

333 WEST 38TH STREET
NEW YORK, NEW YORK

Remedial Action Work Plan

NYC VCP Number: 13CVCP126M

Prepared for:

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REMEDIAL ACTION WORK PLAN

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LIST OF ACRONYMS

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

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

CERTIFICATION

I, Richard Galli, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the 333 West 38th Street, New York, NY, OER Project Number: 12EHAN365M and 13CVCP126M.

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

Name

NYS PE License Number

Signature



EXECUTIVE SUMMARY

Optima Real Estate has enrolled in the New York City Brownfield Cleanup Program (NYC BCP) to investigate and remediate a 2,475-square foot site located at 333 West 38th Street, Manhattan, 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 subject property is located at 333 West 38th Street , New York, New York 10018, Tax Map designation as Block: 762, Lot: 16, herein identified as the “Subject Site”. From the Site, West 39th Street is located to the north, West 38th Street is located to the south, 9th Avenue is to the west and 8th Avenue is to the east. The Site is bounded by a parking garage to the north, a multi-family residential building to the east, West 38th street to the south, and a multi-family residential building to the west. Current zoning at the Site is C6-4M, commercial with manufacturing. The building is located in the GCP2 - Garment Center Special District Preservation Area P-2. The property is also NYC E-Designated for Underground Gasoline Storage Tank Testing Protocol, Window Wall Attenuation and Alternate Ventilation. This E-Designation’s limits HVAC fuel to natural gas, and provides protocol for underground gasoline storage tank testing, Window Wall Attenuation, and Alternate Ventilation. A Site Location Plan is included as **Figure 1**.

The building is currently occupied by a commercial store on the first floor operating as a book store and art gallery. Floors two through five are utilized by “Nowy Dziennik” Polish Daily News and Bicentennial Publishing Co., Inc. The building is serviced by public water, sewer and electrical utilities. Heating is provided by forced air HVAC units located within the drop ceilings.

Summary of Proposed Redevelopment Plan

The future use of the Site will consist of commercial use and will include a 21-story hotel with basement and 79 guest rooms. Four guest rooms will be on each floor and the entire building will encompass 34,000 gross square feet of space. The Site is located approximately 353 feet west of the intersection of 9th Avenue and West 38th Street, on the north side of the block, having a street frontage of 25 feet. The current zoning designation, as per Department of City Planning NYC zoning maps, is C6-4M, commercial with manufacturing. The proposed use is consistent with existing zoning for the property. This RIR may only be implemented for this proposed development scenario.

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

5. Excavation and removal of soil/fill exceeding SCOs. Excavation for development purposes to a depth of approximately 15 feet across entire site and to depths of 27 feet below grade in center of the property.
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
7. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
8. If encountered, removal of underground storage tanks and closure of petroleum spills in compliance with applicable local, State and Federal laws and regulations.
9. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.
10. Import of materials for backfill is not anticipated at the Site. If cover material is required, it will be in compliance with this plan and in accordance with applicable laws and regulations.
11. As part of construction, installation of a vapor barrier system/ waterproofing membrane beneath the entire new floor slab and behind new foundation walls.
12. If Track 1 cleanup is not achieved, construction and maintenance of an engineered composite cover consisting of a 3.5-foot concrete building slab to prevent human exposure to residual soil/fill remaining under the Site;
13. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
14. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.

15. Submission of a RAR that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and if Track 1 Unrestricted SCOs are not achieved, describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP.
16. As long as Track 1 SCOs are met, neither a SMP nor the recording of a “*Declaration of Covenants and Restrictions*” (including a listing of Engineering Controls and a requirement for the management of these controls), will be required.
17. If Track 1 is not achieved, submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
18. If Track 1 is not achieved, continued registration as an “E” Designated property and listing of Engineering Controls and a requirement that management of these controls must be in compliance with an approved SMP; and Institutional Controls including prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

Community Protection Statement

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

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

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

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

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

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

Site Safety Coordinator: This project will have a designated Site safety coordinator to implement the Health and Safety Plan. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. **The Site Safety Coordinator for this project information will be presented at the pre-construction meeting.**

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 on-site Project Manager **(To be announced (TBA))** or NYC Office of Environmental Remediation Project Manager Maurizio Marezio Bertini, Ph.D at (212) 788-3922.

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

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

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

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

Complaint Management: The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the **facility Project Manager (TBA)**, the NYC Office of Environmental Remediation Project Manager Maurizio Marezio Bertini, PhD at (212) 788-3922, or call 311 and mention the Site is in the NYC Brownfield Cleanup Program.

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

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

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

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

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

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

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

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

Truck Routing: Truck routes have been selected to: (a) limit transport through residential areas and past sensitive nearby properties; (b) maximize use of city-mapped truck routes; (c) limit total distance to major highways; (d) promote safety in entry to highways; (e) promote overall safety in trucking; and (f) minimize off-Site line-ups (queuing) of trucks entering the

property. Operators of loaded trucks leaving the Site will be instructed not to stop or idle in the local neighborhood.

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

Long-Term Site Management: To provide long-term protection after the cleanup is complete, if any residual low level contamination remains in soil on the property, the owner will be required to comply with the ongoing Site Management Plan (SMP) including continued inspection of any protective controls (ie: Site covers or passive ventilation systems). 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

Optima Real Estate has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 333 West 38th Street, in the borough of Manhattan, New York (the Site). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 Site Location and Current Usage

The property is located at 333 West 38th Street, New York, New York 10018, Tax Map designation as Block: 762, Lot: 16, herein identified as the “Site”. From the Site, West 39th Street is located to the north, West 38th Street is located to the south, 9th Avenue is to the west and 8th Avenue is to the east. Current zoning at the Site is C6-4M, commercial with manufacturing. The building is located in the GCP2 - Garment Center Special District Preservation Area P-2. The property is also NYC E-Designated for Air Quality. This E-Designation limits HVAC fuel to natural gas, and provides protocol for underground gasoline storage tank testing, Window Wall Attenuation, and Alternate Ventilation. A Site Location Plan is included as Figure 1.

The building is currently occupied by a commercial store on the first floor operating as a book store and art gallery. Floors two through five are utilized by “Nowy Dziennik” Polish Daily News and Bicentennial Publishing Co., Inc. The building is serviced by public water,

sewer and electrical utilities. Heating is provided by forced air HVAC units located within the drop ceilings.

1.2 Proposed Redevelopment Plan

The future use of the Site will consist of commercial use and will include a 21-story hotel with basement and 79 guest rooms. Four guest rooms will be on each floor and the entire building will encompass 34,000 gross square feet of space. Construction plans include excavation of the entire Site to a depth of approximately 15' below grade for installation of a full basement. In addition excavation for the elevator pit, located near the center of the excavation, will increase to a depth of approximately 27' below grade. Upon completion of construction at the Site, there will not be any open space or areas not covered with concrete.

The Site is located approximately 353 feet west of the intersection of 9th Avenue and West 38th Street, on the north side of the block, having a street frontage of 25 feet. The current zoning designation, as per Department of City Planning NYC zoning maps, is C6-4M, commercial with manufacturing. The proposed use is consistent with existing zoning for the property. This RIR may only be implemented for this proposed development scenario. The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

1.3 Description Of Surrounding Property

The property is located in an area generally consisting of residential and commercial development. The past uses of the adjoining properties are predominantly commercial. Research through EDR and Examination of the properties immediately surrounding the subject property revealed no observable conditions that would normally adversely impact the environmental quality of the subject Site. Figure 2 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 (RIR)*, 333 West 38th Street, New York, NY,

OER Project Number: 12EHAN365M”, dated April 2013. A copy of the Sampling Location Plan from the RIR is included as Figure 3.

Summary of the Work Performed under the Remedial Investigation

1. Galli Engineering completed a Phase I Site Assessment at the subject Site in July 2011.
2. In June 2012, a total of six soil borings (SB-1 through SB-6) were performed at the property to depths ranging from 22 to approximately 30 feet below land surface. Soil samples were collected for laboratory analysis in order to characterize the quality of soil and determine if any contamination exists on site. Soil samples were analyzed for volatile organic compounds (VOCs) according to United States Environmental Protection Agency (US EPA) Method 8260; semi-volatile organic compounds (SVOCs) by EPA Method 8270; Target Analyte List (TAL) metals by EPA Method 6010/7470; and Pesticides/PCBs by EPA Method 8081/8082.
3. During the soil boring investigation, three temporary monitoring wells were installed at the property. Groundwater at the site was encountered at a depth of approximately 23 feet below ground surface. After installation, the temporary wells were developed by purging out the sediment via dedicated tubing with check valve, and subsequently sampled for laboratory analysis. However, one of the wells (GW-3) was unable to be sampled due a lack of groundwater recharge. Groundwater Samples were analyzed for the presence of VOCs by Method 8260, SVOCs by Method 8270, Pesticides/PCBs by Method 8081/8082 and TAL Metals by Method 6010/7470.
4. During the June 2012 Phase II field investigation, three soil vapor samples were also collected from below the current basement slab using a Geoprobe with dedicated tubing and summa canisters with 2-hour flow controllers. Two samples were collected at a depth of approximately (20’ below land surface), and one sample was located at the future location of the elevator pits (sampled at ~ 21’ below land surface, due to groundwater at ~23’). The soil vapor samples, SV-1 through SV-3, were submitted to

a NYSDOH ELAP-certified laboratory for analysis of volatile organic compounds (VOCs) by USEPA Method TO-15.

Summary of Environmental Findings

1. Elevation of the property is approximately 38 feet above sea level.
2. Depth to groundwater is approximately 23 feet below land surface.
3. The general topographic gradient slopes towards the west-northwest.
4. The stratigraphy of the site, from the surface down, consists of approximately 1-20 feet of urban fill; underlain by 1-50 meters of unconsolidated glacial till; underlain by bedrock.
5. Soil samples collected during the Phase II investigation showed no VOCs, pesticides or PCBs at detectable concentrations. Several metals were detected in all soil borings at low concentrations, none detected above Track 1 Unrestricted Use SCOs.
6. The results from groundwater analysis indicated that, no VOCs, PCBs or pesticides were detected in any of the samples above Part 703.5 NYS Water Quality Standards (GQS). Two SVOC, benzo(a)anthracene (0.075 ppb) and chrysene (0.063 ppb) were detected slightly above GQS. Metals including aluminum, iron, magnesium, manganese and sodium were detected above GQS in one well.
7. Results of Soil Vapor analysis indicated petroleum and chlorinated VOCs at trace levels. TCA was detected at less than 2.1 ug/m³, TCE was detected at a maximum concentration of 20 ug/m³ and PCE was detected at a maximum concentration of 37.5 ug/m³.

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:

2.1 Groundwater

- Remove contaminant sources causing impact to groundwater.

2.2 Soil

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

2.3 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 (Alternative 1 and Alternative 2) are considered for alternatives analysis for this site:

Alternative 1 involves:

- Establishment of Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
- Removal of all soil/fill exceeding Track 1 SCOs throughout the Site and confirmation that Track 1 SCOs have been achieved with post-excavation endpoint sampling. Excavation for development purposes would take place to a depth of 15 below grade for entire property footprint and to approximate depth of 27 feet below grade for elevator pit.

Based on the results of the remedial investigation, it is expected that this development would not require additional excavation to achieve Track 1 SCOs.

- No engineering or institutional controls are required in a Track 1 cleanup. As part of new construction, a vapor barrier/waterproofing membrane beneath the foundation slab and behind foundation walls up to grade would be installed to prevent exposures from off-Site soil vapor or groundwater.
- Achievement of Track 1 SCOs will result in the E-Designation being permanently removed from the property by the NYC Buildings Department.

Alternative 2 involves:

- Establishment of Track 4 Soil Cleanup Objectives (SCOs).
- Removal of all soils exceeding Track 4 SCOs and confirmation that Track 4 has been achieved with post-excavation endpoint sampling. Excavation for development purposes would take place to a depth of approximately 15 to 27 feet below grade. Based on samples collected in the RIR, it is anticipated that development excavations would be sufficient to achieve Track 4 SCOs;
- Placement of a vapor barrier/waterproofing membrane beneath the foundation slab and along foundation side walls up to grade;
- Placement of a final cover over the entire site to eliminate exposure to remaining soil/fill;
- Establishment of use restrictions including prohibitions on the use of groundwater from the site and prohibitions on other sensitive site uses, such as farming or vegetable gardening, to eliminate future exposure pathways;
- 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; and
- The property will continue to be registered with an E-Designation by the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in the RAWP and a requirement that management of these controls would be in compliance with an approved SMP. Institutional Controls would 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.

3.1 Threshold Criteria

Protection of Public Health and the Environment

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

Alternative 1 would be protective of human health and the environment by removing the fill material at the Site to a depth ranging from 15-27 feet thus eliminating potential for direct contact with contaminated soil/fill once construction is complete and eliminating the risk of contamination leaching into groundwater. Implementing an approved Soil and Materials Management Plan and Community Air Monitoring Plan (CAMP) would minimize potential exposure to contaminated soils during construction. Since construction and remediation will occur in close proximity to groundwater, special attention will be given to selecting appropriate construction techniques during the Site development. Potential migration of soil vapors from offsite into the new building would be prevented by installing a vapor barrier system and waterproofing membrane beneath the entire new floor slab and behind foundation sidewalls as part of the new development.

Alternative 2 would achieve comparable protection of human health and the environment by excavating and removing soil/fill above Track 4 Site Specific SCOs, as well as by employing institutional and engineering controls, including a composite cover system, and a vapor barrier. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Implementing institutional controls and a Site Management Plan would ensure that the composite cover system remains intact and protective. Potential exposure to contaminated soils during construction would be minimized by implementing an approved Soil/Materials Management Plan and Community Air Monitoring Plan (CAMP). Potential contact with contaminated groundwater would be prevented as use for potable purposes is prohibited by city laws and

regulations. Potential post-remediation exposure to soil vapors would be addressed by installing a vapor barrier beneath the foundation slab and outside foundation walls of the new building as part of development.

3.2 Balancing Criteria

Compliance with Standards, Criteria and Guidance (SCGs)

Alternative #1 would achieve compliance with the remedial goals, SCGs and RAOs for soil through the removal of soil/fill to achieve Track 1 SCOs and groundwater protection standards. Compliance with SCGs for soil vapor would be achieved by installing a vapor barrier below the new buildings foundation slab as a part of development. 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.

Alternative #2 would achieve compliance with remedial goals, SCGs, and RAOs for soil through the removal of soil/fill to Track 4 SCOs and groundwater protection standards and capping the Site with a composite cover. Compliance with SCGs for soil vapor would be achieved by installing a vapor barrier below the new buildings foundation slab. A site management plan would ensure that these engineering controls remain protective for the long term. Similar to the Track 1 alternative, 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.

Short-term effectiveness and impacts

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

Both **Alternative #1 and #2** have similar-short term effectiveness during their respective implementations, as each requires excavation of fill material. Both Alternative #1 and #2 are considered to be effective in protecting human health and the environment in the short term and both alternatives will eliminate all exposures to the contaminant sources. Both Alternative 1 and 2 would employ appropriate measures to prevent short term impacts, including a Community Air Monitoring Plan (CAMP) and a Soil/Materials Management Plan (SMMP), during all on-site soil disturbance activities and would effectively prevent the release of significant contaminants into the environment. Both alternatives provide short term effectiveness in protecting the surrounding community by decreasing the risk of contact with on-site contaminants. Construction workers operating under appropriate management procedures and a Health and Safety Plan (HASP) will be protected from on-site contaminants (personal protective equipment would be worn consistent with the documented risks within the respective work zones).

Long-term effectiveness and permanence

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

Both **Alternative 1 and 2** have similar-short term effectiveness during their respective implementations. Alternative 1 would achieve long-term effectiveness and permanence related to on-site contamination by permanently removing all impacted soils and enabling unrestricted usage of the property. Alternative 2 would provide long-term effectiveness by removing most on-site contamination and attaining Track 4 SCOs, establishing engineering controls including a vapor barrier and a composite cover system across the entire site, establishing institutional controls to ensure long-term management including use restrictions, a Site Management Plan, and to memorialize these controls for the long term. The Site Management Plan will ensure long-term effectiveness of all engineering controls and institutional controls by requiring

periodic inspection and certification that these controls and restrictions continue to be in place and are functioning as they were intended to and assuring that protections designed in the remedy will provide continued high levels of protection.

Reduction of Toxicity, Mobility, or Volume of Contaminated Material

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

Alternative #1 would provide maximum reduction of toxicity, mobility, and volume of contaminated material/soil on-site soil by excavation and removal of all soils that exceed Track 1 Unrestricted Use SCOs.

Alternative #2 would permanently eliminate most of the toxicity, mobility, and volume of contaminants from on-site soil because it would include removal of all soil that exceeds Track 4 - SCOs. The remainder of the site will be capped to permanently eliminate exposures and associated toxicity.

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.

Both **Alternative #1 and #2** are feasible and implementable. They use standard materials and services and well established technology that are readily available. The reliability of the remedy is also high. There are no special difficulties associated with any of the activities proposed, which utilize standard industry methods. Excavation of the soil/fill material is required for construction of the proposed building foundation. Installation of the waterproofing/vapor barrier system will be conducted in accordance with standard methods utilized to install waterproofing membranes.

For implementation of both remedies, standard construction equipment utilized for the overall earthwork would be used. OSHA trained personnel will complete all activities that include excavation and handling of impacted soils. No special permits, other than earthwork permits required for completion of the required site redevelopment scope, are required for implementation of the remedy. 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.

Costs associated with both alternatives' will be similar due to the excavation and transportation of the same amount of soil/fill material containing similar concentrations of

contaminants. However, long-term costs for Alternative #2 are likely higher than Alternative #1 based on costs for long term implementation of a Site Management Plan.

In either case, appropriate public health and environmental protections are achieved.

Land Use

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

Both Alternatives are appropriate with respect to the proposed use and to land uses in the vicinity of the Site. The proposed redevelopment of the Site is compatible with its current zoning of C6-4M, commercial with manufacturing. The building is located in the GCP2 - Garment Center Special District Preservation Area P-2 and is consistent with recent development patterns. The Site is bounded by a parking garage to the north, a multi-family residential building to the east, West 38th street to the south, and a multi-family residential building to the west. The property has also been NYC E-Designated for Underground Storage Tank Testing Protocol, Window Wall Attenuation and Alternate Ventilation. The proposed cleanup provides comprehensive protection of public health and the environment for these uses. Improvements in the current condition of the property achieved by both cleanup alternatives are also consistent with the City's goals for cleanup of contaminated land, bringing such properties to productive reuse, and making such properties protective of natural and cultural resources. This RAWP will be subject to public review under the NYC VCP and will provide the opportunity for detailed public input on the land use factors described in this section. This public comment will be

considered by OER prior to approval of this plan.

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.

Both alternatives would potentially result in a similar energy usage based upon the excavation and transportation of the same amount of fill. Additionally, both alternatives would allow, the local re-use of the soil as "Clean Fill" with acceptance into the OER Clean Soil Bank Program would use considerably less energy. Both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action.

4.0 REMEDIAL ACTION

4.1 Summary of Preferred Remedial Action

The preferred remedial action alternative is Track 1 - Unrestricted Use. 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 implementation of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Perform a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establish Track 1 Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Excavation and removal of soil/fill exceeding SCOs. Excavation for development purposes to a depth of approximately 15 feet across entire site and to depths of 27 feet below grade in center of the property.
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
7. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.

8. If encountered, removal of underground storage tanks and closure of petroleum spills in compliance with applicable local, State and Federal laws and regulations.
9. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.
10. Import of materials for backfill is not anticipated at the Site. If cover material is required, it will be in compliance with this plan and in accordance with applicable laws and regulations.
11. As part of construction, installation of a vapor barrier system/ waterproofing membrane beneath the entire new floor slab and behind new foundation walls.
12. If Track 1 cleanup is not achieved, construction and maintenance of an engineered composite cover consisting of a 3.5-foot concrete building slab to prevent human exposure to residual soil/fill remaining under the Site;
13. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
14. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
15. Submission of a RAR that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and if Track 1 Unrestricted SCOs are not achieved, describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP.
16. As long as Track 1 SCOs are met, neither a SMP nor the recording of a “*Declaration of Covenants and Restrictions*” (including a listing of Engineering Controls and a requirement for the management of these controls), will be required.

17. If Track 1 is not achieved, submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
18. If Track 1 is not achieved, continued registration as an “E” Designated property and listing of Engineering Controls and a requirement that management of these controls must be in compliance with an approved SMP; and Institutional Controls including prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

4.2 Soil Cleanup Objectives and Soil/Fill Management

Track 1 - Unrestricted Use Soil Cleanup Objectives (SCOs) are proposed for this project with a contingency for Track 2 - Commercial Use, if the Track 1 Remedy is not met. The SCOs for this Site are listed in Table 4. Soil and materials management on-Site and off-Site, including excavation, handling and disposal, will be conducted in accordance with the Soil/Materials Management Plan in Appendix 3. The location of planned excavation is the entire Site to depths ranging from ~15-27 feet, as shown on Figure 3.

4.2.1 Estimated Soil/Fill Removal Quantities

The total quantity of soil/fill expected to be excavated and disposed off-Site is approximately 1,550 cubic yards.

“Disposal facilities will be reported to OER when they are identified and prior to the start of remedial action.” Additional disposal locations established at a later date will be reported promptly to the OER Project Manager.

4.2.2 End-Point Sampling

Removal actions under this plan will be performed in conjunction with remedial end-point sampling. End-point sampling frequency will consist of the following:

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.
2. For excavations 20 to 300 feet in perimeter:
 - For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
 - For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
3. For sampling of volatile organics, bottom samples should be taken within 24 hours of excavation, and should be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours should be taken at a depth of six to twelve inches.
4. For contaminated soil removal, post remediation soil samples for laboratory analysis should be taken immediately after contaminated soil removal. If the excavation is enlarged horizontally, additional soil samples will be taken pursuant to bullets 1-3 above.

Post-remediation sample locations and depth will be biased towards the areas and depths of highest contamination identified during previous sampling episodes unless field indicators such as field instrument measurements or visual contamination identified during the remedial action indicate that other locations and depths may be more heavily contaminated. In all cases, post-remediation samples should be biased toward locations and depths of the highest expected contamination. A map of proposed End-Point Sampling Locations is included as Figure 4.

