111 ug/l and exceeds its respective NYSDEC TOGS groundwater standard of 5 ug/l. TCE was not detected in soil samples. One SVOC, benzoic Acid was detected in all three groundwater samples at maximum concentration of 14.9 ug/l. Unfiltered and filtered groundwater samples were collected from each of the wells and analyzed for metals. Several metals were identified in groundwater, but none exceeded their respective GQSs in filtered water samples.
8. Soil vapor samples collected during the RI were compared to the compounds listed in Table 6.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion. Soil vapor detected the presence of numerous petroleum related and chlorinated volatile organic compounds. The concentrations of petroleum related (BTEX) compounds ranged from 122 $\mu\text{g}/\text{m}^3$ to 588 $\mu\text{g}/\text{m}^3$. Highest concentrations were detected for hexane at 440 $\mu\text{g}/\text{m}^3$. Chlorinated VOCs including methylene chloride, tetrachloroethene (PCE) and trichloroethene (TCE) were detected in soil vapor at elevated concentrations. PCE was detected in three of five samples at maximum concentration of 31 $\mu\text{g}/\text{m}^3$. TCE was detected in three of five samples at maximum concentration of 34 $\mu\text{g}/\text{m}^3$, for which the NYSDOH have established air guideline values. Methylene chloride was detected in two samples at maximum concentration of 160 $\mu\text{g}/\text{m}^3$. All three of these compounds exceeded their respective NYSDOH air guideline values. Concentrations of TCE and methylene chloride require mitigation.

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 all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
3. Establishment of Site Specific Track 4 Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility(s).
6. Excavation and removal of soil/fill exceeding Track 4 Site Specific SCOs. The partial cellar area will be excavated to depths of 10 feet below grade. The “hot spot” area in the center of the property designated as B-5 during the Remedial Investigation will be excavated to a depth of approximately 5 feet below grade. Approximately, 1200 tons of soils will be excavated and removed from this property.

7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.
8. Management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
9. Removal of underground storage tanks (USTs) (if encountered) and closure of petroleum spills (Spill number of existing spill or if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.
10. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site.
11. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
12. Demarcation of residual soil/fill in landscaped areas.
13. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
14. Installation and operation of an active sub-slab depressurization beneath the new building slab. SSDS is not required beneath the parking areas at grade.
15. Installation of vapor barrier system (minimum 20 mil) beneath the building slab as well as behind foundation sidewalls of the proposed building to grade.
16. Construction and maintenance of an engineered composite cover consisting of briefly describe cover type and thickness such as 2-inch concrete or asphalt paved walkways or driveways, landscaped areas consisting of 2 feet of clean imported soil, 6-inch thick

concrete building slab, to prevent human exposure to residual soil/fill remaining under the Site. Import of materials to be used for backfill and cover in compliance with this plan and in accordance 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. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
19. Submission of an approved Site Management Plan (SMP) in the Remedial Action Plan (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. Submission of a RAR that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.
21. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

COMMUNITY PROTECTION STATEMENT

NYC VOLUNTARY CLEANUP PROGRAM

88-96 Withers Street

Brooklyn, New York

NYC VCP SITE NUMBER: 15CVCP158K

Affiliation	Name	Phone	Email address
OER Project Manager (or)	Amanda Duchesne	212-341-2077	aduchesne@dep.nyc.gov
OER Project Manager			
Site Project Manager			
Consultant	Nelson, Pope & Voorhis, LLC	631-427-5665	earnesen@nelsonpoppe.com
Property Owner	Withers 88 Group, LLC		
Construction Manager			
Document Repository	Brooklyn Public Library – Leonard Library 81 Devoe Street Brooklyn, New York 11211		
Link to OER Website	Link to OER Website		

COMMUNITY PROTECTION STATEMENT

The NYC Office of Environmental Remediation (OER) provides governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action Work Plan (“cleanup plan”) describes the findings of prior environmental studies 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 oversight of the NYC OER, 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 CHASP. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is identified at the beginning of the Community Protection Statement.

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

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

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

these areas, please contact the onsite Project Manager or NYC Office of Environmental Remediation Project Manager listed on the first page of this Community Protection Statement document.

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

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

Hours of Operation The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. For this cleanup project, the hours of operation will conform to requirements of Department of Buildings and will be conveyed to OER before the start of the remedial action.

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

Complaint Management The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager, the NYC Office of Environmental Remediation Project Manager listed on the first page of this Community Protection Statement document, or call 311 and mention the Site is in the NYC Voluntary Cleanup Program.

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

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

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

Stockpile Management Soil stockpiles will be kept covered with tarps to prevent dust, 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 public review online. A link to the online document repository and the public library with Internet access nearest the Site are listed on the first page of this Community Protection Statement document

Long-Term Site Management If long-term protection after the cleanup is needed, the property owner will be required to comply with an ongoing Site Management Plan (if Track 1 is not achieved) that calls for continued inspection of protective controls, such as Site covers. The Site Management Plan is evaluated and approved by the NYC Office of Environmental Remediation. Requirements that the property owner must comply with are defined either in the property's deed **or** established through a city environmental designation. 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

NP&V is working with the Office of Environmental Remediation (OER) to investigate and remediate a property located at 88-96 Withers Street in the East Williamsburg section of Brooklyn, New York (the “Site”). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 SITE LOCATION AND CURRENT USAGE

The Site is located in Brooklyn, New York City and is identified as Block 2742 and Lots 17 & 20 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 12,500-square feet and is bounded by Withers Street to the north, commercial and residential development to the south, Leonard Street to the east, and commercial and residential development to the west. A map of the site boundary is shown in Figure 2. Currently, the Site is occupied by a vacant commercial building.

1.2 PROPOSED REDEVELOPMENT PLAN

The development project consists of a nine (9) story commercial and residential building. The building will have commercial retail unit and lobby on the first floor, mechanical facilities on the second floor and a total of thirty-three residential units on the third through ninth floors. The building will be situated on a concrete slab foundation and a poured concrete foundation that forms a partial basement. Parking will be provided on the west side of the building and will

consist of partially covered ground level parking which can accommodate seventeen automobiles. As part of this development, the referenced lot(s) are expected to be merged into a single lot. Current zoning designation is C 8-1 (Commercial District). The proposed site use is consistent with existing zoning for the property.

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

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The area surrounding the subject property consists of a mix of residential, commercial and industrial properties. Specifically, Withers Street is located immediately to the north, beyond which lies Badame-Sessa Memorial Square. To the south and west properties consist of commercial and residential uses. Leonard Street is located immediately to the east and properties beyond consist of commercial and residential uses. No sensitive receptors (i. e. schools, hospitals, daycare centers, etc.) are located within 500 feet of the site.

Figure 3 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, 88-96 Withers Street*”, dated November, 2013 (RIR).

Summary of Past Uses of Site and Areas of Concern

The building was most recently occupied by Strocchia Iron Works but it has also been occupied by a variety of industrial, commercial and manufacturing uses consisting of a fur cleaning and dyeing facility, an auto repair facility and a filling station. The property is listed with the New York City Department of Buildings and the Department of Planning and Zoning Map as a Hazardous Materials “e” Designation (E-138) due to current/historical petroleum of manufacturing uses.

The AOCs identified for this site include:

1. The entire property is occupied by a building that has historically been used for commercial/industrial purposes, all of which engaged in practices that could have impacted the environment.
2. Soils underlying the subject building are suspected to consist of fill material. Analytical results obtained from soil samples collected at the property confirmed elevated levels of semi-volatile organic compounds and metals in excess of their respective regulatory soil cleanup guidelines established at the time the samples were collected.
3. Due to the noted levels of volatile and semi-volatile organic compounds in soils the potential for soil vapor issues may be present at the site.
4. A groundwater sample collected during the previous Phase II ESA detected a volatile organic compound and metals that exceeded their respective standards.

Summary of the Work Performed under the Remedial Investigation

Nelson, Pope & Voorhis undertook the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed seven soil borings across the entire project Site, and collected fourteen 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 three groundwater samples for chemical analysis to evaluate groundwater quality;
4. Installed six soil vapor probes around Site perimeter and collected five samples for chemical analysis. The sixth soil vapor sample could not be retrieved to a malfunction of the Summa canister.

Summary of Environmental Findings

1. Elevation of the property is approximately fifteen feet.
2. Depth to groundwater is approximately ten feet at the Site.
3. Groundwater flow is generally from east to west beneath the Site.
4. Depth to bedrock is approximately 800 feet at the Site.
5. The stratigraphy of the site, from the surface down, consists of eight feet of fill underlain by silty sand down to at least twelve feet.
6. Soil/fill samples collected during the RI were compared to NYSDEC Part 375-6 Unrestricted Use (Track 1) and Restricted Residential Use (Track 2) Soil Cleanup Objectives (SCOs). Soil/fill samples results showed the presence of several volatile and semi-volatile organic compounds as well as pesticides and metals. No PCBs were detected in any of the samples submitted for laboratory analysis. One VOC, acetone (maximum of 198 ug/kg) exceeded its respective Track 1 Unrestricted Use SCOs in three shallow soil samples. Several SVOCs were detected above their Restricted Residential SCOs and included benzo(a)anthracene (max of 6080 ug/kg), benzo(b)fluoranthene (max of 7730 ug/kg), benzo(a)pyrene (max of 5630 ug/kg), benzo(k)fluoranthene (max of 2810 ug/kg), chrysene (max of 5660 ug/kg), dibenzo(a,h)anthracene (max of 851 ug/kg), and indeno(1,2,3-cd)pyrene (max of 4670 ug/kg) were identified in shallow soil sample (B-5) indicating a shallow hotspot. SVOCs were all below Restricted Residential SCOS in all other soil borings. Four pesticide, 4,4-DDD (max of 22.4 ug/kg), 4,4-DDE (max of 25.5 ug/kg), 4,4-DDT (max of 159 ug/kg) and dieldrin (max of 13.8 ug/kg) were detected above their Unrestricted Use SCOs in two shallow sample. Metals including arsenic (max of 21.3 mg/kg), barium (max of 576 mg/kg), copper (max of 485 mg/kg), lead (max of 1410 mg/kg), and mercury (max of 5.88 mg/kg), were detected above Restricted Residential Use SCOs. All metal exceedances were detected in shallow soils. Overall,

the findings were consistent with observations for historical fill sites in areas throughout NYC.

7. Groundwater samples collected in the RI were compared to NYSDEC 6NYCRR Part 703.5 Groundwater Quality Standards (GQS). Groundwater samples collected during the RI did not detect the presence of pesticides or PCBs in any of the samples collected. One VOC, trichloroethylene (TCE) was detected in one of three groundwater samples at a concentration of 111 ug/l and exceeds its respective NYSDEC TOGS groundwater standard of 5 ug/l. TCE was not detected in soil samples. One SVOC, benzoic Acid was detected in all three groundwater samples at maximum concentration of 14.9 ug/l. Unfiltered and filtered groundwater samples were collected from each of the wells and analyzed for metals. Several metals were identified in groundwater, but none exceeded their respective GQSs in filtered water samples.
8. Soil vapor samples collected during the RI were compared to the compounds listed in Table 6.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion. Soil vapor detected the presence of numerous petroleum related and chlorinated volatile organic compounds. The concentrations of petroleum related (BTEX) compounds ranged from 122 $\mu\text{g}/\text{m}^3$ to 588 $\mu\text{g}/\text{m}^3$. Highest concentrations were detected for hexane at 440 $\mu\text{g}/\text{m}^3$. Chlorinated VOCs including methylene chloride, tetrachloroethene (PCE) and trichloroethene (TCE) were detected in soil vapor at elevated concentrations. PCE was detected in three of five samples at maximum concentration of 31 $\mu\text{g}/\text{m}^3$. TCE was detected in three of five samples at maximum concentration of 34 $\mu\text{g}/\text{m}^3$, for which the NYSDOH have established air guideline values. Methylene chloride was detected in two samples at maximum concentration of 160 $\mu\text{g}/\text{m}^3$. All three of these compounds exceeded their respective NYSDOH air guideline values. Concentrations of TCE and methylene chloride require mitigation.

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 or surface water contamination.

Soil Vapor

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

3.0 REMEDIAL ALTERNATIVES ANALYSIS

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

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

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

Alternative 1 involves:

- Selection of NYSDEC 6NYCRR Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
- Removal of all soil/fill exceeding Track 1 Unrestricted Use SCOs throughout the Site and confirmation that Track 1 Unrestricted Use SCOs have been achieved with post-excavation endpoint sampling. Based on the results of the Remedial Investigation, it is expected that this alternative would require excavation across the entire Site to a depth of

approximately to 5 feet to removal all historic fill. If soil/fill containing analytes at concentrations above Unrestricted Use SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building's cellar level is complete, additional excavation will be performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCOs.

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

Alternative 2 involves

- Establishment of Site-Specific (Track 4) SCOs (listed in Section 4.2).
- Removal of all soil/fill exceeding Track 4 Site-Specific SCOs and confirmation that Track 4 Site-Specific SCOs have been achieved with post-excavation endpoint sampling. Specifically, the “hot spot” area discovered in the central portion of the property during the Remedial Investigation and identified as B-5 will be excavated vertically down to a depth of approximately five feet below ground surface and horizontally approximately five feet in each direction. This will result in approximately twenty yards of impacted material in being removed from the subject property. Excavation for construction of the new building's cellar level would take place to a depth of approximately 10 feet in a majority of the eastern half of the property. If soil/fill containing analytes at concentrations above Track 4 Site-Specific SCOs is still present at the base of the excavation, additional excavation will be performed to meet Track 4 Site-Specific SCOs.
- Placement of a cover system over the entire Site to prevent exposure to remaining soil/fill;

- Installation of a waterproofing/vapor barrier system beneath the building slab and along foundation side walls to prevent potential exposures from soil vapor;
- Installation and operation of an active Sub Slab Depressurization System (SSDS);
- Establishment of use restrictions including prohibitions on the use of groundwater from the Site; prohibitions of sensitive Site uses, such as farming or vegetable gardening, to prevent future exposure pathways; and prohibition of a higher level of land use without OER approval;
- Establishment of an approved Site Management Plan (SMP) to ensure long-term management of these Engineering and Institutional Controls including the performance of periodic inspections and certification that the controls are performing as they were intended. The SMP will note that the property owner and property owner's successors and assigns must comply with the approved SMP; and
- The property will continue to be registered with an E-Designation at the NYC Buildings Department.

3.1 THRESHOLD CRITERIA

Protection of Public Health and the Environment

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

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

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

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

3.2 BALANCING CRITERIA

Compliance with Standards, Criteria and Guidance (SCGs)

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

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

Alternative 2 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to meet Track 4 Site-Specific SCOs. Compliance with SCGs for soil vapor would also be achieved by installing an SSDS and a waterproofing/vapor barrier system below the new building's basement slab and continuing the vapor barrier around

foundation walls. A Site Management Plan would ensure that these controls remained protective for the long term.

Health and safety measures contained in the CHASP and Community Air Monitoring Plan (CAMP) that comply with the applicable SCGs shall be implemented during Site redevelopment under this RAWP. 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 could potentially be higher for Alternative 1 if excavation of greater amounts of historical fill material is encountered below the excavation depth of the proposed building. However, focused attention to means and methods during the remedial action during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize or negate the overall impact of these activities.

An additional short-term adverse impact and risks to the community associated with both remedial alternatives is increased truck traffic. Approximately 85, 25-ton capacity truck trips would be necessary to transport fill and soil excavated during Site development. Truck traffic

will be routed on the most direct course using major thoroughfares where possible and flaggers will be used to protect pedestrians at Site entrances and exits.

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

Long-term effectiveness and permanence

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

Alternative 1 would achieve long-term effectiveness and permanence related to on-Site contamination by permanently removing all impacted soil/fill above Track 1 Unrestricted Use SCOs. Removal of on-Site contaminant sources will prevent future groundwater contamination.

Alternative 2 would provide long-term effectiveness by removing most on-Site contamination and attaining Track 4 Site-Specific SCOs; a composite cover system across the Site, maintaining use restrictions and establishing an SMP to ensure long-term management of ICs, ECs, to memorialize these controls for the long term. The SMP would ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these

controls and restrictions continue to be in place and are functioning as they were intended assuring that protections designed into the remedy will provide continued high level of protection in perpetuity.

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

Reduction of toxicity, mobility, or volume of contaminated material

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

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

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

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

Implementability

This evaluation criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during

its implementation, including technical feasibility of construction and operation, reliability of the selected technology, ease of undertaking remedial action, monitoring considerations, administrative feasibility (e.g. obtaining permits for remedial activities), and availability of services and materials.

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

Cost effectiveness

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

Since historic fill at the Site was found during the RI to only extend to a depth of up to 5 feet below grade, and the new building requires excavation of partial cellar to a depth of 10 ft, the costs associated with both Alternative 1 would be significantly higher than Alternative 2 . This would include additional soil excavation and disposal in at grade parking areas to achieve Unrestricted Use SCOs. This would also require import soils for backfilling. Additional costs would include installation of additional shoring/underpinning, disposal of additional soil, and import of clean soil for backfill. However, long-term costs for Alternative 2 are likely higher than Alternative 1 based on implementation of a Site Management Plan as part of Alternative 2.

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

disposal costs during the excavation of historic fill and other soils during the redevelopment of the Site.

Community Acceptance

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

Based on the overall goals of the remedial program and initial permitting associated with the proposed site development, no adverse community opinion is anticipated for either alternative. This RAWP will be subject to a public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedy. 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 2. Observations here will be supplemented by public comment received on the RAWP.

Land use

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

The current, intended, and reasonably anticipated future land use of the Site and its surroundings are compatible with the selected remedy of soil remediation. The proposed future use of the Site includes a nine (9) story commercial and residential building. 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. The reasonably anticipated future use of the Site and its surroundings will be documented by the applicant in the NYC VCP application, which will include the following conclusions:

The proposed redevelopment of the Site is compatible with its current zoning and is consistent with recent development patterns. The areas surrounding the site are urban and consist of predominantly mixed residential and commercial buildings in zoning districts designated for commercial and residential uses. The development would replace an underutilized site with a modern residential building. The proposed development would create new employment opportunities, living space, and economic and fiscal benefits to the City and State in the form of economic revitalization and tax revenue.

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

The Site is not in close proximity to important cultural resources, including federal or state historic or heritage sites or Native American religious sites, natural resources, waterways, wildlife refuges, wetlands, or critical habitats of endangered or threatened species. The Site is located in an urban area with limited proximity to fish or wildlife. Both alternatives would prevent any potential exposure pathways of contaminant migration affecting fish or wildlife. Municipal water supply wells are not present in this part of City; therefore, groundwater from the Site cannot affect municipal water supply wells or recharge areas. The Site does not lie in a Federal Emergency Management Agency (FEMA)-designated flood plain. Both alternatives are equally protective of natural resources and cultural resources.

Improvements in the current environmental condition of the property achieved by both alternatives are also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse.

Sustainability of the Remedial Action

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

While Alternative 2 would potentially result in lower energy usage based on reducing the volume of material transported off-Site, both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action. The remedial plan would take into consideration the shortest trucking routes during off-Site disposal of historic fill and other soils, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. The New York City Clean Soil Bank program may be utilized for reuse of native soils. To the extent practicable, energy efficient building materials, appliances, and equipment will be utilized to complete the development. A complete list of green remedial activities considered as part of the NYC VCP is included in the Sustainability Statement, included as Appendix 3.

4.0 REMEDIAL ACTION

4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

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

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
3. Establishment of Site Specific Track 4 Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility(s).
6. Excavation and removal of soil/fill exceeding Track 4 Site Specific SCOs. The partial cellar area will be excavated to depths of 10 feet below grade. The “hot spot” area in the center of the property designated as B-5 during the Remedial Investigation will be

excavated to a depth of approximately 5 feet below grade. Approximately, 1200 tons of soils will be excavated and removed from this property.

