

# DECISION DOCUMENT

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Top Hat Cleaners  
Brownfield Cleanup Program  
Brooklyn, Kings County  
Site No. C224208  
September 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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Site No. C224208  
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## **Statement of Purpose and Basis**

This document presents the remedy for the Top Hat Cleaners 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 Top Hat Cleaners 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;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings shall be

constructed, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial design program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWise™ (available in the Sustainable Remediation Forum [SURF] library) or similar Department accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial design program.

Additionally, the remedial design program will include a climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial design program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

## **2. Cover System**

A site cover will be required to allow for restricted residential use of the site in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is to be used it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs. The existing foundation slab located in the cellar of the on-site building will be sealed by installation of a minimum 2-inch concrete slab on top of the existing slab. The walls of the cellar will also be sealed to remove pathways for vapor intrusion. These actions will improve the efficiency of the vapor mitigation system discussed in Paragraph 5.

## **3. Enhanced Bioremediation**

In-situ enhanced biodegradation will be employed to treat dissolved chlorinated volatile organic compounds (VOCs) in groundwater under the partial cellar. The biological breakdown of

contaminants through anaerobic reductive dichlorination will be enhanced by injection of 3-D Microemulsion (electron donor), Bio-Dechlor Inoculum Plus (microbes) and S-MicroZVI (iron source). The method and depth of injection will be determined during the remedial design.

Groundwater monitoring will be required up-gradient, down-gradient and within the treatment zone. Monitoring will be conducted for contaminants of concern (VOCs), dissolved oxygen, oxidation/reduction potential, pH, and other parameters to assess the effectiveness of the treatment. Indoor air monitoring will be required in the onsite building following the bioremediation process to determine if this treatment technology is affecting the indoor air and if any additional measures are needed to protect indoor air quality.

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

Soil vapor extraction (SVE) will be implemented to remove chlorinated VOCs from the subsurface. 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 existing active sub-slab depressurization system installed at the site as an interim remedial measure will be converted into an SVE system to enhance the removal of VOCs from the subsurface. 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.

#### **5. 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.

#### **6. Institutional Control**

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

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

#### **7. 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 6.
- Engineering Controls: The Cover System discussed in Paragraph 2, the SVE system discussed in Paragraph 4, and the Vapor Mitigation system discussed in Paragraph 5.

This plan includes, but may not be limited to:

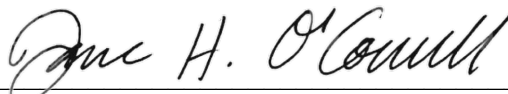
- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
  - a provision for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise 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;
  - descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
  - a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 2 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs);
  - provisions for the management and inspection of the identified engineering controls;
  - 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 groundwater and indoor air to assess the performance and effectiveness of the remedy; and
  - 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 mitigation and 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.

### **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.

September 26, 2023

Date



Jane H. O'Connell

Regional Remediation Engineer, Region 2

# DECISION DOCUMENT

Top Hat Cleaners  
Brooklyn, Kings County  
Site No. C224208  
September 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=C224208>

Brooklyn Public Library - Bushwick  
340 Bushwick Avenue  
Brooklyn, NY 11206  
Phone: (718) 602-1348

Brooklyn Community Board 1  
435 Graham Avenue  
Brooklyn, NY 11211  
Phone: (718) 389-0009

### **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 site is located at 152 Graham Avenue in Brooklyn, NY on the east side of Graham Avenue between Montrose Avenue to the north and Johnson Avenue to the south. The site is bordered by a 3-story mixed residential and commercial building to the north, Graham Avenue to the west, a 4-story mixed residential and commercial building to the south, and a 4-story residential building to the east.

#### **Site Features**

The site is 2,500 square feet (0.057 acres) in area and is currently occupied by a 3-story mixed residential and commercial building with a partial basement and a small rear yard. The building is constructed of concrete, brick, and mortar, and occupies most of the lot area.