New York State ELAP certified labs will be used for all end-point sample analyses. Labs for end-point sample analyses will be reported in the RAR. The RAR will provide a tabular and

map summary of all end-point sample results and will include all data including non-detects and applicable standards and/or guidance values. End-point samples will be analyzed for trigger analytes (those for which SCO exceedances are identified) utilizing the following methodology:

Soil analytical methods will include:

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

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

4.2.3 Import and Reuse of Soils

Import of soils onto the property and reuse of soils already onsite will be performed in conformance with the Soil/Materials Management Plan in Appendix C. However, it is not anticipated that soil will need to be imported or reused/relocated on-site as the entire Site property will be occupied by the new building.

4.3 Engineering Controls

The excavation required for the proposed Site development will achieve Track 1 Unrestricted Use SCOs. No engineering controls are required to address residual contamination at the Site. Since the development depth extends down to or below the water table, a waterproofing membrane, which also acts as a vapor barrier for potential future off site vapor intrusion, will be incorporated into the foundation design as part of development. If Track 1 is not achieved, the following two elements will constitute engineering controls that will be employed in the remedial action to address residual contamination.

- A composite cover system consisting of concrete covered sidewalks, and concrete building slabs;
- A waterproof barrier will be installed beneath the building slab as part of normal construction.

4.3.1 Composite Cover System

As part of new development, the entire property will be covered by an engineered permanent cover system comprised of a concrete-building slab beneath the proposed building. This composite cover system is comprised of:

- 3.5 feet of concrete floor slab

The 3.5 foot thick concrete building slab will be installed as a permanent engineering control for the Site. Based upon the concentrations of contaminants identified at the Site during the Phase II Investigation, either Track 1 - Un-restricted Use, or Track 2 - Commercial Use SCOs should be reached upon completion of soil excavation at the Site. A Site Management Plan (SMP) will be required as contaminant concentrations are expected to be within guidelines.

4.3.2 Waterproof Barrier

A vapor barrier is being built as part of development. However, if Track 1 SCOs are not achieved, the vapor barrier will become a permanent engineering control.

Migration of potential soil vapor from offsite will be mitigated with a combination of building slab and waterproof barrier. As part of normal construction, Optima proposes to install a continuous below grade vapor barrier/waterproofing system below the building slab and behind the basement walls on the new building. The architect has chosen a “Grace” Below Grade Waterproofing System called Preprufe 300R and 160R. Preprufe 300R and 160R membranes are composite sheets of HDPE film, an adhesive, and a weather resistant protective coating. The 0.046 inch thick Preprufe 300R membrane is utilized below the building slab and the 0.032 inch thick Preprufe 160R is utilized on the foundation walls. Both membranes have a 4,000 psi

tensile strength. To prevent leakage, the membrane is applied with minimum of 3 inches of overlap on the previous sheet and Preprufe tape is recommended over the rolled ends and cut edges. Preprufe provides a barrier to water moisture and gas. It is chemically resistant in most types of soils and waters, and protects the structure from salt or sulfate attack. A copy of the product specifications is included in Appendix F and installation details are provided as Figures 5 and 6.

4.4 Institutional Controls

The proposed remedy will achieve Track 1 Unrestricted Use SCOs; therefore, no institutional controls will be required. However, if Track 1 Unrestricted Use SCOs are not achieved, ICs will be incorporated in this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. 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.

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

- 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 and ICs. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification will be submitted by March 31st of the year following the reporting period and will comply with RCNY §43-1407(1)(3).
- Vegetable gardens and farming on the Site are prohibited;

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

4.5 Site Management Plan

Site Management is the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. Based upon the concentrations of contaminants identified for this Site, it is anticipated that Track 1 remedy will be achieved at the Site and therefore, a SMP will not be required. If neither the Track 1 nor Track 2 remedies are met, a SMP will be developed to describe appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by this RAWP. The Site Management Plan will be submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management will continue until terminated in writing by OER.

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

Site management activities, reporting, and EC/IC certification will be scheduled on a periodic basis to be established in the SMP and will be subject to review and modification by OER. The SMP (if necessary), will be based on a calendar year and certification reports will be due for submission to OER in the same month it was approved, each following year, until terminated in writing by OER.

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 pathways indicates that the potential for exposure exists; it does not imply that exposures actually occur.

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

Known and Potential Sources

Based on the results of the RIR, historic fill is present at the Site at grade. Based on the RIR, the contaminants of concern are as follows:

Soil:

- Several metals were detected below their respective Unrestricted Residential SCO.

Groundwater:

- Two SVOC, benzo(a)anthracene (0.075 ppb) and chrysene (0.063 ppb) were detected slightly above GQS.
- The metals sodium, iron and manganese were detected in GW-2 above their respective ambient groundwater limits.

Soil Vapor:

- Vapor analysis indicated petroleum and chlorinated VOCs at trace levels. TCA was detected at less than 2.1 ug/m³, TCE was detected at a maximum concentration of 20 ug/m³ and PCE was detected at a maximum concentration of 37.5 ug/m³.

Nature, Extent, Fate and Transport of Contaminants

Low level metals are present in the shallow fill throughout the site. Groundwater identified two SVOCs, which were not detected in soil. Given the residential history of the site and the lack of a contaminant source in soil on the site in the RI, low level VOCs detected in soil vapor were likely from an off-site source.

Potential Routes of Exposure

The five elements of an exposure pathway are:

- 1) The source of contamination (urban fill);
- 2) The environmental media (urban fill) and transport mechanisms (wind or water causing direct contact, ingestion, and inhalation);
- 3) The point of exposure (proximity to exposed urban fill);
- 4) The route of exposure (direct contact with the urban fill or dust resulting from disturbance of the fill material);
- 5) The receptor population (workers involved in the excavation and disturbance of the urban fill material or others proximal to the work area or the site).

An exposure pathway is considered complete when all five elements of an exposure pathway are documented. A potential pathway exists when any one or more of the five elements comprising an exposure pathway cannot be determined. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway has not existed in the past, does not exist in the present, and will never exist in the future. Three potential primary routes exist by which chemicals can enter the body:

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

CONTAMINANTS PROFILE

Chemical	Exposure Route	Symptoms of Overexposure
Arsenic	Inhalation Ingestion Skin Contact	<ul style="list-style-type: none"> • Stomach ache, nausea, vomiting, diarrhea. • Fatigue, abnormal heart rate. • Skin changes- redness and swelling.
Cobalt	Inhalation Ingestion Skin Contact	<ul style="list-style-type: none"> • Abdominal discomfort, nausea and/or constipation, diarrhea, • Weakness, muscle pains, irritability, headache. • Dizziness.
Lead	Inhalation Ingestion Skin Contact	<ul style="list-style-type: none"> • Abdominal discomfort, nausea and/or constipation, diarrhea, metallic taste. • Weakness, muscle pains, irritability, headache. • Dizziness.
Magnesium	Skin Contact	<ul style="list-style-type: none"> • FLAMMABLE SOLID in metal form • WATER REACTIVE in metal form
Manganese	Inhalation Ingestion Skin Contact	<ul style="list-style-type: none"> • Cause metal fume fever • Abdominal pain and nausea • Hypoglycemia • Chronic exposure can cause impairment of central nervous system
Mercury	Inhalation Ingestion Skin Contact	<ul style="list-style-type: none"> • Lung damage, nausea, vomiting, diarrhea. • Increase in blood pressure and/or heart rate. • Skin rash, eye irritation.
Nickel	Skin Contact Inhalation Ingestion	<ul style="list-style-type: none"> • Skin sensitization, allergic reaction • Nausea, vomiting, diarrhea • Metal fume fever (sever flu like symptoms)

Selenium	Inhalation Ingestion Skin Contact	<ul style="list-style-type: none"> • Highly toxic via inhalation • Toxic – may be fatal • May cause skin burns
Thallium	Inhalation Ingestion Skin Contact	<ul style="list-style-type: none"> • HIGHLY TOXIC via all routes in metallic form.
Zinc	Inhalation Ingestion Skin Contact	<ul style="list-style-type: none"> • Stomach cramps, nausea, diarrhea. • “Metal Fume Fever”. • Skin irritation.
MtBE	Inhalation Ingestion Skin Contact	<ul style="list-style-type: none"> • Possible Human Carcinogen • Irritating to eyes, nose, and throat • Headaches • Dizziness
Polycyclic Aromatic Hydrocarbons (PAH's)	Inhalation Ingestion Skin Contact	<ul style="list-style-type: none"> • Probable Human Carcinogen.

Existence of Human Health Exposure

Based upon the relatively low contaminant concentrations identified in the Phase II Report, there is very little potential for human Health Exposure.

Current Conditions: Potential exposure pathways include ingestion and dermal contact with soil/fill. There is no potential for contaminated soil vapors to accumulate, as there are no structures currently on site. Access to the site is currently controlled.

Construction/Remediation Activities: The potential exposure pathways to onsite contamination are by ingestion, dermal, or inhalation exposure by onsite workers during the remedial action and offsite due to emission of fugitive dust. During the remedial action, on-site and offsite exposure pathways will be minimized by preventing access to the site, through implementation of soil/materials management, dust controls, and a CHASP.

Proposed Future Conditions: Under future remediated conditions, soils will be removed from the site. The site will be fully capped, limiting potential direct exposure to soil and groundwater remaining in place, and engineering controls including the building foundation and a vapor barrier system will prevent exposure to soil and soil vapor. The site is served by a public water supply, and groundwater is not used at the site. There are no plausible off-site pathways for ingestion, inhalation, or dermal exposure to contaminants derived from the site.

Receptor Populations

Based upon the relatively low contaminant concentrations identified during site investigation, there is very little potential for exposure to contaminants at the Site.

On-Site Receptors: During construction, onsite receptors will include construction worker and visitors. After construction, onsite receptors will include child and adult residents.

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

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

Overall Human Health Exposure Assessment

Due to the low concentrations of contaminants identified at the Site, there is little risk of human exposure. Based upon this analysis, complete on-Site exposure pathways appear to be present only during the excavation/remediation phase. During the remedial action, on-Site exposure pathways will be minimized by preventing access to the Site through implementation of soils/materials management, storm water pollution prevention, dust controls, employment of a

community air monitoring program, and implementation of a construction health and safety plan. After the remedial action is complete, there will be no remaining exposure pathways to on-Site soil/fill, as the entire Site will be capped with an engineered composite cover system, and the vapor barrier and concrete building slab will interrupt potential for soil vapor intrusion.

During construction the Site will be completely fenced, with a locked gate, to prevent any unauthorized entrance and/or possible exposure to on-Site soils.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 Project Organization and Oversight

Principal personnel who will participate in the remedial action include Richard Galli, P.E., Principal of Galli Engineering, Ken Brooks, Senior Project Manager and Michael Gremillion Senior Geologist. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Richard Galli, PE, and Frank Gehrling, Senior Geologist.

5.2 Site Security

Site access will be controlled by a chain link fence surrounding the property with a locked gated entrance.

5.3 Work Hours

The hours for operation of remedial construction will be from 7am through 3:30pm. These hours conform to the New York City Department of Buildings construction code requirements.

5.4 Health and Safety Plan

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

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

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

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

5.5 Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) has been prepared for this project and is included as Appendix E. The CAMP includes procedures for real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the work area. 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.

5.5.1 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. Exceedances of action levels observed during performance of the CAMP will be reported to the OER Project Manager and included in the Daily Report.

5.5.2 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

5.7.1 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.

5.7.2 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.

5.7.3 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.

5.7.3a Dewatering

Dewatering is not expected at the site.

5.7.4 Equipment and Material Staging

Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations. The location of proposed equipment and material staging areas, truck inspection station, stockpile areas, and other pertinent remedial management features will be provided to OER prior to the start of construction.

5.7.5 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.

5.7.6 Truck Inspection Station

An outbound-truck inspection station will be set up close to the Site exit prior to the start of the remedial action. 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.

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 entering and leaving the Site will be provided to OER prior to the start of construction.

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

5.10.1 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.

5.10.2 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.

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

Storm Response Reporting

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

6.0 FINAL ENGINEERING REPORT

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

- Information required by this RAWP;
- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan (if required);
- 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;
- 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 any material imported onto the Site;
- Reports and supporting material will be submitted in digital form; and

Remedial Action Report Certification

The following certification will appear in front of the Executive Summary of the FER. The certification will include the following statements:

I, _____, am currently a professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the **Site name Site number**. (NYC VCP Site No. 13CVCP126M).

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

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

7.0 SCHEDULE

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

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAWP	0	NA
Fact Sheet 2 announcing start of remedy	0	NA
Mobilization	8	2
Remedial Excavation	10	8
Demobilization	18	2
Record Declaration of Covenants and Restrictions (If Required)	30	12
Submit Final Engineering Report	32	12

Remedial Action Work Plan
333 West 38th Street, New York, New York

OER Project Number 12EHAN365M
April 2013

APPENDICES

Remedial Action Work Plan
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APPENDIX A
Citizen Participation Plan

Remedial Action Work Plan
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APPENDIX B
Sustainability Statement

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APPENDIX C
Soil/Materials Management Plan

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APPENDIX D
Health & Safety Plan

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APPENDIX E
Community Air Monitoring Plan

APPENDIX F
Waterproof/Vapor Barrier Specifications

Remedial Action Work Plan
333 West 38th Street, New York, New York

OER Project Number: 12EHAN365M
April 2013

TABLES

TABLE 1
Soil Sampling Results - VOCs, SVOCs, PCBs and Pesticides

333 West 38th Street
 New York, NY

COMPOUND	NYSDEC Regulatory Guidance	SAMPLING LOCATIONS										
		SB-1	SB-1S	SB-1D	SB-2	SB-2S	SB-4	SB-4S	SB-5	SB-5S	SB-6	SB-6S
VOCs	375-6.8(b) Residential Use SCOs	NONE DETECTED										
SVOCs	375-6.8(b) Residential Use SCOs											
Butylbenzylphthalate	n/a	ND	ND	ND	ND	ND	3,300	4,200	940	ND	ND	ND
PCBs	375-6.8(b) Residential Use SCOs	NONE DETECTED										
Pesticides	375-6.8(b) Residential Use SCOs	NONE DETECTED										

Notes:

All compounds are reported in micro gram per Kilogram (ug/kg).

n/a = Not Available

ND = Not Detected above method detection limit.

TABLE 2
Soil Sampling Results - Metals

333 West 38th Street
New York, NY

COMPOUND	NYSDEC Part 375-6.8(b) Residential Use SCO's	SAMPLING LOCATION										
		SB-1	SB-1S	SB-1D	SB-2	SB-2S	SB-4	SB-4S	SB-5	SB-5S	SB-6	SB-6S
Aluminum	n/a	13,300	11,400	11,500	11,400	10,900	7,450	10,700	8,830	13,300	3,720	12,300
Antimony	n/a	-	-	-	-	-	-	-	-	-	-	-
Arsenic	16	0.83	3.41	5.89	0.76	0.96	1.18	5.86	0.86	3.43	1.24	7.93
Barium	350	171	45.6	53.8	153	154	111	103	106	202	46.0	120
Beryllium	14	0.84	0.38	0.45	0.72	0.41	0.37	0.61	0.41	0.48	-	0.59
Calcium	n/a	15,900	1,150	1,090	3,370	2,350	3,060	1,810	3,970	1,510	1,390	1,580
Cobalt	n/a	11.7	6.95	7.51	9.19	5.66	5.64	10.1	6.02	7.38	2.95	10.2
Chromium	36	29.6	13.6	17.1	25.1	13.2	25.6	14.9	24.5	16.7	15.7	14.8
Copper	270	17.6	11.6	12.1	15.2	15.7	23.8	18.1	24.2	9.71	9.29	4.15
Iron	n/a	27,300	24,600	30,900	20,800	17,000	14,200	33,300	12,800	22,700	7,290	23,900
Potassium	n/a	4,860	709	714	4,060	1,090	975	737	1,420	1,230	825	859
Magnesium	n/a	8,840	2,760	2,660	4,430	3,110	2,260	2,560	2,610	2,570	1,530	2,290
Manganese	2,000	725	300	433	543	363	299	688	413	689	70.8	534
Sodium	n/a	344	81.6	77.1	243	90.0	485	108	724	101	151	113
Nickel	140	27.5	12.6	13.0	22.4	17.0	13.9	16.5	15.2	13.8	9.38	13.4
Lead	400	11.7	9.50	8.62	11.0	8.84	5.63	19.5	7.02	9.36	13.1	10.5
Vanadium	n/a	31.5	18.7	18.7	27.8	14.7	27.3	23.9	21.1	21.7	10.7	46.3
Zinc	2,200	52.9	46.9	48.7	42.3	49.5	19.4	78.6	19.4	47.1	21.0	82
Total Mercury	0.81	-	-	-	-	-	-	-	-	0.07	0.12	0.46

Note: All Concentrations are in milligrams per kilogram (mg/Kg).

TABLE 3
Groundwater Sampling Detections – VOCs, SVOCs, Pesticides and PCBs

333 West 38th Street
 New York, NY

COMPOUND	NYSDEC REGULATORY STANDARD	SAMPLE LOCATION		
VOCs (EPA 8260)	TOGS 1.1.1	GW-1	GW-2	GW-FB
Toluene	5	ND	1.3	ND
SVOCs (EPA 8270)	TOGS 1.1.1	GW-1	GW-2	GW-FB
Benz(a)anthracene	0.002	0.075	0.042	ND
Chrysene	0.002	0.063	ND	ND
Pesticides (EPA 8081)	TOGS 1.1.1	GW-1	GW-2	GW-FB
Pesticides	--	None Detected	None Detected	None Detected
PCBs (EPA 8082)	TOGS 1.1.1	GW-1	GW-2	GW-FB
PCB's	0.09	None Detected	None Detected	None Detected

Notes:

All concentrations are in micrograms per liter (ug/L)

Results of all other compounds within their designated analyte groups were non-detectable

ND = Compound not detected.

NA = Not Available

FB = Field Blank

TABLE 4
Groundwater Sampling Results – Metals

333 West 38th Street
New York, NY

TAL METALS	Part 703.5 Groundwater Standards	GW-1	GW-1 (Filtered)	GW-2	GW-2 (Filtered)	GW-FB	GW-FB (Filtered)
Silver	0.05	ND	ND	ND	ND	ND	ND
Aluminum	0.1	31.8	0.33	1.22	0.14	ND	ND
Arsenic	0.025	0.011	ND	0.005	0.007	ND	ND
Barium	1.0	1.30	0.094	0.095	0.102	ND	ND
Beryllium	0.011	0.004	ND	ND	ND	ND	ND
Calcium	n/a	189	93.5	99.3	145	0.033	0.01
Cadmium	0.005	0.001	ND	ND	ND	ND	ND
Cobalt	0.005	0.057	ND	ND	ND	ND	ND
Chromium	0.05	0.180	ND	0.007	ND	ND	ND
Copper	0.2	0.212	ND	0.015	ND	ND	ND
Iron	0.3	56.9	0.150	4.02	4.12	0.013	ND
Potassium	n/a	22.2	12.6	9.8	14.5	ND	0.3
Magnesium	35	51.1	15.3	30.1	45.0	ND	ND
Manganese	0.3	11.9	0.623	1.61	1.76	ND	ND
Sodium	20	14.1	13.7	47.8	71.8	ND	ND
Nickel	0.2	0.166	0.007	0.011	0.008	0.001	0.001
Lead	0.05	0.038	ND	ND	ND	0.003	ND
Vanadium	0.014	0.073	ND	ND	ND	ND	ND
Zinc	0.066	0.208	0.002	0.045	0.008	0.016	0.012
Mercury	0.0014	ND	ND	ND	ND	ND	ND

Notes:

All Concentrations are reported in milligrams per liter (mg/L).

ND = Analyte not detected above method detection limit.

Values in **bold** exceed the NYSDEC ambient groundwater limits.

TABLE 5
Soil Vapor Analytical Results

333 West 38th Street
New York, NY

Sample Designation	SV-1	SV-2	SV-3
Sample Type	Soil Vapor	Soil Vapor	Soil Vapor
Carbon Tetrachloride	ND	ND	ND
NYSDOH Matrices Decision	NFA	NFA	NFA
1,1,1-Trichloroethane	2.13	1.15	ND
NYSDOH Matrices Decision	NFA	NFA	NFA
Tetrachloroethene	ND	6.17	37.5
NYSDOH Matrices Decision	NFA	NFA	NFA
Trichloroethene	ND	6.93	20.0
NYSDOH Matrices Decision	NFA	NFA	NFA

Notes:

All concentrations are in micrograms per cubic meter.

ND = Not Detected above the method detection limit.

NFA = No Further Action required by NYSDOH Soil Vapor/Indoor Air Matrix 1.