7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.
8. Management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
9. Removal of underground storage tanks (USTs) (if encountered) and closure of petroleum spills (Spill number of existing spill or if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.
10. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site.
11. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
12. Demarcation of residual soil/fill in landscaped areas.
13. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
14. Installation and operation of an active sub-slab depressurization beneath the new building slab. SSDS is not required beneath the parking areas at grade.
15. Installation of vapor barrier system (minimum 20 mil) beneath the building slab as well as behind foundation sidewalls of the proposed building to grade.

16. Construction and maintenance of an engineered composite cover consisting of briefly describe cover type and thickness such as 2-inch concrete or asphalt paved walkways or driveways, landscaped areas consisting of 2 feet of clean imported soil, 6-inch thick concrete building slab, to prevent human exposure to residual soil/fill remaining under the Site. Import of materials to be used for backfill and cover in compliance with this plan and in accordance 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. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
19. Submission of an approved Site Management Plan (SMP) in the Remedial Action Plan (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. Submission of a RAR that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.
21. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT

Track 4 SCOs are proposed for this project. The SCOs for this Site are:

<u>Contaminant</u>	<u>Track 4 SCOs</u>
Total SVOCs	250 ppm
Arsenic	23 ppm
Lead	1,000 ppm
Mercury	2.5 ppm
Barium	600 ppm

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

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

Soil/Fill Removal Quantities

The total quantity of soil/fill expected to be excavated and disposed off-Site is 1,232 tons.

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

End-point Sampling

End-point samples will be analyzed for compounds and elements as described below 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.

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

Confirmation End-point Sampling Removal actions for development purposes under this plan will be performed in conjunction with confirmation soil sampling. Four confirmation samples will be collected from the base of the excavation at locations to be determined by OER. To evaluate attainment of Track 4 Site-specific SCOs, analytes will include those for which SCOs have been developed, including SVOCs and metals according to analytical methods described above. If Track 1 Unrestricted Use SCOs are pursued, samples will be analyzed for VOCs, SVOCs, pesticides, PCBs and metals according to analytical methods described above.

End-point Sampling at Hotspots Identified During the Remedial Investigation In addition, endpoint samples will be collected from the sidewalls and base of excavation at the hotspot location identified in the Remedial Investigation (B-5). B-5 hotspot sidewall and bottom samples will be analyzed for SVOCs and metals according to analytical methods described above.

The criterion presented below is generic plan for hotspot action for hotspots identified during excavation. For larger excavations, sampling frequency may be modified with approval by OER. If hotspots are identified during the remedial program, hotspot removal actions will be performed to ensure that hot-spots are fully removed. Analytes for end-point sampling will be those parameters that are driving the hot-spot removal action and will be approved by OER. Analysis will be performed according to analytical methods described above. Frequency for hot-spot end-point sample collection is as follows:

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.
2. For excavations 20 to 300 feet in perimeter:

- For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
 - For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
3. For sampling of volatile organics, bottom samples should be taken within 24 hours of excavation, and should be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours should be taken at six to twelve inches.
4. For contaminated soil removal, post remediation soil samples for laboratory analysis should be taken immediately after contaminated soil removal. If the excavation is enlarged horizontally, additional soil samples will be taken pursuant to bullets 1-3 above.

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

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

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

One blind duplicate sample for every 20 samples collected will be submitted to the approved laboratory for analysis of the same parameters. Trip blanks will be used whenever samples are

transported to the laboratory for analysis of VOCs. One trip blank will be submitted to the laboratory with each shipment of soil samples. Trip blanks will not be used for samples to be analyzed for metals, SVOCs or pesticides.

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

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

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

Field blanks will be prepared by pouring distilled or deionized water over decontaminated equipment and collecting the water in laboratory provided containers.

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 4. Soil import is not anticipated at this time.

4.3 ENGINEERING CONTROLS

The excavation required for the proposed Site development will achieve Track 4 Site Specific SCOs. Engineering Controls are required in the remedial action to address residual contamination remaining at the site. The Site has 3 primary Engineering Control Systems. These are:

- composite cover system consisting of asphalt covered roads, concrete covered sidewalks, concrete building slab, and clean imported soil in landscaped areas;
- soil vapor barrier; and
- sub-slab depressurization system;

Composite Cover

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. This composite cover system is comprised of a 6-inch thick concrete building slab beneath the areas of proposed building, 2 feet of clean soils in landscaped areas, 2 feet soil beneath asphalt covered parking areas, etc.

Figure 5 shows the location of each cover type built at the Site.

The composite cover system would serve as a permanent engineering control. The system will be inspected and reported at specified intervals as required by this RAWP and the SMP. A Soil Management Plan will be included in the SMP 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 SMP in the RAR.

Vapor Barrier

Migration of potential soil vapor from onsite or offsite sources in the future will be mitigated with a combination of building slab and vapor barrier. The vapor barrier will consist

of a 20-mil VaporBlock Plus VBP20 under-slab vapor/gas barrier which consists of seven layers made from polyethylene and EVOH resins. The vapor barrier will extend throughout the area occupied by the footprint of the new building and up the foundation sidewalls in accordance with manufacturer specifications.

The project's Professional Engineer licensed by the State of New York will have primary direct responsibility for overseeing the implementation of the vapor barrier. The extent of the proposed vapor barrier membrane is provided in the plans provided in Appendices 6 and 7. The Remedial Action Report will include photographs (maximum of two photos per page) of the installation process, PE/RA certified letter (on company letterhead) from primary contractor responsible for installation oversight and field inspections, and a copy of the manufacturers certificate of warranty.

Sub-Slab Depressurization System

Migration of soil vapor will be mitigated with the construction of a passive sub-slab depressurization system underneath the new building slab. The system is not needed in parking areas. The system will be comprised of multiple loops beneath the building footprint. Additional details regarding the location of the vents, construction materials, capacity of the system will be determined by a NYS PE and provided to OER through STIP letter.

4.4 INSTITUTIONAL CONTROLS

Institutional Controls (IC) have been incorporated in this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. Institutional Controls are listed below. Long-term employment of EC/ICs will be implemented under a site-specific Site Management Plan (SMP) that will be included in the RAR. The property will continue to be registered with an E-Designation by the NYC Buildings Department.

Institutional Controls for this remedial action are:

- The property will continue to be registered with an E-Designation by the NYC Buildings Department. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the Site Management Plan which will note that the property owner and property owner's successors and assigns must comply with the approved SMP;
- Submittal of a Site Management Plan in the RAR for approval by OER that provides procedures for appropriate operation, maintenance, monitoring, inspection, reporting and certification of ECs. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification shall be submitted at a frequency to be determine by OER in the SMP and will comply with RCNY §43-1407(1)(3).
- Vegetable gardens and farming on the Site are prohibited in contact with residual soil materials;

- Use of groundwater underlying the Site is prohibited without treatment rendering it safe for its intended use;
- All future activities on the Site that will disturb residual material must be conducted pursuant to the soil management provisions in an approved SMP; and
- 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 will be the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site Management responsibilities defined in Site Management Plan are implemented.

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

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

4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

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

Data and information 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 under current and future conditions by characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport. This QHHEA was prepared in accordance with Appendix 3B and Section 3.3 (b) 8 of the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation.

Known and Potential Contaminant Sources

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

Soil:

- One VOC, acetone exceeded its Unrestricted Use SCOs.
- Several SVOCs were detected above their Restricted Residential SCOs and included benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were identified in shallow soil sample (B-5) indicating a shallow hotspot.
- Pesticides were identified, but did not exceed Restricted Residential Use SCOs.
- Metals including arsenic, barium, copper, lead, and mercury, were detected above Restricted Residential Use SCOs.

Groundwater:

- One VOC, trichloroethylene (TCE) was detected in groundwater exceeding its GQS.
- One SVOC, benzoic Acid which was detected in all three groundwater samples above GQS.
- Several metals were identified in groundwater, but none exceeded their respective GQSs.

Soil Vapor:

- Petroleum related VOCs were detected at moderate concentrations.
- Chlorinated VOCs including methylene chloride, tetrachloroethene (PCE) and trichloroethene (TCE) were detected in soil vapor at elevated concentrations and require monitoring/mitigation per NYSDOH guidance matrix.

Nature, Extent, Fate and Transport of Contaminants

Several semi-volatile organic compounds were detected at elevated levels in a hot spot in the approximate center of the property identified as B-5. Metals and SVOCs were detected throughout the Site at various depths within historic fill material. Potential transport mechanisms for contaminants of concern consist of migration into groundwater, volatilization into soil vapor and direct contact. Trichloroethylene was detected in one groundwater sample collected from downgradient well MW-2 which was located in the northwestern corner of the property. Based on the detection of this compound in soil vapor samples collected at the property it is concluded that this contaminant is volatilizing from groundwater into soil vapor. Methylene chloride, tetrachloroethene and trichloroethene were detected above monitoring threshold established by the New York State DOH. These VOCs were not detected in soil.

Receptor Populations

On-Site Receptors: Because the site is currently entirely developed with a vacant building, access to Site is restricted by walls and locked doors. Onsite receptors are limited to trespassers and site representatives and visitors granted access to the property. During construction, potential

on-site receptors include construction workers, site representatives, and visitors. Under proposed future conditions, potential on-site receptors include adult and child building residents, workers and visitors..

Off-Site Receptors: Potential off-site receptors within a 400 foot radius of the Site include: adult and child residents; commercial and construction workers; pedestrians; trespassers; and passerby based on the following:

1. Commercial Businesses (up to 400 foot) – existing and future
2. Residential Buildings (up to 400 foot) – existing and future
3. Building Construction/ Renovation (up to 400 foot) – existing and future
4. Pedestrians, Trespassers, Cyclists (up to 400 foot) – existing and future

Potential Routes of Exposure

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

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

Potential Exposure Points

Current Conditions: The site is currently capped with concrete surfaces that comprise the building foundation and sidewalks. Therefore, there are no potential exposure pathways from ingestion, inhalation, or dermal absorption of soil/ fill. Groundwater has been found to be contaminated and is not exposed at the site, and because the site is served by the public water supply, groundwater is not used at the site and there are no potential for exposure. Because the site is currently developed, there is potential for soil vapor to accumulate on site. However, the building is currently vacant and unoccupied.

Construction/ Remediation Activities: During the remedial action, onsite workers will come into direct contact with surface soils, subsurface soils, and groundwater, as a result of on-Site construction and excavation activities. Due to the depth of groundwater, contact with groundwater is expected. On-Site construction workers potentially could ingest, inhale or have dermal contact with any exposed impacted soil, and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through the Soil/Materials Management Plan, dust controls, and through the implementation of the Community Air Monitoring Program and a Construction Health and Safety Plan.

Proposed Future Conditions: Under future remediated conditions, all soils in excess of Track 4 SCOs will be removed. The site will be fully capped, limiting potential direct exposure to soil and groundwater remaining in place, and engineering controls (vapor barrier/SSDS) will prevent any exposure to potential for inhalation via soil vapor intrusion. The site is served by the public water supply, and groundwater is not used at the site. There are no plausible off-site pathways for oral, inhalation, or dermal exposure to contaminants derived from the site. **Overall Human Health Exposure Assessment**

There is complete exposure pathways for the current site condition for soil vapor. There is no complete exposure pathway under future conditions after the site is developed. There is a potential complete exposure pathway that requires mitigation during implementation of the remedy. This assessment takes into consideration the reasonably anticipated use of the site, which includes a commercial/residential structure, site-wide impervious surface cover cap, and a subsurface SSDS and vapor barrier system for the building. During remedial construction, on-Site and off-Site exposures to contaminated dust from historic fill material will be addressed through dust controls, and through the implementation of the Community Air Monitoring Program, the Soil/Materials Management Plan, and a Construction Health and Safety Plan. Potential post-construction use of groundwater is not considered an option because groundwater in this area of New York City is not used as a potable water source. There are no surface waters in close proximity to the Site that could be impacted or threatened.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 PROJECT ORGANIZATION AND OVERSIGHT

Principal personnel who will participate in the remedial action include Thomas F. Lembo the Professional Engineer (PE) as well as Eric C. Arnesen, LPG and Steven J. McGinn who will be the Qualified Environmental Professionals (QEP) for this project...

5.2 SITE SECURITY

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

5.3 WORK HOURS

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. The hours of operation will be conveyed to OER during the pre-construction meeting.

5.4 CONSTRUCTION HEALTH AND SAFETY PLAN

The Health and Safety Plan is included in Appendix 5. The Site Safety Coordinator will be Eric C. Arnesen, or other designated representative of the construction contractor. 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 CHASP. That document will define the specific project contacts for use in case of emergency.

5.5 COMMUNITY AIR MONITORING PLAN

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

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

or adjacent to a school or residence. Exceedences of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the OER Project Manager and included in the Daily Report.

VOC Monitoring, Response Levels, and Actions

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

5.6 AGENCY APPROVALS

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

5.7 SITE PREPARATION

Pre-Construction Meeting

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

Mobilization

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

Utility Marker Layouts, Easement Layouts

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

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

Dewatering

- Dewatering would be required in order to excavate the contaminated soil and fill material below the saturated zone or water table (expected to be thirteen to fourteen feet below grade). Dewatering for this site would require a pumping system, settling tanks, possibly a treatment system, and the appropriate NYCDEP permits for discharged the groundwater into the sewer system.

Equipment and Material Staging

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

Stabilized Construction Entrance

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

Truck Inspection Station

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

Extreme Storm Preparedness and Response Contingency Plan

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

Storm Preparedness

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

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to OER at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such

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

Storm Response Reporting

A site inspection report will be submitted to OER at the completion of site inspection. An inspection report established by OER is available on OER's website (www.nyc.gov/oer) and will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the OER project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number. Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil

that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYS DEC; description of corrective actions; schedule for corrective actions. This report should be completed and submitted to OER project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

5.8 TRAFFIC CONTROL

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

Record Keeping and Photo Documentation

Job-site record keeping for all remedial work will be performed. These records will be maintained on-Site during the project and will be available for inspection by OER staff. Representative photographs will be taken of the Site prior to any remedial activities and during major remedial activities to illustrate remedial program elements and contaminant source areas.

Photographs will be submitted at the completion of the project in the RAR in digital format (i.e. jpeg files).

5.11 COMPLAINT MANAGEMENT

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

5.12 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

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

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

6.0 REMEDIAL ACTION REPORT

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

- Information required by this RAWP;
- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan;
- 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.
- 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, Thomas F. Lembo, 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 88-96 Withers Street Site (NYC OER Project Number 15EHAZ069K and NYC VCP Project Number 15CVCP158K).

I, Eric C. Arnesen, am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the 88-96 Wither Street Site (NYC OER Project Number 15EHAZ069K and NYC VCP Project Number 15CVCP158K).

I certify that the OER-approved Remedial Action Work Plan dated June 15, 2015 and Stipulations in a letter dated month day, year; if any were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

Name

NYS PE License Number

Signature

Date

PE Stamp

QEP Name

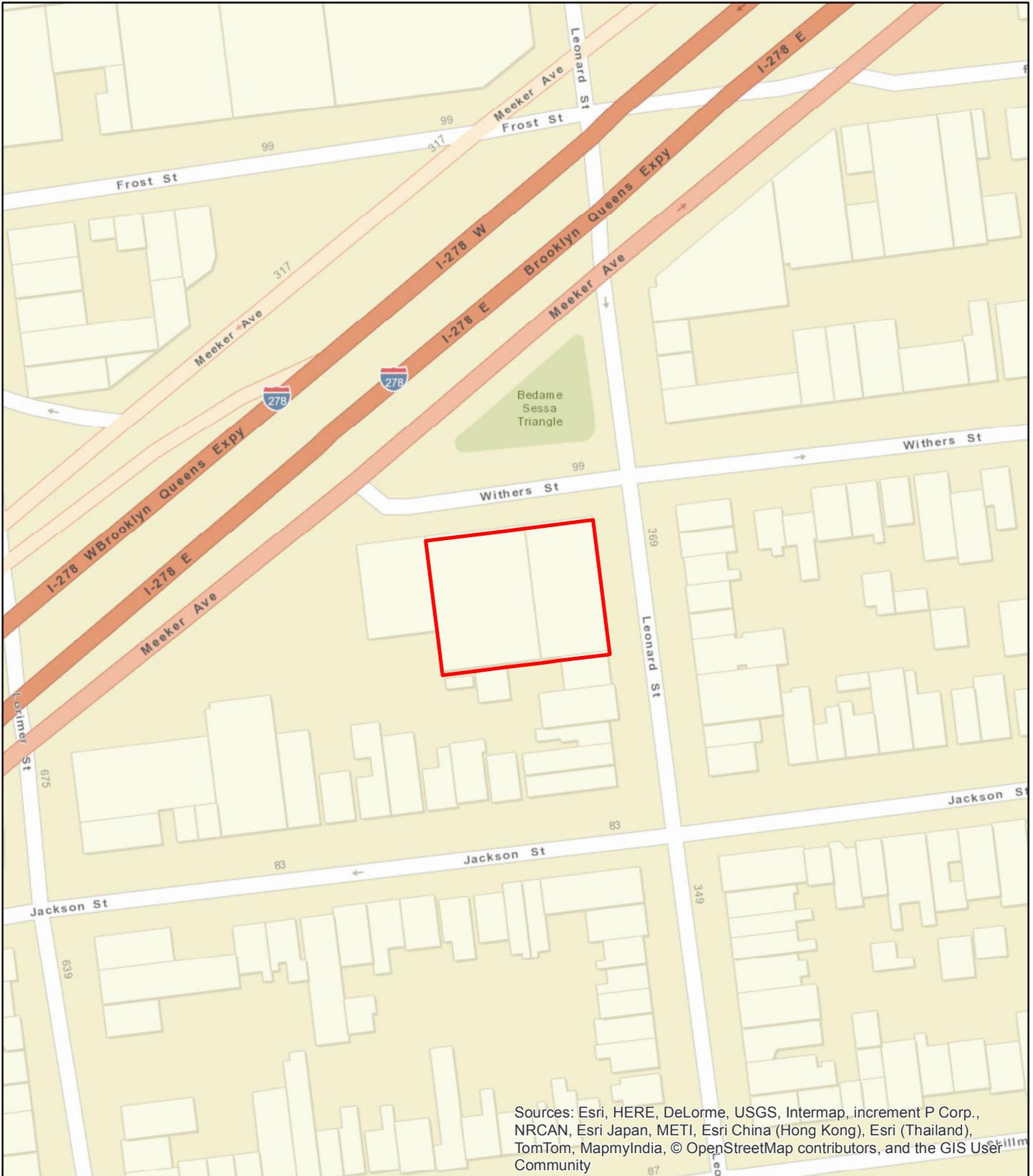
QEP Signature

Date

7.0 SCHEDULE

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a 7.5 month remediation period is anticipated.