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

The site is currently zoned as R6 but is categorized in the S2 building class according to the NYC Zoning Resolution, which allows mixed-use as a residential building with one attached store or office.

#### **Past Use of the Site**

According to the Sanborn maps, the site was historically occupied by an unidentified store and 3-story dwelling between 1887 and 1950, although the existing building was constructed in 1920. The first-floor commercial space has been utilized as a dry-cleaning facility, identified as Top Hat Cleaners, since circa 1960. The dry cleaner is currently drop-off only and does not conduct dry cleaning activities on site.

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

The site is generally level and is at an elevation of approximately 27 feet above sea level. The geology of Brooklyn consists of unconsolidated glacial deposits. Shallow soils at the site consist of "urban fill" material that is composed of fine to medium sand and silt with fine to coarse



gravel and traces of brick and other miscellaneous debris, underlain by native sediments composed of fine to coarse sand, silt with fine to coarse gravel and some clay. The groundwater beneath the site was encountered at depths ranging between 17.5 feet and 22.5 feet below ground surface, and groundwater flow was determined to be towards the north/northwest towards the East River, which is located approximately 2,640 feet from the site.

A site location map is attached as Figure 1, and a site plan is attached as Figure 2.

#### **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 restricted-residential use (which allows for commercial use and 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 Participant. The Applicant has an obligation to address on-site and off-site contamination. Accordingly, no enforcement actions are necessary.

#### **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
- soil vapor
- indoor air
- 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 contaminant(s) of concern identified at this site is/are:

tetrachloroethene (PCE)  
trichloroethene (TCE)

vinyl chloride  
cis-1,2-dichloroethene

The contaminant(s) 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.

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

## IRM- SSDS

### Sub-Slab Depressurization System (SSDS) Installation On-site

- Installation of an active sub-slab depressurization system (SSDS) on-site; and
- Implementation of the Operation, Maintenance and Monitoring Plan for the SSDS.

Results of the IRM were documented in the IRM Construction Completion Report dated September 2021.

### **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), pesticides, poly-chlorinated biphenyls (PCBs), and metals. Groundwater was also analyzed for per- and polyfluoroalkyl substances (PFAS). Soil vapor was analyzed for VOCs. Based upon investigations conducted to date, the primary contaminants of concern are chlorinated VOCs including tetrachloroethene (PCE) and its degradation products.

Soil - Elevated levels of chlorinated VOCs were detected in soil with the highest concentrations beneath the basement of the site at depths between 2 and 12 feet below grade. PCE was detected at a maximum concentration of 440 parts per million (ppm) compared to the Restricted-Residential Soil Cleanup Objective (RRSCO) value of 19 ppm and Protection of Groundwater Soil Cleanup Objection (PGSCO) of 2 ppm.

No SVOCs, metals, pesticides or PCBs were detected at concentrations exceeding their respective RRSCOs. Data does not indicate any off-site impacts in soil related to the site.

Groundwater - Chlorinated VOCs were detected in all monitoring wells. PCE was detected at a maximum concentration of 29,000 parts per billion (ppb) compared to the Ambient Water Quality Standards (AWQS) of 5 ppb, trichloroethene (TCE) was detected at a maximum concentration of 200 ppb compared with AWQS of 5 ppb, cis-1,2-dichloroethene (cis-1,2-DCE) at a maximum concentration of 1,400 ppb compared with AWQS of 5 ppb, and vinyl chloride at a maximum concentration of 25 ppb compared with AWQS of 2 ppb.

For the PFAS compounds, perfluorooctanoic acid (PFOA) was found at a maximum concentration of 140 parts per trillion (ppt) compared to the Ambient Water Quality Guidance Value (AWQGV) of 6.7 ppt and perfluorooctanesulfonic acid (PFOS) was found at a maximum

concentration of 270 ppt compared to the AWQGV of 2.7 ppt. The concentration of PFAS is similar in upgradient and downgradient monitoring wells and therefore appears to be from an off-site source.