TABLE 6
Soil Cleanup Objectives
333 West 38th Street, New York, NY

Soil Cleanup Objectives - from Tables 375-6.8 (a) and (b)			
Contaminant	CAS Number	Track 1 - Unrestricted Use 375-6.8(a)	Track 2 - Residential Use 375-6.8(b)
Metals		SCO	SCO
Arsenic	7440-38-2	13	16
Barium	7440-39-3	350	350
Beryllium	7440-41-7	7.2	14
Cadmium	7440-43-9	2.5	2.5
Chromium, hexavalent	18540-29-9	1	22
Chromium, trivalent	16065-83-1	30	36
Copper	7440-50-8	50	270
Total Cyanide		27	27
Lead	7439-92-1	63	400
Manganese	7439-96-5	1,600	2,000
Total Mercury		0.18	0.81
Nickel	7440-02-0	30	140
Selenium	7782-49-2	3.9	36
Silver	7440-22-4	2	36
Zinc	7440-66-6	109	2,200
PCBs/Pesticides	CAS Number	Track 1 - Unrestricted Use	Track 2 - Residential Use
2,4,5-TP Acid (Silvex)	93-72-1	3.8	58
4,4'-DDE	72-55-9	0.0033	1.8
4,4'-DDT	50-29-3	0.0033	1.7
4,4'-DDD	72-54-8	0.0033	2.6
Aldrin	309-00-2	0.005	0.019

TABLE 6
Soil Cleanup Objectives
333 West 38th Street, New York, NY

PCBs/Pesticides (Continued)	CAS Number	Track 1 - Unrestricted Use	Track 2 - Residential Use
alpha-BHC	319-84-6	0.02	0.097
beta-BHC	319-85-7	0.036	0.072
Chlordane (alpha)	5103-71-9	0.094	0.91
delta-BHC	319-86-8	0.04	100
Dibenzofuran	132-64-9	7	14
Dieldrin	60-57-1	0.005	0.039
Endosulfan I	959-98-8	2.4	4.8
Endosulfan II	33213-65-9	2.4	4.8
Endosulfan sulfate	1031-07-8	2.4	4.8
Endrin	72-20-8	0.014	2.2
Heptachlor	76-44-8	0.042	0.42
Lindane	58-89-9	0.1	0.28
Polychlorinated biphenyls	1336-36-3	0.1	1
SVOCs	CAS Number	Track 1 - Unrestricted Use	Track 2 - Residential Use
Acenaphthene	83-32-9	20	100
Acenaphthylene	208-96-8	100	100
Anthracene	120-12-7	100	100
Benz(a)anthracene	56-55-3	1	1
Benzo(a)pyrene	50-32-8	1	1
Benzo(b)fluoranthene	205-99-2	1	1
Benzo(g,h,i)perylene	191-24-2	100	100
Benzo(k)fluoranthene	207-08-9	0.8	1
Chrysene	218-01-9	1	1
Dibenz(a,h)anthracene	53-70-3	0.33	0.33
Fluoranthene	206-44-0	100	100
Fluorene	86-73-7	30	100
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	0.5

TABLE 6
Soil Cleanup Objectives
333 West 38th Street, New York, NY

SVOCs (Continued)	CAS Number	Track 1 - Unrestricted Use	Track 2 - Residential Use
m-Cresol	108-39-4	0.33	100
Naphthalene	91-20-3	12	100
o-Cresol	95-48-7	0.33	100
p-Cresol	106-44-5	0.33	34
Pentachlorophenol	87-86-5	0.8	2.4
Phenanthrene	85-01-8	100	100
Phenol	108-95-2	0.33	100
Pyrene	129-00-0	100	100
VOCs	CAS Number	Track 1 - Unrestricted Use	Track 2 - Residential Use
1,1,1-Trichloroethane	71-55-6	0.68	100
1,1-Dichloroethane	75-34-3	0.27	19
1,1-Dichloroethene	75-35-4	0.33	100
1,2-Dichlorobenzene	95-50-1	1.1	100
1,2-Dichloroethane	107-06-2	0.02	2.3
cis -1,2-Dichloroethene	156-59-2	0.25	59
trans-1,2-Dichloroethene	156-60-5	0.19	100
1,3-Dichlorobenzene	541-73-1	2.4	17
1,4-Dichlorobenzene	106-46-7	1.8	9.8
1,4-Dioxane	123-91-1	0.1	9.8
Acetone	67-64-1	0.05	100
Benzene	71-43-2	0.06	2.9
n-Butylbenzene	104-51-8	12	100
Carbon tetrachloride	56-23-5	0.76	1.4
Chlorobenzene	108-90-7	1.1	100
Chloroform	67-66-3	0.37	10
Ethylbenzene	100-41-4	1	30

TABLE 6
Soil Cleanup Objectives
 333 West 38th Street, New York, NY

VOCs (Continued)	CAS Number	Track 1 - Unrestricted Use	Track 2 - Residential Use
Hexachlorobenzene	118-74-1	0.33	0.33
Methyl ethyl ketone	78-93-3	0.12	62
Methyl tert-butyl ether	1634-04-4	0.93	51
Methylene chloride	75-09-2	0.05	100
n – Propylbenzene	103-65-1	3.9	100
sec-Butylbenzene	135-98-8	11	100
tert-Butylbenzene	98-06-6	5.9	100
Tetrachloroethene	127-18-4	1.3	5.5
Toluene	108-88-3	0.7	100
Trichloroethene	79-01-6	0.47	10
1,2,4-Trimethylbenzene	95-63-6	3.6	47
1,3,5-Trimethylbenzene	108-67-8	8.4	47
Vinyl chloride	75-01-4	0.02	0.21
Xylene (mixed)	1330-20-7	0.26	100

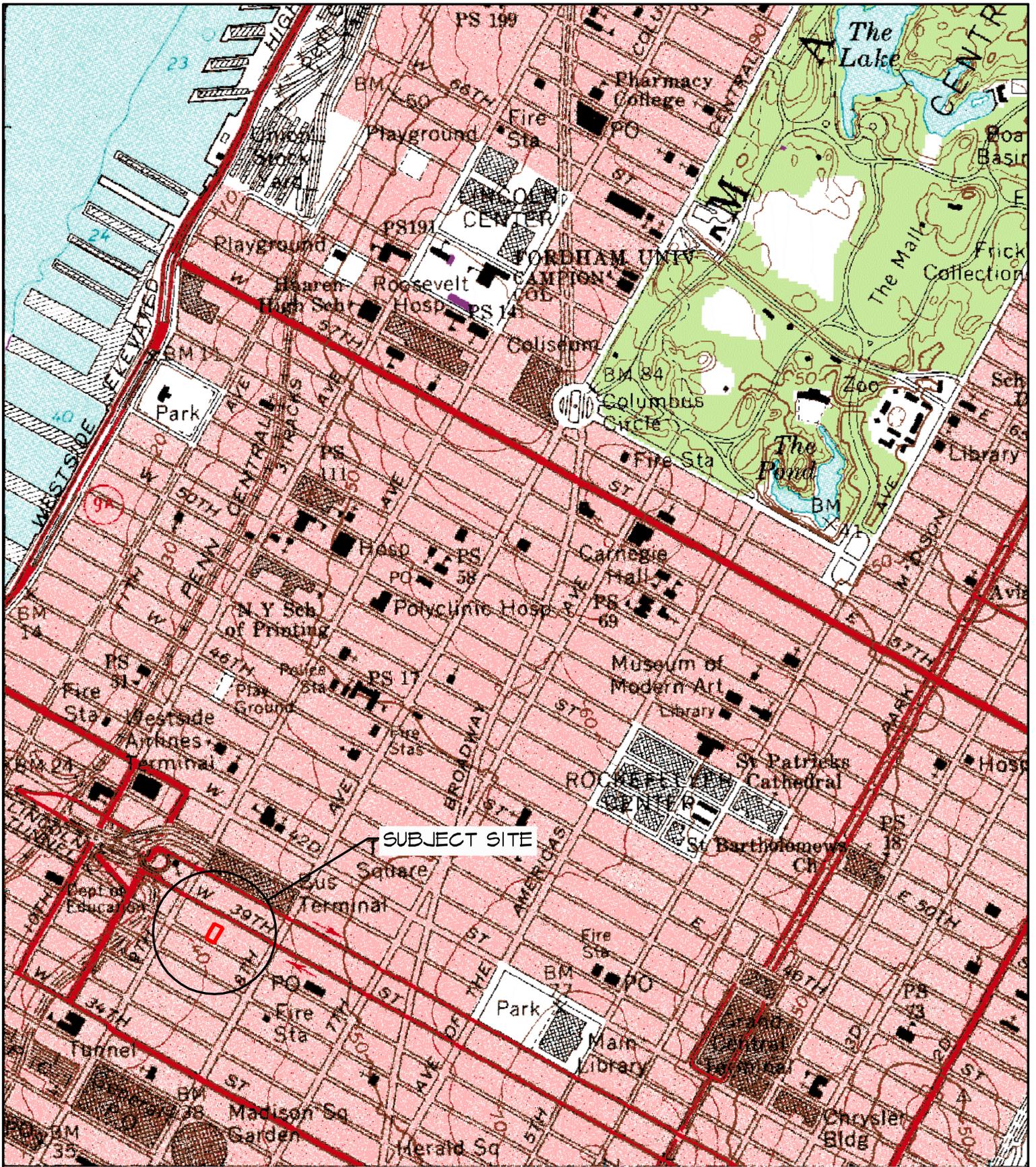
Notes:

All soil cleanup objectives are reported in milligrams per kilogram (mg/Kg).

Remedial Action Work Plan
333 West 38th Street, New York, New York

OER Project Number 12EHAN365M
April 2013

FIGURES



Galli Engineering, P.C.



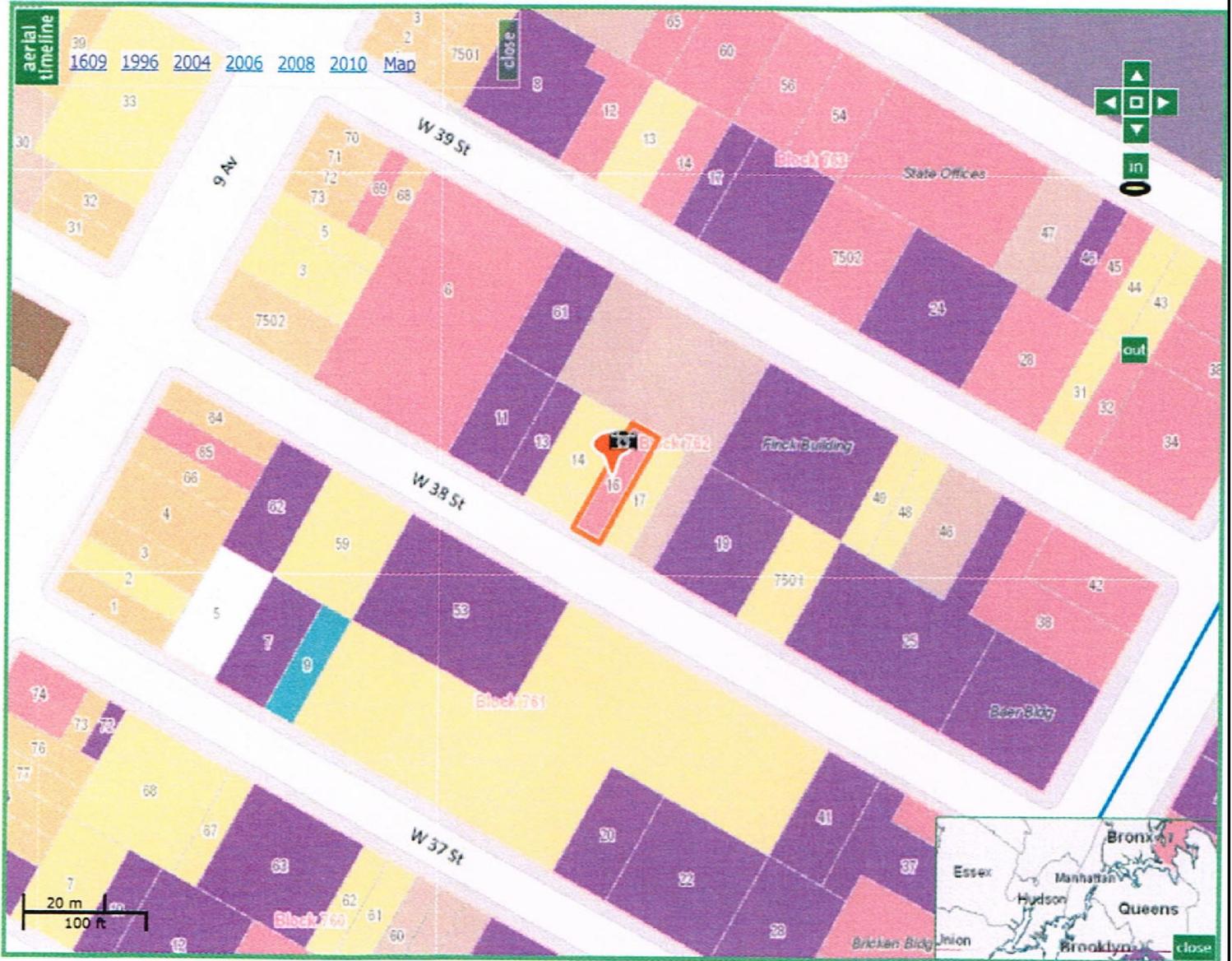
734 Walt Whitman Road,
Suite 402A
Melville, New York 11747

JOB NO. 0954-01-002	
DATE 9/30/12	
SCALE N.T.S.	CHKD. BY KLB
DRWN. BY JJR	DSGN. BY KLB

333 W. 38th STREET

FIGURE 1 – SITE LOCATION MAP

Address	Block & Lot	ZIP Code	Neighborhood	Community District	County/Borough
333 w 38th street			Manhattan		
					Search



- | | | | |
|---|--------------------------|---|--------------|
|  | 1 & 2 FAMILY RESIDENTIAL |  | INDUSTRIAL |
|  | MULTI-FAMILY RESIDENTIAL |  | PARKING |
|  | COMMERCIAL |  | INSTITUTIONS |

Galli Engineering, P.C.



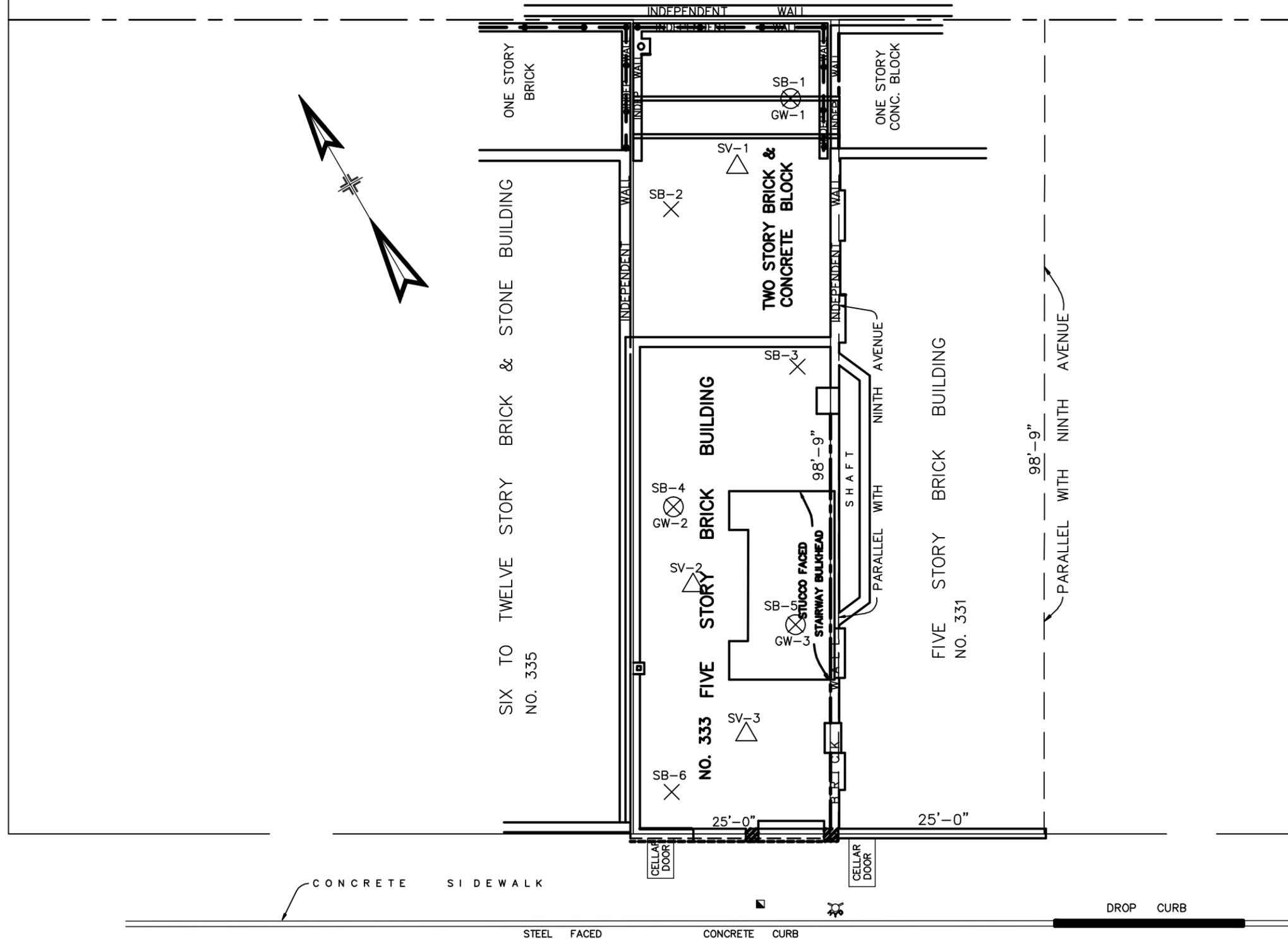
734 Walt Whitman Road,
Suite 402A
Melville, New York 11747

JOB NO.	0954-01-002
DATE	3/25/13
SCALE	CHKD. BY
N.T.S.	KLB
DRWN. BY	DSGN. BY
JJR	KLB

333 W. 38th STREET, NEW YORK, N.Y.

FIGURE 2 – SURROUNDING LAND USAGE

NINTH AVENUE



LEGEND

- SB-? X SOIL BORING LOCATION
- GW-? O GROUNDWATER SAMPLE LOCATION
- SV-? Δ SOIL VAPOR LOCATION

WEST 38

STREET

REV.	DATE	DESCRIPTION	BY
3	5/14/12	REVISED AS PER OER/NYCDEP COMMENTS.	AS
2	5/10/12	REVISED AS PER OER/NYCDEP COMMENTS.	AS
1	4/19/12	REVISED AS PER OER/NYCDEP COMMENTS.	AS
JOB NO. 0954-01-001			
DRAWN ADS		OPTIMA REAL-ESTATE 333 WEST 38th STREET, NEW YORK, NY	
CHECKED SD		SAMPLING LOCATION PLAN	
APPROVED RDS			
SEAL		 Galli Engineering, P.C. <small>734 Wolf Whitman Road, Suite 402A Melville, New York 11747</small>	
DATE	SCALE	DRAWING NO.	
4/06/12	1" = 1'-0"	FIGURE 3	

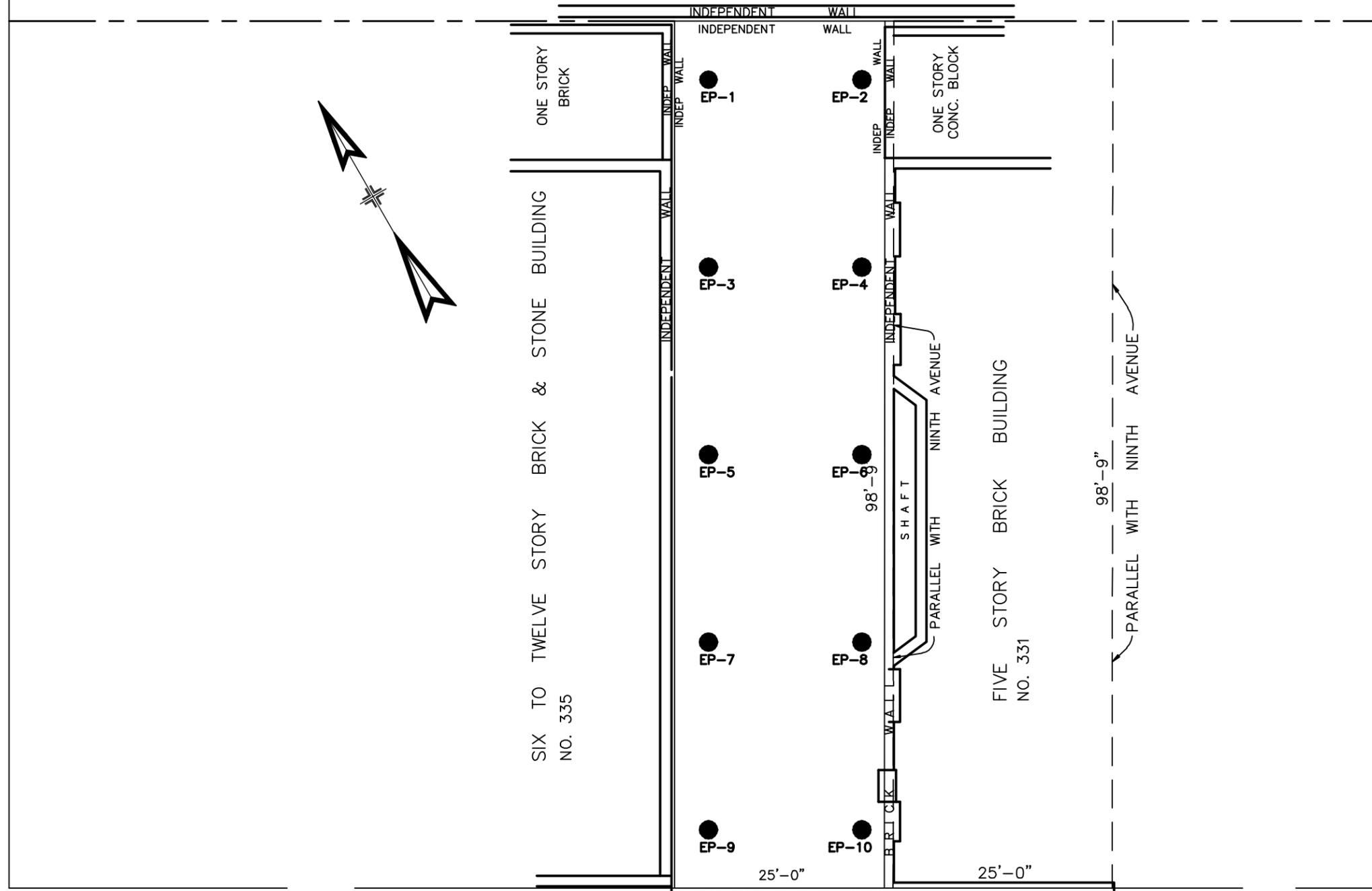
UNAUTHORIZED ALTERATION OF, OR ADDITION TO PLANS OR DOCUMENTS BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

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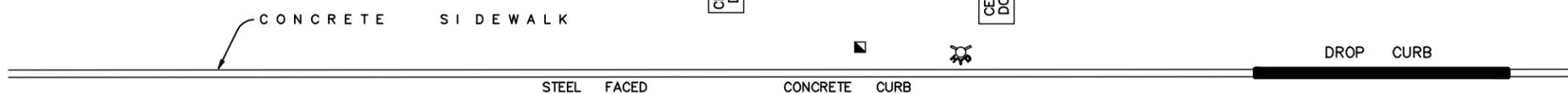
COPIES OF THIS DOCUMENT NOT MARKED WITH AN ORIGINAL OF THE PROFESSIONAL ENGINEERS INKED SEAL OR HIS EMBOSSED SEAL SHALL NOT BE CONSIDERED TO BE VALID TRUE COPIES.

NOTE: SITE INFORMATION TAKEN FROM PROPERTY SURVEY PREPARED BY LINK LAND SURVEYORS, P.C. DATED OCTOBER 11, 2011.

NINTH AVENUE



LEGEND
 EP-1 ● ENDPOINT SAMPLING LOCATION



WEST 38

STREET

UNAUTHORIZED ALTERATION OF, OR ADDITION TO PLANS OR DOCUMENTS BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.
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NOTE: SITE INFORMATION TAKEN FROM PROPERTY SURVEY PREPARED BY LINK LAND SURVEYORS, P.C. DATED OCTOBER 11, 2011.