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAWP	0	-
Fact Sheet 2 announcing start of remedy	0	-
Mobilization	1	1
Remedial Excavation	2	24
Demobilization	26	2
Submit Remedial Action Report	30	4



**FIGURE 1
SITE LOCATION MAP**

Source: ESRI web map service
Scale: 1 inch = 100 feet



**Remedial
Action Work Plan**
88-96 Withers St
Brooklyn





FIGURE 2 SITE MAP

Source: NYS Orthophotography, 2012
Scale: 1 inch = 50 feet



**Remedial
Action Work Plan**
88-96 Withers St
Brooklyn



**FIGURE 3
SURROUNDING LAND USE MAP**

**Remedial
Action Work Plan
88-96 Withers St
Brooklyn**



Source: ESRI, WMS; NYC Oasis Web Map
Scale: 1 inch = 100 feet



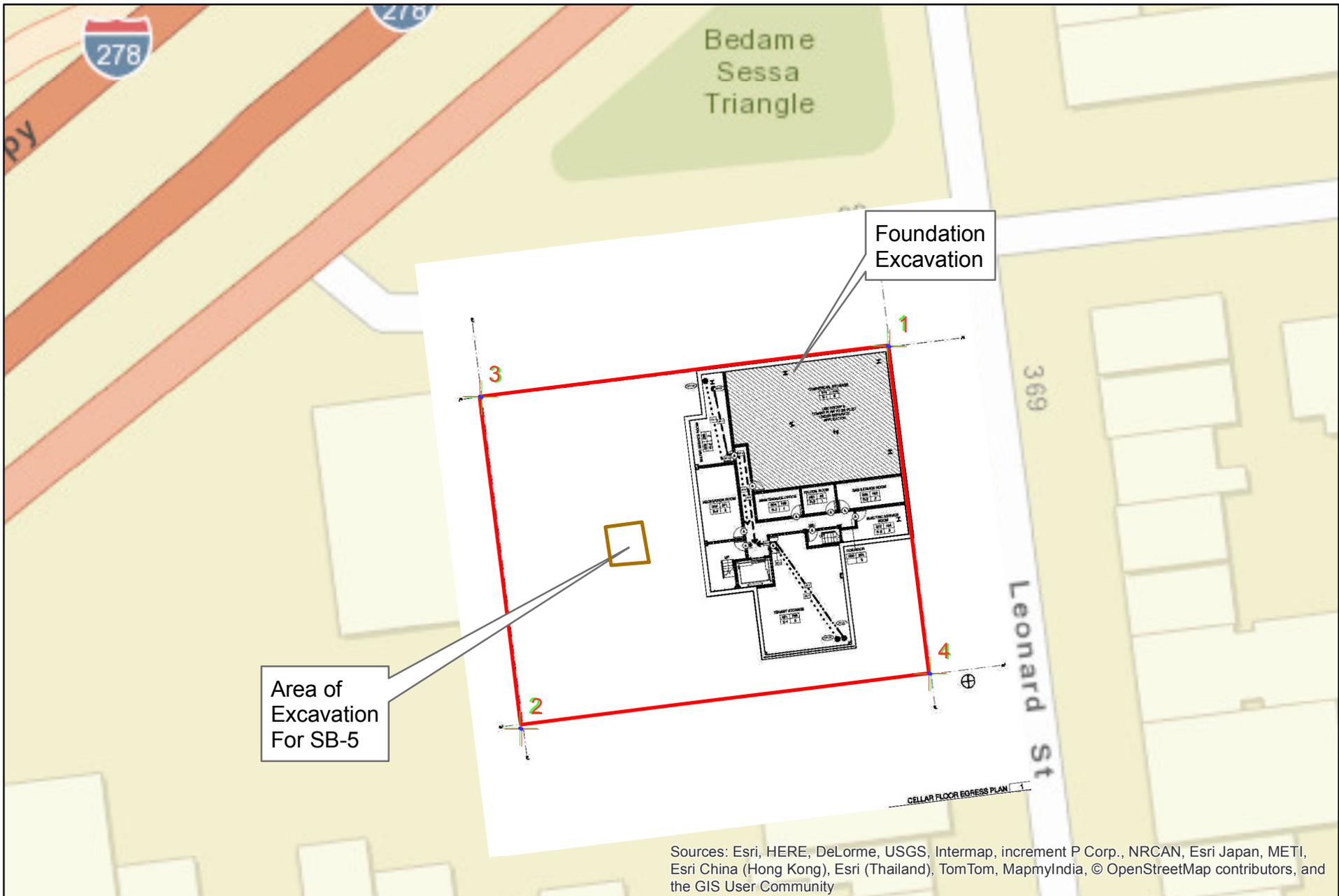


FIGURE 4
SITE EXCAVATION DIAGRAM

Source: base from NYS Orthophotography, 2012;
Perkins Eastman plans, 2014
Scale: 1 inch = 40 feet



**Remedial
Action Work Plan**
88-96 Withers St
Brooklyn

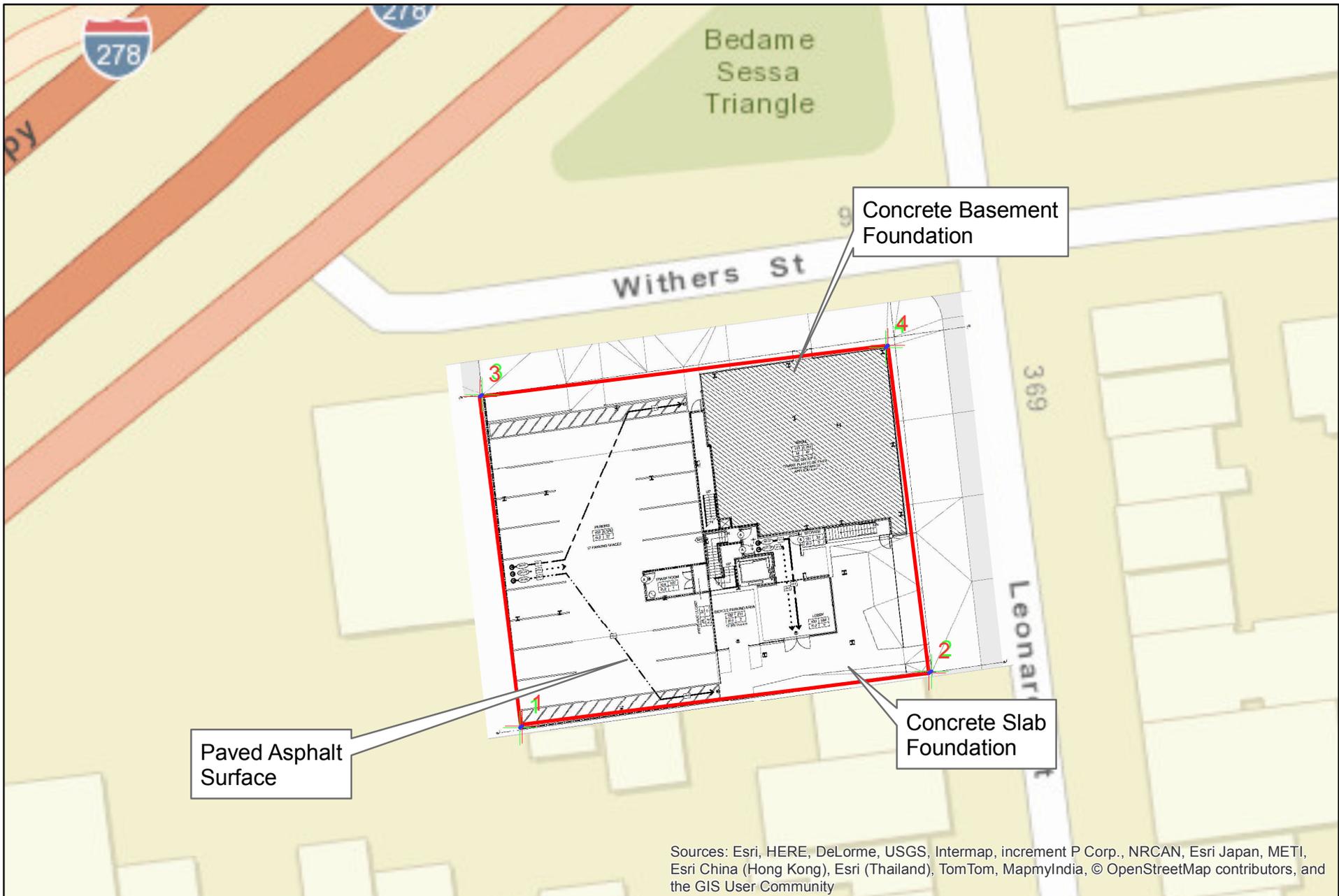
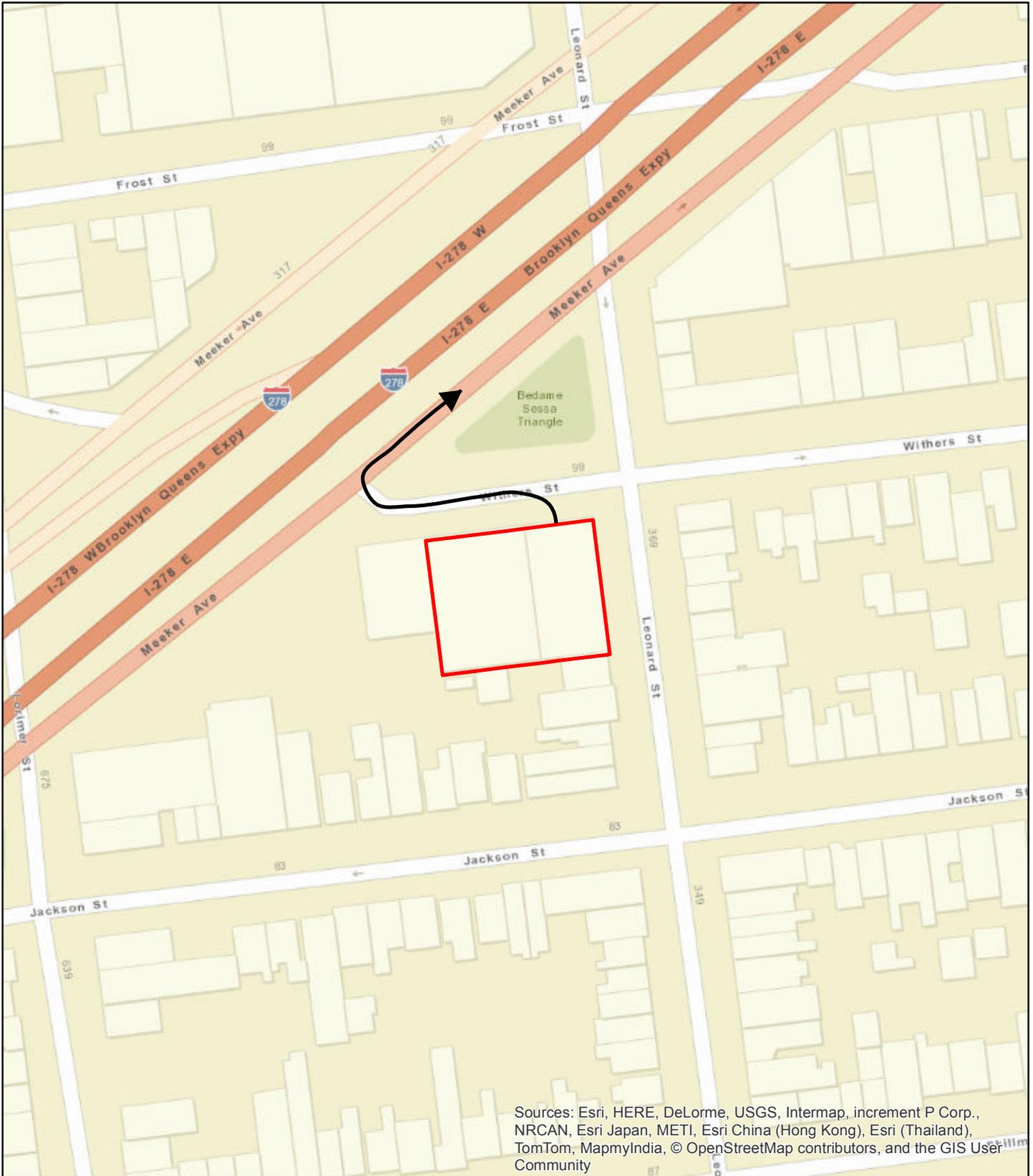


FIGURE 5
SITE WIDE COVER SYSTEM PLAN

Source: base from NYS Orthophotography, 2012;
 Perkins Eastman plans, 2014
 Scale: 1 inch = 40 feet



**Remedial
 Action Work Plan**
88-96 Withers St
Brooklyn



**FIGURE 6
TRUCK ROUTE MAP**

Source: ESRI web map service
Scale: 1 inch = 100 feet



**OER Remedial
Action Plan**
88-96 Withers St
Brooklyn



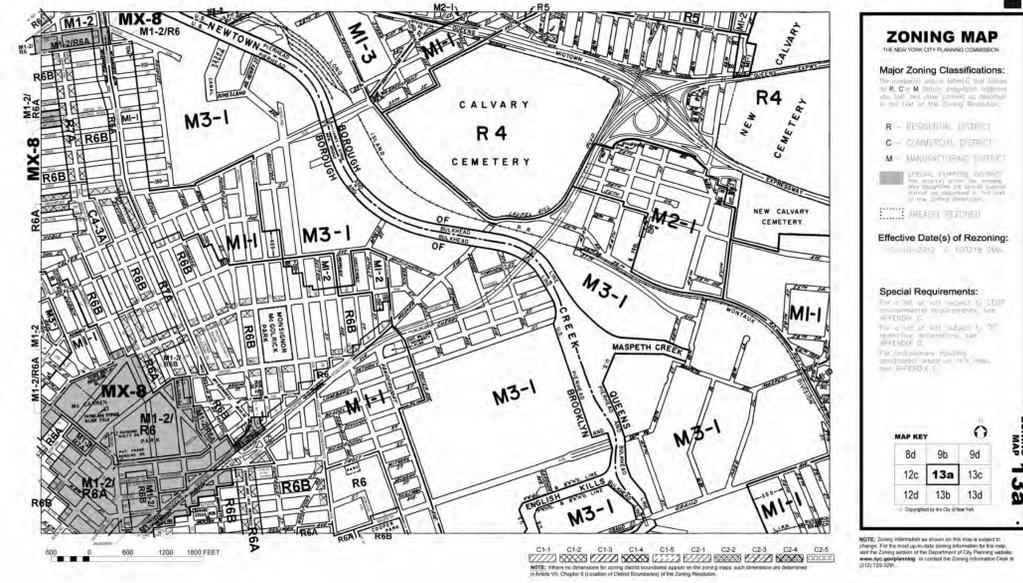
APPENDIX 1
PROPOSED DEVELOPMENT PLANS

88 Withers Street

88 Withers St., Brooklyn, NY 11211

DOB FILING SET

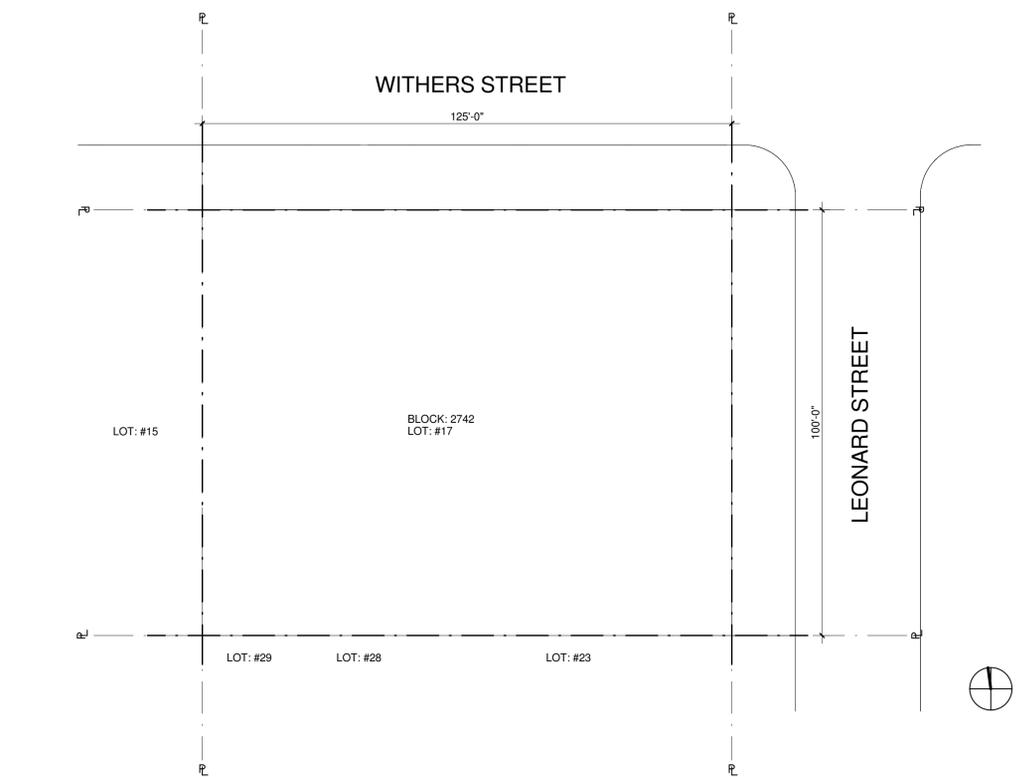
ZONING MAP



FLOOD MAP



PLOT PLAN



BUILDING CLASSIFICATION

ADDRESS: 88 WITHERS STREET
BLOCK: 2742
LOT: 17 & 20

ZONING: M1-2/R6/MX 8/INCLUSIONARY HOUSING DESIGNATED AREA 1
BROOKLYN CB1 - MAP 2

ZONING MAP: 13a

HISTORIC DISTRICT: NO
COMMUNITY BOARD: 7
FLOOD ZONE: NO
FIRE DISTRICT: BROOKLYN

CONSTRUCTION CLASS: 1B NON-COMBUSTIBLE
SPRINKLERED?: YES
STRUCT. OCC. CATEGORY: II
BUILDING HEIGHT: 99.98 FT

MULTIPLE DWELLING?: YES
OCC. GROUPS PROVIDED: R-2 (R-2 DOMINANT)

LOWEST FDNY ACCESS: AT GRADE - EL 0.00'
HIGHEST FDNY ACCESS: AT TOP OF BUILDING - EL. 99.98 FT

RELATED APPLICATIONS

FILED IN CONJUNCTION WITH NB NO.

STRUCTURAL
MECHANICAL
FIRE PROTECTION PLAN
PLUMBING

SEPARATE APPLICATIONS

ALT-2 APPLICATIONS NO.

