

# DECISION DOCUMENT

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458 East 99th Street  
Brownfield Cleanup Program  
Brooklyn, Kings County  
Site No. C224254  
July 2023



**Department of  
Environmental  
Conservation**

Prepared by  
Division of Environmental Remediation  
New York State Department of Environmental Conservation

# DECLARATION STATEMENT - DECISION DOCUMENT

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458 East 99th Street  
Brownfield Cleanup Program  
Brooklyn, Kings County  
Site No. C224254  
July 2023

## **Statement of Purpose and Basis**

This document presents the remedy for the 458 East 99th Street brownfield cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the 458 East 99th Street site and the public's input to the proposed remedy presented by the Department.

## **Description of Selected Remedy**

The elements of the selected remedy are as follows:

### **1. Remedial Design**

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at

a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

## **2. Soil Vapor Extraction (SVE)**

Soil vapor extraction (SVE) will be implemented to remove volatile organic compounds (VOCs) from the subsurface and to prevent off-site migration of contaminated soil vapor. VOCs will be physically removed from the soil by applying a vacuum to wells that have been installed into the vadose zone (the area below the ground but above the water table). The vacuum draws air through the soil matrix which carries the VOCs from the soil to the SVE well. The air extracted from the SVE wells is then treated as necessary prior to being discharged to the atmosphere.

One SVE well will be installed into the vadose zone and screened from ground surface to a depth of approximately 7 feet below ground surface. The air containing VOCs extracted from the SVE wells will be treated by passing the air stream through activated carbon which removes the VOCs from the air prior to it being discharged to the atmosphere.

## **3. Vapor Mitigation**

Any on-site buildings will be required to have a sub-slab depressurization system, or other acceptable measures, to mitigate the migration of vapors into the building from the subsurface.

## **4. Institutional Control**

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require compliance with the Department approved SMP;
- allow the use and development of the controlled property for commercial use as defined by Part 375-1.8(g)(2)(iii), although land use is subject to local zoning laws;
- require the remedial party to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3); and
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOHMH.

## **5. Site Management Plan**

A Site Management Plan is required which includes the following:

- a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in Paragraph 4 above.

Engineering Controls: The SVE system discussed in Paragraph 2 and the vapor mitigation system discussed in Paragraph 3.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use, and

- groundwater water use restrictions;
- provisions for the management and inspection of the identified engineering controls;
- a provision for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated pursuant to a plan approved by the Department. Based on the investigation results and the Department determination of the need for a remedy, a Remedial Action Work Plan (RAWP) will be developed for the final remedy for the site, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment.
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of soil, groundwater, soil vapor and/or indoor air to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the Department.

c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

- procedures for operating and maintaining the remedy;
- compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting,
- maintaining site access controls and Department notification; and
- providing the Department access to the site and O&M records.

The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

### **Declaration**

The remedy conforms with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate and takes into consideration Department guidance, as appropriate. The remedy is protective of public health and the environment.

July 14, 2023




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Date

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Jane H. O'Connell  
Regional Remediation Engineer, Region 2

# DECISION DOCUMENT

458 East 99th Street  
Brooklyn, Kings County  
Site No. C224254  
July 2023

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## **SECTION 1: SUMMARY AND PURPOSE**

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of contaminants at this site, as more fully described in this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum.

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, where a contaminant is present at levels exceeding the soil cleanup objectives or other health-based or environmental standards, criteria or guidance, based on the reasonably anticipated use of the property.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

## **SECTION 2: CITIZEN PARTICIPATION**

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repositories:

DECInfo Locator - Web Application  
<https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C224254>

Brooklyn Public Library  
1580 Rockaway Parkway  
Brooklyn, NY 11236  
Phone: (718) 257-6547

Brooklyn Community Board 18  
1097 Bergen Avenue  
Brooklyn, NY 11234  
Phone: (718) 241-0422

### **Receive Site Citizen Participation Information By Email**

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at <http://www.dec.ny.gov/chemical/61092.html>

### **SECTION 3: SITE DESCRIPTION AND HISTORY**

#### **Location:**

The 458 East 99<sup>th</sup> Street site is located on the west side of East 99th Street between Foster Avenue and Rockaway Avenue in Brooklyn, NY. The site is bordered on the east by East 99th Street and by various commercial, industrial, and manufacturing businesses immediately to the west, south, and north.