3	5/14/12	REVISED AS PER OER/NYCDEP COMMENTS.	AS
2	5/10/12	REVISED AS PER OER/NYCDEP COMMENTS.	AS
1	4/19/12	REVISED AS PER OER/NYCDEP COMMENTS.	AS
REV.	DATE	DESCRIPTION	BY
JOB NO. 0954-01-001		OPTIMA REAL-ESTATE 333 WEST 38th STREET, NEW YORK, NY	
DRAWN ADS			
CHECKED SD			
APPROVED RDS		ENDPOINT SOIL SAMPLING LOCATIONS	
SEAL		 Galli Engineering, P.C. 734 Wolf Whitman Road, Suite 402A Melville, New York 11747	
DATE	SCALE	DRAWING NO.	
4/06/12	N.T.S.	FIGURE 4	

THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ARCHITECTS. DO NOT SCALE THE DRAWINGS. THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION PURPOSES UNTIL SIGNED BY THE CONSULTANTS.

#	DATE	DESCRIPTION
01		
02		
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REVISIONS:

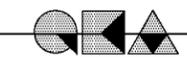
10
09
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04
03
02
01

ISSUED DRAWINGS:



Galli Engineering, P.C.
 734 WALT WHITMAN ROAD, SUITE 402A
 MELVILLE, NEW YORK 11747
 PH: 1-631-271-9292 FAX: 1-631-271-9345

#	DATE	DESCRIPTION
01	01/10/2012	ISSUED TO DCB
02	11-09-11	ISSUED TO DCB
03	09-21-11	ISSUED TO DCB



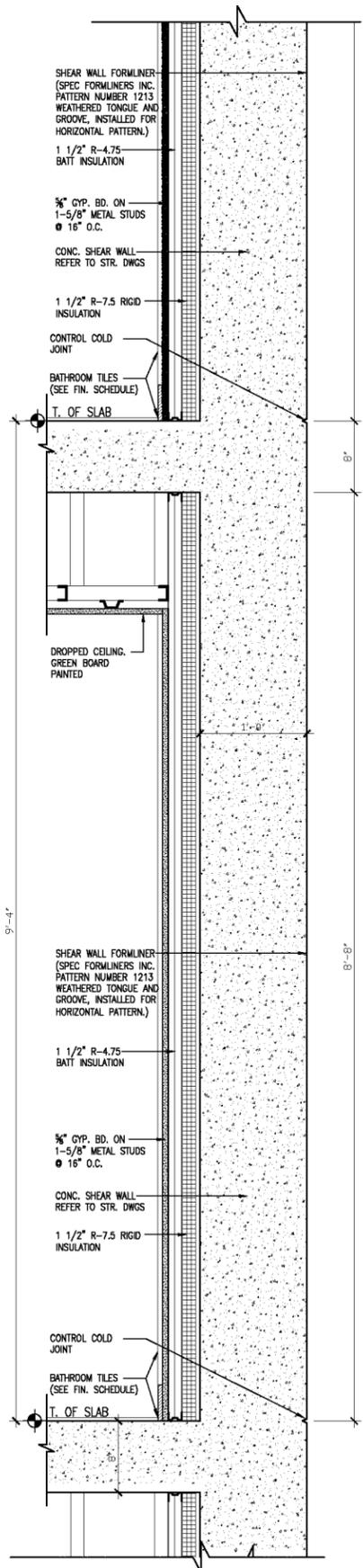
GENE KAUFMAN ARCHITECT PC
 525 BROADWAY, NEW YORK, N.Y. 10012
 TEL. (212) 625-8700 FAX. (212) 625-8867

PROJECT:
 333 WEST 38th STREET
 NEW YORK, NY

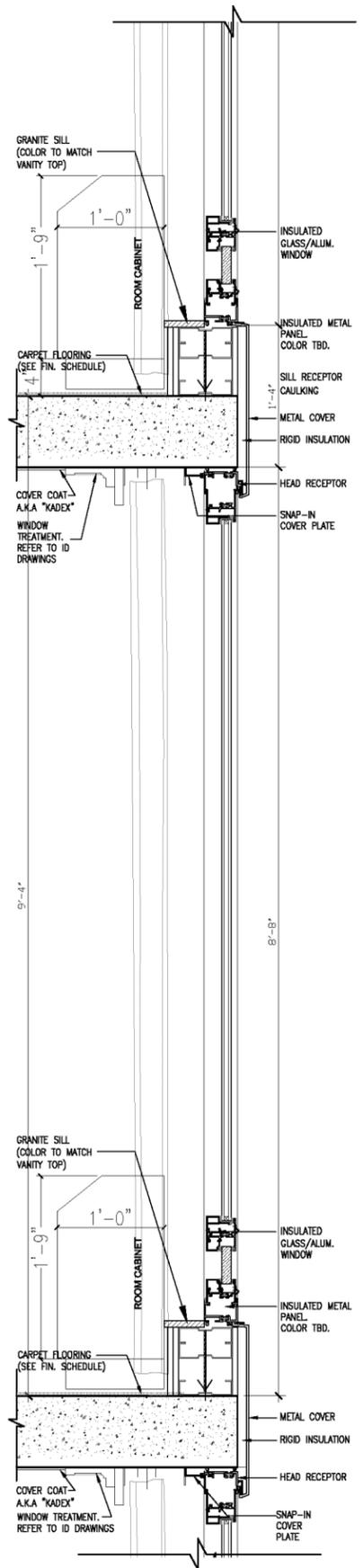
WALL SECTION DETAILS



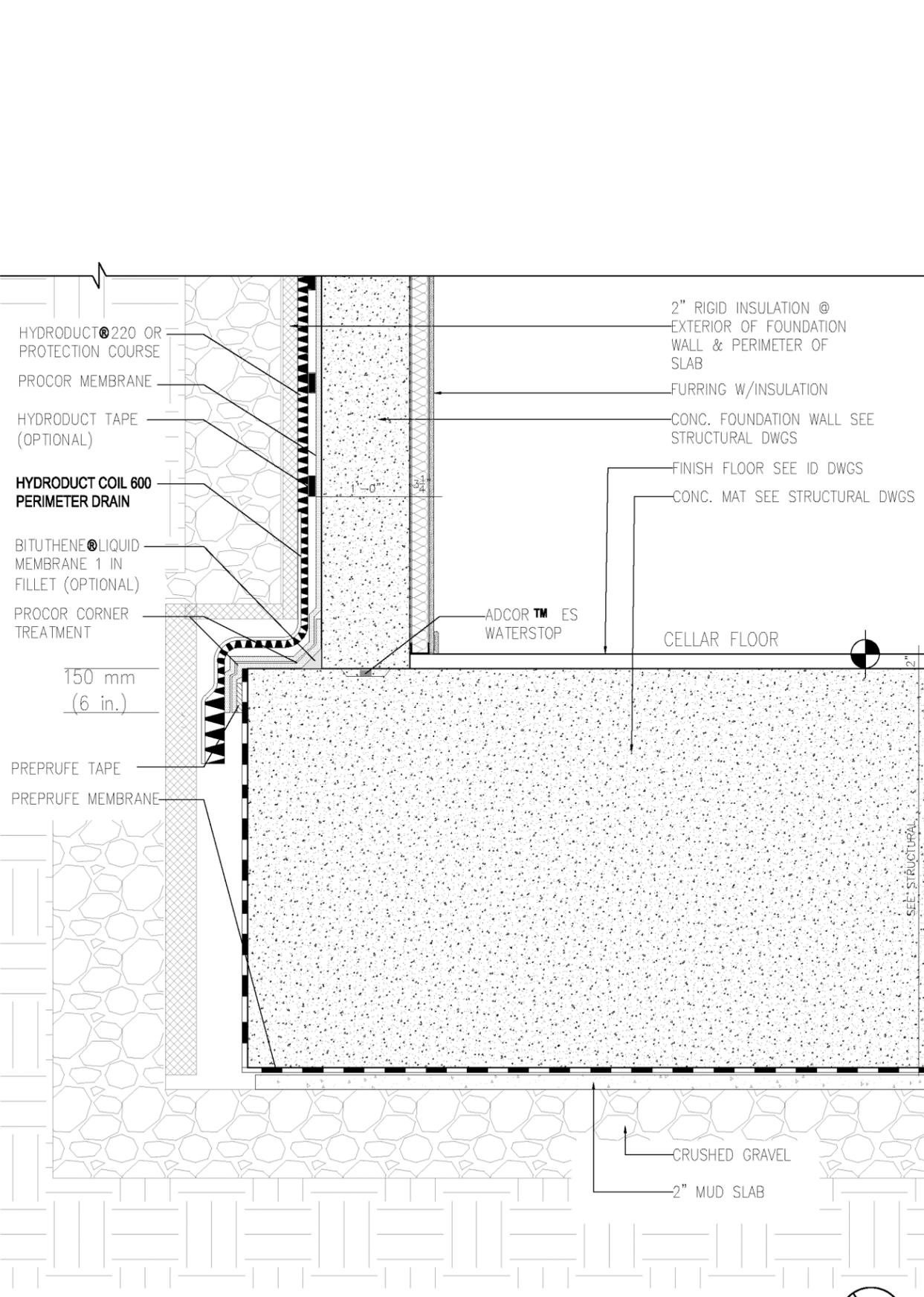
DATE: JUNE 21TH, 2012
 SCALE: AS NOTED
 DRAWING NUMBER:
FIGURE 6



1 WALL SECTIONS AT SHEAR WALL
 Scale: 1 1/2" = 1'-0"



2 WALL SECTIONS AT FRONT METAL PANEL
 Scale: 1 1/2" = 1'-0"



3 WATERPROOFING SECTION/DETAIL
 Scale: 1 1/2" = 1'-0"



Remedial Action Work Plan
333 West 38th Street, New York, New York

OER Project Number 12EHAN365M
April 2013

APPENDICES

Remedial Action Work Plan
333 West 38th Street, New York, New York

OER Project Number 12EHAN365M
April 2013

APPENDIX A
Citizen Participation Plan

APPENDIX A

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Optima Real Estate Inc., (Optima) have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Brownfield 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 BCP, Optima 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, Maurizio Marezio Bertini, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 788-3922

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

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

Repository Name

Repository Address

Repository Telephone Number

Repository Hours of Operation

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

Public Notice and Public Comment: Public notice to all members of the Project Contact List is required at three major steps during the performance of the cleanup program (listed below) and at other points that may be required by OER. Notices will include Fact Sheets with descriptive project summaries, updates on recent and upcoming project activities, repository information, and important phone and email contact information. All notices will be prepared by Optima, reviewed and approved by OER prior to distribution and mailed by Optima. Public comment is solicited in public notices for all work plans developed under the NYC Brownfield Cleanup Program. Final review of all work plans by OER will consider all public comments. Approval will not be granted until the public comment period has been completed.

Citizen Participation Milestones. Public notice and public comment activities occur at several steps during a typical NYC BCP project. See flow chart on the following page, which identifies when during the NYC BCP 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.**

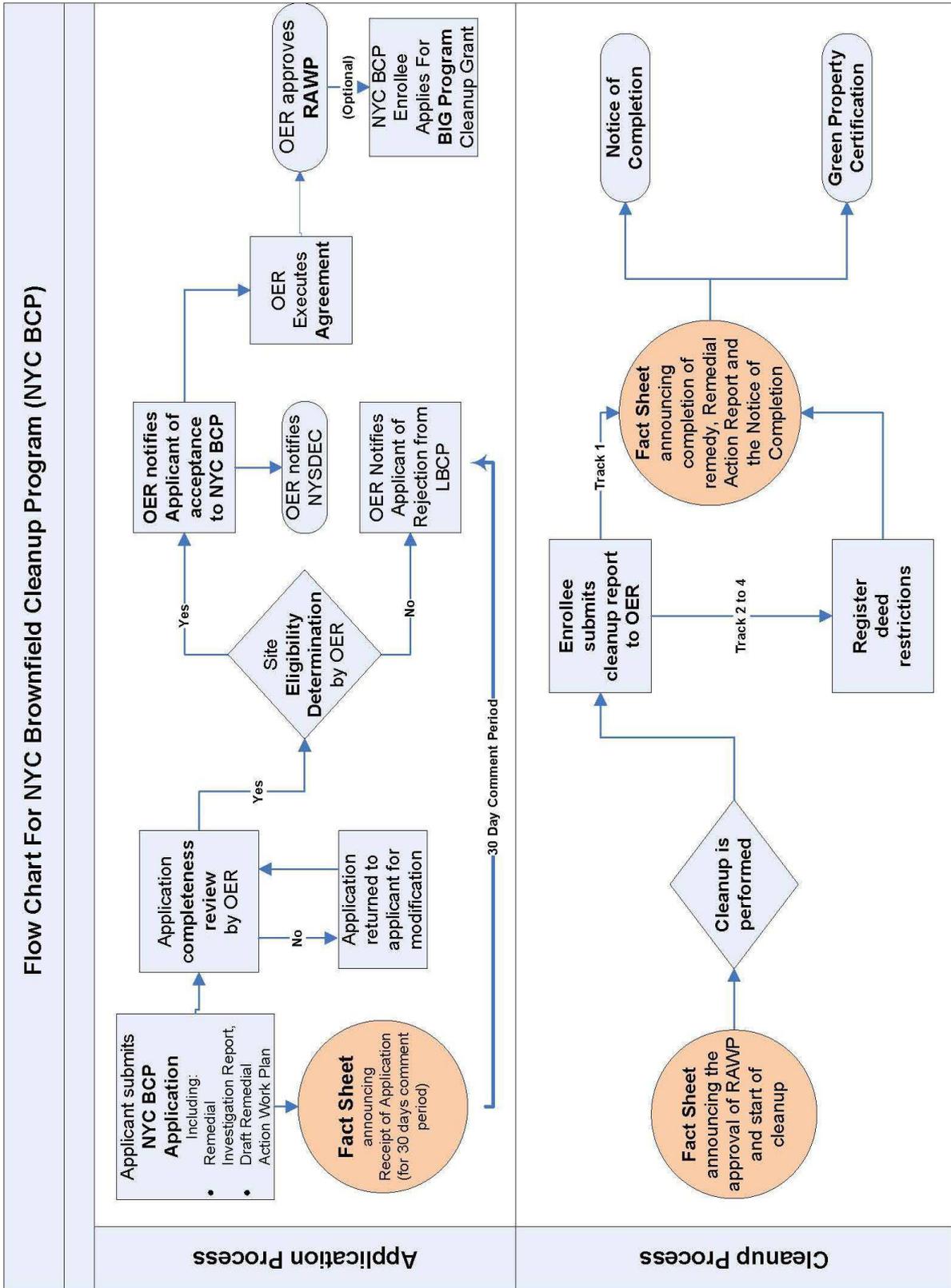
Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the availability of the Remedial Investigation Report and Remedial Action Work Plan and the initiation of a 30-day public comment period on the Remedial Action Work Plan. The Fact Sheet summarizes 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.



Remedial Action Work Plan
333 West 38th Street, New York, New York

OER Project Number 12EHAN365M
April 2013
Page 5 of 5

Remedial Action Work Plan
333 West 38th Street, New York, New York

OER Project Number 12EHAN365M
April 2013

APPENDIX B
Sustainability Statement

APPENDIX B

SUSTAINABILITY STATEMENT

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

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

Based upon the results from previous soil sampling performed at the Site, any soil excavated from the Site location should meet Part 375-6.8(b) Residential Use Guidelines. Therefore, Galli on behalf of Optima proposes that the soil excavated from the Site be accepted into the OER Clean Soil Bank Program for utilization on another local project in need of fill material. Acceptance of this soil into the Clean Fill Program will provide a significant energy savings by a reduction in fuel use by providing a local disposal option.

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 Final Engineering Report (FER).

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.

Since the proposed building will encompass the entire Site property, there are no plans for utilization of non-renewable resources such as top-soil. In addition, any soil necessary for backfill will be utilized from on-site sources.

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 FER.

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.

There are no plans to import fill material to the Site Location. The results of previous soil sampling performed at the Site indicated that soils met Residential Use SCOs and therefore may be re-used on-site as necessary. The re-use of on-site materials will greatly reduce the cost and energy consumption involved with the import of fill material.

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

Conversion to Clean Fuels: Use of clean fuel improves NYC's air quality by reducing harmful emissions. Based on the Site locations E-designation, the proposed building will utilize natural gas for heating purposes.

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.

Upon completion of the proposed building, the entire Site property will be covered by a concrete building slab and a waterproof membrane. The presence of these engineering controls will greatly reduce the possibility of any recontamination of the subject Site.

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

Paperless Brownfield Cleanup Program: Optima 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: Optima 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.

Remedial Action Work Plan
333 West 38th Street, New York, New York

OER Project Number 12EHAN365M
April 2013

APPENDIX C
Soil/Materials Management Plan

SOIL MANAGEMENT PLAN

OER Project Number: 12EHAN365M

April 2013

FOR WORK AT:

333 West 38th Street
New York, NY 10018

TAX MAP DESIGNATION:

Block: 762 Lot: 16

PREPARED FOR:

OPTIMA Real Estate
Gene Kaufman Architect P.C.
525 Broadway 8th Floor
New York, NY 10012

PREPARED BY:

Galli Engineering, P.C.
734 Walt Whitman Road, Suite 402A
Melville, NY 11747

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1.3	Characterization of Excavated Materials	2
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APPENDICES

APPENDIX A: Community Air Monitoring Plan (CAMP)

APPENDIX B: Health and Safety Plan (HASP)

1.0 INTRODUCTION

The following Soil/Materials Management Plan (SMP) is presented for OER Project Number 12EHAN365M, located at 333 West 38th Street, New York, NY 10018. This plan describes the methods and procedures for the soil/fill excavation work to be performed prior to construction of a new 21 Story Hotel at the Site.

In addition, a Community Air Monitoring Plan (CAMP) has been prepared and attached as **Appendix A**, and a Health and Safety Plan (HASP) has been prepared to include excavation of Soil/Fill as well as environmental monitoring during excavation. The HASP is attached as **Appendix B**.

Based upon the results of the Phase II Site Assessment, submitted by Galli Engineering, PC, in September 2012, no VOCs, SVOCs, PCBs, Pesticides or TAL Metals were identified in any of the soil samples above NYSEDC part 375-6.8(b) Residential Use Soil Cleanup Objectives (SCOs). Therefore, no excavation, stockpiling, or disposal of contaminated soil is expected for the "Site" location.

1.1 Soil Screening Methods

During excavation, visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional and will be presented in the Final Engineering Report (FER). Results of any soil screening performed during invasive work performed during the remedy and development phases will be provided to the NYC Office of Environmental Remediation (NYCOER), prior to issuance of the Notice of Satisfaction.

1.2 Stockpile Methods

Any excavated soil suspected of contamination will be scanned with a Photoionization Detector (PID) and compared to background levels. If elevated PID readings are detected (> 5ppm over background), the suspect soil 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 in Section 3.8 of the RAWP. 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 Applicant to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated

material generated at an environmental remediation Site in New York under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Applicant. 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 a Final Remediation Report (FER).

The FER 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 FER.

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

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

1.7 Materials Reuse On-Site

Soil and fill that is derived from the property that meets the soil cleanup objectives established in the Remedial Action Work plan (RAWP) may be reused on-Site. “Reuse on-Site” means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to Engineering 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 plan are followed.

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

If contamination is detected, upon completion of 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 FER; 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 FER. This demarcation will constitute the top of the site management horizon.

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. However, importing of soils is not expected on this project. If required, 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 the RAWP.

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 the RAWP. The FER 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.

1.9.1 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 FER. 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

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

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

1.11 Storm-water Pollution Prevention

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in the 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 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 Full List volatiles and semi-volatiles, pesticides/PCBs, and TAL metals, as appropriate.

1.13 Odor, Dust and Nuisance Control

1.13.1 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 FER.

1.13.2 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 Closure Report.

1.13.3 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 during the remedial program, as necessary, to prevent nuisances.

1.14 Import of Clean Cover

Based upon the results of the Phase II Investigation performed at the subject Site, no soil is anticipated to be imported to the Site for use as clean cover (the anticipated construction will be a zero lot line building). Any soil necessary for construction purposes is expected to be utilized

from on-Site materials obtained during excavation for the proposed building. In the event that additional clean cover material is required, any imported soil is required to be uncontaminated, clean soil that meets the lesser of the appropriate NYSDEC 6 NYCRR Part 375-6.8 Restricted Use Class SCOs and the NYSDEC 6 NYCRR Part 375-6.8 groundwater protection SCO.

If required, imported clean soil cover will be from an approved source/facility and will be evaluated by the PE/QEP to ensure:

- 1) That a segregated stockpile of five tons (five cubic yards) is properly maintained at the source and will not be comingled with any other material prior to importing and grading the clean soil material at the Site;
- 2) That the material does not include any solid waste, including construction and demolition material, as it's prohibited;
- 3) That screening for evidence of contamination by visual, olfactory and PID soil screening practices prior to testing at the source as well as upon importing to the Site for grading is completed; and
- 4) That a maximum five-part composite sample will be collected from the segregated stockpile at the source at a minimum frequency of one sample per 250 cubic yards and analyzed for the following Full List parameters:
 - VOCs by EPA Method 8260C (rev. 2006)
 - SVOCs by EPA Method 8270D (rev. 2007)
 - Pesticides by EPA Method 8081B (rev. 2000)
 - PCBs by EPA Method 8082A (rev. 2000)
 - TAL Metals by EPA Method 6010C (rev. 2007)

Upon receipt of the segregated stockpile analytical results collected at the source, a Clean Soil Sampling Report will be submitted to OER for review/approval prior to importing. The report will include the following:

- 1) Summary of number of samples collected and analyzed, tabulated data and comparison to the selected Site Use SCOs;
- 2) Analytical data sheets and chain of custody documentation;
- 3) Photographs from the segregated stockpile at the source with sample point locations identified;
- 4) An affidavit from the source/facility on company letterhead stating that the segregated stockpile for five tons (five cubic yards) has been properly maintained at the source and complies with the requirements listed above; and
- 5) A copy of source/facility NYSDEC permit.

If contamination is detected, a highly visible demarcation barrier (i.e. orange geo-synthetic material or equivalent) will be installed beneath the clean soil/fill surface cover. Upon importing and grading the OER approved clean soil cover on top of a highly visible demarcation barrier, the following documentation will be presented in the Final Engineering Report:

1. Copies of purchase invoices;
2. Truck transportation slips from the source to the Site;
3. Confirmation of OER approved clean soil cover material imported and graded at the site on top of highly visible demarcation barrier (If contamination is detected);
4. Site plan depicting all areas where the OER approved clean soil cover has been placed; and
5. Photographs documenting the importing and grading of the OER approved clean soil cover across the site with the underlying highly visible demarcation barrier (i.e. orange geo-synthetic material or equivalent).