FULL BUILDING DEMOLITION
SPRINKLER/STANDPIPE
TEMPORARY STANDPIPE
FIRE ALARM
CURB CUT
SUPPORT OF EXCAVATION
TEMPORARY SHORING
FIRE PROTECTION PLAN
BUILDERS PAVEMENT PLAN -
RETAIL TENANT PLAN

DRAWING INDEX

- Z-000 .00 COVER SHEET
- Z-001 .00 SITE PLAN, BASE PLANE CALCS. AND ZONING ANALYSIS
- Z-002 .00 FLOOR AREA CALCULATIONS
- Z-003 .00 FLOOR AREA CALCULATIONS
- Z-004 .00 FLOOR AREA CALCULATIONS
- A-00 .00 GENERAL NOTES, SYMBOLS, ABBREVIATIONS
- A-01 .00 BUILDING CODE COMPLIANCE
- A-02 .00 NOTES & INSPECTIONS
- A-10 .00 CELLAR FLOOR LIFE SAFETY PLAN
- A-11 .00 FIRST FLOOR LIFE SAFETY PLAN
- A-12 .00 SECOND FLOOR LIFE SAFETY PLAN
- A-13 .00 THIRD THRU SIXTH FLOORS LIFE SAFETY PLAN
- A-17 .00 SEVENTH THRU EIGHTH FLOORS LIFE SAFETY PLAN
- A-19 .00 NINTH FLOOR LIFE SAFETY PLAN
- A-20 .00 ROOF LIFE SAFETY PLAN
- A-30 .00 STAIR DETAILS

DOB APPROVAL STAMP

xxx/xx/xxxx Set Description
Date: No.: Description:

Project:
88 Withers Street

88 Withers Street
Brooklyn, NY 11211

Sheet Title:
COVER SHEET

Project Number: 15690
Signature & Seal:

Drawn By: J, JB

Checked By: RHD, JB

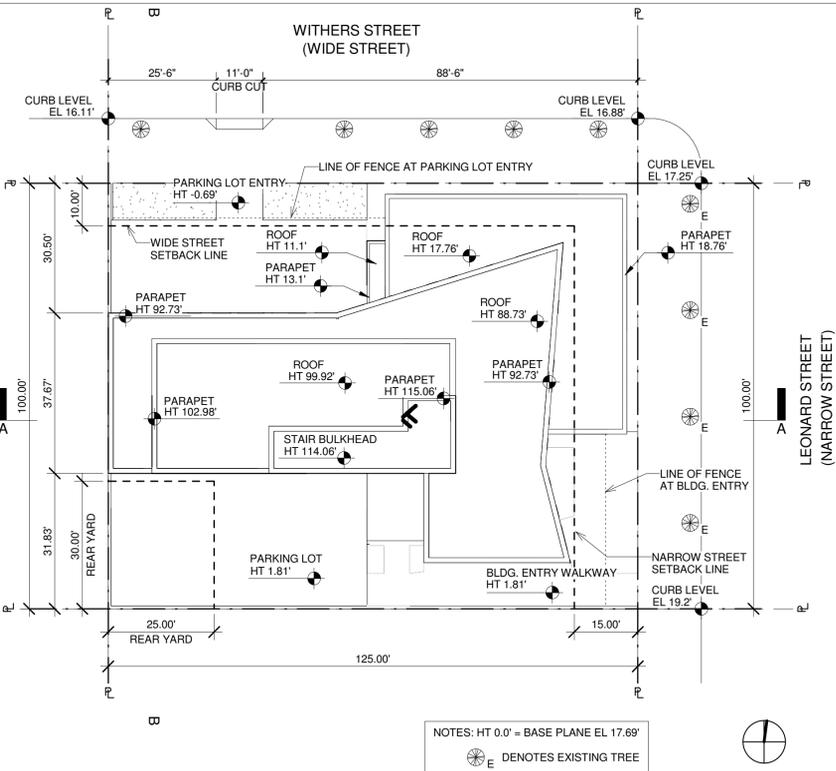
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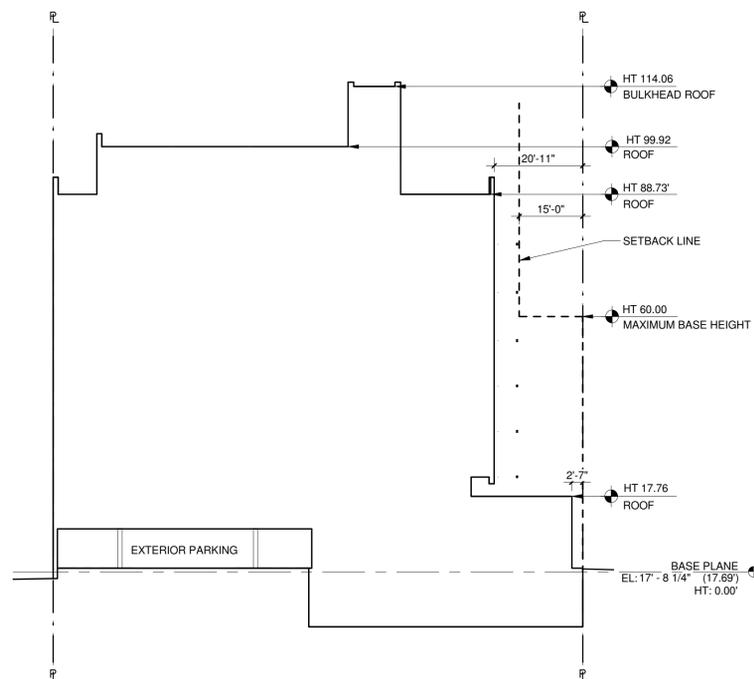
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NYC DOB Number: Sheet: 0 of 14

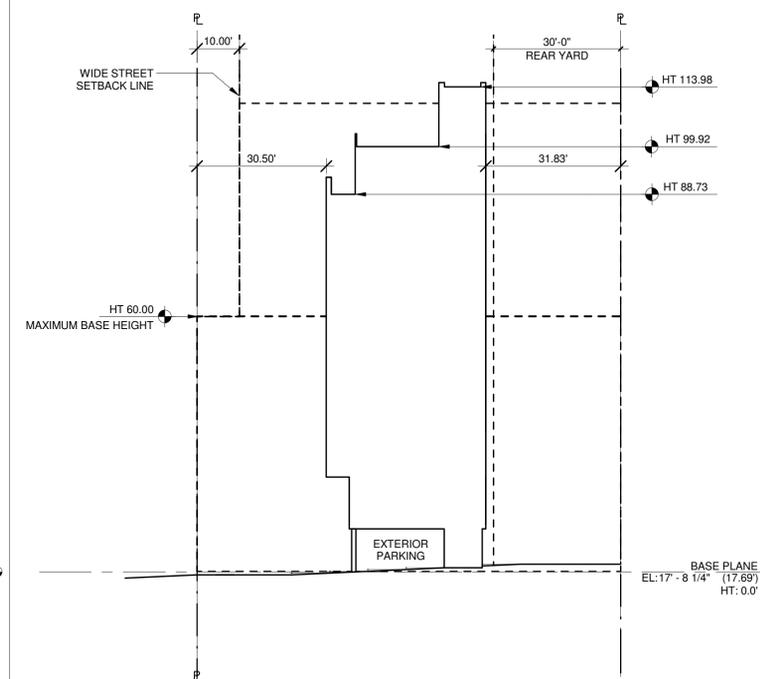
SITE PLAN



ZONING SECTION A-A



ZONING SECTION B-B



AREA CALCULATIONS

LEVEL	GSF	DEDUCTIONS	RESIDENTIAL FA	COMMERCIAL FA	TOTAL ZFA
1ST FLOOR	4333.06 SF	-180.73 SF	1362.14 SF	2790.19 SF	4152.33 SF
2ND FLOOR	3175.02 SF	-3175.02 SF	0 SF	0 SF	0 SF
3RD FLOOR	5019.42 SF	-419.93 SF	4599.49 SF	0 SF	4599.49 SF
4TH FLOOR	5019.42 SF	-419.93 SF	4599.49 SF	0 SF	4599.49 SF
5TH FLOOR	5019.42 SF	-419.93 SF	4599.49 SF	0 SF	4599.49 SF
6TH FLOOR	5019.42 SF	-419.93 SF	4599.49 SF	0 SF	4599.49 SF
7TH FLOOR	5019.42 SF	-432.46 SF	4586.96 SF	0 SF	4586.96 SF
8TH FLOOR	5019.42 SF	-432.46 SF	4586.96 SF	0 SF	4586.96 SF
9TH FLOOR	2190.46 SF	-166.57 SF	2023.89 SF	0 SF	2023.89 SF
TOTAL	39,815.06 SF	-6066.96 SF	30,957.91 SF	2790.19 SF	33,748.1 SF

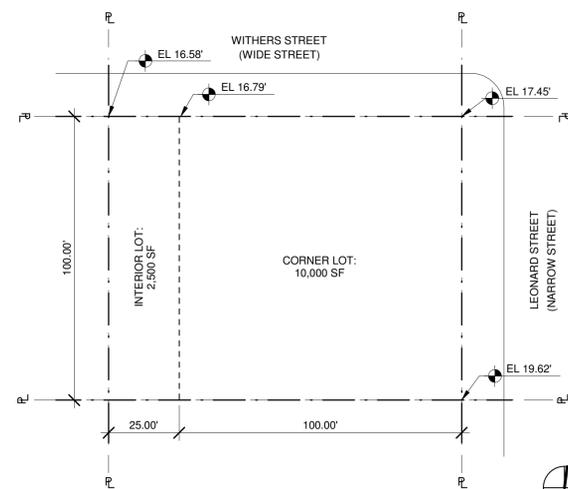
ZONING ANALYSIS

- 1. BLOCK: 2742
- 2. LOTS: 17 & 20
- MAP 13A 3. ZONING DISTRICTS: M1-2 / R6 / MX-8 / INCLUSIONARY HOUSING DESIGNATED AREA / BROOKLYN CB / MAP 2
- 4. ZONING LOT AREA: 125.00' X 100.00' = 12,500 SF
- 123-10 5. USES PERMITTED: A. USE GROUPS 1-14 AND 16-17 WITH LIMITATIONS
- 123-20 6. USES PROVIDED: A. USE GROUP 2: MULTIFAMILY RESIDENTIAL B. USE GROUP 6: RETAIL
- 123-63 7. FLOOR AREA PERMITTED: A. MAXIMUM RESIDENTIAL FAR = 2.70 B. MAXIMUM COMMERCIAL FAR = 2.00 C. TOTAL MAXIMUM FAR = 2.70 D. MAXIMUM RESIDENTIAL FA = 2.70 X 12,500 = 33,750 E. MAXIMUM COMMERCIAL FA = 2.00 X 12,500 = 25,000 F. MAXIMUM TOTAL FA = 33,750
- 43-12 8. FLOOR AREA PROVIDED A. RESIDENTIAL FA = 30,958 B. COMMERCIAL FA = 2790 C. TOTAL FA = 33,748
- 123-652 9. REAR YARD REQUIREMENTS A. REQUIRED FOR INTERIOR LOT: 30.00 B. REQUIRED FOR CORNER LOT: NOT REQUIRED
- 43-311 10. LOT COVERAGE REQUIREMENTS A. LOT COVERAGE: NOT REQUIRED FOR MIXED BUILDING
- 43-26 11. DENSITY A. DWELLING UNIT FACTOR 680 B. RESIDENTIAL FA 30,958 C. MAXIMUM NUMBER OF D.U.s 30,958/680 = 45 D. DWELLING UNITS PROVIDED 33 COMPLIES
- 23-24 12. HEIGHT AND SETBACK REQUIREMENTS A. MAXIMUM BASE HEIGHT 60.00 COMPLIES B. MAXIMUM BLDG. HEIGHT 110.00 COMPLIES C. SETBACK WIDE STREET 10.00 COMPLIES D. SETBACK NARROW STREET 15.00 COMPLIES
- 123-662 13. ACCESSORY OFF-STREET PARKING REQUIRED A. MAXIMUM SIZE OF ACCESSORY PARKING FACILITY: = 200 SPACES B. REQUIRED RESIDENTIAL PARKING 1. PERCENT OF TOTAL RESIDENCES = 50% 2. NUMBER OF RESIDENCES = 33 3. REQUIRED SPACES 33 X .50 = 17 SPACES C. PROVIDED RESIDENTIAL PARKING 1. SPACES PROVIDED 17 COMPLIES SEE DWG. A-11

- 44-21 13. (CONT.)
- 44-23 C. REQUIRED COMMERCIAL SPACES 1. USE GROUP 6 - PRC-B = 1 PER 300 SF 2. COMMERCIAL FA = 2790 SF 3. SPACES REQUIRED 2790/300 = 9 4. WAIVER OF REQUIREMENTS 9 < 15 D. PROVIDED COMMERCIAL SPACES 1. NOT REQUIRED / NOT PROVIDED
- 44-52 14. REQUIRED OFF-STREET LOADING A. COMMERCIAL USES LESS THAN 8,000 SF. NOT REQUIRED / NOT PROVIDED
- 25-63 15. ACCESS TO STREET A. CURB CUT LOCATION NOT LESS THAN 50.00' FROM INTERSECTION OF TWO STREETS B. CURB CUT REQUIREMENTS 1. ONE CURB CUT PER STREET FRONTAGE 2. MAXIMUM WIDTH OF CURB CUT = 12' COMPLIES
- 25-631 16. BICYCLE PARKING A. BICYCLE PARKING REQUIREMENTS 1. 1 SPACE PER 2 DWELLING UNITS 2. 33 D.U.s = 17 SPACES B. BICYCLE PARKING PROVIDED = 17 SPACES C. AREA REQUIRED = 15 SF/BICYCLE D. AREA PROVIDED = 12.5 SF SEE DWG. A-11
- 25-81 17. STREET TREE PLANTING A. STREET TREES REQUIRED 1. 1 TREE PER 25' OF STREET FRONTAGE 2. STREET FRONTAGE = 225.00' 3. 225' / 25 = 9 TREES REQUIRED B. STREET TREES PROVIDED 1. 9 TREES PROVIDED: 4 EXISTING / 5 NEW C. PLANTING STRIPS NOT REQUIRED / NOT PROVIDED COMPLIES

BASE PLANE CALCULATIONS

- A. BASE PLANE AT CALCULATION INTERIOR LOT PORTION OF SITE (16.58' + 16.79') / 2 = EL. 16.69'
- B. BASE PLANE AT CALCULATION CORNER LOT PORTION OF SITE (16.79' + 17.45' + 19.62') / 3 = EL. 17.95'
- C. LOT COVERAGE CALCULATIONS INTERIOR LOT: 2500 SF / 12,500 SF = 0.2 CORNER LOT: 10,000 SF / 12,500 SF = 0.8
- D. ADJUSTED BASE PLANE CALCULATION INTERIOR LOT: 16.69' X 0.2 = 3.33' CORNER LOT: 17.95' X 0.8 = 14.36' ADJUSTED BASE PLANE = 3.33' + 14.36' = 17.69'



PBDW ARCHITECTS

Platt Byard Dovell White Architects LLP
20 West 22nd Street, New York, NY 10010
212.691.2440 | pbdw.com

Anastos Engineering Associates | Structural Engineer
240 West 35th Street, New York, NY 10001
212.714.0993 | anastoseng.com

Rodkin Cardinale Engineers | Mechanical Engineer
224 West 29th Street, New York, NY 10001
212.239.1892 | rcnep.com

Design 2147 Limited | Code Consultant
52 Diamond Street, Brooklyn, NY 11222
718.383.9340 | design2147.com

DOB APPROVAL STAMP

Project: 88 Withers Street

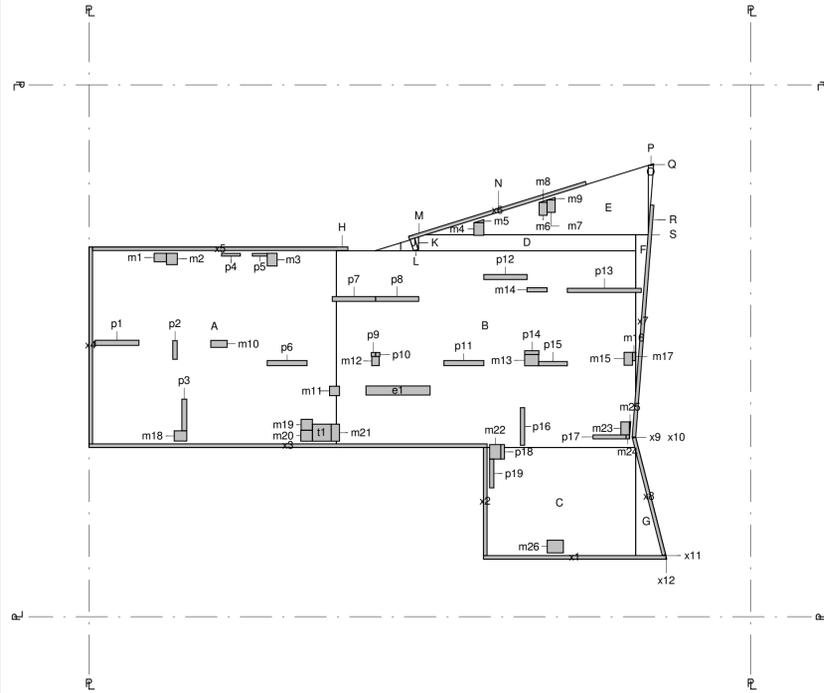
88 Withers Street
Brooklyn, NY 11211

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**SITE PLAN, BASE PLANE
CALCS. AND ZONING
ANALYSIS**

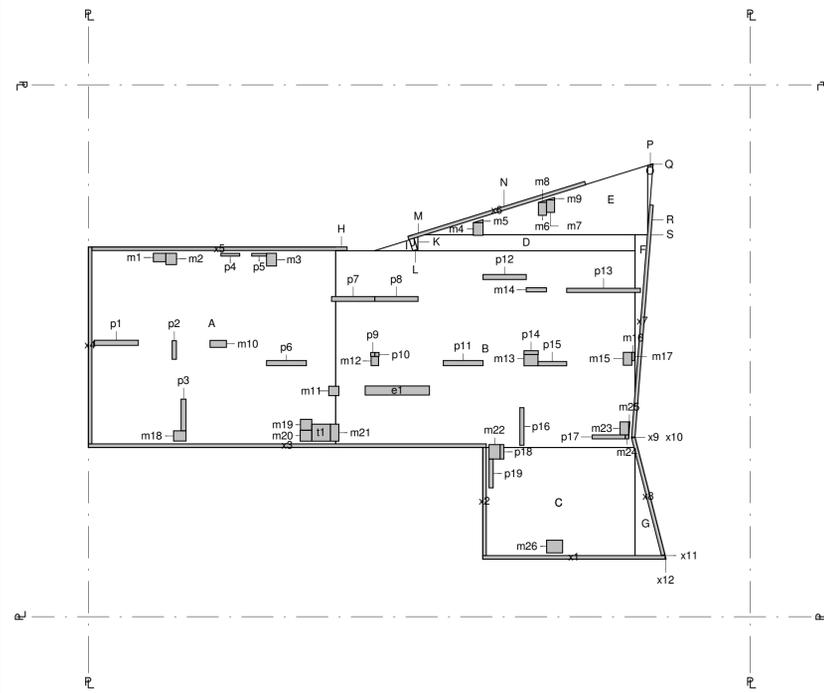
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Checked By: RHD, JB
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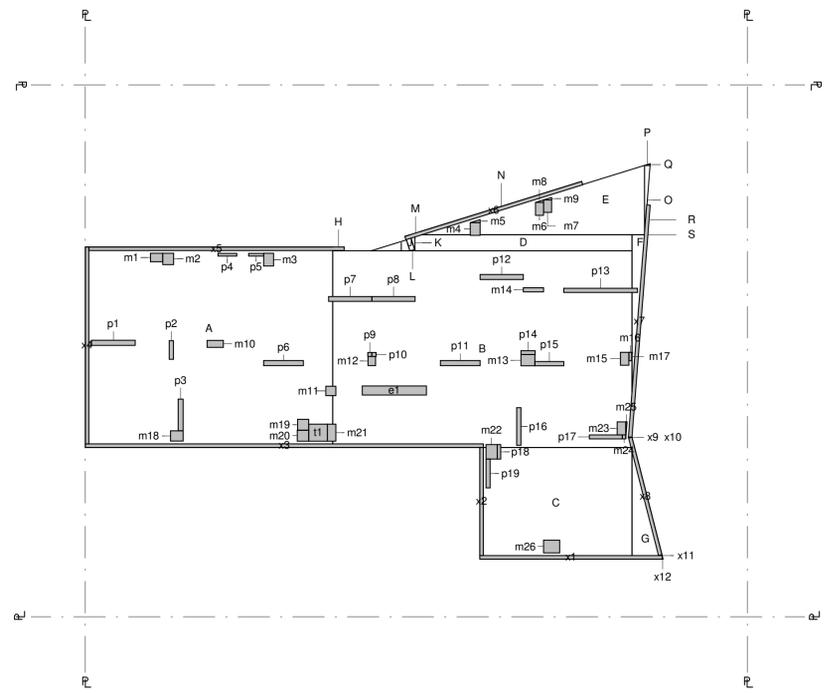
NYC DOB Number: Sheet: 2 of 14