#### **Site Features:**

The 0.14-acre site is currently developed with a one-story masonry and steel office/warehouse building with on-grade 4-inch concrete slab and a concrete alleyway and is used as a commercial woodworking shop.

#### **Past Uses of the Site:**

The site was undeveloped, vacant land until the existing one-story building was built in 1952. A variety of commercial and industrial operations, including a dry-cleaning warehousing operation were present from 1966 through 1973.

#### **Current Zoning and Land Use:**

The site is zoned E1-Warehouse. The building is currently occupied by a wood working shop for assembling of cabinets, etc. There is no manufacturing conducted at the site.

#### **Site Geology and Hydrology:**

Beneath the slab, the lithology consists of fill (consisting of sand, gravel, brick, concrete) that was encountered from approximately 0.5 to 4 feet below ground surface (ft-bgs). Fill materials overlie native fine to coarse sand with some gravel and silt. Light to dark grey organic-rich silt was observed at several locations at depths of approximately 10 to 15 ft-bgs once the groundwater table was encountered. Based on site-specific sampling, the depth to groundwater is approximately 11 ft-bgs. The direction of groundwater flow is to the east towards Fresh Creek, which is located approximately 0.7 miles from the site.

A site location map is attached as Figure 1.

#### **SECTION 4: LAND USE AND PHYSICAL SETTING**

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) were/was evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the Remedial Investigation (RI) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the RI Report.

#### **SECTION 5: ENFORCEMENT STATUS**

The Applicant under the Brownfield Cleanup Agreement is a Volunteer. The Volunteer does not have an obligation to address off-site contamination. The Department has determined that this site poses a significant threat to human health and the environment and there is the potential for off-site impacts that will require remedial activities; accordingly, enforcement action is necessary.

The Department will seek to identify any parties (other than the Volunteer) known or suspected to be responsible for contamination at or emanating from the site, referred to as Potentially Responsible Parties (PRPs). The Department will bring an enforcement action against the PRPs. If an enforcement action cannot be brought or does not result in the initiation of a remedial program by any PRPs, the Department will evaluate the off-site contamination for action under the State Superfund. The PRPs are subject to legal actions by the State for recovery of all response costs the State incurs or has incurred

#### **SECTION 6: SITE CONTAMINATION**

##### **6.1: Summary of the Remedial Investigation**

A remedial investigation (RI) serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and
- assess risk to human health and the environment.

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess groundwater and soil borings or test pits are installed to sample soil and/or waste(s) identified. If

other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will also be sampled for the presence of contamination. Data collected in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 6.3.

The analytical data collected on this site includes data for:

- groundwater
- soil
- sub-slab vapor

### **6.1.1: Standards, Criteria, and Guidance (SCGs)**

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. For a full listing of all SCGs see: <http://www.dec.ny.gov/regulations/61794.html>

### **6.1.2: RI Results**

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized below. Additionally, the RI Report contains a full discussion of the data. The contaminants of concern identified at this site is/are:

tetrachloroethene (PCE)	1,1,1-trichloroethane
trichloroethene (TCE)	1,1-dichloroethane
cis-1,2-dichloroethene	chloroethane
vinyl chloride	

The contaminants of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor intrusion

## **6.2: Interim Remedial Measures**

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Decision Document.

There were no IRMs performed at this site during the RI.

## **6.3: Summary of Environmental Assessment**

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The RI report presents a detailed discussion of any existing and potential impacts from the site to fish and wildlife receptors.

### Nature and Extent of Contamination:

Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), per- and polyfluoroalkyl substances (PFAS), and pesticides. Soil vapor samples were analyzed for VOCs. Based upon investigations conducted to date, the primary contaminants of concern are chlorinated solvents, specifically tetrachloroethene (PCE) and its breakdown products.

Soil - Three soil borings advanced to a depth of 25 feet below ground surface (ft-bgs) identified one VOC detection specifically PCE at a concentration of 18 parts per million (ppm) which exceeds the Protection of Groundwater Soil Cleanup Objectives (PGWSCO) of 1.3 ppm but does not exceed the Commercial Use Soil Cleanup Objective (CUSCO) of 150 ppm. There were no exceedances of CUSCOs for SVOCs, metals, pesticides, PCBs or PFAS in soil. Data does not indicate any off-site impacts in soil related to the site.