Soil Management Plan – E Designation Site
333 West 38th Street, New York, NY 10018

OER Project Number 12EHAN365M
April 2013

APPENDIX A
Community Air Monitoring Plan (CAMP)

COMMUNITY AIR MONITORING PLAN FOR EXCAVATION ACTIVITIES

**OER Project Number
12EHAN365M**

April 2013

PREPARED FOR:
OPTIMA Real Estate
Gene Kaufman Architect P.C.
525 Broadway 8th Floor
New York, NY 10012

FOR WORK AT:
333 West 38th Street
New York, NY 10018

Tax Map Designation:
Block: 762 Lot: 16

PREPARED BY:
Galli Engineering, P.C.
734 Walt Whitman Road, Suite 402A
Melville, NY 11747

Richard D. Galli, P.E.

Date

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Community Air Monitoring Plan

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1.0 INTRODUCTION

The following Community Air Monitoring Plan (CAMP) was prepared by Galli Engineering, P.C. for Optima Real Estate to be used on the project during the excavation of fill material at 333 West 38th Street, New York, NY 10018. The project is under authority of the Mayor's Office of Environmental Remediation (OER). This CAMP is for the work that will be done to excavate fill material at the project site for construction purposes.

The subject building is developed as a five-story commercial building with basement and currently contains office space and one commercial store. The lot measures 25 feet by 99 feet. The building was constructed in 1920 and has a total floor area of approximately 9,000 square feet of commercial space. The first and second floors measure 25 feet by 100 feet while the third, fourth, and fifth floors measure approximately 25 feet by 62 feet. Zoning is C6-4M, commercial with manufacturing. The building is located in the GCP2 - Garment Center Special District Preservation Area P-2. The property is NYC E-Designated for Air Quality with HVAC fuel limited to natural gas; Underground Gasoline Storage Tanks Testing Protocol and Window Wall Attenuation and Alternate Ventilation required. The commercial store is on the first floor and is utilized as a book store and art gallery. Floors two through five are utilized by "Nowy Dziennik" Polish Daily News and Bicentennial Publishing Co., Inc.

2.0 SCOPE OF WORK

The work that will be covered by this CAMP is the excavation of on-site soils to make room for the new building construction. The volume of soil to be removed from the site is estimated at 1,550 cubic yards. Development plans for the site include a 21 story hotel with basement and 79 guest rooms. Four guest rooms will be on each floor and the entire building will encompass 34,000 gross square feet of space.

3.0 AIR MONITORING PROCEDURES

The following sections describe the specific CAMP monitoring procedures that will be followed on site:

3.1 Particulate Monitoring

The air will be monitored in real time during the excavation of Site soils or other activities that involve loading or unloading soils in connection with handling of fill materials. Air monitoring for particulates (or dust) will be performed continuously during Project excavation activities using both air monitoring equipment and visual observations. Monitoring equipment capable of measuring particulate matter smaller than 10 microns (PM-10) and capable of averaging over periods of 15 minutes or less will be used. Positioning of the meters will not be permanent during the duration of the project. Upwind readings will be taken multiple times during the day and logged. This upwind number will be the number used to compare with downwind readings. The meter will be set up at approximately 4 feet to 5 feet in height, to intersect the breathing zone. The equipment will be logging the 15 minute average concentrations for subsequent reporting.

The on-site Galli Engineering person responsible for these actions (CAMP Coordinator) will record the estimated wind speed and direction as described below. These will allow the on-site person to ensure that monitoring equipment will be appropriately positioned based on wind direction.

The monitoring results will be compared to the following:

If the downwind PM-10 particulate level is 100 ug/m^3 greater than background or upwind perimeter for a 15 minute period or if visible dust is observed leaving the work area, then dust suppression techniques shall be employed. Work may continue with dust suppression techniques, provided that the downwind PM-10 particulate levels do not exceed 150 ug/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

If after dust suppression techniques are implemented, downwind PM-10 particulate levels are greater than 150 ug/m^3 above the upwind level, work shall be stopped, reevaluated and changes initiated to reduce levels to less than 150 ug/m^3 above background conditions and to prevent visible dust from migrating off site, up to and including work stoppage if necessary.

Work may continue with dust suppression, provided that downwind PM-10 levels are not more than 150 ug/m^3 greater than the upwind levels; all measures necessary to ensure PM-10 levels of less than 150 ug/m^3 above background will be utilized.

Dust suppression measures that may be employed are:

- Limiting on site vehicle speed to 5 miles per hour.
- Watering unpaved surfaces, including haul roads.
- Covering and/or water misting of stockpiled materials.
- Loading of any dry soil which may release dust from trucks, will be accompanied by manual water spaying of soil.
- Minimizing drop height when loading dump trucks.
- Covering of all trucks carrying soil.
- Washing the wheels of trucks as they exit the site.
- Watering of any active face that is being excavated.

There may be situations where visible dust is generated by excavation activities and migrates to downwind locations but is not detected by the monitoring equipment at or above the action levels. Therefore, if visible dust is observed leaving the working area, dust suppression techniques such as those described above will be employed.

All air monitoring data and the locations of monitoring equipment will be recorded and available for review by OER.

3.2 Volatile Organic Compound Monitoring

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area. Monitoring will be on a continuous basis. VOC monitoring will be

implemented during all soil excavation, handling or loading. Upwind concentration should be measured at the start of each workday and periodically afterwards to establish background conditions.

The monitoring work will be performed using a Rae Systems MiniRae 2000 Photoionization Detector or equivalent. The equipment will be calibrated at least once a day with the manufacturer's recommended calibration gas. The equipment will be capable of calculating 15 minute time weighted 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 exceeds 5 parts per million (ppm) above background for the 15 minute average, work activities must be temporarily halted in the area of concern. Monitoring should continue to see if instantaneous numbers drop. Work activity can commence when instantaneous readings fall below 5 ppm.

If total organic vapor levels at the downwind perimeter of the work area persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities in the area of concern must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level at the downwind perimeter of the work area is below 5 ppm over background for the 15 minute average.

If the organic vapor level is more than 25 ppm above background at the downwind perimeter of the work area, work activities shall be halted in the area of concern until corrective measures are identified and implemented to reduce emissions.

All 15 minute readings should be recorded for review by MOER. Instantaneous readings used for decision making should also be recorded.

4.0 QUALIFIED INDIVIDUALS

Galli Engineering, P.C. (Galli) will be supplying personnel to conduct the air monitoring under this CAMP. All of the individuals will report to the senior construction foreman on-site and will have the authority to stop work that is causing high dust or VOC readings.

Soil Management Plan – E Designation Site
333 West 38th Street, New York, NY 10018

OER Project Number: 12EHAN365M
April 2013

APPENDIX B
Health and Safety Plan (HASP)

**HEALTH AND SAFETY PLAN
FOR:**

OER Project Number: 12EHAN365M

APRIL 2013

PROJECT LOCATION:

333 West 38th Street
New York, NY 10018

TAX MAP DESIGNATION:

Block: 762 Lot: 16

PREPARED FOR:

OPTIMA Real Estate
Gene Kaufman Architect P.C.
525 Broadway 8th Floor
New York, NY 10012

PREPARED BY:

Galli Engineering, P.C.
734 Walt Whitman Road, Suite 402A
Melville, NY 11747

Richard D. Galli, P.E.

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1.0 PURPOSE

This Health and Safety Plan (HASP) has been prepared to describe procedures to be employed to protect workers and to minimize nuisance impacts to adjacent properties during the period when excavation of soil for new building construction is under way (the Work Period). ***This HASP is not meant to be inclusive of all construction activities on the Site, it only covers excavation and management of soils/fill removed for construction of the new building.***

All persons working on the site during the Work Period will be given a copy of the HASP for review prior to beginning soil excavation and sampling work at the site. The Contractor and his subs shall implement, maintain and enforce these procedures during the Work Period.

This project will include the excavation of soil/fill for the construction of a new Hotel. Development plans for the site include the 21 story hotel with a basement and 79 guest rooms. Four guest rooms will be on each floor and the entire building will encompass 34,000 gross square feet of space.

The Contractor shall designate a responsible person to act as the Health and Safety Manager (HSM) for implementation of this HASP. The HSM will conduct initial site specific training and provide support for all health and safety activities as necessary, including upgrading or downgrading the level of personnel protection.

The HSM shall be assigned to the Site on a full time basis and be either the Contractor's employee or a subcontractor who reports to the Contractor in matters pertaining to site safety and health.

The following definitions shall be used throughout this specification:

1. **Health and Safety Manager (HSM):** The Contractor's employee or agent assigned to the Site on a full time basis for the duration of the Work Period with functional responsibility for implementation of the CHASP.
2. **Initial Remedial Action:** An action taken to mitigate a health or safety problem so that subsequent work may have a lesser impact on worker safety or the environment.
3. **Site:** For the purpose of this HASP, "the Site" shall be the entire construction site at 333 West 38th Street, New York, NY 10018, Block: 762 Lot: 16.
4. **Monitoring:** Indicates the use of field instrumentation to provide information regarding the levels of organic vapors or dust being released during remedial action. Monitoring required by this CHASP shall be conducted to evaluate employee exposures to toxic materials and potential for impacts to adjacent properties.
5. **Physician:** A licensed physician with experience in the practice of occupational medicine and provided by the Contractor.

2.0 REGULATORY REQUIREMENTS AND APPLICABLE PUBLICATIONS

The site specific HASP shall be consistent with the requirements of:

1. Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29, Code of Federal Regulations, Parts 1910 and 1926 (29 CFR 1910 and 1926), specifically including 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response".
2. United State Environmental Protection Agency (USEPA) Standard Operating Guidelines Revised November, 1984.
3. Corps of Engineers Accident Prevention and Safety and Health Requirements Manual, EM 385-1-1. Revised October 1984.
4. NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Site Activities, October 1985, DHHS (NIOSH) Publ. No. 85-115.
5. United States Environmental Protection Agency (USEPA) Standard Operating Procedures and Quality Assurance Manual, Region IV. April 1986.

The HASP shall address, but not necessarily be limited to, the following components:

1. Names of key personnel and alternates responsible for site safety and health (responsibilities and chain of command)
2. Site Description and Evaluation
3. Site Control Measures (work zones, communication, and security)
4. Safety Training

5. Emergency Equipment and First Aid Requirements
6. Personnel Protective Equipment
7. Personnel Hygiene and Decontamination
8. Air and Noise Monitoring (Environmental and Personnel)
9. Confined Space Entry Procedures
10. Equipment Decontamination

Determination of the appropriate level of worker safety equipment and procedures shall be made by the Contractor as a result of an initial site survey, review of existing data and a continuing safety and health monitoring program performed by the Contractor's HSM in accordance with the requirements specified herein.

Should any unforeseen or site specific safety related factor, hazard, or condition become evident during the performance of work at this Site, the Contractor will bring such to the attention of the Owner both verbally and in writing as quickly as possible, for resolution. In the interim, the Contractor shall take prudent action to establish and maintain safe working conditions and to safeguard employees, the public, and the environment.

3.0 SITE CONTROL

Prior to beginning any construction activities, the Site will be completely fenced off with a locked gate in order to prevent unauthorized access during non-working hours. During the Work Period, all construction vehicles will be logged on and off the site by the HSM or his delegate.

Communications

Telephone communications will be available via cell phones. Emergency numbers, including police, fire, ambulance, hospital and OER shall be prominently posted or available on site.

Security

Site security shall be provided and maintained 24 hours per day for the duration of the work in order to restrict unauthorized access to the site. The Security Office shall be maintained in the Contractor's facilities. Specific components of this security operation are as follows:

1. Vehicular access to the work area shall be restricted to authorized vehicles only.
2. A log of security incidents will be maintained.
3. No visitors shall be allowed on-site without the expressed approval of the Owner.

Environmental Controls

Dust raised by activities will be minimized by spraying water freely on all access ways to and from the site; on all exposed faces of any working pile; on areas traversed by construction equipment; and, at any other area where dust is seen to be created.

4.0 TRAINING

The Contractor shall be required to verify that all of his personnel assigned to or regularly entering the work area have been presented a copy of the HASP and have reviewed appropriate safety training in accordance with 29 CFR 1910.120. All workers will have received the 40 hour HAZWOPER initial training. They will also have an up-to-date 8 hour refresher course.

A site-specific health and safety briefing will be given to all personnel who will be working in the Work Area during the Work Period to familiarize them with the site safety procedures.

5.0 EMERGENCY EQUIPMENT AND FIRST AID

The Contractor shall be required to develop contingency plans including evacuation procedures and routes to places of refuge or safe distances from the danger area, for the following potential emergencies: chemical exposure, personal injury, potential or actual fire or explosion, and environmental accident (spill or release). In the event of any such emergency, the Contractor shall without delay take diligent action to remove or otherwise minimize the cause of the emergency; alert the Owner and institute whatever measures might be necessary to prevent any repetition of the conditions or actions resulting in the emergency.

Emergency medical care services shall be available at a nearby medical facility with established emergency routes. The staff at the facility shall be advised of any potential unusual medical emergencies that might result.

The Contractor shall establish emergency communications with a health care facility and emergency services if warranted by anticipated site conditions. The name of this facility, name of contact, emergency routes and emergency communications arrangements are provided on the first page of this safety plan.

In addition the Contractor shall provide certain equipment: A fully stocked first aid kit shall be provided and maintained in close proximity to the work, but not inside a hazardous work area. The first aid kit shall be specially marked and provided with adequate supplies necessary to cleanse and decontaminate burns, wounds, or lesions. It shall comply with OSHA 29 CFR 1910.151 Appendix A or ANSI Z308.1-1998 "Minimum Requirements for Workplace First-aid Kits".

6.0 PERSONNEL PROTECTIVE EQUIPMENT

During the Work Period, either the Contractor or his subs shall be required to provide all on-site personnel with appropriate personnel safety equipment and protective clothing and will ensure that all safety equipment and protective clothing is kept clean and well maintained. "Action levels" for determining the specified minimum levels of protection shall be based upon air monitoring results and direct contact potential. Specific action levels are listed in Table 8.1. The level of personnel protection required at the Site is not expected to exceed Modified Level D. Any changes to the minimum level of protection shall be approved by the HSM and the Owner. At a minimum the following items shall be provided:

Protective clothing shall be furnished for on-site personnel consisting of:

Modified Level D Equipment:

(* refers to optional equipment, if applicable)

Work clothing as dictated by weather

Coveralls

Gloves*

Hardhat

Safety glasses*

Safety shoes or boots; chemical-resistant, steel toe and shank

Outer, disposable, chemical resistant boots*

Face shield*

Upgrade as necessary to Level C when air monitoring Action Levels are exceeded.

Level C Equipment:

(* refers to optional equipment, if applicable)

Full-face or half-mask air purifying, canister-equipped respirator (NIOSH approved)

Hooded chemical-resistant clothing

Coveralls*

Gloves, inner, chemical-resistant

Gloves, outer, chemical-resistant

Safety boots; chemical-resistant, steel toe and shank

Disposable outer, chemical-resistant boot covers*

Hardhat

Escape air mask*

Face shield*

2 way radios (worn under outside protective clothing)*

All prescription eyeglasses in use on the Site shall be safety glasses. Prescription lens inserts shall be provided for full face respirators.

Footwear used on-site shall be steel-toed, steel shank safety shoes or boots, with chemical resistant soles and shall meet ASTM F2412 and F2413.

All on-site personnel shall wear a hardhat when engaging in construction or excavation activities.

All personnel protective equipment worn on-site shall be decontaminated or properly disposed of at the end of the work day. The HSM is responsible for ensuring all reusable personnel protective equipment is decontaminated and sanitized before being reissued.

Respirators shall be individually assigned and not interchanged between workers for the duration of the project. Respirators shall not be reissued without proper decontamination and disinfection.

Cartridges, canisters and filters shall be changed at least daily. A procedure for assuring periodic cleaning and maintenance of facemasks and change-out of filters shall be provided by the Contractor.

Modified Level D shall be the minimum level of protection set for all primary operations performed at the Site, unless an upgrade is required in accordance with the provisions set forth in the Air Monitoring program.

7.0 PERSONAL HYGIENE AND DECONTAMINATION

During the Work Period, all on-site personnel performing or supervising remedial work at this site or exposed or subject to exposure to hazardous chemical vapors, liquids, or contaminated solids shall observe and adhere to the personnel hygiene-related provisions of this paragraph. The following conditions and procedures shall be followed:

1. The Contractor or his subs shall be required to provide and require use by personnel of all protective clothing including disposable work clothing and safety boots, storage and disposal containers for used disposable outerwear, washing facilities, a facility for changing into and out of and storing work clothing separate from street clothing, a lunch and/or break room, and portable toilets.
2. Disposable outerwear shall not be reused and when removed, shall be placed inside disposal containers provided for this purpose.
3. Smoking is prohibited at the worksite.
4. Employees must wash up before eating in the designated areas.

8.0 AIR AND NOISE MONITORING

Air and noise monitoring will be performed continuously during remedial activities at the Site. However, due to the relatively low levels of contaminants identified during the Phase II Investigation, there is little potential for worker exposure to dangerous contaminants and/or adverse impacts from surrounding properties.

In the event that additional chemical contamination is identified, the Contractor will advise the Owner, who will contact the Engineering Consultant. The Consultant will monitor the work area with a photoionization detector (PID). All readings will be taken in the workers' breathing zone to determine whether an action level has been met and/or exceeded. Air monitoring results will be documented on the Air Monitoring Log (Appendix A).

Air monitoring action levels (Table - 1) have been established to indicate the chemical concentrations in the breathing zone that require an upgrade in level of personnel protective equipment (PPE). The action levels apply to all tasks performed on this site. Guidelines for frequency of air monitoring are presented below.

If noise complaints are registered, noise measurements will be taken and readings compared against limits set forth in the NYC Zoning Resolution.

TABLE - 1 AIR MONITORING ACTION LEVELS			
Instrument*	Function	Measurement	Action
Photoionization Detector (PID), Flame Ionization Detector (FID)	Measured total organic vapors	0-5 ppm	• Level D required
		5-500 ppm	• Upgrade to Level C
		> 500 ppm	• Stop work. Contact PM and HSR for guidance
Oxygen/Combustible Gas Meter (O ₂ /LEL) NOTE: Combustible gas meter readings obtained in an oxygen deficient atmosphere will not be accurate	Measures oxygen level (O ₂) and lower explosive limit (% LEL)	O ₂ 19.5-22%	• Acceptable conditions - Continue normal activity
		O ₂ <19.5	• Ventilate the space • Notify PM and SSHO if unable to achieve acceptable conditions
		O ₂ >22%	• Leave area immediately: this atmosphere is extremely flammable • Notify PM and SSHO
		LEL <10%	• Acceptable conditions - Continue normal activity
		LEL >10%	• Leave area immediately • Contact PM and SSHO for guidance on venting and other safety measures
* NOTE: Instruments must be calibrated according to manufacturer's recommendations			

Air Monitoring Frequency Guidelines

Continuous monitoring will be performed during all excavation activities. In addition, periodic monitoring will also be conducted during the Work Period when: (1) it is possible that an IDLH condition or a flammable atmosphere has developed or (2) there is an indication that exposures may have risen over permissible exposure limits or published exposure levels since the last monitoring. Look for a possible rise in exposures associated with these situations:

- Change in Site Area - work begins on a different section of the site
- Change in Contaminants - handling contaminants other than those first identified
- Change in On-Site Activity - one operation ends and another begins
- Handling Leaking Drums or Containers
- Working with Obvious Liquid Contamination (e.g., a spill or lagoon)

9.0 CONFINED SPACE ENTRY PROCEDURES AND PERMIT

No confined space entry is anticipated for this work. In the event that Site work requires personnel to enter confined spaces, a confined Space Entry Procedure and Permit must be utilized. **No personnel shall enter an area identified as a confined space without using the confined space entry procedures.** The purpose of the confined space entry procedure is to protect employees from potentially hazardous environments and to facilitate immediate rescue in an emergency situation. A Confined Space Entry Permit must be posted at the entrance to each confined space.

DEFINITION: A Permit Required Confined Space means an enclosed space which is large enough and so configured that an employee can bodily enter and perform assigned work; has limited or restricted means for entry or exit (some examples are tanks, vessels, silos, storage bins, hoppers, vaults, pits and diked areas); is not designed for continuous employee occupancy; and has one or more of the following characteristics: (A) contains or has a known potential to contain a hazardous atmosphere (including oxygen deficient); (B) contains a material with the potential for engulfment of an entrant; (C) has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor which slopes downward and tapers to a smaller cross-section; or (D) contains any other recognized serious safety or health hazard.

Protocol for Confined Space Entry

- Perform the appropriate air monitoring activity at various depths in the space prior to entry. Monitor for: (1) oxygen level, (2) flammable vapors, and (3) toxic vapors.
- Ventilate the atmosphere in the space so that entry may be made safely without respiratory protection. If this is not feasible, appropriate respiratory protection must be worn by authorized entrants and attendants.
- Wear appropriate respiratory protection when ventilation alone can not achieve acceptable atmospheric levels of oxygen or flammable or toxic vapors. Note: Respirators alone are not sufficient in oxygen deficient atmospheres.
- Provide emergency means of evacuation - lifelines, mechanical hoist, etc.
- Provide at least one attendant to remain outside the confined space entering the confined space who is required to stay at the entrance of the confined space.

10.0 EQUIPMENT DECONTAMINATION

All equipment used in the work area during the Work Period shall be decontaminated prior to leaving the Site. The procedures for decontamination of equipment shall be approved by the Engineer. The Contractor shall be responsible for monitoring all vehicle decontamination prior to exiting the Site, where required.

1. Personnel engaged in vehicle decontamination shall wear protective equipment including disposable clothing and respiratory protection (as necessary) consistent with the requirements of this HASP.
2. Decontamination will consist only of rinsing with water unless there is an obvious additional need.

Health and Safety Plan – E Designation Site
333 West 38th Street, New York, NY 10018

OER Project Number: 12EHAN365M
April 2013

APPENDIX A

Site Emergency Form

SITE EMERGENCY FORM

Contaminants of Concern: None Identified
Minimum Level of Protection: Modified Level D

Do not endanger your life. Survey the situation before taking any action

Site Location Address: 333 West 38th Street, New York, NY 10018

EMERGENCY PHONE NUMBERS

IN THE EVENT OF ANY EMERGENCY,
CONTACT PROJECT MANAGER OR HEALTH
AND SAFETY REPRESENTATIVE.