GROSS AREA PROPOSED				MECHANICAL/PLUMBING/PERIMETER DEDUCTIONS			
A	46.72	x	37.67	=	1759.76	SF	RESIDENTIAL
B	56.52	x	36.95	=	2088.28	SF	RESIDENTIAL
C	28.75	x	21.00	=	603.74	SF	RESIDENTIAL
D	41.00	x	3.01	=	123.57	SF	RESIDENTIAL
E	42.22	x	13.05	=	275.50	SF	RESIDENTIAL
F	38.05	x	3.00	=	57.02	SF	RESIDENTIAL
G	22.91	x	5.87	=	67.25	SF	RESIDENTIAL
H	2.16	x	0.72	=	1.55	SF	RESIDENTIAL
I	2.16	x	7.00	=	7.57	SF	RESIDENTIAL
J	2.88	x	0.91	=	2.64	SF	RESIDENTIAL
K	0.93	x	3.01	=	1.40	SF	RESIDENTIAL
L	0.92	x	0.28	=	0.13	SF	RESIDENTIAL
M	0.63	x	2.01	=	0.63	SF	RESIDENTIAL
N	31.94	x	0.63	=	20.00	SF	RESIDENTIAL
O	1.03	x	13.05	=	6.72	SF	RESIDENTIAL
P	1.03	x	0.32	=	0.16	SF	RESIDENTIAL
Q	0.03	x	0.32	=	0.00	SF	RESIDENTIAL
R	0.63	x	5.58	=	3.49	SF	RESIDENTIAL
S	0.62	x	0.05	=	0.02	SF	RESIDENTIAL
				=	5019.42	SF	
e1	12.13	x	1.71	=	-20.78	SF	RESIDENTIAL
m1	2.33	x	1.60	=	-3.74	SF	RESIDENTIAL
m2	2.05	x	2.13	=	-4.36	SF	RESIDENTIAL
m3	1.86	x	2.40	=	-4.46	SF	RESIDENTIAL
m4	1.86	x	2.40	=	-4.46	SF	RESIDENTIAL
m5	1.86	x	0.58	=	-0.54	SF	RESIDENTIAL
m6	1.52	x	2.43	=	-3.68	SF	RESIDENTIAL
m7	1.52	x	2.35	=	-3.56	SF	RESIDENTIAL
m8	1.52	x	0.47	=	-0.36	SF	RESIDENTIAL
m9	1.52	x	0.47	=	-0.36	SF	RESIDENTIAL
m10	3.08	x	1.30	=	-4.01	SF	RESIDENTIAL
m11	1.91	x	1.76	=	-3.35	SF	RESIDENTIAL
m12	1.42	x	1.74	=	-2.46	SF	RESIDENTIAL
m13	2.64	x	2.10	=	-5.55	SF	RESIDENTIAL
m14	3.81	x	0.76	=	-2.90	SF	RESIDENTIAL
m15	1.59	x	2.44	=	-3.87	SF	RESIDENTIAL
m16	0.55	x	1.58	=	-0.87	SF	RESIDENTIAL
m17	1.58	x	0.12	=	-0.10	SF	RESIDENTIAL
m18	2.36	x	1.93	=	-4.57	SF	RESIDENTIAL
m19	2.12	x	2.04	=	-4.34	SF	RESIDENTIAL
m20	2.18	x	2.06	=	-4.50	SF	RESIDENTIAL
m21	1.58	x	3.19	=	-5.05	SF	RESIDENTIAL
m22	2.11	x	2.73	=	-5.77	SF	RESIDENTIAL
m23	1.63	x	2.45	=	-4.01	SF	RESIDENTIAL
m24	0.65	x	0.76	=	-0.49	SF	RESIDENTIAL
m25	3.08	x	0.24	=	-0.36	SF	RESIDENTIAL
m26	3.03	x	2.40	=	-7.28	SF	RESIDENTIAL
p1	8.26	x	0.98	=	-8.08	SF	RESIDENTIAL
p2	0.81	x	3.48	=	-2.83	SF	RESIDENTIAL
p3	0.93	x	5.95	=	-5.52	SF	RESIDENTIAL
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p13	13.94	x	0.76	=	-10.60	SF	RESIDENTIAL
p14	2.69	x	0.73	=	-1.98	SF	RESIDENTIAL
p15	5.43	x	0.81	=	-4.41	SF	RESIDENTIAL
p16	0.80	x	7.07	=	-5.63	SF	RESIDENTIAL
p17	6.24	x	0.76	=	-4.74	SF	RESIDENTIAL
p18	0.68	x	2.73	=	-1.86	SF	RESIDENTIAL
p19	0.80	x	5.43	=	-4.32	SF	RESIDENTIAL
t1	3.54	x	3.19	=	-11.29	SF	RESIDENTIAL
x1	34.45	x	0.67	=	-22.97	SF	RESIDENTIAL
x2	0.67	x	20.33	=	-13.56	SF	RESIDENTIAL
x3	75.16	x	0.67	=	-50.10	SF	RESIDENTIAL
x4	0.67	x	37.00	=	-24.67	SF	RESIDENTIAL
x5	48.21	x	0.67	=	-32.14	SF	RESIDENTIAL
x6	34.95	x	0.67	=	-23.30	SF	RESIDENTIAL
x7	0.67	x	43.75	=	-29.17	SF	RESIDENTIAL
x8	0.67	x	22.79	=	-15.19	SF	RESIDENTIAL
x9	0.67	x	0.11	=	-0.04	SF	RESIDENTIAL
x10	0.67	x	0.11	=	-0.04	SF	RESIDENTIAL
x11	0.67	x	0.17	=	-0.06	SF	RESIDENTIAL
x12	0.67	x	0.17	=	-0.06	SF	RESIDENTIAL
				=	-419.93	SF	
TOTAL R6 ZFA PROPOSED				4599.49	SF		

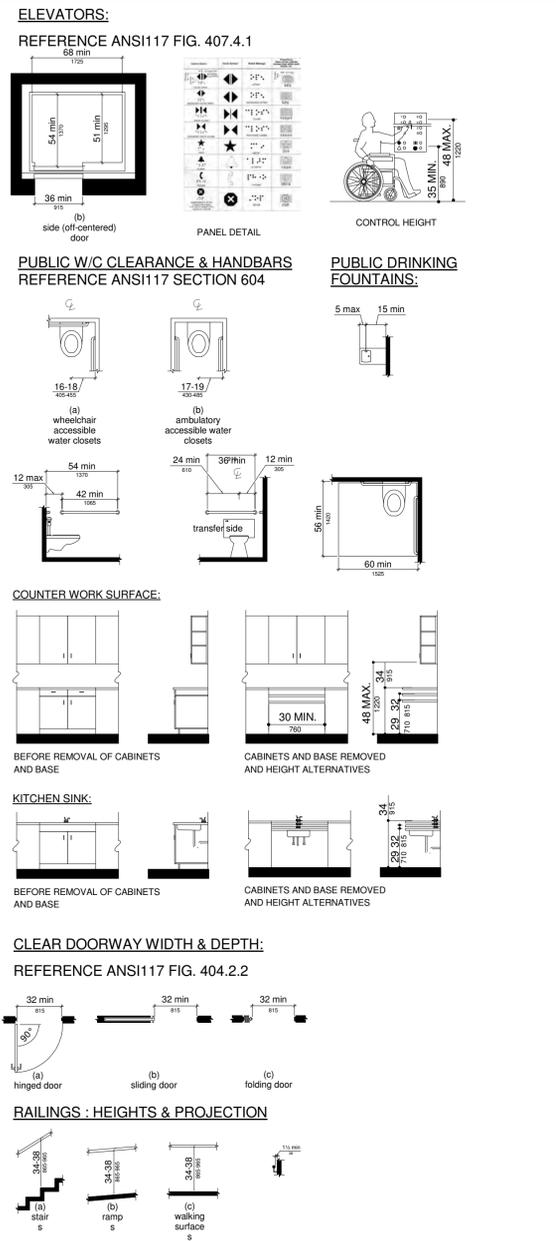
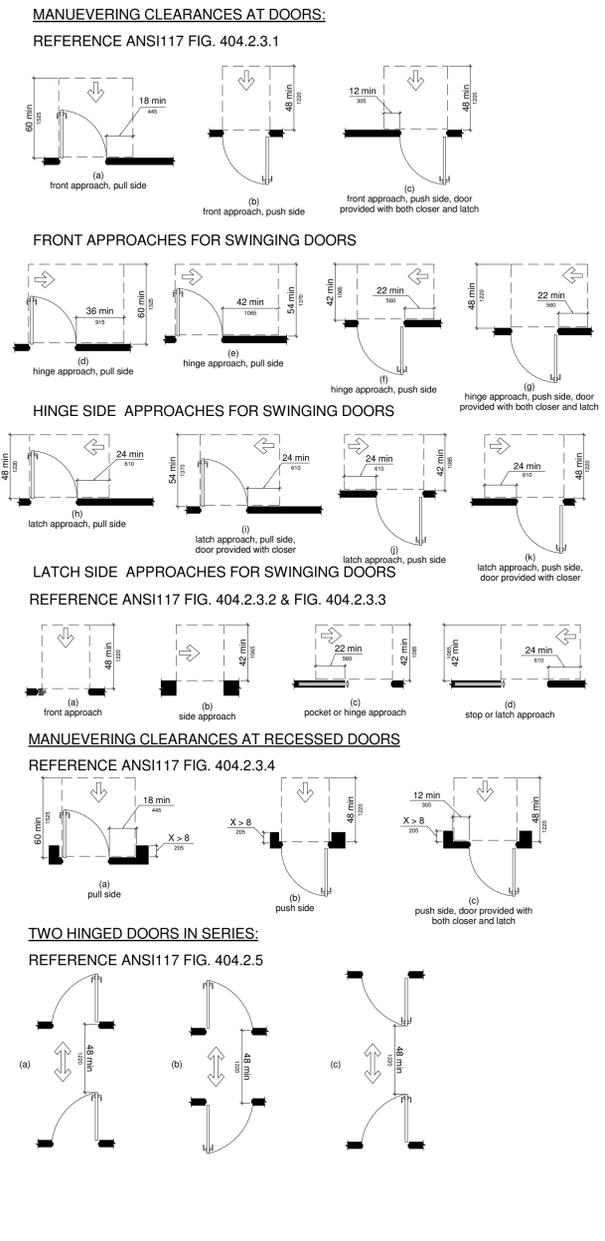


GROSS AREA PROPOSED				MECHANICAL/PLUMBING/PERIMETER DEDUCTIONS			
A	46.72	x	37.67	=	1759.76	SF	RESIDENTIAL
B	56.52	x	36.95	=	2088.28	SF	RESIDENTIAL
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D	41.00	x	3.01	=	123.57	SF	RESIDENTIAL
E	42.22	x	13.05	=	275.50	SF	RESIDENTIAL
F	38.05	x	3.00	=	57.02	SF	RESIDENTIAL
G	22.91	x	5.87	=	67.25	SF	RESIDENTIAL
H	2.16	x	0.72	=	1.55	SF	RESIDENTIAL
I	2.16	x	7.00	=	7.57	SF	RESIDENTIAL
J	2.88	x	0.91	=	2.64	SF	RESIDENTIAL
K	0.93	x	3.01	=	1.40	SF	RESIDENTIAL
L	0.92	x	0.28	=	0.13	SF	RESIDENTIAL
M	0.63	x	2.01	=	0.63	SF	RESIDENTIAL
N	31.94	x	0.63	=	20.00	SF	RESIDENTIAL
O	1.03	x	13.05	=	6.72	SF	RESIDENTIAL
P	1.03	x	0.32	=	0.16	SF	RESIDENTIAL
Q	0.03	x	0.32	=	0.00	SF	RESIDENTIAL
R	0.63	x	5.58	=	3.49	SF	RESIDENTIAL
S	0.62	x	0.05	=	0.02	SF	RESIDENTIAL
				=	5019.42	SF	
e1	12.13	x	1.71	=	-20.78	SF	RESIDENTIAL
m1	2.33	x	1.60	=	-3.74	SF	RESIDENTIAL
m2	2.05	x	2.13	=	-4.36	SF	RESIDENTIAL
m3	1.86	x	2.40	=	-4.46	SF	RESIDENTIAL
m4	1.86	x	2.40	=	-4.46	SF	RESIDENTIAL
m5	1.86	x	0.58	=	-0.54	SF	RESIDENTIAL
m6	1.52	x	2.43	=	-3.68	SF	RESIDENTIAL
m7	1.52	x	2.35	=	-3.56	SF	RESIDENTIAL
m8	1.52	x	0.47	=	-0.36	SF	RESIDENTIAL
m9	1.52	x	0.47	=	-0.36	SF	RESIDENTIAL
m10	3.08	x	1.30	=	-4.01	SF	RESIDENTIAL
m11	1.91	x	1.76	=	-3.35	SF	RESIDENTIAL
m12	1.42	x	1.74	=	-2.46	SF	RESIDENTIAL
m13	2.64	x	2.10	=	-5.55	SF	RESIDENTIAL
m14	3.81	x	0.76	=	-2.90	SF	RESIDENTIAL
m15	1.59	x	2.44	=	-3.87	SF	RESIDENTIAL
m16	0.55	x	1.58	=	-0.87	SF	RESIDENTIAL
m17	1.58	x	0.12	=	-0.10	SF	RESIDENTIAL
m18	2.36	x	1.93	=	-4.57	SF	RESIDENTIAL
m19	2.12	x	2.04	=	-4.34	SF	RESIDENTIAL
m20	2.18	x	2.06	=	-4.50	SF	RESIDENTIAL
m21	1.58	x	3.19	=	-5.05	SF	RESIDENTIAL
m22	2.11	x	2.73	=	-5.77	SF	RESIDENTIAL
m23	1.63	x	2.45	=	-4.01	SF	RESIDENTIAL
m24	0.65	x	0.76	=	-0.49	SF	RESIDENTIAL
m25	3.08	x	0.24	=	-0.36	SF	RESIDENTIAL
m26	3.03	x	2.40	=	-7.28	SF	RESIDENTIAL
p1	8.26	x	0.98	=	-8.08	SF	RESIDENTIAL
p2	0.81	x	3.48	=	-2.83	SF	RESIDENTIAL
p3	0.93	x	5.95	=	-5.52	SF	RESIDENTIAL
p4	3.55	x	0.53	=	-1.87	SF	RESIDENTIAL
p5	2.81	x	0.53	=	-1.48	SF	RESIDENTIAL
p6	7.51	x	0.96	=	-7.20	SF	RESIDENTIAL
p7	8.16	x	0.93	=	-7.57	SF	RESIDENTIAL
p8	8.16	x	0.93	=	-7.57	SF	RESIDENTIAL
p9	0.78	x	0.74	=	-0.57	SF	RESIDENTIAL
p10	0.80	x	0.74	=	-0.59	SF	RESIDENTIAL
p11	7.51	x	0.96	=	-7.20	SF	RESIDENTIAL
p12	8.16	x	0.93	=	-7.57	SF	RESIDENTIAL
p13	13.94	x	0.76	=	-10.60	SF	RESIDENTIAL
p14	2.69	x	0.73	=	-1.98	SF	RESIDENTIAL
p15	5.43	x	0.81	=	-4.41	SF	RESIDENTIAL
p16	0.80	x	7.07	=	-5.63	SF	RESIDENTIAL
p17	6.24	x	0.76	=	-4.74	SF	RESIDENTIAL
p18	0.68	x	2.73	=	-1.86	SF	RESIDENTIAL
p19	0.80	x	5.43	=	-4.32	SF	RESIDENTIAL
t1	3.54	x	3.19	=	-11.29	SF	RESIDENTIAL
x1	34.45	x	0.67	=	-22.97	SF	RESIDENTIAL
x2	0.67	x	20.33	=	-13.56	SF	RESIDENTIAL
x3	75.16	x	0.67	=	-50.10	SF	RESIDENTIAL
x4	0.67	x	37.00	=	-24.67	SF	RESIDENTIAL
x5	48.21	x	0.67	=	-32.14	SF	RESIDENTIAL
x6	34.95	x	0.67	=	-23.30	SF	RESIDENTIAL
x7	0.67	x	43.75	=	-29.17	SF	RESIDENTIAL
x8	0.67	x	22.79	=	-15.19	SF	RESIDENTIAL
x9	0.67	x	0.11	=	-0.04	SF	RESIDENTIAL
x10	0.67	x	0.11	=	-0.04	SF	RESIDENTIAL
x11	0.67	x	0.17	=	-0.06	SF	RESIDENTIAL
x12	0.67	x	0.17	=	-0.06	SF	RESIDENTIAL
				=	-419.93	SF	
TOTAL R6 ZFA PROPOSED				4599.49	SF		



GROSS AREA PROPOSED				MECHANICAL/PLUMBING/PERIMETER DEDUCTIONS			
A	46.72	x	37.67	=	1759.76	SF	RESIDENTIAL
B	56.52	x	36.95	=	2088.28	SF	RESIDENTIAL
C	28.75	x	21.00	=	603.74	SF	RESIDENTIAL
D	41.00	x	3.01	=	123.57	SF	RESIDENTIAL
E	42.22	x	13.05	=	275.50	SF	RESIDENTIAL
F	38.05	x	3.00	=	57.02	SF	RESIDENTIAL
G	22.91	x	5.87	=	67.25	SF	RESIDENTIAL
H	2.16	x	0.72	=	1.55	SF	RESIDENTIAL
I	2.16	x	7.00	=	7.57	SF	RESIDENTIAL
J	2.88	x	0.91	=	2.64	SF	RESIDENTIAL
K	0.93	x	3.01	=	1.40	SF	RESIDENTIAL
L	0.92	x	0.28	=	0.13	SF	RESIDENTIAL
M	0.63	x	2.01	=	0.63	SF	RESIDENTIAL
N	31.94	x	0.63	=	20.00	SF	RESIDENTIAL
O	1.03	x	13.05	=	6.72	SF	RESIDENTIAL
P	1.03	x	0.32	=	0.16	SF	RESIDENTIAL
Q	0.03	x	0.32	=	0.00	SF	RESIDENTIAL
R	0.63	x	5.58	=	3.49	SF	RESIDENTIAL
S	0.62	x	0.05	=	0.02	SF	RESIDENTIAL
				=	5019.42	SF	
e1	12.13	x	1.71	=	-20.78	SF	RESIDENTIAL
m1	2.33	x	1.60	=	-3.74	SF	RESIDENTIAL
m2	2.05	x	2.13	=	-4.36	SF	RESIDENTIAL
m3	1.86	x	2.40	=			