Groundwater - PCE exceeded the NYSDEC Ambient Water Quality Standards and Guidance Values (AWQSGV) at a maximum concentration of 11 parts per billion (ppb) in the shallow groundwater interface between 5-15 ft-bgs and up to 10 ppb in the deep groundwater between 20-25 ft-bgs. Trichloroethene (TCE) was detected in the shallow zone at a concentration of 13 ppb and in the deep zone at a maximum concentration of 59 ppb. Cis-1,2-dichloroethene and vinyl chloride were detected at maximum concentrations of 32 ppb and 23 ppb, respectively, in shallow groundwater at 340 ppb and 180 ppb, respectively, in the deep zone. There were also AWQSGV exceedances of 1,1,1-trichloroethane (62 ppb), 1,1-dichloroethane (370 ppb), 1,2-dichloroethane (1.6 ppb) and chloroethane (310 ppb) in the deep zone at the upgradient southwestern perimeter of the site. Concentrations were lower downgradient of this location in the south-eastern perimeter of the site. The AWQSGV for each of these VOCs is 5 ppb, except vinyl chloride which is 2 ppb.

No SVOCs exceeded the AWQS. Metal exceedances of AWQS included iron, manganese, and sodium - all of which are considered naturally occurring and are not site-specific contaminants of concern. The PFAS compounds perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic

acid (PFOS) were found at maximum concentrations of 113 parts per trillion (ppt) and 13 ppt compared to their respective AWQSGV of 6.7 ppt and 2.7 ppt.

Data does not indicate any off-site impacts in groundwater related to the site.

Sub-slab Vapor and Indoor Air - PCE was the dominant contaminant detected in sub-slab vapor at elevated concentrations up to 16,000 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) and was found in indoor air at a maximum concentration of  $3.9 \mu\text{g}/\text{m}^3$ . TCE was detected in sub-slab soil vapor at a maximum concentration of  $440 \mu\text{g}/\text{m}^3$  but was not detected in air.

Data indicates the potential for off-site impacts in soil vapor related to the site.

#### **6.4: Summary of Human Exposure Pathways**

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure*.

Since the site is covered by the building and asphalt or concrete people will not come into contact with site-related soil and groundwater contamination unless they dig below the surface. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by site contamination. Volatile organic compounds in soil vapor (air spaces within the soil) may move into buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Soil vapor intrusion sampling identified impacts in on-site indoor air quality. Additionally, environmental sampling indicates that soil vapor intrusion may be a concern off-site.

#### **6.5: Summary of the Remediation Objectives**

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

##### **Groundwater**

###### **RAOs for Public Health Protection**

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

###### **RAOs for Environmental Protection**

- Remove the source of ground or surface water contamination.

## Soil

### **RAOs for Public Health Protection**

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

### **RAOs for Environmental Protection**

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

## Soil Vapor

### **RAOs for Public Health Protection**

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

## **SECTION 7: ELEMENTS OF THE SELECTED REMEDY**

The alternatives developed for the site and the evaluation of the remedial criteria are presented in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The selected remedy is a Track 2: Restricted use with generic soil cleanup objectives remedy.

The selected remedy is referred to as the Soil Vapor Extraction and Soil Vapor Mitigation remedy.

The elements of the selected remedy, as shown in Figure 2, are as follows:

### **1. Remedial Design**

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and

sustainable re-development.

- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

## **2. Soil Vapor Extraction (SVE)**

Soil vapor extraction (SVE) will be implemented to remove volatile organic compounds (VOCs) from the subsurface and to prevent off-site migration of contaminated soil vapor. VOCs will be physically removed from the soil by applying a vacuum to wells that have been installed into the vadose zone (the area below the ground but above the water table). The vacuum draws air through the soil matrix which carries the VOCs from the soil to the SVE well. The air extracted from the SVE wells is then treated as necessary prior to being discharged to the atmosphere.

One SVE well will be installed into the vadose zone and screened from ground surface to a depth of approximately 7 feet below ground surface. The air containing VOCs extracted from the SVE wells will be treated by passing the air stream through activated carbon which removes the VOCs from the air prior to it being discharged to the atmosphere.