Ambulance: 911
Fire: 911
Police: 911
Poison Control: 1-800-222-1222

Project Manager: (631) 271-9292 Richard Galli, P.E.
Health/Safety Rep: (631) 271-9292

Hospital Name: Bellevue Hospital Center: 462 1st Avenue, New York, 10016
Hospital Phone: General Information: (212) 562-4141

FIRST AID FOR PETROLEUM HYDROCARBON EMERGENCIES

Ingestion: DO NOT INDUCE VOMITING. Call Poison Control, follow instructions. Administer CPR, if necessary. Seek Medical attention.

Inhalation: Remove person from contaminated environment. DO NOT ENTER A CONFINED SPACE TO RESCUE SOMEONE WHO HAS BEEN OVERCOME UNLESS PROPERLY EQUIPPED AND A STANDBY PERSON IS PRESENT. Administer CPR if necessary. Seek medical attention.

Skin Contact: Brush off dry material, remove wet or contaminated clothing. Flush skin thoroughly with water. Seek medical attention if irritation persists.

Eye Contact: Flush eyes with water for 15 minutes. Seek medical attention.

Exposure Symptoms: Headache, dizziness, nausea, drowsiness, irritation of eyes, nose, throat breathing difficulties.

Contingency Plan: Report incident to Project Manager after emergency procedures have been implemented.

APPENDIX B

Route to Hospital

ROUTE TO HOSPITAL

HOSPITAL DIRECTIONS

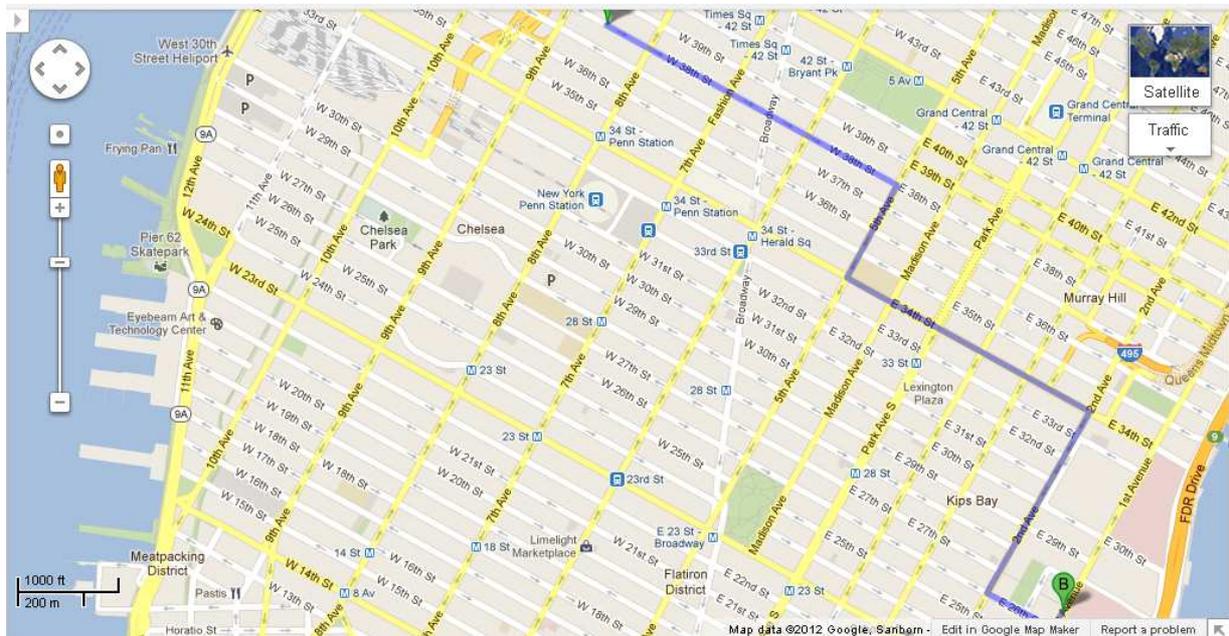
1. Head southeast on W 38th St toward 8th Ave
2. Turn right onto 5th Ave
3. Turn left onto E 34th St
4. Turn right onto 2nd Ave
5. Turn left onto E 26th St
6. Turn left onto 1st Avenue
Destination will be on the right

Bellevue Hospital Center
462 1st Ave
New York, NY 10016

HOSPITAL INFORMATION

Bellevue Hospital Center
462 1st Ave
New York, NY 10016

General Information: (212) 562-4141



Health and Safety Plan – E Designation Site
333 West 38th Street, New York, NY 10018

OER Project Number: 12EHAN365M
April 2013

APPENDIX C

EMERGENCY FIRST AID

EMERGENCY FIRST AID

1. Survey the situation. Do not endanger your own life. **DO NOT ENTER A CONFINED SPACE TO RESCUE SOMEONE WHO HAS BEEN OVERCOME UNLESS PROPERLY EQUIPPED AND A STANDBY PERSON IS PRESENT.**
2. Call 911 or the fire department **IMMEDIATELY**. Explain the physical injury, chemical exposure, fire or release.
3. Decontaminate the victim without delaying life-saving procedures.
4. If the victim's condition appears to be noncritical, but seems to be more severe than minor cuts, he/she should be transported to the nearest hospital by trained Emergency Medical Services (EMS) personnel. Let the doctor assume the responsibility for determining the severity of the injury. If the condition is obviously serious, EMS must transport the victim.
5. Notify the Project Manager.

EMERGENCY FIRST AID PROCEDURES	
To Stop Bleeding	Cardiopulmonary Resuscitation (CPR) Only to be used by trained persons
<ol style="list-style-type: none"> 1. Give medical statement. 2. Assure airway, breathing and circulation. 3. Use DIRECT PRESSURE over the wound with clean dressing or your hand (use nonpermeable gloves). Direct pressure will control most bleeding. 4. Bleeding from an artery or several injury sites may require DIRECT PRESSURE on a PRESSURE POINT. Use pressure points for 30-60 seconds to help control severe bleeding. 5. Continue primary care and seek medical aid as needed. 	<ol style="list-style-type: none"> 1. Give medical statement 2. Arousal: Check for consciousness. 3. Open airway with chin-lift. 4. Look, listen and feel for breathing. 5. If breathing is absent, give 2 full rescue breaths. 6. Check the pulse for 5 to 10 seconds. 7. If pulse is present, continue rescue breathing: 1 breath every 5 seconds.

Health and Safety Plan – E Designation Site
333 West 38th Street, New York, NY 10018

OER Project Number: 12EHAN365M
April 2013

APPENDIX D

MSDS DEFINITIONS

MSDS DEFINITIONS

TLV-TWA	<u>Threshold Limit Value - Time Weighted Average</u> - The time-weighted average concentration for a normal 8-hour work day and a 40-hour work week, to which nearly all workers may be repeatedly exposed without adverse effect.
PEL	<u>Permissible Exposure Limit</u> - Time-weighted average concentrations similar to (and in many cases derived from) the Threshold Limit Values.
REL	<u>Recommended Exposure Limit</u> - as defined by NIOSH similar to the Threshold Limit Values.
IDLH	<u>Immediately Dangerous to Life or Health</u> - Any atmospheric condition that poses an immediate threat to life, or which is likely to result in acute or immediate severe health effects. Oxygen deficiency is IDLH.
LEL	<u>Lower Explosive Limit</u> - The minimum concentration of vapor in air below which propagation of a flame will not occur in the presence of an ignition source.
UEL	<u>Upper Explosive Limit</u> - The maximum concentration of vapor in air above which propagation of a flame will not occur in the presence of an ignition source.
FP	<u>Flash Point</u> - The lowest temperature at which the vapor of a combustible liquid can be made to ignite momentarily in air.
VP	<u>Vapor Pressure</u> - The pressure characteristic at any given temperature of a vapor in equilibrium with its liquid or solid form, often expressed in millimeters of mercury (mm Hg).
Odor Threshold	A property displayed by a particular compound. Low detection indicates a physiological sensation due to molecular contact with the olfactory nervous system (based on 50% of the population).
IP	<u>Ionization Potential</u> - The energy required to form an ion by removal of a given electron from an atom.

Health and Safety Plan – E Designation Site
333 West 38th Street, New York, NY 10018

OER Project Number: 12EHAN365M
April 2013

APPENDIX E

Contaminants Profile

CONTAMINANTS PROFILE			
Chemical	Exposure Route	Symptoms of Overexposure	Incompatibilities
Volatile Organic Compounds	Inhalation and/or ingestion, skin contact	Eye, nose, and throat irritation; headaches, loss of coordination, nausea; damage to liver, kidney, and central nervous system.	
Semi Volatile Organic Compounds	Inhalation and/or ingestion, skin contact	Eye, nose, and throat irritation; headaches, loss of coordination, nausea; damage to liver, kidney, and central nervous system.	
Heavy Metals	Inhalation and/or ingestion, skin contact	Abdominal discomfort, nausea and/or constipation, diarrhea, metallic taste, weakness, muscle pains, irritability, headache, dizziness.	
Arsenic	Inhalation, skin absorption, skin and/or eye contact ingestion	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin, [potential occupational carcinogen]	Strong oxidizers, bromine azide [Note: Hydrogen gas can react with inorganic arsenic to form the highly toxic gas arsine.]
Lead	Inhalation, ingestion, skin and/or eye contact	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension	Strong oxidizers, hydrogen peroxide, acids
Mercury	Inhalation, skin absorption, ingestion, skin and/or eye contact	Paresthesia; ataxia, dysarthria; vision, hearing disturbance; spasticity, jerking limbs; dizziness; salivation; lacrimation (discharge of tears); nausea, vomiting, diarrhea, constipation; skin burns; emotional disturbance; kidney injury; possible teratogenic effects	Strong oxidizers such as chlorine
PCB's	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes; chloracne; liver damage; reproductive effects; [potential occupational carcinogen]	Strong oxidizers
Pesticides	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; paresthesia tongue, lips, face; tremor; anxiety, dizziness, confusion, malaise (vague feeling of discomfort), headache, lassitude (weakness, exhaustion); convulsions; paresis hands; vomiting; [potential occupational carcinogen]	Strong oxidizers, alkalis

APPENDIX F

Monitoring, Visitor and HASP Acknowledgement Forms

VISITOR/TRAINEE GUIDELINES

Optima Real Estate is committed to providing a safe environment on all work sites for visitors, trainees, employees and/or passersby. In order to accomplish this, the following guidelines must be followed.

1. VISITORS

Any person not actively participating in the work at the site is regarded as a "visitor" and must follow these visitor/trainee guidelines. Visitors must be accompanied by an authorized representative while on site.

Sites must be marked with signs, placards, and/or barricades to designate hazardous boundaries. Visitors will not be allowed on any site that is not adequately marked.

2. TRAINEES

Trainees are employees of Optima Real Estate or their representatives who have not yet completed the required safety training program. New hires and in-house company transfers will be considered trainees until safety training requirements are met.

Trainees will be informed of restrictions by their supervisor and must abide by them before visiting active sites.

Trainees will be permitted to visit Optima Real Estate sites as observers as long as the following conditions are met:

- Trainees are supervised at all times while observing on site.
- Trainees do not perform work functions of any type while on site.
- Trainees do not handle any equipment, tools and/or supplies while on site.
- Trainees do not enter any hazardous or hot zone or confined space areas while on site.

Supervisors will be responsible for informing trainees of the above conditions and for ensuring that the conditions are met. Supervisors will also ensure that trainees will not be asked to violate the conditions listed above.

A Trainee/Visitor Agreement Form must be signed by both the trainee and the supervisor.

Infractions of the above agreement will be viewed as extremely serious and will be subject to discipline up to and including termination for either the trainee and/or supervisor.

AGREEMENT AND ACKNOWLEDGMENT STATEMENT

Health and Safety Plan Agreement

Employees of Optima Real Estate or their representatives have the authority to stop activities performed by subcontractors or visitors at this site if any field activity is not performed in accordance with the requirements of this Health and Safety Plan, and as per directive of the Site Supervisor (SS).

All Employees of Optima Real Estate, their representatives, subcontractors and visitors are required to sign the following agreement.

1. I have read and fully understand the Construction Health and Safety Plan (CHASP) and my individual responsibilities.
2. I agree to abide by the provisions of the Construction Health and Safety Plan (CHASP).

Name: _____

Date: _____

Remedial Action Work Plan
333 West 38th Street, New York, New York

OER Project Number 12EHAN365M
April 2013

APPENDIX D
Health & Safety Plan

**HEALTH AND SAFETY PLAN
FOR:**

OER Project Number: 12EHAN365M

APRIL 2013

PROJECT LOCATION:

333 West 38th Street
New York, NY 10018

TAX MAP DESIGNATION:

Block: 762 Lot: 16

PREPARED FOR:

OPTIMA Real Estate
Gene Kaufman Architect P.C.
525 Broadway 8th Floor
New York, NY 10012

PREPARED BY:

Galli Engineering, P.C.
734 Walt Whitman Road, Suite 402A
Melville, NY 11747

Richard D. Galli, P.E.

Date

UNAUTHORIZED ALTERATION OF, OR ADDITION TO, PLANS OR DOCUMENTS BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER IS A VIOLATION OF SECTION 7209, SUBDIVISION 2, OF THE NEW YORK STATE EDUCATION LAW. ANY ALTERATION OF THIS DOCUMENT MUST BE DONE BY A PERSON ACTING UNDER THE DIRECT SUPERVISION OF A LICENSED PROFESSIONAL IN ACCORDANCE WITH THE STATE EDUCATION LAW. COPIES OF THIS DOCUMENT NOT MARKED WITH AN ORIGINAL OF THE PROFESSIONAL ENGINEERS INKED SEAL SHALL NOT BE CONSIDERED VALID TRUE COPIES.

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Appendix E:	Contaminants Profile
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1.0 PURPOSE

This Health and Safety Plan (HASP) has been prepared to describe procedures to be employed to protect workers and to minimize nuisance impacts to adjacent properties during the period when excavation of soil for new building construction is under way (the Work Period). ***This HASP is not meant to be inclusive of all construction activities on the Site, it only covers excavation and management of soils/fill removed for construction of the new building.***

All persons working on the site during the Work Period will be given a copy of the HASP for review prior to beginning soil excavation and sampling work at the site. The Contractor and his subs shall implement, maintain and enforce these procedures during the Work Period.

This project will include the excavation of soil/fill for the construction of a new Hotel. Development plans for the site include the 21 story hotel with a basement and 79 guest rooms. Four guest rooms will be on each floor and the entire building will encompass 34,000 gross square feet of space.

The Contractor shall designate a responsible person to act as the Health and Safety Manager (HSM) for implementation of this HASP. The HSM will conduct initial site specific training and provide support for all health and safety activities as necessary, including upgrading or downgrading the level of personnel protection.

The HSM shall be assigned to the Site on a full time basis and be either the Contractor's employee or a subcontractor who reports to the Contractor in matters pertaining to site safety and health.

The following definitions shall be used throughout this specification:

1. **Health and Safety Manager (HSM):** The Contractor's employee or agent assigned to the Site on a full time basis for the duration of the Work Period with functional responsibility for implementation of the CHASP.
2. **Initial Remedial Action:** An action taken to mitigate a health or safety problem so that subsequent work may have a lesser impact on worker safety or the environment.
3. **Site:** For the purpose of this HASP, "the Site" shall be the entire construction site at 333 West 38th Street, New York, NY 10018, Block: 762 Lot: 16.
4. **Monitoring:** Indicates the use of field instrumentation to provide information regarding the levels of organic vapors or dust being released during remedial action. Monitoring required by this CHASP shall be conducted to evaluate employee exposures to toxic materials and potential for impacts to adjacent properties.
5. **Physician:** A licensed physician with experience in the practice of occupational medicine and provided by the Contractor.

2.0 REGULATORY REQUIREMENTS AND APPLICABLE PUBLICATIONS

The site specific HASP shall be consistent with the requirements of:

1. Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29, Code of Federal Regulations, Parts 1910 and 1926 (29 CFR 1910 and 1926), specifically including 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response".
2. United State Environmental Protection Agency (USEPA) Standard Operating Guidelines Revised November, 1984.
3. Corps of Engineers Accident Prevention and Safety and Health Requirements Manual, EM 385-1-1. Revised October 1984.
4. NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Site Activities, October 1985, DHHS (NIOSH) Publ. No. 85-115.
5. United States Environmental Protection Agency (USEPA) Standard Operating Procedures and Quality Assurance Manual, Region IV. April 1986.

The HASP shall address, but not necessarily be limited to, the following components:

1. Names of key personnel and alternates responsible for site safety and health (responsibilities and chain of command)
2. Site Description and Evaluation
3. Site Control Measures (work zones, communication, and security)
4. Safety Training

5. Emergency Equipment and First Aid Requirements
6. Personnel Protective Equipment
7. Personnel Hygiene and Decontamination
8. Air and Noise Monitoring (Environmental and Personnel)
9. Confined Space Entry Procedures
10. Equipment Decontamination

Determination of the appropriate level of worker safety equipment and procedures shall be made by the Contractor as a result of an initial site survey, review of existing data and a continuing safety and health monitoring program performed by the Contractor's HSM in accordance with the requirements specified herein.

Should any unforeseen or site specific safety related factor, hazard, or condition become evident during the performance of work at this Site, the Contractor will bring such to the attention of the Owner both verbally and in writing as quickly as possible, for resolution. In the interim, the Contractor shall take prudent action to establish and maintain safe working conditions and to safeguard employees, the public, and the environment.

3.0 SITE CONTROL

Prior to beginning any construction activities, the Site will be completely fenced off with a locked gate in order to prevent unauthorized access during non-working hours. During the Work Period, all construction vehicles will be logged on and off the site by the HSM or his delegate.

Communications

Telephone communications will be available via cell phones. Emergency numbers, including police, fire, ambulance, hospital and OER shall be prominently posted or available on site.

Security

Site security shall be provided and maintained 24 hours per day for the duration of the work in order to restrict unauthorized access to the site. The Security Office shall be maintained in the Contractor's facilities. Specific components of this security operation are as follows:

1. Vehicular access to the work area shall be restricted to authorized vehicles only.
2. A log of security incidents will be maintained.
3. No visitors shall be allowed on-site without the expressed approval of the Owner.

Environmental Controls

Dust raised by activities will be minimized by spraying water freely on all access ways to and from the site; on all exposed faces of any working pile; on areas traversed by construction equipment; and, at any other area where dust is seen to be created.

4.0 TRAINING

The Contractor shall be required to verify that all of his personnel assigned to or regularly entering the work area have been presented a copy of the HASP and have reviewed appropriate safety training in accordance with 29 CFR 1910.120. All workers will have received the 40 hour HAZWOPER initial training. They will also have an up-to-date 8 hour refresher course.

A site-specific health and safety briefing will be given to all personnel who will be working in the Work Area during the Work Period to familiarize them with the site safety procedures.

5.0 EMERGENCY EQUIPMENT AND FIRST AID

The Contractor shall be required to develop contingency plans including evacuation procedures and routes to places of refuge or safe distances from the danger area, for the following potential emergencies: chemical exposure, personal injury, potential or actual fire or explosion, and environmental accident (spill or release). In the event of any such emergency, the Contractor shall without delay take diligent action to remove or otherwise minimize the cause of the emergency; alert the Owner and institute whatever measures might be necessary to prevent any repetition of the conditions or actions resulting in the emergency.

Emergency medical care services shall be available at a nearby medical facility with established emergency routes. The staff at the facility shall be advised of any potential unusual medical emergencies that might result.

The Contractor shall establish emergency communications with a health care facility and emergency services if warranted by anticipated site conditions. The name of this facility, name of contact, emergency routes and emergency communications arrangements are provided on the first page of this safety plan.

In addition the Contractor shall provide certain equipment: A fully stocked first aid kit shall be provided and maintained in close proximity to the work, but not inside a hazardous work area. The first aid kit shall be specially marked and provided with adequate supplies necessary to cleanse and decontaminate burns, wounds, or lesions. It shall comply with OSHA 29 CFR 1910.151 Appendix A or ANSI Z308.1-1998 "Minimum Requirements for Workplace First-aid Kits".

6.0 PERSONNEL PROTECTIVE EQUIPMENT

During the Work Period, either the Contractor or his subs shall be required to provide all on-site personnel with appropriate personnel safety equipment and protective clothing and will ensure that all safety equipment and protective clothing is kept clean and well maintained. "Action levels" for determining the specified minimum levels of protection shall be based upon air monitoring results and direct contact potential. Specific action levels are listed in Table 8.1. The level of personnel protection required at the Site is not expected to exceed Modified Level D. Any changes to the minimum level of protection shall be approved by the HSM and the Owner. At a minimum the following items shall be provided:

Protective clothing shall be furnished for on-site personnel consisting of:

Modified Level D Equipment:

(* refers to optional equipment, if applicable)

Work clothing as dictated by weather

Coveralls

Gloves*

Hardhat

Safety glasses*

Safety shoes or boots; chemical-resistant, steel toe and shank

Outer, disposable, chemical resistant boots*

Face shield*

Upgrade as necessary to Level C when air monitoring Action Levels are exceeded.

Level C Equipment:

(* refers to optional equipment, if applicable)

Full-face or half-mask air purifying, canister-equipped respirator (NIOSH approved)

Hooded chemical-resistant clothing

Coveralls*

Gloves, inner, chemical-resistant

Gloves, outer, chemical-resistant

Safety boots; chemical-resistant, steel toe and shank

Disposable outer, chemical-resistant boot covers*

Hardhat

Escape air mask*

Face shield*

2 way radios (worn under outside protective clothing)*

All prescription eyeglasses in use on the Site shall be safety glasses. Prescription lens inserts shall be provided for full face respirators.

Footwear used on-site shall be steel-toed, steel shank safety shoes or boots, with chemical resistant soles and shall meet ASTM F2412 and F2413.

All on-site personnel shall wear a hardhat when engaging in construction or excavation activities.

All personnel protective equipment worn on-site shall be decontaminated or properly disposed of at the end of the work day. The HSM is responsible for ensuring all reusable personnel protective equipment is decontaminated and sanitized before being reissued.

Respirators shall be individually assigned and not interchanged between workers for the duration of the project. Respirators shall not be reissued without proper decontamination and disinfection.

Cartridges, canisters and filters shall be changed at least daily. A procedure for assuring periodic cleaning and maintenance of facemasks and change-out of filters shall be provided by the Contractor.