ACCESSIBILITY REQUIREMENTS



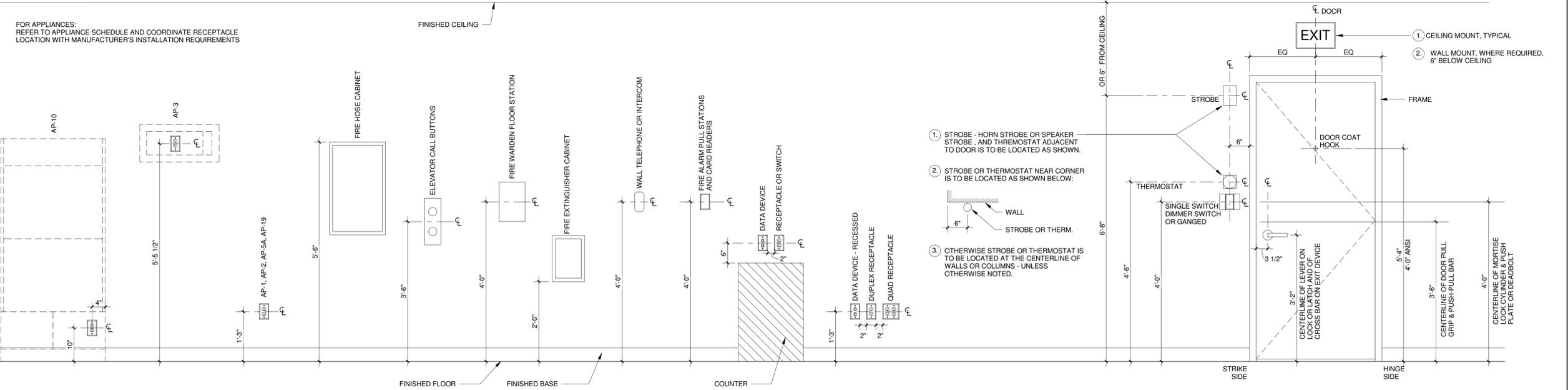
BUILDING CODE ANALYSIS

APPLICABLE CODES		REQUIRED FIRE RESISTANCE RATINGS FOR BUILDING ELEMENTS		MEANS OF EGRESS- EXIT ACCESS TRAVEL DISTANCE (SPRINKLERED)	
NEW YORK CITY BUILDING CODE, 2008 (NYCBC)	NEW YORK CITY FUEL GAS CODE, 2006	TABLE 601	BUILDING ELEMENT	1013.3	COMMON PATH OF EGRESS TRAVEL (EXCEPT H.B.F.S)
NEW YORK CITY MECHANICAL CODE, 2008	NEW YORK CITY PLUMBING CODE, 2008		STRUCTURAL FRAME	1013.3	COMMON PATH OF EGRESS TRAVEL @ B.F.S
NEW YORK CITY FIRE CODE, 2008	NEW YORK CITY ELECTRICAL CODE, 2007		BEARING WALLS- EXTERIOR	1024.8	COMMON PATH OF EGRESS TRAVEL @ A
NEW YORK CITY ENERGY CONSERVATION CODE, 2011	AMERICAN DISABILITIES ACT, 2010		BEARING WALLS- INTERIOR		
	ANSI A117.1, 2003		NON-BEARING WALLS & PART- EXT.		
	NFPA 101 LIFE SAFETY CODE, 2006		NON-BEARING WALLS & PARTITIONS- INT.		
	NFPA 13 STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS, 2002, AS MODIFIED BY APPENDIX Q OF NYCBC		FLOOR CONSTRUCTION		
	NFPA 14 STANDARD FOR THE INSTALLATION OF STANDPIPES & HOSE SYSTEMS, 2003 AS MODIFIED BY APPENDIX Q OF NYCBC		ROOF CONSTRUCTION		
	NFPA 72 NATIONAL FIRE ALARM CODE, 2002, AS MODIFIED BY APPENDIX Q OF NYCBC				
BUILDING CLASSIFICATION		REQUIRED FIRE RESISTANCE RATINGS FOR EXTERIOR WALLS		MEANS OF EGRESS- EXIT ACCESS TRAVEL DISTANCE (NON-SPRINKLERED)	
508.3.2	ONE HIGH RISE BUILDING WITH SEPARATED OCCUPANCIES	TABLE 602	FIRE SEPARATION DIST.	TABLE 1015.1	EXIT ACCESS TRAVEL DISTANCE @ F.M.R.S-1
			CONST. TYPE	TABLE 1015.1	EXIT ACCESS TRAVEL DISTANCE @ B
			USE A,B,E,R-2	TABLE 1015.1	EXIT ACCESS TRAVEL DISTANCE @ F-2, S-2
				TABLE 1024.7	EXIT ACCESS TRAVEL DISTANCE @ A-1,2,3.4 (PRIMARY)
				TABLE 1024.7	EXIT ACCESS TRAVEL DIST. @ A-1,2,3.4 (SECONDARY)
OCCUPANCY CLASSIFICATION		SHAFT ENCLOSURE RATING		ACCESSIBLE DWELLING & SLEEPING UNITS	
310.1.2	R-2 IS THE MAIN USE OR DOMINANT OCCUPANCY OF THE BUILDING	TABLE 707.4	> 3 STORIES, 2 HOURS	1107.6.2	IN R-2, EVERY DWELLING UNIT TO BE A TYPE B UNIT
			< 3 STORIES, 1 HOUR, (But not less than rating of the floor that is penetrated)	1018.1	
USE GROUPS		MAXIMUM AREA OF EXTERIOR WALL OPENINGS - R-2		MINIMUM PLUMBING FACILITIES	
302.1	RESIDENTIAL (MULTIPLE DWELLING) MERCANTILE	TABLE 704.8	CLASSIFICATION OF OPENING	TABLE PC403.1	WATER CLOSET
			FIRE SEPARATION DIST. (FEET)		LAVATORY
			% of EXTERIOR WALL AREA ALLOWED		BATHTUB/SHOWER
					KITCHEN SINK
					CLOTHES WASHER CONNECTION
INCIDENTAL USES		INTERIOR CORRIDOR FIRE RESISTANCE RATINGS (SPRINKLERED)		AUTOMATIC SPRINKLER SYSTEM	
TABLE 508.2	MECH and/or ELEC. ROOM	TABLE 1016.1.2	OCCUPANCY	BC903.3.1.1	SPRINKLER SYSTEM TO BE PROVIDED IN ACCORDANCE WITH NFPA 13 AS MODIFIED BY NYCBC APPENDIX Q
	PARKING GARAGE		REQUIRED FIRE RESISTANCE RATING		
	STORAGE ROOMS > 100SF				
	WASTE & LINEN RM.S > 100SF				
CONSTRUCTION TYPE		SPECIAL DETAILED REQUIREMENTS BASED ON USE & OCCUPANCY		STANDPIPE SYSTEM	
TABLE 601	TYPE 1B NON COMBUSTIBLE	N/A	N/A	BC905.2	CLASS 1 AUTOMATIC WET STANDPIPE SYSTEM TO BE PROVIDED IN ACCORDANCE WITH NFPA 14, AS MODIFIED BY NYCBC APPENDIX Q
TABLE 503, 504.2	UNLIMITED			BC905.3.2	
ALLOWABLE BUILDING HEIGHT		MEANS OF EGRESS- EGRESS WIDTH		PORTABLE FIRE EXTINGUISHERS	
TABLE 503	UNLIMITED	TABLE 1005.1	STAIR (WIDTH PER OCCUPANT SERVED)	FC906.1	TO BE PROVIDED IN ACCORDANCE WITH NFPA 10
			OTHER EGRESS COMP. (WIDTH PER OCCUPANT SERVED)		
			MIN. STAIRWAY WIDTH (TYPICAL)		
			MIN. CORRIDOR WIDTH (MECH. EGMT. ACCESS)		
			MIN. CORRIDOR WIDTH (<50 OCCUPANTS)		
			MIN. CORRIDOR WIDTH (WITHIN R-2/R-3 DWELLING)		
			MIN. CORRIDOR WIDTH (>50 OCCUPANTS)		
			MIN. CORRIDOR WIDTH (GROUP E SERVING CLASSROOMS)		
ALLOWABLE NUMBER OF STORIES		MEANS OF EGRESS- ACCESSIBLE MEANS OF EGRESS		FIRE ALARM SYSTEM	
TABLE 503	UNLIMITED	1007.1	2 REQUIRED FROM EACH FLOOR- 2 PROVIDED FROM EACH FLOOR	BC907.1	FIRE ALARM SYSTEM TO BE PROVIDED IN ACCORDANCE WITH NFPA 72 AS MODIFIED BY NYCBC APPENDIX Q
ALLOWABLE BUILDING AREA PER FLOOR		ROOFING SYSTEM		BC1505.1	ROOFING SYSTEM TO BE CLASS A PER ASTM E108 OR UL 790
TABLE 503	UNLIMITED				

BUILDING OCCUPANCY CALCULATIONS

LEVEL	CELLAR	1	2	3	4	5	6	7	8	9	ROOF	TOTAL
OCCUPANCY	R-2	R-2	R-2	R-2	R-2	R-2	R-2	R-2	R-2	R-2		
OCCUPANCY LOAD	19	75	4	26	26	26	26	24	24	9	0	259

TYPICAL DEVICE LOCATIONS



PBDW ARCHITECTS

Platt Byard Dovell White Architects LLP
20 West 22nd Street, New York, NY 10010
212.691.2440 | pbdw.com

Anastos Engineering Associates | Structural Engineer
240 West 35th Street, New York, NY 10001
212.714.0993 | anastoseng.com

Rodkin Cardinale Engineers | Mechanical Engineer
224 West 29th Street, New York, NY 10001
212.239.1892 | rcnep.com

Design 2147 Limited | Code Consultant
52 Diamond Street, Brooklyn, NY 11222
718.383.9340 | design2147.com

DOB APPROVAL STAMP

Date: No.: Description:

Project: **88 Withers Street**

88 Withers Street
Brooklyn, NY 11211

Sheet Title: **BUILDING CODE COMPLIANCE**

Project Number: 15690

Signature & Seal:

Drawn By: JB

Checked By: RHD, JB

Scale: As indicated

Sheet Number: **A-01.00**

NYC DOB Number: Sheet: 7 of 14

DEPARTMENT OF BUILDING NOTES

APPLICABLE REGULATIONS AS PER THE BUILDING CODE OF THE CITY OF NEW YORK.

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE BUILDING CODE OF THE CITY OF NEW YORK, AND WITH THE REGULATIONS OF OTHER AGENCIES HAVING JURISDICTION.
2. BEFORE COMMENCING WORK, THE CONTRACTOR SHALL FILE ALL REQUIRED CERTIFICATES OF INSURANCE WITH THE DEPARTMENT OF BUILDINGS, OBTAIN ALL REQUIRED PERMITS, AND PAY ALL FEES REQUIRED BY GOVERNING NEW YORK CITY AND NEW YORK STATE AGENCIES.
3. THE CONTRACTOR, UPON COMPLETION OF THE WORK, SHALL APPLY FOR AND ACQUIRE THE CERTIFICATE OF OCCUPANCY. EACH CONTRACTOR SHALL ARRANGE FOR THE INSPECTIONS AND SIGN OFFS APPLICABLE TO THEIR WORK.
4. THE CONTRACTOR SHALL COORDINATE ALL WORK PROCEDURES WITH THE REQUIREMENTS OF LOCAL AUTHORITIES.
5. PLUMBING AND ELECTRICAL WORK SHALL BE PERFORMED BY PERSONS LICENSED IN THEIR TRADES, WHO SHALL ARRANGE FOR AND OBTAIN REQUIRED INSPECTIONS AND SIGN OFFS.
6. ALL NECESSARY APPROVALS FOR ELECTRICAL WORK SHALL BE OBTAINED FROM THE BUREAU FROM ELECTRICAL CONTROL.
7. ALL PERMITS ISSUED BY THE DEPARTMENT OF BUILDINGS SHALL BE POSTED IN A CONSPICUOUS PLACE, OPEN TO PUBLIC INSPECTION, UNTIL THE COMPLETION OF THE WORK, OR UNTIL THE EXPIRATION OF THE PERMIT.
8. ALL MATERIALS, ASSEMBLIES, FORMS, AND METHODS OF CONSTRUCTION AND SERVICE EQUIPMENT SHALL MEET THE FOLLOWING REQUIREMENT PER SECTION 27-131:
A. SHALL HAVE BEEN ACCEPTED FOR USE UNDER THE PRESCRIBED CODE TEST METHODS BY THE COMMISSIONER OR
B. APPROVED BY THE BOARD OF STANDARDS AND APPEALS OR MEA.

MULTIPLE DWELLING LAW

Sec. 67. Hotels and certain other class A and class B dwellings.

- 1. There shall be one or more completely enclosed compartments for the storage of mattresses, furniture, paints, floor wax, linens, brooms, mops and other such inflammable or combustible paraphernalia incidental to the occupancy and maintenance of the dwelling, and such paraphernalia shall be stored in no other portion of such dwelling. Such compartments shall be completely protected by one or more automatic sprinkler heads. Every door from any such compartment shall be self-closing. Closets which do not exceed one hundred square feet in floor area may be used for the temporary storage of such paraphernalia, except mattresses, furniture, paints and insecticides containing inflammable materials and are excluded from the requirements of this subdivision.
2. All kitchens and pantries serving restaurants in such non-fireproof dwellings shall be equipped with one or more automatic sprinkler heads.
7. a. All doors opening from shafts, stair halls or stairs and the door assemblies shall be fire-resistive with the doors self-closing and without transoms or any other opening.
b. All other doors opening upon entrance halls or other public halls or corridors in every part of the dwelling shall be self-closing.
c. All openings which provide direct access to a fire-escape from a public hall or corridor shall be equipped with fireproof doors and assemblies which are door self-closing or fireproof windows glazed with clear wire glass. Doors providing access to fire-escapes from public halls or corridors may be glazed with clear wire glass.
d. It shall be unlawful to attach to or maintain on or about any door required to be self-closing any device which prevents the self-closing of such door.
8. a. (i) Every means of egress shall be indicated by a sign reading "EXIT" in red letters at least eight inches high on a white background, or vice versa, illuminated at all times during the day and night by a red light of at least twenty-five watts or equivalent illumination. Such light shall be maintained in a keyless socket. On all stories where doors, openings or passageways giving access to any means of egress are not visible from all portions of such stories, lighted or reflective directional signs shall be maintained in conspicuous locations, indicating in red on a white background, or vice versa, the direction of travel to the nearest means of egress. In addition to being posted in conspicuous locations, such signs located near the floor, giving direction to the nearest means of egress, shall also be maintained. At least one sign shall be visible from the doorway of each room or suite of rooms. Existing signs and illumination may be accepted if, in the opinion of the department, such existing signs and illumination serve the intent and purpose of this subdivision. Supplementary signs, fire-stairs, fire-towers or fire-escapes which do not lead to the entrance story or to a street or to a yard or court, leading to a street, shall be clearly marked "NOT AN EXIT" in black letters at least four inches high on a yellow background and at the termination of each such stair, fire-stair, fire-tower or fire-escape, there shall be a directional sign indicating the nearest means of egress leading to a street. All signs shall be constructed, located and illuminated in a manner satisfactory to the department.
b. On each floor of every hotel or motel having two or more stories where the rooms or suites of rooms are connected by an interior hallway, there shall be posted by each stairway, elevator or other means of egress a printed scale floor plan of the particular story, which shall show all means of egress, clearly labeling those to be used in case of fire. Such signs shall be posted in other conspicuous areas throughout the building. Said floor plan shall be no smaller than eight inches by ten inches and shall be posted in such a manner that it cannot be readily removed.
11. a. There shall be a fire-retarded bulkhead in the roof over, or connecting directly by means of a public hall with the highest portion of, every stair extending to the highest story below the main roof. Stairs leading to such bulkheads shall be fire-retarded as required for other public stairs and shall have at the top fireproof doors and assemblies with the doors self-closing. All stairs to required bulkheads shall be provided with a guide or handrail. A scuttle so constructed as to be readily opened may be substituted for a bulkhead in such dwellings two stories or less in height. Such scuttle shall be at least twenty-one inches in width and twenty-eight inches in length, covered on the outside with metal and provided with a stationary iron or steel ladder leading thereto.
c. A bulkhead door or scuttle shall never be self-locking and shall be fastened on the inside with movable rustproof bolts, hooks, or a lock which does not require a key to open from the inside of the dwelling.
12. In every such dwelling containing thirty or more rooms used for living or sleeping purposes by transient occupants there shall be a closed-circuit interior fire alarm system. Such alarm system shall be so installed and maintained that it can be operated manually from any story to sound an alarm or alarms capable of being heard clearly in all parts of the dwelling. Such alarm system shall be installed, arranged and maintained in a manner satisfactory to the fire department.

13. When the local building code requires a standpipe system such system shall comply with all of the applicable requirements of such code.

14. In every such fireproof dwelling containing fifty or more rooms used for living or sleeping purposes by transient occupants and in every such non-fireproof dwelling containing thirty or more such rooms, the owner shall employ one or more watchmen or clerks whose duty it shall be to visit every portion of the dwelling at frequent regular intervals for the purpose of detecting fire or other sources of danger and giving immediate and timely warning thereof to all the occupants. There shall be provided a watchman's clock system or other device to record the movements of such watchman. Such system shall be installed, supervised and maintained in a manner satisfactory to the fire department. However, the provisions of this subdivision shall not apply where, throughout the dwelling, a closed-circuit, automatic, thermostatic fire-detecting system is installed which actuates a fire alarm, or where, throughout the dwelling, an approved-type automatic sprinkler system is installed which actuates a fire alarm by the flow of water through such system.

15. a. Nothing in this section shall be construed as permitting partitions or materials which are not fireproof in any fireproof dwelling; nor shall anything in this section be deemed to abrogate any powers or duties vested by law in the fire commissioner or fire department, except that an existing sprinkler installation, fire alarm or standpipe system which has been approved or accepted by the department having jurisdiction and installed before July first, nineteen hundred forty-eight, shall, after inspection by the said department, be deemed to be in compliance with the requirements of this section or may be altered or adapted to meet such requirements instead of a completely new installation or system.
b. All automatic sprinkler heads required by this section shall be constructed to fuse at a temperature not higher than one hundred sixty-five degrees Fahrenheit, spaced so as to protect the area which is required to be sprinklered, and installed, arranged and maintained in conformity with regulations adopted by the department.
c. For the purposes of subdivisions twelve and fourteen of this section, the term "transient occupancy" shall mean the occupancy of a room for living purposes by the same person or persons for a period of ninety days or less.

HOUSING MAINTENANCE CODE NOTES:

- 1. CLEANING OF ROOFS, YARDS, COURTS AND OTHER OPEN SPACES OF A DWELLING CONTAINING TWO OR MORE DWELLING UNITS, AND THE OCCUPANCY OF A SINGLE FAMILY AS PER SEC. D26-11.01 H.M.C.
2. PAINTING OF PUBLIC PARTS OR ANY ACCEPTABLE WALL COVERING WITHIN DWELLING TO COMPLY WITH SEC. D26-12.01 H.M.C.
3. OWNER IN CONTROL OF A DWELLING SHALL KEEP THE PREMISES FREE FROM RODENTS AND INFESTATIONS, INSECTS AND OTHER PESTS AS PER SEC. D-13.03 H.M.C.
4. ANY CONDITION WHICH PROVIDES SHELTER OR PROTECTION FOR RODENTS OR INSECTS AND OTHER PESTS SHALL BE ELIMINATED AS PER SEC. D26-13.05 H.M.C.
5. RECEPTACLES FOR COLLECTION OF WASTED, MANNER TO BE PROVIDED AS PER SEC. D26-14.05 H.M.C.
6. DRAINAGE OF ROOFS, COURTS, AND YARD TO COMPLY WITH SEC. D26-16.03 H.M.C.
7. WINDOWS IN ALL ROOMS, EXCEPT BATHROOMS AND KITCHENETTES SHALL BE AT LEAST ONE TENTH THE AREA OF THE ROOM AND BE AT LEAST 12 SQ. FT. IN AREA B.S.B. D26-30.03 H.M.C.
8. ROOMS HAVING ONLY ONE WINDOW LESS THAN 18 SQ. FT. IN AREA SHALL HAVE A TRANSOM OVER THE DOOR, HAVING A MIN. AREA OF 144 SQ. IN. B.S.B. D26-30.03 H.M.C.
9. BOARD OF STANDARDS AND APPEALS APPROVED TYPE PEEPHOLES APPROXIMATELY 5 FEET ABOVE FINISHED FLOOR TO BE PROVIDED IN ENTRANCE DOORS OF DWELLING UNITS AS PER SEC. D26-01 H.M.C. AND DEPT. OF RULES AND REGS.
10. KEY LOCK IN THE ENTRANCE DOOR TO EACH DWELLING UNIT WITH AT LEAST ONE KEY TO BE PROVIDED BY OWNER AS PER SEC. D26-20.05 H.M.C.
11. PROPER FLOOR SIGNS TO BE PROVIDED IN PUBLIC HALL HEAR STAIRS AND ELEVATOR AND WITHIN STAIRS AS PER SEC. D26-21.08 H.M.C. AND DEPT. OF RULES AND REGS.
12. PROPER STREET NUMBERS TO BE PROVIDED IN FRONT OF THE DWELLING AS PER SEC. D26-21.05 H.M.C. AND RULES AND REGS. OF THE BOROUGH PRESIDENT
13. REGISTRATION STATEMENT TO BE FILED WHICH INCLUDES METES AND BOUNDS OF PROPERTY, THE OWNER'S NAME AND ADDRESS, OR IF A CORPORATION, THE NAME AND ADDRESS OF OFFICER AS PER SEC. D26-41.01 AND D26-41.03 H.M.C.
14. REGISTRATION IDENTIFICATION SIGN CONTAINING DWELLING SERIAL NUMBER TO BE POSTED AS PER SEC. D26-41.15 H.M.C.

SPECIAL INSPECTIONS

Table with 2 columns: SPECIAL INSPECTIONS and CODE/SECTION. Lists various inspection items like FLOOD ZONE COMPLIANCE, FIRE ALARM TEST, STRUCTURAL STEEL - WELDING, etc.

PROGRESS INSPECTIONS

Table with 2 columns: PROGRESS INSPECTIONS and CODE/SECTION. Lists items like PRELIMINARY, FOOTING AND FOUNDATION, LOWEST FLOOR ELEVATION, etc.