## **3. Vapor Mitigation**

Any on-site buildings will be required to have a sub-slab depressurization system, or other acceptable measures, to mitigate the migration of vapors into the building from the subsurface.

## **4. Institutional Control**

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require compliance with the Department approved SMP;
- allow the use and development of the controlled property for commercial use as defined by Part 375-1.8(g)(2)(iii), although land use is subject to local zoning laws;
- require the remedial party to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8(h)(3); and
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOHMH.

## **5. Site Management Plan**

A Site Management Plan is required which includes the following:

a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

- Institutional Controls: The Environmental Easement discussed in Paragraph 4 above.
- Engineering Controls: The SVE system discussed in Paragraph 2 and the vapor mitigation system discussed in Paragraph 3.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use, and groundwater water use restrictions;
- provisions for the management and inspection of the identified engineering controls;
- a provision for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated pursuant to a plan approved by the Department. Based on the investigation results and the Department determination of the need for a remedy, a Remedial Action Work Plan (RAWP) will be developed for the final remedy for the site, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment.
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of soil, groundwater, soil vapor and/or indoor air to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the Department.

c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

- procedures for operating and maintaining the remedy;
- compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting,
- maintaining site access controls and Department notification; and
- providing the Department access to the site and O&M records.

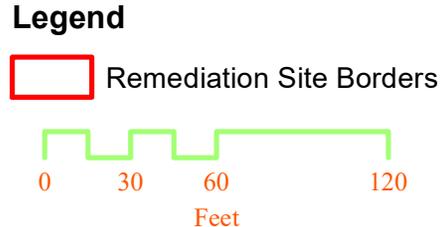
The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.



NYS ITS GIS Program Office, Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



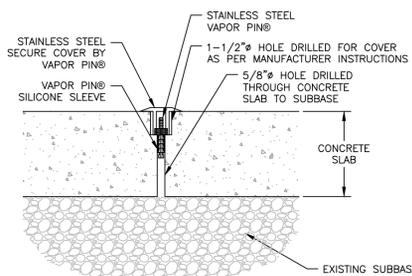
**Figure 1 - Site Location Map**  
**458 East 99th Street**  
**Site No. C224254**



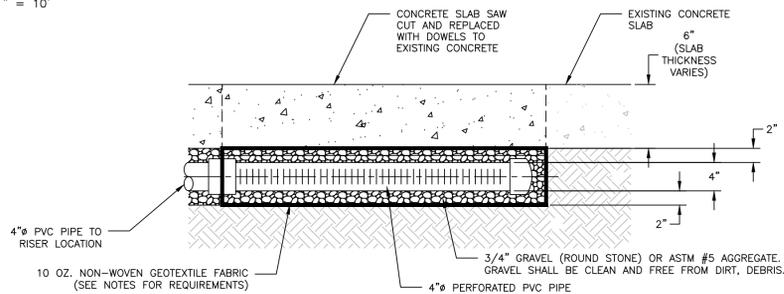


SOIL VAPOR EXTRACTION SYSTEM/SUB-SLAB DEPRESSURIZATION SYSTEM PLAN

SCALE: 1" = 10'