Modified Level D shall be the minimum level of protection set for all primary operations performed at the Site, unless an upgrade is required in accordance with the provisions set forth in the Air Monitoring program.

7.0 PERSONAL HYGIENE AND DECONTAMINATION

During the Work Period, all on-site personnel performing or supervising remedial work at this site or exposed or subject to exposure to hazardous chemical vapors, liquids, or contaminated solids shall observe and adhere to the personnel hygiene-related provisions of this paragraph. The following conditions and procedures shall be followed:

1. The Contractor or his subs shall be required to provide and require use by personnel of all protective clothing including disposable work clothing and safety boots, storage and disposal containers for used disposable outerwear, washing facilities, a facility for changing into and out of and storing work clothing separate from street clothing, a lunch and/or break room, and portable toilets.
2. Disposable outerwear shall not be reused and when removed, shall be placed inside disposal containers provided for this purpose.
3. Smoking is prohibited at the worksite.
4. Employees must wash up before eating in the designated areas.

8.0 AIR AND NOISE MONITORING

Air and noise monitoring will be performed continuously during remedial activities at the Site. However, due to the relatively low levels of contaminants identified during the Phase II Investigation, there is little potential for worker exposure to dangerous contaminants and/or adverse impacts from surrounding properties.

In the event that additional chemical contamination is identified, the Contractor will advise the Owner, who will contact the Engineering Consultant. The Consultant will monitor the work area with a photoionization detector (PID). All readings will be taken in the workers' breathing zone to determine whether an action level has been met and/or exceeded. Air monitoring results will be documented on the Air Monitoring Log (Appendix A).

Air monitoring action levels (Table - 1) have been established to indicate the chemical concentrations in the breathing zone that require an upgrade in level of personnel protective equipment (PPE). The action levels apply to all tasks performed on this site. Guidelines for frequency of air monitoring are presented below.

If noise complaints are registered, noise measurements will be taken and readings compared against limits set forth in the NYC Zoning Resolution.

TABLE - 1 AIR MONITORING ACTION LEVELS			
Instrument*	Function	Measurement	Action
Photoionization Detector (PID), Flame Ionization Detector (FID)	Measured total organic vapors	0-5 ppm	• Level D required
		5-500 ppm	• Upgrade to Level C
		> 500 ppm	• Stop work. Contact PM and HSR for guidance
Oxygen/Combustible Gas Meter (O ₂ /LEL) NOTE: Combustible gas meter readings obtained in an oxygen deficient atmosphere will not be accurate	Measures oxygen level (O ₂) and lower explosive limit (% LEL)	O ₂ 19.5-22%	• Acceptable conditions - Continue normal activity
		O ₂ <19.5	• Ventilate the space • Notify PM and SSHO if unable to achieve acceptable conditions
		O ₂ >22%	• Leave area immediately: this atmosphere is extremely flammable • Notify PM and SSHO
		LEL <10%	• Acceptable conditions - Continue normal activity
		LEL >10%	• Leave area immediately • Contact PM and SSHO for guidance on venting and other safety measures
* NOTE: Instruments must be calibrated according to manufacturer's recommendations			

Air Monitoring Frequency Guidelines

Continuous monitoring will be performed during all excavation activities. In addition, periodic monitoring will also be conducted during the Work Period when: (1) it is possible that an IDLH condition or a flammable atmosphere has developed or (2) there is an indication that exposures may have risen over permissible exposure limits or published exposure levels since the last monitoring. Look for a possible rise in exposures associated with these situations:

- Change in Site Area - work begins on a different section of the site
- Change in Contaminants - handling contaminants other than those first identified
- Change in On-Site Activity - one operation ends and another begins
- Handling Leaking Drums or Containers
- Working with Obvious Liquid Contamination (e.g., a spill or lagoon)

9.0 CONFINED SPACE ENTRY PROCEDURES AND PERMIT

No confined space entry is anticipated for this work. In the event that Site work requires personnel to enter confined spaces, a confined Space Entry Procedure and Permit must be utilized. **No personnel shall enter an area identified as a confined space without using the confined space entry procedures.** The purpose of the confined space entry procedure is to protect employees from potentially hazardous environments and to facilitate immediate rescue in an emergency situation. A Confined Space Entry Permit must be posted at the entrance to each confined space.

DEFINITION: A Permit Required Confined Space means an enclosed space which is large enough and so configured that an employee can bodily enter and perform assigned work; has limited or restricted means for entry or exit (some examples are tanks, vessels, silos, storage bins, hoppers, vaults, pits and diked areas); is not designed for continuous employee occupancy; and has one or more of the following characteristics: (A) contains or has a known potential to contain a hazardous atmosphere (including oxygen deficient); (B) contains a material with the potential for engulfment of an entrant; (C) has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor which slopes downward and tapers to a smaller cross-section; or (D) contains any other recognized serious safety or health hazard.

Protocol for Confined Space Entry

- Perform the appropriate air monitoring activity at various depths in the space prior to entry. Monitor for: (1) oxygen level, (2) flammable vapors, and (3) toxic vapors.
- Ventilate the atmosphere in the space so that entry may be made safely without respiratory protection. If this is not feasible, appropriate respiratory protection must be worn by authorized entrants and attendants.
- Wear appropriate respiratory protection when ventilation alone can not achieve acceptable atmospheric levels of oxygen or flammable or toxic vapors. Note: Respirators alone are not sufficient in oxygen deficient atmospheres.
- Provide emergency means of evacuation - lifelines, mechanical hoist, etc.
- Provide at least one attendant to remain outside the confined space entering the confined space who is required to stay at the entrance of the confined space.

10.0 EQUIPMENT DECONTAMINATION

All equipment used in the work area during the Work Period shall be decontaminated prior to leaving the Site. The procedures for decontamination of equipment shall be approved by the Engineer. The Contractor shall be responsible for monitoring all vehicle decontamination prior to exiting the Site, where required.

1. Personnel engaged in vehicle decontamination shall wear protective equipment including disposable clothing and respiratory protection (as necessary) consistent with the requirements of this HASP.
2. Decontamination will consist only of rinsing with water unless there is an obvious additional need.

Health and Safety Plan – E Designation Site
333 West 38th Street, New York, NY 10018

OER Project Number: 12EHAN365M
April 2013

APPENDIX A

Site Emergency Form

SITE EMERGENCY FORM

Contaminants of Concern: None Identified
Minimum Level of Protection: Modified Level D

Do not endanger your life. Survey the situation before taking any action

Site Location Address: 333 West 38th Street, New York, NY 10018

EMERGENCY PHONE NUMBERS

IN THE EVENT OF ANY EMERGENCY,
CONTACT PROJECT MANAGER OR HEALTH
AND SAFETY REPRESENTATIVE.

Ambulance: 911
Fire: 911
Police: 911
Poison Control: 1-800-222-1222

Project Manager: (631) 271-9292 Richard Galli, P.E.
Health/Safety Rep: (631) 271-9292

Hospital Name: Bellevue Hospital Center: 462 1st Avenue, New York, 10016
Hospital Phone: General Information: (212) 562-4141

FIRST AID FOR PETROLEUM HYDROCARBON EMERGENCIES

Ingestion: DO NOT INDUCE VOMITING. Call Poison Control, follow instructions. Administer CPR, if necessary. Seek Medical attention.

Inhalation: Remove person from contaminated environment. DO NOT ENTER A CONFINED SPACE TO RESCUE SOMEONE WHO HAS BEEN OVERCOME UNLESS PROPERLY EQUIPPED AND A STANDBY PERSON IS PRESENT. Administer CPR if necessary. Seek medical attention.

Skin Contact: Brush off dry material, remove wet or contaminated clothing. Flush skin thoroughly with water. Seek medical attention if irritation persists.

Eye Contact: Flush eyes with water for 15 minutes. Seek medical attention.

Exposure Symptoms: Headache, dizziness, nausea, drowsiness, irritation of eyes, nose, throat breathing difficulties.

Contingency Plan: Report incident to Project Manager after emergency procedures have been implemented.

APPENDIX B

Route to Hospital

ROUTE TO HOSPITAL

HOSPITAL DIRECTIONS

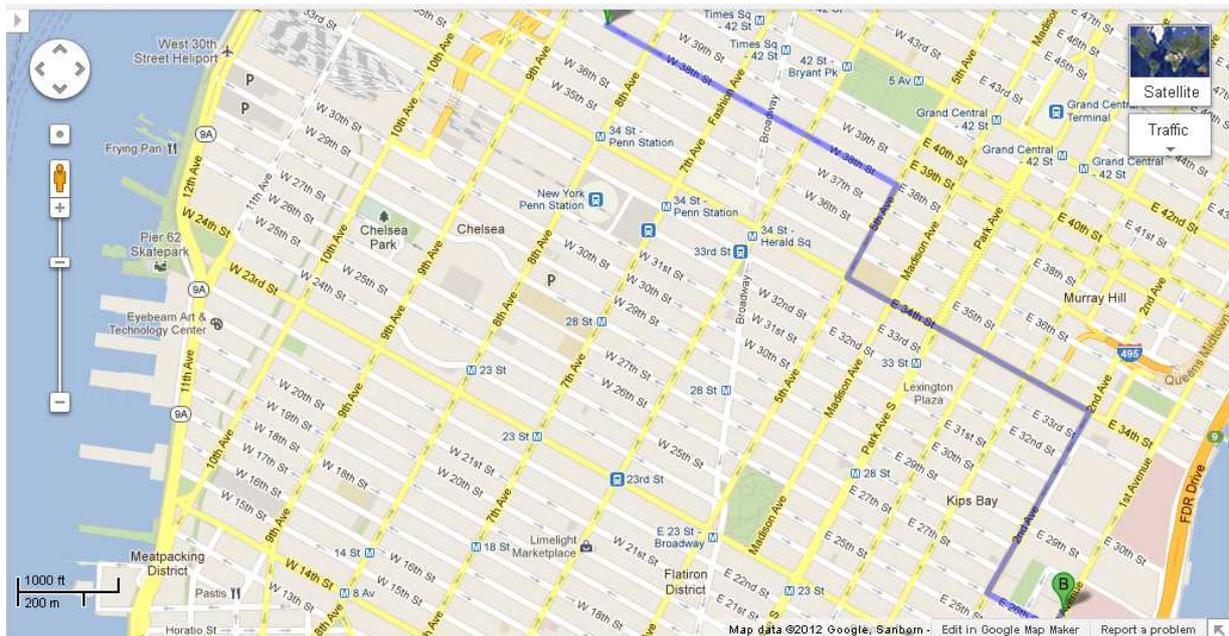
1. Head southeast on W 38th St toward 8th Ave
2. Turn right onto 5th Ave
3. Turn left onto E 34th St
4. Turn right onto 2nd Ave
5. Turn left onto E 26th St
6. Turn left onto 1st Avenue
Destination will be on the right

Bellevue Hospital Center
462 1st Ave
New York, NY 10016

HOSPITAL INFORMATION

Bellevue Hospital Center
462 1st Ave
New York, NY 10016

General Information: (212) 562-4141



Health and Safety Plan – E Designation Site
333 West 38th Street, New York, NY 10018

OER Project Number: 12EHAN365M
April 2013

APPENDIX C

EMERGENCY FIRST AID

EMERGENCY FIRST AID

1. Survey the situation. Do not endanger your own life. **DO NOT ENTER A CONFINED SPACE TO RESCUE SOMEONE WHO HAS BEEN OVERCOME UNLESS PROPERLY EQUIPPED AND A STANDBY PERSON IS PRESENT.**
2. Call 911 or the fire department **IMMEDIATELY**. Explain the physical injury, chemical exposure, fire or release.
3. Decontaminate the victim without delaying life-saving procedures.
4. If the victim's condition appears to be noncritical, but seems to be more severe than minor cuts, he/she should be transported to the nearest hospital by trained Emergency Medical Services (EMS) personnel. Let the doctor assume the responsibility for determining the severity of the injury. If the condition is obviously serious, EMS must transport the victim.
5. Notify the Project Manager.

EMERGENCY FIRST AID PROCEDURES	
To Stop Bleeding	Cardiopulmonary Resuscitation (CPR) Only to be used by trained persons
<ol style="list-style-type: none"> 1. Give medical statement. 2. Assure airway, breathing and circulation. 3. Use DIRECT PRESSURE over the wound with clean dressing or your hand (use nonpermeable gloves). Direct pressure will control most bleeding. 4. Bleeding from an artery or several injury sites may require DIRECT PRESSURE on a PRESSURE POINT. Use pressure points for 30-60 seconds to help control severe bleeding. 5. Continue primary care and seek medical aid as needed. 	<ol style="list-style-type: none"> 1. Give medical statement 2. Arousal: Check for consciousness. 3. Open airway with chin-lift. 4. Look, listen and feel for breathing. 5. If breathing is absent, give 2 full rescue breaths. 6. Check the pulse for 5 to 10 seconds. 7. If pulse is present, continue rescue breathing: 1 breath every 5 seconds.

Health and Safety Plan – E Designation Site
333 West 38th Street, New York, NY 10018

OER Project Number: 12EHAN365M
April 2013

APPENDIX D

MSDS DEFINITIONS

MSDS DEFINITIONS

TLV-TWA	<u>Threshold Limit Value - Time Weighted Average</u> - The time-weighted average concentration for a normal 8-hour work day and a 40-hour work week, to which nearly all workers may be repeatedly exposed without adverse effect.
PEL	<u>Permissible Exposure Limit</u> - Time-weighted average concentrations similar to (and in many cases derived from) the Threshold Limit Values.
REL	<u>Recommended Exposure Limit</u> - as defined by NIOSH similar to the Threshold Limit Values.
IDLH	<u>Immediately Dangerous to Life or Health</u> - Any atmospheric condition that poses an immediate threat to life, or which is likely to result in acute or immediate severe health effects. Oxygen deficiency is IDLH.
LEL	<u>Lower Explosive Limit</u> - The minimum concentration of vapor in air below which propagation of a flame will not occur in the presence of an ignition source.
UEL	<u>Upper Explosive Limit</u> - The maximum concentration of vapor in air above which propagation of a flame will not occur in the presence of an ignition source.
FP	<u>Flash Point</u> - The lowest temperature at which the vapor of a combustible liquid can be made to ignite momentarily in air.
VP	<u>Vapor Pressure</u> - The pressure characteristic at any given temperature of a vapor in equilibrium with its liquid or solid form, often expressed in millimeters of mercury (mm Hg).
Odor Threshold	A property displayed by a particular compound. Low detection indicates a physiological sensation due to molecular contact with the olfactory nervous system (based on 50% of the population).
IP	<u>Ionization Potential</u> - The energy required to form an ion by removal of a given electron from an atom.

Health and Safety Plan – E Designation Site
333 West 38th Street, New York, NY 10018

OER Project Number: 12EHAN365M
April 2013

APPENDIX E

Contaminants Profile

CONTAMINANTS PROFILE			
Chemical	Exposure Route	Symptoms of Overexposure	Incompatibilities
Volatile Organic Compounds	Inhalation and/or ingestion, skin contact	Eye, nose, and throat irritation; headaches, loss of coordination, nausea; damage to liver, kidney, and central nervous system.	
Semi Volatile Organic Compounds	Inhalation and/or ingestion, skin contact	Eye, nose, and throat irritation; headaches, loss of coordination, nausea; damage to liver, kidney, and central nervous system.	
Heavy Metals	Inhalation and/or ingestion, skin contact	Abdominal discomfort, nausea and/or constipation, diarrhea, metallic taste, weakness, muscle pains, irritability, headache, dizziness.	
Arsenic	Inhalation, skin absorption, skin and/or eye contact ingestion	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin, [potential occupational carcinogen]	Strong oxidizers, bromine azide [Note: Hydrogen gas can react with inorganic arsenic to form the highly toxic gas arsine.]
Lead	Inhalation, ingestion, skin and/or eye contact	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension	Strong oxidizers, hydrogen peroxide, acids
Mercury	Inhalation, skin absorption, ingestion, skin and/or eye contact	Paresthesia; ataxia, dysarthria; vision, hearing disturbance; spasticity, jerking limbs; dizziness; salivation; lacrimation (discharge of tears); nausea, vomiting, diarrhea, constipation; skin burns; emotional disturbance; kidney injury; possible teratogenic effects	Strong oxidizers such as chlorine
PCB's	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes; chloracne; liver damage; reproductive effects; [potential occupational carcinogen]	Strong oxidizers
Pesticides	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; paresthesia tongue, lips, face; tremor; anxiety, dizziness, confusion, malaise (vague feeling of discomfort), headache, lassitude (weakness, exhaustion); convulsions; paresis hands; vomiting; [potential occupational carcinogen]	Strong oxidizers, alkalis

APPENDIX F

Monitoring, Visitor and HASP Acknowledgement Forms

VISITOR/TRAINEE GUIDELINES

Optima Real Estate is committed to providing a safe environment on all work sites for visitors, trainees, employees and/or passersby. In order to accomplish this, the following guidelines must be followed.

1. VISITORS

Any person not actively participating in the work at the site is regarded as a "visitor" and must follow these visitor/trainee guidelines. Visitors must be accompanied by an authorized representative while on site.

Sites must be marked with signs, placards, and/or barricades to designate hazardous boundaries. Visitors will not be allowed on any site that is not adequately marked.

2. TRAINEES

Trainees are employees of Optima Real Estate or their representatives who have not yet completed the required safety training program. New hires and in-house company transfers will be considered trainees until safety training requirements are met.

Trainees will be informed of restrictions by their supervisor and must abide by them before visiting active sites.

Trainees will be permitted to visit Optima Real Estate sites as observers as long as the following conditions are met:

- Trainees are supervised at all times while observing on site.
- Trainees do not perform work functions of any type while on site.
- Trainees do not handle any equipment, tools and/or supplies while on site.
- Trainees do not enter any hazardous or hot zone or confined space areas while on site.

Supervisors will be responsible for informing trainees of the above conditions and for ensuring that the conditions are met. Supervisors will also ensure that trainees will not be asked to violate the conditions listed above.

A Trainee/Visitor Agreement Form must be signed by both the trainee and the supervisor.

Infractions of the above agreement will be viewed as extremely serious and will be subject to discipline up to and including termination for either the trainee and/or supervisor.

AGREEMENT AND ACKNOWLEDGMENT STATEMENT

Health and Safety Plan Agreement

Employees of Optima Real Estate or their representatives have the authority to stop activities performed by subcontractors or visitors at this site if any field activity is not performed in accordance with the requirements of this Health and Safety Plan, and as per directive of the Site Supervisor (SS).

All Employees of Optima Real Estate, their representatives, subcontractors and visitors are required to sign the following agreement.

1. I have read and fully understand the Construction Health and Safety Plan (CHASP) and my individual responsibilities.
2. I agree to abide by the provisions of the Construction Health and Safety Plan (CHASP).

Name: _____

Date: _____

Remedial Action Work Plan
333 West 38th Street, New York, New York

OER Project Number 12EHAN365M
April 2013

APPENDIX E
Community Air Monitoring Plan

COMMUNITY AIR MONITORING PLAN FOR EXCAVATION ACTIVITIES

**OER Project Number
12EHAN365M**

April 2013

PREPARED FOR:
OPTIMA Real Estate
Gene Kaufman Architect P.C.
525 Broadway 8th Floor
New York, NY 10012

FOR WORK AT:
333 West 38th Street
New York, NY 10018

Tax Map Designation:
Block: 762 Lot: 16

PREPARED BY:
Galli Engineering, P.C.
734 Walt Whitman Road, Suite 402A
Melville, NY 11747

Richard D. Galli, P.E.

Date

UNAUTHORIZED ALTERATION OF, OR ADDITION TO, PLANS OR DOCUMENTS BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER IS A VIOLATION OF SECTION 7209, SUBDIVISION 2, OF THE NEW YORK STATE EDUCATION LAW. ANY ALTERATION OF THIS DOCUMENT MUST BE DONE BY A PERSON ACTING UNDER THE DIRECT SUPERVISION OF A LICENSED PROFESSIONAL IN ACCORDANCE WITH THE STATE EDUCATION LAW. COPIES OF THIS DOCUMENT NOT MARKED WITH AN ORIGINAL OF THE PROFESSIONAL ENGINEERS INKED SEAL SHALL NOT BE CONSIDERED VALID TRUE COPIES.

Community Air Monitoring Plan

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1.0 INTRODUCTION

The following Community Air Monitoring Plan (CAMP) was prepared by Galli Engineering, P.C. for Optima Real Estate to be used on the project during the excavation of fill material at 333 West 38th Street, New York, NY 10018. The project is under authority of the Mayor's Office of Environmental Remediation (OER). This CAMP is for the work that will be done to excavate fill material at the project site for construction purposes.

The subject building is developed as a five-story commercial building with basement and currently contains office space and one commercial store. The lot measures 25 feet by 99 feet. The building was constructed in 1920 and has a total floor area of approximately 9,000 square feet of commercial space. The first and second floors measure 25 feet by 100 feet while the third, fourth, and fifth floors measure approximately 25 feet by 62 feet. Zoning is C6-4M, commercial with manufacturing. The building is located in the GCP2 - Garment Center Special District Preservation Area P-2. The property is NYC E-Designated for Air Quality with HVAC fuel limited to natural gas; Underground Gasoline Storage Tanks Testing Protocol and Window Wall Attenuation and Alternate Ventilation required. The commercial store is on the first floor and is utilized as a book store and art gallery. Floors two through five are utilized by "Nowy Dziennik" Polish Daily News and Bicentennial Publishing Co., Inc.

2.0 SCOPE OF WORK

The work that will be covered by this CAMP is the excavation of on-site soils to make room for the new building construction. The volume of soil to be removed from the site is estimated at 1,550 cubic yards. Development plans for the site include a 21 story hotel with basement and 79 guest rooms. Four guest rooms will be on each floor and the entire building will encompass 34,000 gross square feet of space.

3.0 AIR MONITORING PROCEDURES

The following sections describe the specific CAMP monitoring procedures that will be followed on site:

3.1 Particulate Monitoring

The air will be monitored in real time during the excavation of Site soils or other activities that involve loading or unloading soils in connection with handling of fill materials. Air monitoring for particulates (or dust) will be performed continuously during Project excavation activities using both air monitoring equipment and visual observations. Monitoring equipment capable of measuring particulate matter smaller than 10 microns (PM-10) and capable of averaging over periods of 15 minutes or less will be used. Positioning of the meters will not be permanent during the duration of the project. Upwind readings will be taken multiple times during the day and logged. This upwind number will be the number used to compare with downwind readings. The meter will be set up at approximately 4 feet to 5 feet in height, to intersect the breathing zone. The equipment will be logging the 15 minute average concentrations for subsequent reporting.