ENERGY CODE PROGRESS INSPECTION

Table with 2 columns: ENERGY CODE PROGRESS INSPECTION and CODE/SECTION. Lists items like PROTECTION OF FOUNDATION INSULATION, INSULATION PLACEMENT AND R VALUES, FENESTRATION THERMAL VALUES AND RATINGS, etc.

TABLE II - PROGRESS INSPECTIONS FOR ENERGY CODE COMPLIANCE - COMMERCIAL BUILDINGS

Table with 4 columns: Inspection/Test, Periodic (minimum), Reference Standard (See ECC Chapter 6) or Other Criteria, ECC or Other Citation. Lists various energy code inspection items like Envelope Inspections, Fenestration thermal values, etc.

IIIB Mechanical and Service Water Heating Inspections

Table with 4 columns: Inspection/Test, Periodic (minimum), Reference Standard (See ECC Chapter 6) or Other Criteria, ECC or Other Citation. Lists mechanical and service water heating inspection items like Outdoor air intakes and exhaust openings, HVAC system controls, etc.

Table with 4 columns: Inspection/Test, Periodic (minimum), Reference Standard (See ECC Chapter 6) or Other Criteria, ECC or Other Citation. Contains detailed notes for IIIB4 and IIIB5 regarding ductwork and air leakage testing.

Table with 4 columns: Inspection/Test, Periodic (minimum), Reference Standard (See ECC Chapter 6) or Other Criteria, ECC or Other Citation. Lists electrical power and lighting system inspection items like Electrical metering, Lighting in dwelling units, etc.

Table with 4 columns: Inspection/Test, Periodic (minimum), Reference Standard (See ECC Chapter 6) or Other Criteria, ECC or Other Citation. Lists other inspection items like Maintenance information, etc.

(J) Energy Analysis of Constructed Conditions. In accordance with Section 26-104.3 of the Administrative Code and section EOC 103.4, if constructed work differs from the last-approved full energy analysis, an as-built energy analysis shall be submitted to the Department, listing the actual values used in the building, for all applicable Energy Code-regulated items and demonstrating that the building complies with the Energy Code. Such energy analysis shall be signed and sealed by a registered design professional. The progress inspector shall certify that to the best of his or her knowledge and belief the building as built complies with such signed and sealed energy analysis and construction drawings for energy code compliance; where no trade-offs have been used among disciplines, more than one registered design professional may sign and seal the elements of the energy analysis. The energy analysis shall be approved or accepted by the Department prior to sign-off.

DOB APPROVAL STAMP

Date: No.: Description:

Project: 88 Withers Street

88 Withers Street
Brooklyn, NY 11211

Sheet Title:

NOTES & INSPECTIONS

Project Number: 15690

Signature & Seal:

Drawn By: JB, MM

Checked By: MM

Scale: 12" = 1'-0"

Sheet Number:

A-02.00

NYC DOB Number:

Sheet:

8 of

(A-03) TRAVEL DISTANCES - BREAKDOWN - 3-6 FLOORS

TRAVEL DISTANCE SEGMENT	EGRESS PATH SEGMENT LENGTH	EGRESS PATH MULTIPLIER	TRAVEL DISTANCE
CPT-3P			
3P-1	23' - 3"	1	23' - 3"
3P-2	8' - 9"	1	8' - 9"
3P-3	9' - 6"	1	9' - 6"
3P-4	10' - 2"	1	10' - 2"
3P-5	5' - 10"	1	5' - 10"
			57' - 6"
CPT-3S			
3S-1	11' - 3"	1	11' - 3"
3S-2	3' - 11"	1	3' - 11"
3S-3	18' - 11"	1	18' - 11"
3S-4	10' - 5"	1	10' - 5"
3S-5	15' - 3"	1	15' - 3"
			59' - 9"
CPT-3T			
3T-1	18' - 1"	1	18' - 1"
3T-2	19' - 2"	1	19' - 2"
3T-3	17' - 10"	1	17' - 10"
			55' - 2"
RP-3P			
3P-1	24' - 6"	1	24' - 6"
3P-2	9' - 3"	1	9' - 3"
3P-3	9' - 6"	1	9' - 6"
3P-4	10' - 3"	1	10' - 3"
3P-5	8' - 10"	1	8' - 10"
			62' - 3"
RP-3S			
3S-1	13' - 0"	1	13' - 0"
3S-2	3' - 11"	1	3' - 11"
3S-3	18' - 11"	1	18' - 11"
3S-4	10' - 3"	1	10' - 3"
3S-5	15' - 8"	1	15' - 8"
			61' - 8"
RP-3T			
3T-1	19' - 11"	1	19' - 11"
3T-2	19' - 3"	1	19' - 3"
3T-3	18' - 10"	1	18' - 10"
			57' - 11"

(A-03) TRAVEL DISTANCES - 3-6 FLOORS

REMOTE POINT	TRAVEL DISTANCE	MAX ALLOWABLE	COMPLIES
CPT-3P	57' - 6"	75' - 0"	YES
CPT-3S	59' - 9"	75' - 0"	YES
CPT-3T	55' - 2"	75' - 0"	YES
RP-3P	62' - 3"	200' - 0"	YES
RP-3S	61' - 8"	200' - 0"	YES
RP-3T	57' - 11"	200' - 0"	YES

CAPACITY OF EXIT STAIRS BC 1005.1

SPACE SERVED	NO. OF PEOPLE	EGRESS WIDTH PER OCCUPANT	REQUIRED EGRESS WIDTH	PROVIDED WIDTH
3RD/4TH/5TH/6TH FLOOR	26	0.3'	7.8'	STAIR B & C 44" WIDE EACH

DOOR TYPE SCHEDULE

KEY	W x H	EGRESS WIDTH	FIRE RATING	NOTES
(A)	36" x 80"	34.25"	90 MIN	HOLLOW METAL F.P.S.C.
(B)	72" x 60"	56.5"	90 MIN	HOLLOW METAL F.P.S.C.
(C)	36" x 80"	34.25"	90 MIN	ALUMINUM & GLASS WITH LOUVERED TRANSOM

CAPACITY OF EXIT DOORS BC 1005.1

SPACE SERVED	NO. OF PEOPLE	EGRESS WIDTH PER OCCUPANT	REQUIRED EGRESS WIDTH	DOOR TYPE
UNIT A	6	0.2'	1.2'	DOOR TYPE A 34.25" CL
UNIT B	6	0.2'	1.2'	DOOR TYPE A 34.25" CL
UNIT C	3	0.2'	0.6'	DOOR TYPE A 34.25" CL
UNIT D	3	0.2'	0.6'	DOOR TYPE A 34.25" CL
UNIT E	4	0.2'	0.8'	DOOR TYPE A 34.25" CL
UNIT F	4	0.2'	0.8'	DOOR TYPE A 34.25" CL
TRASH RM	0	0.2'	0.0'	DOOR TYPE A 34.25" CL
3RD/4TH/5TH/6TH FLOOR	26	0.2'	5.2'	DOOR TYPE A 34.25" CL EACH

CAPACITY OF EXIT CORRIDORS BC 1005.1

SPACE SERVED	NO. OF PEOPLE	EGRESS WIDTH PER OCCUPANT	REQUIRED EGRESS WIDTH	PROVIDED WIDTH
3RD/4TH/5TH/6TH FLOOR	26	0.3'	7.8'	42"

LEGEND:

- REMOTE POINT
- PRIMARY EGRESS PATH
- SECONDARY EGRESS PATH
- COMMON PATH OF TRAVEL
- 1 HOUR RATED PARTITION
- 2 HOUR RATED PARTITION
- 3 HOUR RATED PARTITION
- SAFE AREA
- EXISTING WALL
- NEW WALL

ROOM NAME ROOM NUMBER

AREA AREA

USE # NO. OF PERSONS OCCUPANCY GROUP

RP-#LTP REMOTE POINT NUMBER

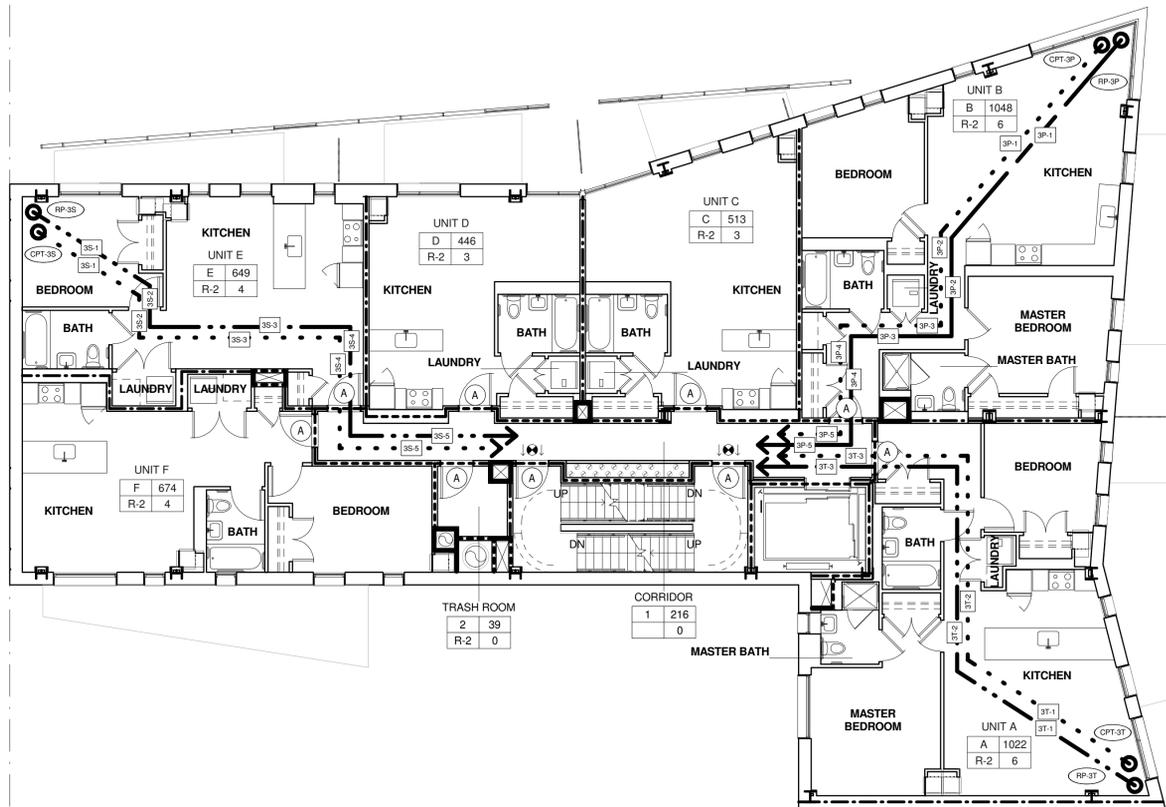
RP-#LTP TRAVEL DISTANCE REMOTE POINT

TYPE: P = PRIMARY
S = SECONDARY

SEGMENT NUMBER TRAVEL DISTANCE SEGMENT

RP-#LTP REMOTE POINT NUMBER

EGRESS DOOR NUMBER



DOB APPROVAL STAMP

Date:	No.:	Description:

Project: **88 Withers Street**

88 Withers Street
Brooklyn, NY 11211

Sheet Title:
THIRD THRU SIXTH FLOORS LIFE SAFETY PLAN

Project Number: 15690	Signature & Seal:
Drawn By: JB, IJ	
Checked By: RHD, JB	
Scale: As indicated	

Sheet Number: **A-13.00**

NYC DOB Number: _____ Sheet: 12 of 14

(A-07) TRAVEL DISTANCES - BREAKDOWN - 7-8 FLOORS

TRAVEL DISTANCE SEGMENT	EGRESS PATH SEGMENT LENGTH	EGRESS PATH MULTIPLIER	TRAVEL DISTANCE
CPT-7P			
7P-1	23' - 3"	1	23' - 3"
7P-2	8' - 9"	1	8' - 9"
7P-3	9' - 6"	1	9' - 6"
7P-4	10' - 2"	1	10' - 2"
7P-5	5' - 10"	1	5' - 10"
			57' - 6"
CPT-7S			
7S-1	11' - 3"	1	11' - 3"
7S-2	14' - 4"	1	14' - 4"
7S-3	34' - 2"	1	34' - 2"
			59' - 9"
CPT-7T			
7T-1	18' - 1"	1	18' - 1"
7T-2	19' - 2"	1	19' - 2"
7T-3	17' - 10"	1	17' - 10"
			55' - 2"
RP-7P			
7P-1	24' - 6"	1	24' - 6"
7P-2	9' - 3"	1	9' - 3"
7P-3	9' - 6"	1	9' - 6"
7P-4	10' - 3"	1	10' - 3"
7P-5	8' - 10"	1	8' - 10"
			62' - 3"
RP-7S			
7S-1	13' - 0"	1	13' - 0"
7S-2	14' - 1"	1	14' - 1"
7S-3	34' - 7"	1	34' - 7"
			61' - 8"
RP-7T			
7T-1	19' - 11"	1	19' - 11"
7T-2	19' - 3"	1	19' - 3"
7T-3	18' - 10"	1	18' - 10"
			57' - 11"

LEGEND:

- REMOTE POINT
- PRIMARY EGRESS PATH
- SECONDARY EGRESS PATH
- COMMON PATH OF TRAVEL
- 1 HOUR RATED PARTITION
- 2 HOUR RATED PARTITION
- 3 HOUR RATED PARTITION
- SAFE AREA
- EXISTING WALL
- NEW WALL

ROOM NAME: ROOM NUMBER

AREA: NO. OF PERSONS OCCUPANCY GROUP

101 SF #

USE #

RP-#LTP: REMOTE POINT NUMBER
TRAVEL DISTANCE
REMOTE POINT
TYPE: P = PRIMARY
S = SECONDARY

P-#L: SEGMENT NUMBER
TRAVEL DISTANCE SEGMENT
REMOTE POINT NUMBER

#: EGRESS DOOR NUMBER

(A-07) TRAVEL DISTANCES - 7-8 FLOORS

REMOTE POINT	TRAVEL DISTANCE	MAX ALLOWABLE	COMPLIES
CPT-7P	57' - 6"	75' - 0"	YES
CPT-7S	59' - 9"	75' - 0"	YES
CPT-7T	55' - 2"	75' - 0"	YES
RP-7P	62' - 3"	200' - 0"	YES
RP-7S	61' - 8"	200' - 0"	YES
RP-7T	57' - 11"	200' - 0"	YES

CAPACITY OF EXIT STAIRS BC 1005.1

SPACE SERVED	NO. OF PEOPLE	EGRESS WIDTH PER OCCUPANT	REQUIRED EGRESS WIDTH	PROVIDED WIDTH
7TH/8TH FLOOR	24	0.3'	7.2'	STAIR B & C 44" WIDE EACH

DOOR TYPE SCHEDULE

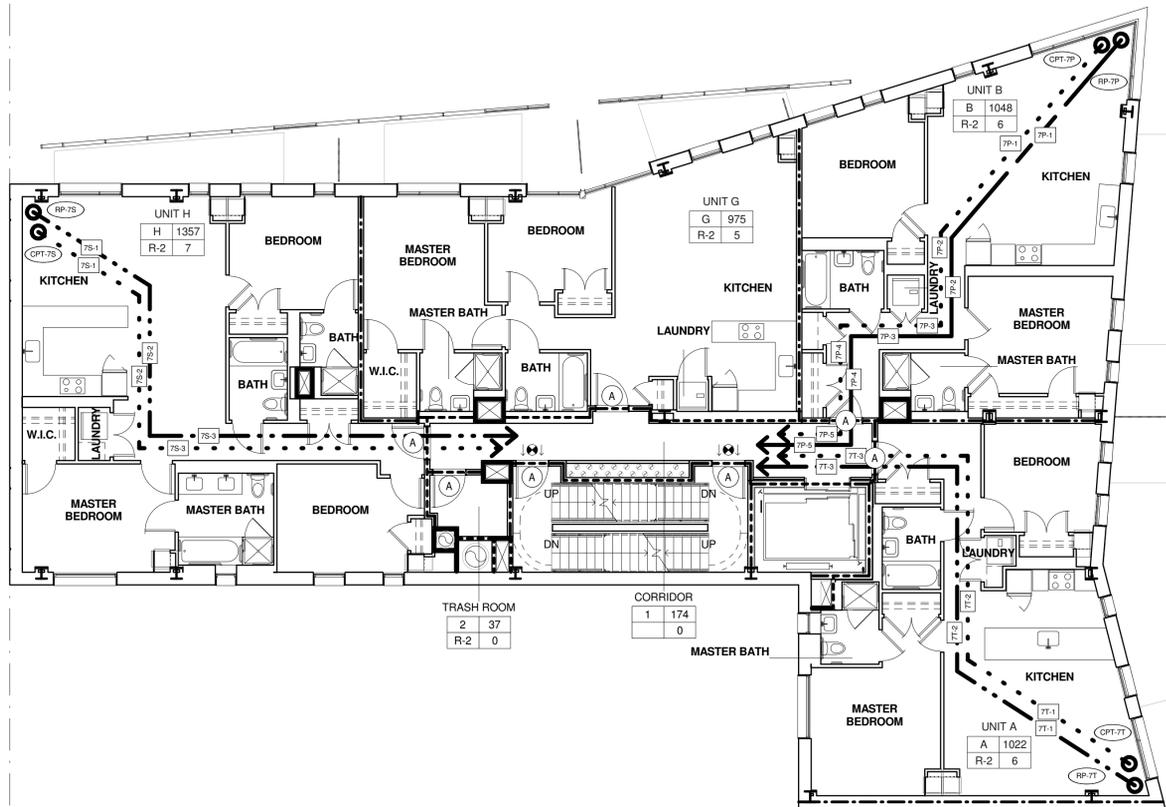
KEY	W x H	EGRESS WIDTH	FIRE RATING	NOTES
(A)	36" X 80"	34.25"	90 MIN	HOLLOW METAL F.P.S.C.
(B)	72" X 60"	56.5"	90 MIN	HOLLOW METAL F.P.S.C.
(C)	36" X 80"	34.25"	90 MIN	ALUMINUM & GLASS WITH LOUVERED TRANSOM

CAPACITY OF EXIT DOORS BC 1005.1

SPACE SERVED	NO. OF PEOPLE	EGRESS WIDTH PER OCCUPANT	REQUIRED EGRESS WIDTH	DOOR TYPE
UNIT A	6	0.2'	1.2'	DOOR TYPE A 34.25" CL.
UNIT B	6	0.2'	1.2'	DOOR TYPE A 34.25" CL.
UNIT G	5	0.2'	1.0'	DOOR TYPE A 34.25" CL.
UNIT H	7	0.2'	1.4'	DOOR TYPE A 34.25" CL.
TRASH RM.	0	0.2'	0.0'	DOOR TYPE A 34.25" CL.
7TH/8TH FLOOR	24	0.2'	4.8'	DOOR TYPE A 34.25" CL. EACH

CAPACITY OF EXIT CORRIDORS BC 1005.1

SPACE SERVED	NO. OF PEOPLE	EGRESS WIDTH PER OCCUPANT	REQUIRED EGRESS WIDTH	CORRIDOR WIDTH
7TH/8TH FLOOR	24	0.3'	7.2'	42"



DOB APPROVAL STAMP

Date: No.: Description:

Project: 88 Withers Street

88 Withers Street
Brooklyn, NY 11211

Sheet Title:
SEVENTH THRU EIGHTH FLOORS LIFE SAFETY PLAN

Project Number: 15690
Signature & Seal:
Drawn By: JB, IJ
Checked By: RHD, JB
Scale: As indicated

Sheet Number:

A-17.00

(A-10) TRAVEL DISTANCES - BREAKDOWN - ROOF

TRAVEL DISTANCE SEGMENT	EGRESS PATH SEGMENT LENGTH	EGRESS PATH MULTIPLIER	TRAVEL DISTANCE
CPT-RP			
RP-1	29' - 8"	1	29' - 8"
RP-RP			
RP-1	33' - 11"	1	33' - 11"