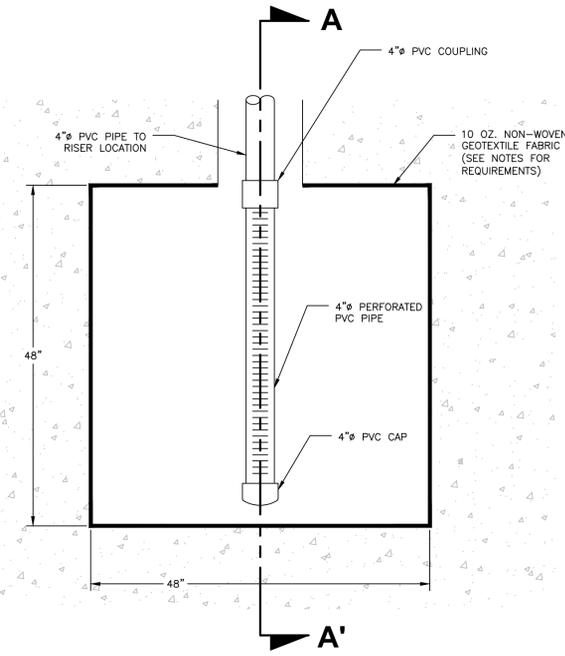


1 TYPICAL SOIL VAPOR MONITORING POINT DETAIL  
SCALE: N.T.S.

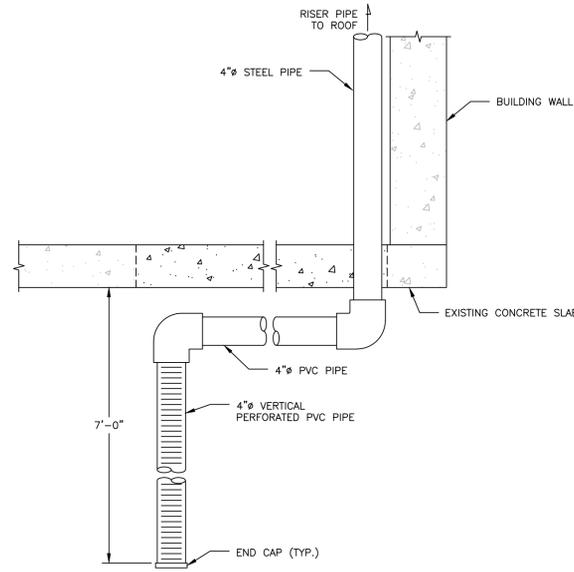


PROFILE VIEW A-A'

2 SUB-SLAB DEPRESSURIZATION SYSTEM SUCTION PIT DETAIL  
SCALE: N.T.S.



PLAN VIEW



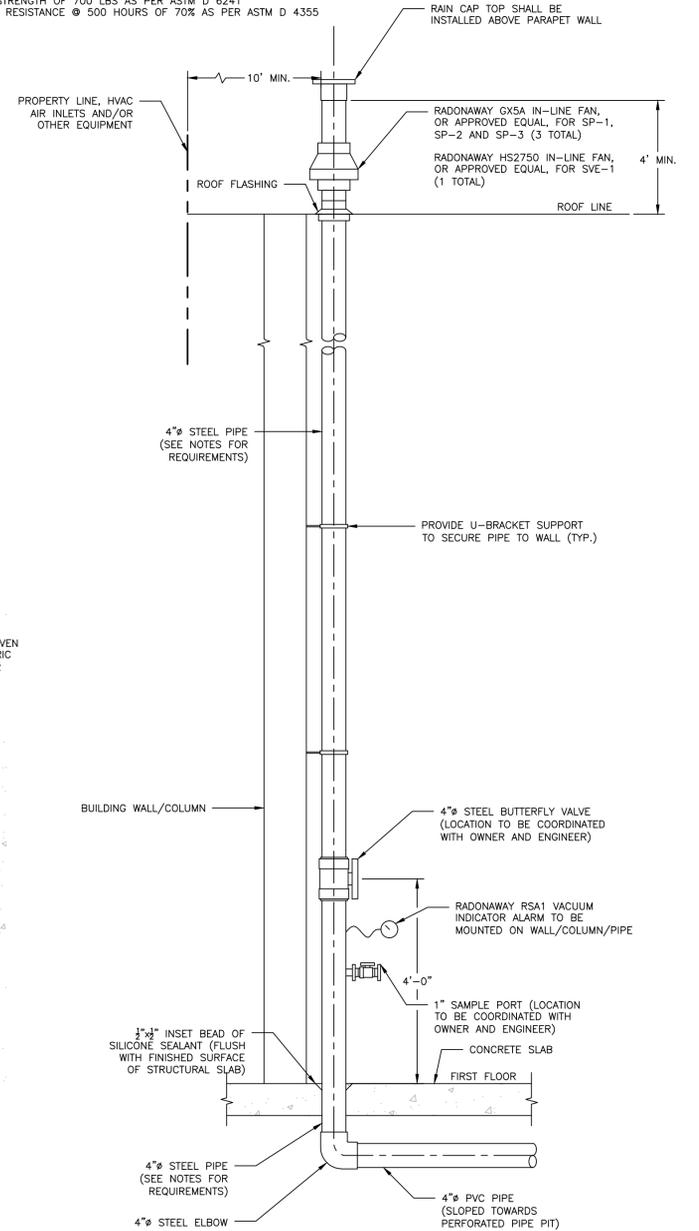
PROFILE VIEW

4 SOIL VAPOR EXTRACTION POINT DETAIL

SCALE: N.T.S.