The on-site Galli Engineering person responsible for these actions (CAMP Coordinator) will record the estimated wind speed and direction as described below. These will allow the on-site person to ensure that monitoring equipment will be appropriately positioned based on wind direction.

The monitoring results will be compared to the following:

If the downwind PM-10 particulate level is 100 ug/m^3 greater than background or upwind perimeter for a 15 minute period or if visible dust is observed leaving the work area, then dust suppression techniques shall be employed. Work may continue with dust suppression techniques, provided that the downwind PM-10 particulate levels do not exceed 150 ug/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

If after dust suppression techniques are implemented, downwind PM-10 particulate levels are greater than 150 ug/m^3 above the upwind level, work shall be stopped, reevaluated and changes initiated to reduce levels to less than 150 ug/m^3 above background conditions and to prevent visible dust from migrating off site, up to and including work stoppage if necessary.

Work may continue with dust suppression, provided that downwind PM-10 levels are not more than 150 ug/m^3 greater than the upwind levels; all measures necessary to ensure PM-10 levels of less than 150 ug/m^3 above background will be utilized.

Dust suppression measures that may be employed are:

- Limiting on site vehicle speed to 5 miles per hour.
- Watering unpaved surfaces, including haul roads.
- Covering and/or water misting of stockpiled materials.
- Loading of any dry soil which may release dust from trucks, will be accompanied by manual water spaying of soil.
- Minimizing drop height when loading dump trucks.
- Covering of all trucks carrying soil.
- Washing the wheels of trucks as they exit the site.
- Watering of any active face that is being excavated.

There may be situations where visible dust is generated by excavation activities and migrates to downwind locations but is not detected by the monitoring equipment at or above the action levels. Therefore, if visible dust is observed leaving the working area, dust suppression techniques such as those described above will be employed.

All air monitoring data and the locations of monitoring equipment will be recorded and available for review by OER.

3.2 Volatile Organic Compound Monitoring

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area. Monitoring will be on a continuous basis. VOC monitoring will be

implemented during all soil excavation, handling or loading. Upwind concentration should be measured at the start of each workday and periodically afterwards to establish background conditions.

The monitoring work will be performed using a Rae Systems MiniRae 2000 Photoionization Detector or equivalent. The equipment will be calibrated at least once a day with the manufacturer's recommended calibration gas. The equipment will be capable of calculating 15 minute time weighted 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 exceeds 5 parts per million (ppm) above background for the 15 minute average, work activities must be temporarily halted in the area of concern. Monitoring should continue to see if instantaneous numbers drop. Work activity can commence when instantaneous readings fall below 5 ppm.

If total organic vapor levels at the downwind perimeter of the work area persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities in the area of concern must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level at the downwind perimeter of the work area is below 5 ppm over background for the 15 minute average.

If the organic vapor level is more than 25 ppm above background at the downwind perimeter of the work area, work activities shall be halted in the area of concern until corrective measures are identified and implemented to reduce emissions.

All 15 minute readings should be recorded for review by MOER. Instantaneous readings used for decision making should also be recorded.

4.0 QUALIFIED INDIVIDUALS

Galli Engineering, P.C. (Galli) will be supplying personnel to conduct the air monitoring under this CAMP. All of the individuals will report to the senior construction foreman on-site and will have the authority to stop work that is causing high dust or VOC readings.

APPENDIX F
Waterproof/Vapor Barrier Specifications

PREPRUFE® 300R & 160R

Pre-applied waterproofing membranes that bond integrally to poured concrete for use below slabs or behind basement walls on confined sites

Description

Preprufe® 300R & 160R membranes are unique composite sheets comprising a thick HDPE film, an aggressive pressure sensitive adhesive and a weather resistant protective coating.

Unlike conventional non-adhering membranes, which are vulnerable to water ingress tracking between the unbonded membrane and structure, the unique Preprufe bond to concrete prevents ingress or migration of water around the structure.

The Preprufe R System includes:

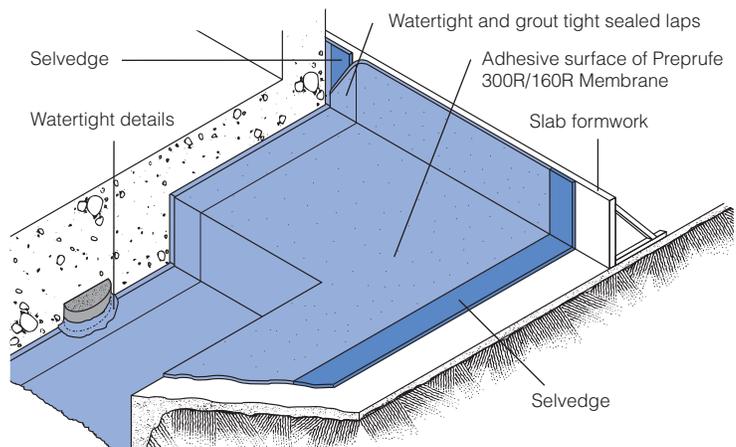
- **Preprufe 300R**—heavy-duty grade for use below slabs and on rafts (i.e. mud slabs). Designed to accept the placing of heavy reinforcement using conventional concrete spacers.
- **Preprufe 160R**—thinner grade for blindside, zero property line applications against soil retention systems.
- **Preprufe Tape LT**—for covering cut edges, roll ends, penetrations and detailing (temperatures between 25°F (-4°C) and 86°F (+30°C)).
- **Preprufe Tape HC**—as above for use in Hot Climates (minimum 50°F (10°C)).
- **Bituthene® Liquid Membrane**—for sealing around penetrations, etc.
- **Adcor™ ES**—waterstop for joints in concrete walls and floors
- **Preprufe Tieback Covers**—preformed cover for soil retention wall tieback heads
- **Preprufe Preformed Corners**—preformed inside and outside corners

Preprufe 300R & 160R membranes are applied either horizontally to smooth prepared concrete, carton forms or well rolled and compacted earth or crushed stone substrate; or vertically to permanent formwork or adjoining structures. Concrete is then cast directly against the adhesive side of the membranes. The specially developed Preprufe adhesive layers work together to form a continuous and integral seal to the structure.

Preprufe can be returned up the inside face of slab formwork but is not recommended for conventional twin-sided formwork on walls, etc. Use Bituthene self-adhesive membrane or Procor® fluid applied membrane to walls after removal of formwork for a fully bonded system to all structural surfaces.

Advantages

- **Forms a unique continuous adhesive bond to concrete poured against it**—prevents water migration and makes it unaffected by ground settlement beneath slabs
- **Fully-adhered watertight laps** and detailing
- **Provides a barrier to water, moisture and gas**—physically isolates the structure from the surrounding ground
- **BBA Certified** for basement Grades 2, 3, & 4 to BS 8102:1990
- **Zero permeance** to moisture
- **Solar reflective**—reduced temperature gain
- **Simple and quick to install**—requiring no priming or fillets
- **Can be applied to permanent formwork**—allows maximum use of confined sites
- **Self protecting**—can be trafficked immediately after application and ready for immediate placing of reinforcement
- **Unaffected by wet conditions**—cannot activate prematurely
- **Inherently waterproof, non-reactive system:**
 - not reliant on confining pressures or hydration
 - unaffected by freeze/thaw, wet/dry cycling
- **Chemical resistant**—effective in most types of soils and waters, protects structure from salt or sulphate attack



Drawings are for illustration purposes only. Please refer to graceconstruction.com for specific application details.

Installation

The most current application instructions, detail drawings and technical letters can be viewed at graceconstruction.com. For other technical information contact your local Grace representative.

Preprufe 300R & 160R membranes are supplied in rolls 4 ft (1.2 m) wide, with a selvage on one side to provide self-adhered laps for continuity between rolls. The rolls of Preprufe Membrane and Preprufe Tape are interwound with a disposable plastic release liner which must be removed before placing reinforcement and concrete.

Substrate Preparation

All surfaces—It is essential to create a sound and solid substrate to eliminate movement during the concrete pour. Substrates must be regular and smooth with no gaps or voids greater than 0.5 in. (12 mm). Grout around all penetrations such as utility conduits, etc. for stability (see Figure 1).

Horizontal—The substrate must be free of loose aggregate and sharp protrusions. Avoid curved or rounded substrates. When installing over earth or crushed stone, ensure substrate is well compacted to avoid displacement of substrate due to traffic or concrete pour. The surface does not need to be dry, but standing water must be removed.

Vertical—Use concrete, plywood, insulation or other approved facing to sheet piling to provide support to the membrane. Board systems such as timber lagging must be close butted to provide support and not more than 0.5 in. (12 mm) out of alignment.

Membrane Installation

Preprufe can be applied at temperatures of 25°F (-4°C) or above. When installing Preprufe in cold or marginal weather conditions 55°F (<13°C) the use of Preprufe Tape LT is recommended at all laps and detailing. Preprufe Tape LT should be applied to clean, dry surfaces and the release liner must be removed immediately after application. Alternatively, Preprufe Low Temperature (LT) is available for low temperature condition applications. Refer to Preprufe LT data sheet for more information.

Horizontal substrates—Place the membrane HDPE film side to the substrate with the clear plastic release liner facing towards the concrete pour. End laps should be staggered to avoid a build up of layers. Leave plastic release liner in position until overlap procedure is completed (see Figure 2).

Accurately position succeeding sheets to overlap the previous sheet 3 in. (75 mm) along the marked selvage. Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap. Peel back the plastic release liner from between the overlaps as the two layers are bonded together. Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller. Completely remove the plastic liner to expose the protective coating. Any initial tack will quickly disappear.

Refer to Grace Tech Letter 15 for information on suitable rebar chairs for Preprufe.

Vertical substrates—Mechanically fasten the membrane vertically using fasteners appropriate to the substrate with the clear plastic release liner facing towards the concrete pour. The membrane may be installed in any convenient length. Fastening can be made through the selvage using a small and low profile head fastener so that the membrane lays flat and allows firmly rolled overlaps. Immediately remove the plastic release liner.

Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to

overlap. Roll firmly to ensure a watertight seal.

Roll ends and cut edges—Overlap all roll ends and cut edges by a minimum 3 in. (75 mm) and ensure the area is clean and free from contamination, wiping with a damp cloth if necessary. Allow to dry and apply Preprufe Tape LT (or HC in hot climates) centered over the lap edges and roll firmly (see Figure 3). Immediately remove printed plastic release liner from the tape.

Details

Refer to Preprufe Field Application Manual, Section V Application Instructions or visit graceconstruction.com. This manual gives comprehensive guidance and standard details.

Membrane Repair

Inspect the membrane before installation of reinforcement steel, formwork and final placement of concrete. The membrane can be easily cleaned by power washing if required. Repair damage by wiping the area with a damp cloth to ensure the area is clean and free from dust, and allow to dry. Repair small punctures (0.5 in. (12 mm) or less) and slices by applying Preprufe Tape centered over the damaged area and roll firmly. Remove the release liner from the tape. Repair holes and large punctures by applying a patch of Preprufe membrane, which extends 6 in. (150 mm) beyond the damaged area. Seal all edges of the patch with Preprufe Tape, remove the release liner from the tape and roll firmly. Any areas of damaged adhesive should be covered with Preprufe Tape. Remove printed plastic release liner from tape. Where exposed selvage has lost adhesion or laps have not been sealed, ensure the area is clean and dry and cover with fresh Preprufe Tape, rolling firmly. Alternatively, use a hot air gun or similar to activate adhesive and firmly roll lap to achieve continuity.

Pouring of Concrete

Ensure the plastic release liner is removed from all areas of Preprufe membrane and tape.

It is recommended that concrete be poured within 56 days (42 days in hot climates) of application of the membrane. Following proper ACI guidelines, concrete must be placed carefully and consolidated properly to avoid damage to the membrane. Never use a sharp object to consolidate the concrete.

Removal of Formwork

Preprufe membranes can be applied to removable formwork, such as slab perimeters, elevator and lift pits, etc. Once the concrete is poured the formwork must remain in place until the concrete has gained sufficient compressive strength to develop the surface bond. Preprufe membranes are not recommended for conventional twin-sided wall forming systems.

A minimum concrete compressive strength of 1500 psi (10 N/mm²) is recommended prior to stripping formwork supporting Preprufe membranes. Premature stripping may result in displacement of the membrane and/or spalling of the concrete.

Refer to Grace Tech Letter 17 for information on removal of formwork for Preprufe.

Figure 1



Figure 2

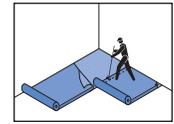
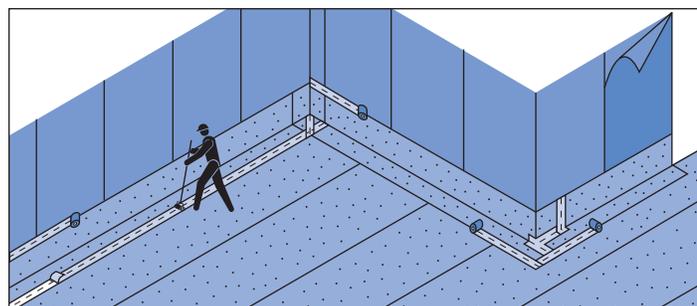
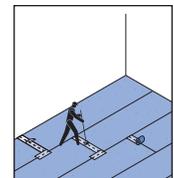


Figure 3

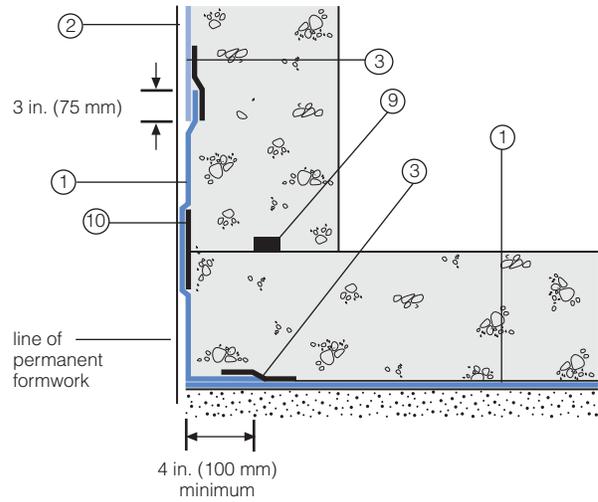


Detail Drawings

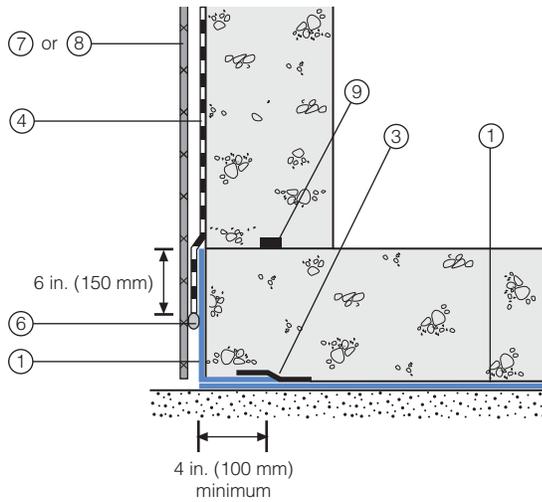
Details shown are typical illustrations and not working details. For a list of the most current details, visit us at graceconstruction.com.

For technical assistance with detailing and problem solving please call toll free at 866-333-3SBM (3726).

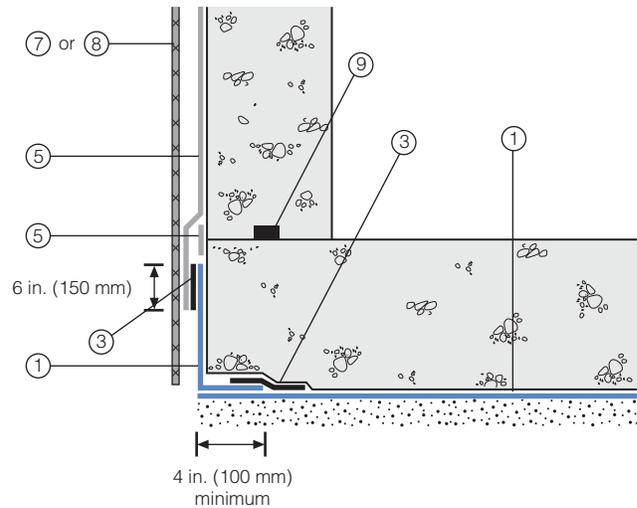
Wall base detail against permanent shutter



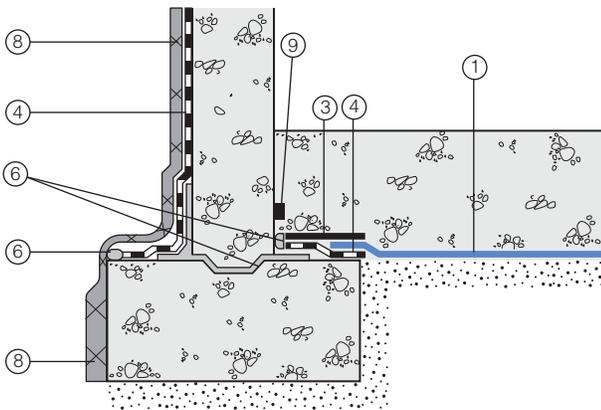
Bituthene wall base detail (Option 1)



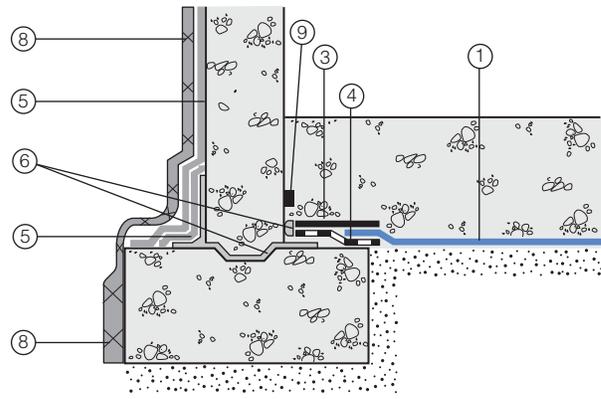
Procor wall base detail (Option 1)



Bituthene wall base detail (Option 2)



Procor wall base detail (Option 2)



- 1 Preprufe 300R
- 2 Preprufe 160R
- 3 Preprufe Tape
- 4 Bituthene

- 5 Procor
- 6 Bituthene Liquid Membrane
- 7 Protection

- 8 Hydroduct®
- 9 Adcor ES
- 10 Preprufe CJ Tape

Supply

Dimensions (Nominal)	Preprufe 300R Membrane	Preprufe 160R Membrane	Preprufe Tape (LT or HC*)
Thickness	0.046 in. (1.2 mm)	0.032 in. (0.8 mm)	
Roll size	4 ft x 98 ft (1.2 m x 30 m)	4 ft x 115 ft (1.2 m x 35 m)	4 in. x 49 ft (100 mm x 15 m)
Roll area	392 ft ² (36 m ²)	460 ft ² (42 m ²)	
Roll weight	108 lbs (50 kg)	92 lbs (42 kg)	4.3 lbs (2 kg)
Minimum side/end laps	3 in. (75 mm)	3 in. (75 mm)	3 in. (75 mm)
* LT denotes Low Temperature (between 25°F (-4°C) and 86°F (+30°C)) HC denotes Hot Climate (50°F (>+10°C))			
Ancillary Products			
Bituthene Liquid Membrane—1.5 US gal (5.7 liter) or 4 US gal (15.1 liter)			

Physical Properties

Property	Typical Value 300R	Typical Value 160R	Test Method
Color	white	white	
Thickness	0.046 in. (1.2 mm)	0.032 in. (0.8 mm)	ASTM D3767
Lateral Water Migration Resistance	Pass at 231 ft (71 m) of hydrostatic head pressure	Pass at 231 ft (71 m) of hydrostatic head pressure	ASTM D5385, modified ¹
Low temperature flexibility	Unaffected at -20°F (-29°C)	Unaffected at -20°F (-29°C)	ASTM D1970
Resistance to hydrostatic head	231 ft (71 m)	231 ft (71 m)	ASTM D5385, modified ²
Elongation	500%	500%	ASTM D412, modified ³
Tensile strength, film	4000 psi (27.6 MPa)	4000 psi (27.6 MPa)	ASTM D412
Crack cycling at -9.4°F (-23°C), 100 cycles	Unaffected, Pass	Unaffected, Pass	ASTM C836
Puncture resistance	221 lbs (990 N)	100 lbs (445 N)	ASTM E154
Peel adhesion to concrete	5 lbs/in. (880 N/m)	5 lbs/in. (880 N/m)	ASTM D903, modified ⁴
Lap peel adhesion	5 lbs/in. (880 N/m)	5 lbs/in. (880 N/m)	ASTM D1876, modified ⁵
Permeance to water vapor transmission	0.01 perms (0.6 ng/(Pa × s × m ²))	0.01 perms (0.6 ng/(Pa × s × m ²))	ASTM E96, method B
Water absorption	0.5%	0.5%	ASTM D570

Footnotes:

- Lateral water migration resistance is tested by casting concrete against membrane with a hole and subjecting the membrane to hydrostatic head pressure with water. The test measures the resistance of lateral water migration between the concrete and the membrane.
- Hydrostatic head tests of Preprufe Membranes are performed by casting concrete against the membrane with a lap. Before the concrete cures, a 0.125 in. (3 mm) spacer is inserted perpendicular to the membrane to create a gap. The cured block is placed in a chamber where water is introduced to the membrane surface up to the head indicated.
- Elongation of membrane is run at a rate of 2 in. (50 mm) per minute.
- Concrete is cast against the protective coating surface of the membrane and allowed to properly dry (7 days minimum). Peel adhesion of membrane to concrete is measured at a rate of 2 in. (50 mm) per minute at room temperature.
- The test is conducted 15 minutes after the lap is formed (per Grace published recommendations) and run at a rate of 2 in. (50 mm) per minute.

Specification Clauses

Preprufe 300R or 160R shall be applied with its adhesive face presented to receive fresh concrete to which it will integrally bond. Only Grace Construction Products approved membranes shall be bonded to Preprufe 300R/160R. All Preprufe 300R/160R system materials shall be supplied by Grace Construction Products, and applied strictly in accordance with their instructions. Specimen performance and formatted clauses are also available.

NOTE: Use Preprufe Tape to tie-in Procor with Preprufe.

Health and Safety

Refer to relevant Material Safety data sheet. Complete rolls should be handled by a minimum of two persons.

www.graceconstruction.com

For technical assistance call toll free at 866-333-3SBM (3726)

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