(A-10) TRAVEL DISTANCES - ROOF

REMOTE POINT	TRAVEL DISTANCE	MAX ALLOWABLE	COMPLIES
CPT-RP	29' - 8"	75' - 0"	YES
RP-RP	33' - 11"	200' - 0"	YES

CAPACITY OF EXIT STAIRS BC 1005.1

SPACE SERVED	NO. OF PEOPLE	EGRESS WIDTH PER OCCUPANT	REQUIRED EGRESS WIDTH	PROVIDED WIDTH
MECH. ROOF	0	0.3'	0.0'	STAIR B & C 44" WIDE EACH

DOOR TYPE SCHEDULE

KEY	W x H	EGRESS WIDTH	FIRE RATING	NOTES
(A)	36" X 80"	34.25"	90 MIN	HOLLOW METAL F.P.S.C.
(B)	72" X 60"	56.5"	90 MIN	HOLLOW METAL F.P.S.C.
(C)	36" X 80"	34.25"	90 MIN	ALUMINUM & GLASS WITH LOUVERED TRANSOM

CAPACITY OF EXIT DOORS BC 1005.1

SPACE SERVED	NO. OF PEOPLE	EGRESS WIDTH PER OCCUPANT	REQUIRED EGRESS WIDTH	DOOR TYPE
MECH. ROOF	0	0.2'	0.0'	DOOR TYPE C 34.25" CL. EACH

LEGEND:

-  REMOTE POINT
-  PRIMARY EGRESS PATH
-  SECONDARY EGRESS PATH
-  COMMON PATH OF TRAVEL
-  1 HOUR RATED PARTITION
-  2 HOUR RATED PARTITION
-  3 HOUR RATED PARTITION
-  SAFE AREA
-  EXISTING WALL
-  NEW WALL

- ROOM NAME
- ROOM NUMBER
- AREA
- NO. OF PERSONS OCCUPANCY GROUP
- USE #

- RP-#LTRP
- REMOTE POINT NUMBER
- TRAVEL DISTANCE
- REMOTE POINT
- TYPE: P = PRIMARY
S = SECONDARY

- P-#L
- SEGMENT NUMBER
- TRAVEL DISTANCE SEGMENT
- REMOTE POINT NUMBER

- #
- EGRESS DOOR NUMBER

DOB APPROVAL STAMP

Date: No.: Description:

Project:
88 Withers Street

88 Withers Street
Brooklyn, NY 11211

Sheet Title:
ROOF LIFE SAFETY PLAN

Project Number:
15690

Drawn By:
JB, IJ

Checked By:
RHD, JB

Scale:
As indicated

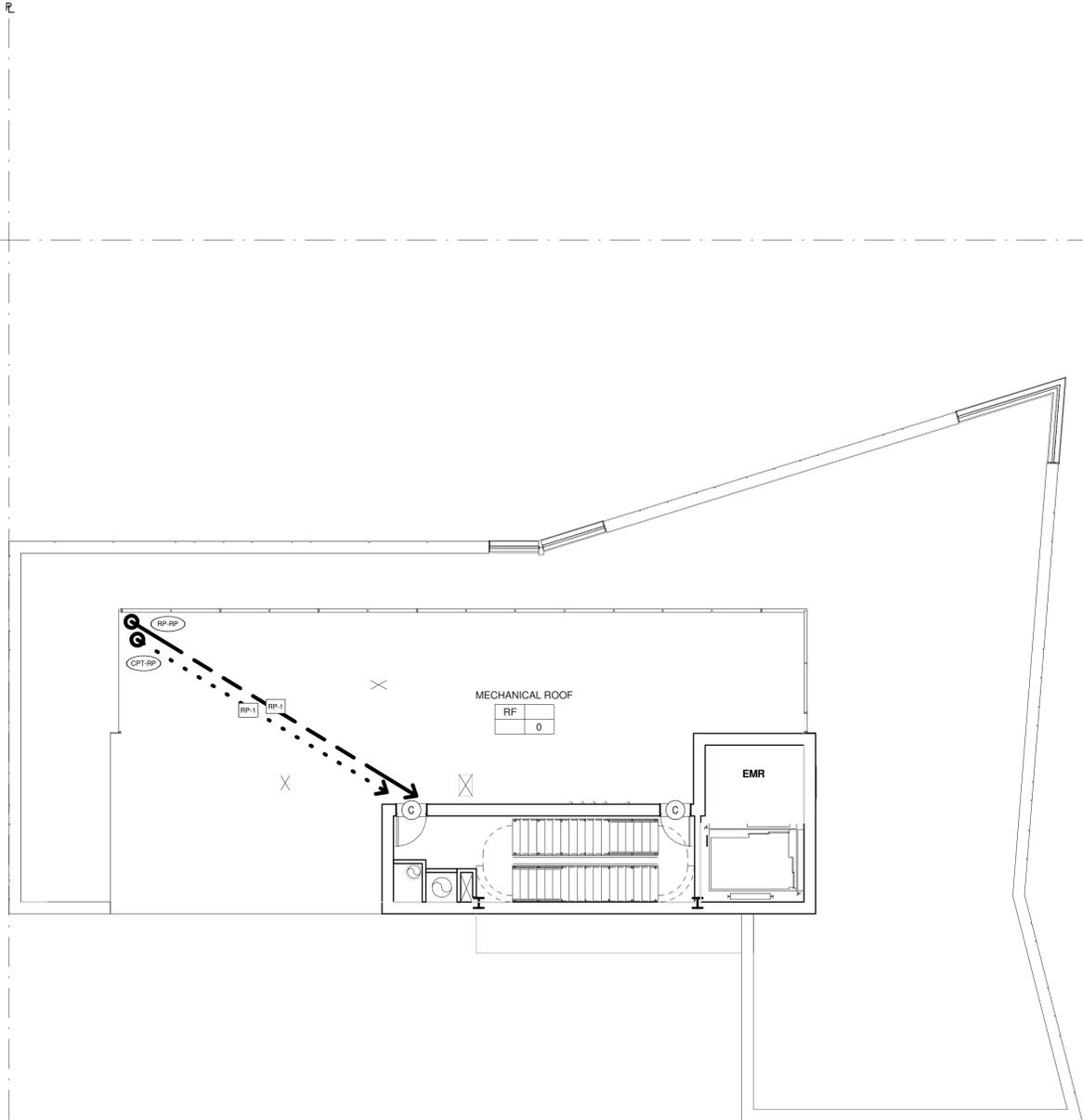
Sheet Number:

Signature & Seal:

A-20.00

NYC DOB Number:

Sheet:
15 of 14



ROOF EGRESS PLAN 1
1/8" = 1'-0"

APPENDIX 2

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Withers 88 Group, 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, Withers 88 Group, 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, Amanda Duchesne, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 788-8841.

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

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

Repositories A document repository is maintained online. Internet access to view OER's document repositories is available at public libraries. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project. The library nearest the Site is:

Brooklyn Public Library – Leonard Library

81 Devoe Street

Brooklyn, New York 11211

Sunday Closed

Monday 10:00 am to 6:00 pm

Tuesday 1:00 pm to 8:00 pm

Wednesday 1:00 pm to 8:00 pm

Thursday 10:00 am to 6:00 pm

Friday 10:00 am to 6:00 pm

Saturday 10:00 am to 5:00 pm

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

Identify Issues of Public Concern No known issues of public concern are related to the subject property and proposed development.

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 Withers 88 Group, LLC, reviewed and approved by OER prior to distribution and mailed by Withers 88 Group, LLC. Public comment is solicited in public notices for all work plans developed under the NYC Voluntary Cleanup Program. Final review of all work plans by OER will consider all public comments. Approval will not be granted until the public comment period has been completed.

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

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

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

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

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

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

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

APPENDIX 3

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.

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

An estimate of the enhanced stormwater retention capability of the redevelopment project will be included in the RAR.

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

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

Paperless Brownfield Cleanup Program Withers 88 Group, 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 Withers 88 Group, 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 4

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 describe here or show in 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 in 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.

1.7 MATERIALS REUSE ON-SITE

Soil and fill that is derived from the property that meets the Soil Cleanup Objectives (SCOs) established in this plan may be reused on-Site. The SCOs for on-Site reuse are Track 2 Restricted/Restricted Residential/Commercial/Industrial as modified by the Track 4 Site-Specific SCOs listed Section 4.2. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to the NYC VCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed. No material is expected to be reused at the Site..

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

1.8 DEMARCATION

After completion of hotspot removal and any other invasive remedial activities, 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 listed in Section 4.2.

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 STORMWATER POLLUTION PREVENTION

Applicable laws and regulations pertaining to stormwater pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this 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 5
CONSTRUCTION HEALTH AND SAFETY PLAN
HEALTH AND SAFETY PLAN
NELSON, POPE & VOORHIS, LLC
HEALTH AND SAFETY
PLAN
FOR THE
88-96 WITHERS STREET SITE
BROOKLYN, NEW YORK

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

June 15, 2015

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STATEMENT OF COMMITMENT

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

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

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

1.0 INTRODUCTION

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

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

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

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

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

2.0 POLICY STATEMENT

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

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

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

2.1 SCOPES AND APPLICABILITY

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

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

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

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

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

2.2 Personnel

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

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

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

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

2.2.1 Site Specific Health and Safety Personnel

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

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

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

Other Contractors: _____

Other: _____

2.3 Objectives

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

2.4 Management Commitment

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

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

2.5 Employee's Responsibilities

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

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

3.0 IMPLEMENTATION

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

3.1 Recommended Contractor/Sample Collection Manager Responsibilities

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

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

3.2 The Trade Subcontractor's Responsibilities

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

3.3 Inspections

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

3.3.1 Procedure

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

3.4 Safety Orientation Program

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

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

3.5 Training and Education

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

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

3.6 General Safety Rules and Requirements

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

3.7 Protective Equipment

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

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

3.8 Codes and Regulations

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

3.9 Safety and Health Provisions

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

4.0 HAZARD COMMUNICATION PROGRAM

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

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

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

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

4. Material Safety Data Sheets (MSDS)/Safety Data Sheets (SDS) Program. Evaluation and Distribution of Material Safety Data Sheets/Safety Data Sheets to Employees.
 - a. **NELSON, POPE & VOORHIS, LLC** shall maintain copies of any material safety data sheets/safety data sheets that are received with incoming shipments of the sealed containers of hazardous chemicals. Shall obtain a material safety data sheet/safety data sheets for sealed containers of hazardous chemicals received without a material safety data sheet/safety data sheets. Shall provide the material safety data sheet/safety data sheets, if an employee requests and shall ensure that the material safety data sheets/safety data sheets are readily accessible during each work shift.
 - b. Master copies of each MSDS/SDS will be maintained in the field office.
 - c. Right-To-Know (worker) copies will be available to all employees in the facility, and located as a minimum in the field office. Additionally, a list of the hazardous chemicals known to be present in each department using an identity that is referenced from the appropriate MSDS/SDS will be located in the field office. **NELSON, POPE & VOORHIS, LLC** will ensure a system is in place to maintain a current set of MSDS's/SDS's.
 - d. MSDS/SDS copies will be maintained for all chemicals abandoned for use for a period of 30 years.
 - e. MSDS/SDS requests. A request letter will be forwarded to any vender who does not provide an MSDS/SDS with a product received by this company. The letter will be forwarded within one day of receipt of the material. The format will be the same as the sample letter located at the back of this instruction.

5. Sub-Contractors Employees Program. Non-Company Employees, Visitors, Contract Employees, Contractor Personnel, and In-House Representatives. Any contractor bringing chemicals on-site must provide **NELSON, POPE & VOORHIS, LLC** with the appropriate hazard information on these substances, including the labels used and the precautionary measures to be taken in working with these chemicals. Consult with the Health and Safety Officer where this determination is unclear or assistance is required.

4.1 Sample Letter Requesting an MSDS

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

Dear Sir:

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

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

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

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

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

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

Sincerely

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

5.0 FALL PROTECTION PLAN (WORKING AT ELEVATION)

5.1 Holes

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

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

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

6.0 PERMIT REQUIRED CONFINED SPACE SAFETY PLAN

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

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

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

6.1 Responsibility

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

6.2 Training

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

7.0 TRENCHING AND EXCAVATION SAFETY PLAN

Regulatory Standard: 29 CFR 1926. Subpart P.

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

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

7.1 Responsibility

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

7.2 General Requirements

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

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

7.3 Surface Encumbrances and Underground Installations Safety Guidelines

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

7.4 Trench Safety

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

8.0 SOIL REMEDIATION

8.1 Hazardous Characterization/Identification

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

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

8.2 Potential Exposures

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

8.2.1 Level of Protection

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

8.2.2 Description of Potential Health Effects and Hazards

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

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

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

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

8.2.3 General Work Practices

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

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

8.2.4 Termination of Sampling

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

8.3 Orientation and Training

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

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

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

8.4 Monitoring Equipment

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

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

8.5 Injuries

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

8.6 Levels of Protection

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

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

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

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

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

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

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

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

8.7 Personal Protective Equipment

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

APPENDIX "A" **OVERVIEW**

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

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

SAFETY

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

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

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

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

JOB SITE SAFETY PROCEDURES

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

UTILITIES

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

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

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

ACCIDENT INVESTIGATION

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

APPENDIX "B"

NELSON, POPE & VOORHIS, LLC ACCIDENT REPORT

INJURED PERSON: _____ REPORT DATE: _____

SOCIAL SECURITY NO: _____

DOCTOR / HOSPITAL NAME: _____

HOME ADDRESS: _____

OCCUPATION: _____ AGE _____ SEX _____

ADDRESS ACCIDENT OCCURRED: _____ TIME OF ACCIDENT _____ AM PM

DATE STOPPED WORK BECAUSE OF THIS INJURY: _____

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

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

HAS EMPLOYEE RETURNED TO WORK YES NO

IF YES, DATE: _____

WHAT WAS EMPLOYEE DOING WHEN INJURED?

(PLEASE BE SPECIFIC, IDENTIFY TOOLS, EQUIPMENT OR MATERIAL THE EMPLOYEE WAS USING)

HOW DID THE ACCIDENT OR EXPOSURE OCCUR?

(PLEASE DISCRIBE FULLY THE EVENTS THAT RESULTED IN INJURY. TELL WHAT HAPPENED AND HOW IT HAPPENED.) PLEASE USE SEPARATE SHEETS IF NECESSARY.

OBJECT OR SUBJECT THAT DIRECTLY INJURED EMPLOYEE: _____

DATE SUPERVISOR FIRST KNEW OF THE INJURY: _____

SUPERVISOR SIGNATURE: _____

TITLE: _____

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

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

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

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

APPENDIX 6

MANUFACTURER DESIGN DIAGRAMS AND SPECIFICATIONS FOR THE VAPOR/MOISTURE BARRIER

VAPORBLOCK® PLUS™ VBP20

Under-Slab Vapor / Gas Barrier



Product Description

VaporBlock® Plus™ 20 is a seven-layer co-extruded barrier made from state-of-the-art polyethylene and EVOH resins to provide unmatched impact strength as well as superior resistance to gas and moisture transmission. VaporBlock® Plus™ 20 is a highly resilient underslab / vertical wall barrier designed to restrict naturally occurring gases such as radon and/or methane from migrating through the ground and concrete slab. VaporBlock® Plus™ 20 is more than 100 times less permeable than typical high-performance polyethylene vapor retarders against Methane, Radon and other harmful VOCs.

VaporBlock® Plus™ 20 is one of the most effective underslab gas barriers in the building industry today far exceeding ASTM E-1745 (Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs) Class A, B and C requirements. Available in a 20 (Class A) mil thicknesses designed to meet the most stringent requirements. VaporBlock® Plus™ 20 is produced within the strict guidelines of our ISO 9001:2008 Certified Management System.

Product Use

VaporBlock® Plus™ 20 resists gas and moisture migration into the building envelop when properly installed to provide protection from toxic/harmful chemicals. It can be installed as part of a passive or active control system extending across the entire building including floors, walls and crawl spaces. When installed as a passive system it is recommended to also include a ventilated system with sump(s) that could be converted to an active control system with properly designed ventilation fans.

VaporBlock® Plus™ 20 works to protect your flooring and other moisture-sensitive furnishings in the building's interior from moisture and water vapor migration, greatly reducing condensation, mold and degradation.

Size & Packaging

VaporBlock® Plus™ 20 is available in 10' x 150' rolls to maximize coverage. All rolls are folded on heavy-duty cores for ease in handling and installation. Other custom sizes with factory welded seams are available based on minimum volume requirements. Installation instructions and ASTM E-1745 classifications accompany each roll.



Under-Slab Vapor/Gas Retarder

Product

Part

VaporBlock Plus 20 VBP20

APPLICATIONS

Radon Barrier	Under-Slab Vapor Retarder
Methane Barrier	Foundation Wall Vapor Retarder
VOC Barrier	

VaporBlock® Plus™
UNDERSLAB VAPOR RETARDER / GAS BARRIER

VAPORBLOCK® PLUS™ VBP20

Under-Slab Vapor / Gas Barrier

PROPERTIES	TEST METHOD	VAPORBLOCK PLUS 20	
		IMPERIAL	METRIC
APPEARANCE		White/Gold	
THICKNESS, NOMINAL		20 mil	0.51 mm
WEIGHT		102 lbs/MSF	498 g/m ²
CLASSIFICATION	ASTM E 1745	CLASS A, B & C	
TENSILE STRENGTH LBF/IN (N/CM) AVERAGE MD & TD (NEW MATERIAL)	ASTM E 154 Section 9 (D-882)	58 lbf	102 N
IMPACT RESISTANCE	ASTM D 1709	2600 g	
MAXIMUM USE TEMPERATURE		180° F	82° C
MINIMUM USE TEMPERATURE		-70° F	-57° C
PERMEANCE (NEW MATERIAL)	ASTM E 154 Section 7 ASTM E 96 Procedure B	0.0098 Perms grains/(ft ² ·hr·in·Hg)	0.0064 Perms g/(24hr·m ² ·mm Hg)
(AFTER CONDITIONING) PERMS (SAME MEASUREMENT AS ABOVE PERMEANCE)	ASTM E 154 Section 8, E96 Section 11, E96 Section 12, E96 Section 13, E96	0.0079 0.0079 0.0097 0.0113	0.0052 0.0052 0.0064 0.0074
WVTR	ASTM E 96 Procedure B	0.0040 grains/hr-ft ²	0.0028 gm/hr-m ²
RADON DIFFUSION COEFFICIENT	K124/02/95	< 1.1 x 10 ⁻¹³ m ² /s	
METHANE PERMEANCE	ASTM D 1434	< 1.7 x 10 ⁻¹⁰ m ² /d·atm 0.32 GTR (Gas Transmission Rate) ml/m ² ·D·ATM	

VaporBlock® Plus™ Placement

All instructions on architectural or structural drawings should be reviewed and followed.

Detailed installation instructions accompany each roll of VaporBlock® Plus™ and can also be located on our website.

ASTM E-1643 also provides general installation information for vapor retarders.

VaporBlock® Plus™
UNDERSLAB VAPOR RETARDER / GAS BARRIER

VaporBlock® Plus™ is a seven-layer co-extruded barrier made using high quality virgin-grade polyethylene and EVOH resins to provide unmatched impact strength as well as superior resistance to gas and moisture transmission.

Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. Chemical resistance, odor transmission, longevity as well as other performance criteria is not implied or given and actual testing must be performed for applicability in specific applications and/or conditions. RAVEN INDUSTRIES MAKES NO WARRANTIES AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage. Limited Warranty available at www.RavenEFD.com



Scan QR Code to download current technical data sheets via the Raven website.



Engineered Films Division
P.O. Box 5107
Sioux Falls, SD 57117-5107
Ph: (605) 335-0174 • Fx: (605) 331-0333

Toll Free: 800-635-3456
Email: efdsales@ravenind.com
www.ravenefd.com
1/11 EFD 1125

APPENDIX 7

SSDS SYSTEM DETAILS