SOIL VAPOR EXTRACTION SYSTEM/SUB-SLAB DEPRESSURIZATION SYSTEM NOTES

- CONTRACTOR SHALL COORDINATE INSTALLATION OF SOIL VAPOR EXTRACTION SYSTEM/SUB-SLAB DEPRESSURIZATION SYSTEM (SVES/SSDS) WITH EXISTING SITE CONDITIONS INCLUDING BUT NOT LIMITED TO: EXISTING EQUIPMENT, ELECTRICAL SYSTEMS AND UTILITIES.
- CONTRACTOR SHALL FIELD VERIFY THE DESIGN INVERT ELEVATIONS (BOTTOM OF PIPING) FOR PENETRATIONS. THE CONTRACTOR SHALL ALSO FIELD VERIFY THE HORIZONTAL OFFSETS FOR THE LOCATIONS OF THE VERTICAL RISERS.
- ALL SVES/SSDS PIPING SHALL BE SLOPED TOWARDS THE PERFORATED PIPE SUCTION PITS TO PREVENT ANY POTENTIAL MOISTURE BUILD UP AND BLOCKAGES.
- ALL ABOVE GRADE SVES/SSDS PIPING (ALONG WITH FITTINGS AND APPURTENANCES) SHALL CONSIST OF GALVANIZED STEEL, CAST-IRON, OR DUCTILE IRON PIPE AND INSTALLED IN ACCORDANCE WITH THE NYC PLUMBING CODE CHAPTERS 7 AND 9 FOR VENT PIPE.
- PVC PIPE SHALL BE JOINED TOGETHER USING EITHER SOLVENTS, SLIP-JOINTS SECURED WITH SELF-TAPPING SCREWS OR THREADED CONNECTIONS.
- ALL PENETRATIONS THROUGH THE FLOOR SHALL BE SEALED USING A SILICONE BASED WATERPROOF SEALANT OR EQUIVALENT.
- THE BUILDING CONCRETE SLAB WILL BE RESTORED IN THE AREAS OF SVES/SSDS INSTALLATION AND IMPERFECTIONS/INCONSISTENCIES IN THE SLAB WILL BE SEALED AS PART OF THE SVES/SSDS INSTALLATION.
- EACH SSDS SUCTION PIT SHALL BE INSTALLED WITH A RADONAWAY GX5A IN-LINE FAN, VALVE AND RADONAWAY RSA1 VACUUM INDICATOR ALARM.
- THE SVES POINT SHALL BE INSTALLED WITH A RADONAWAY HS2750 IN-LINE FAN, VALVE AND RADONAWAY RSA1 VACUUM INDICATOR ALARM.
- THE SURFACES TO BE LINED WITH GEOTEXTILE SHALL BE FREE OF ALL ROCKS, STONES, SHARP OBJECTS OR CONSTRUCTION DEBRIS OF ANY KIND.
- INSTALL GEOTEXTILE NONWOVEN FABRIC DIRECTLY ON FILL. MATERIAL OVERLAPS SHALL BE A MINIMUM OF 12" AND THE OVERLAPPED SEAMS WILL BE SEALED WITH TAPE.
- NON-WOVEN GEOTEXTILE SHALL MEET OR EXCEED FOLLOWING PROPERTY VALUES:
  - MINIMUM MASS PER UNIT AREA OF 10 OZ/YD<sup>2</sup> AS PER ASTM D 5261
  - MINIMUM GRAB STRENGTH OF 250 LBS AS PER ASTM D 4632
  - MINIMUM PUNCTURE STRENGTH OF 700 LBS AS PER ASTM D 6241
  - MINIMUM ULTRAVIOLET RESISTANCE @ 500 HOURS OF 70% AS PER ASTM D 4355



3 RISER DETAIL  
SCALE: N.T.S.

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PROJECT NAME:  
458 EAST 99TH STREET  
BROOKLYN, NY 11236

PROJECT FOR:  
458 EAST 99TH STREET LLC

TITLE:  
REMEDIAL ALTERNATIVE 2:  
TRACK 2 COMMERCIAL USE  
VIA SVES/SSDS

FIGURE NO.  
**2**