No SVOCs, pesticides or PCBs were detected at concentrations exceeding their respective AWQS. For metals, manganese and sodium were detected at concentrations exceeding AWQS. These metals are ubiquitous and naturally occurring and are not considered to be site-specific contaminants of concern. Data indicates that off-site groundwater is impacted by site-related VOC contaminants.

Soil Vapor, Sub-Slab Soil Vapor and Indoor Air - In on-site sub-slab soil vapor PCE was detected at a maximum concentration of 277,000 micrograms per cubic meter (ug/m<sup>3</sup>), cis-1,2-DCE at a maximum concentration of 2,070 ug/m<sup>3</sup>, and TCE at a maximum concentration of 1,240 ug/m<sup>3</sup>. PCE and TCE were detected in indoor air samples at maximum concentrations of 396 ug/m<sup>3</sup> and 18 ug/m<sup>3</sup>, respectively. PCE was also detected at a concentration of 929,000 ug/m<sup>3</sup> in a soil vapor sample collected beneath the sidewalk immediately off-site. After the start-up of the sub-slab depressurization system, PCE and TCE were detected in indoor air samples at maximum concentrations of 21 ug/m<sup>3</sup> and 14 ug/m<sup>3</sup>, respectively.

Data indicates that off-site soil vapor is impacted by site-related VOC contaminants. Several off-site properties were identified and solicited for soil vapor intrusion sampling; however, only one property owner granted access. The results of the soil vapor intrusion sampling at that property indicated that no further action was needed.

#### **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*.

Access to the site is unrestricted. However, contact with contaminated soil or groundwater is unlikely unless people dig below the ground surface. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in soil vapor (air spaces within the soil) may move into buildings and affect the indoor air quality. This process is referred to as soil vapor intrusion. A sub-slab depressurization system (system that ventilate/remove the air beneath the building) was installed in the on-site building to prevent the indoor air quality from being affected by the contamination in soil vapor beneath the buildings. Environmental sampling indicates that the potential exists for site contamination to affect the indoor air of off-site buildings.

#### **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**

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of groundwater 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 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 4: Restricted Residential remedy.

The selected remedy is referred to as the Groundwater Treatment, Soil Vapor Extraction, Vapor Mitigation and Cover System remedy.

The elements of the selected remedy, as shown in Figures 3 through 5, 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;
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- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings shall be constructed, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial design program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWise<sup>TM</sup> (available in the Sustainable Remediation Forum [SURF] library) or similar Department accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial design program.

Additionally, the remedial design program will include a climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial design program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

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upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is to be used it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs. The existing foundation slab located in the cellar of the on-site building will be sealed by installation of a minimum 2-inch concrete slab on top of the existing slab. The walls of the cellar will also be sealed to remove pathways for vapor intrusion. These actions will improve the efficiency of the vapor mitigation system discussed in Paragraph 5.

### **3. Enhanced Bioremediation**

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Groundwater monitoring will be required up-gradient, down-gradient and within the treatment zone. Monitoring will be conducted for contaminants of concern (VOCs), dissolved oxygen, oxidation/reduction potential, pH, and other parameters to assess the effectiveness of the treatment. Indoor air monitoring will be required in the onsite building following the bioremediation process to determine if this treatment technology is affecting the indoor air and if any additional measures are needed to protect indoor air quality.

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## 7. **Site Management Plan**

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- 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:
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  - Engineering Controls: The Cover System discussed in Paragraph 2, the SVE system discussed in Paragraph 4, and the Vapor Mitigation system discussed in Paragraph 5.

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;
- 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;
- descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 2 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs);
- provisions for the management and inspection of the identified engineering controls;
- 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 groundwater and indoor air to assess the performance and effectiveness of the remedy; and
  - 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 mitigation and 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.

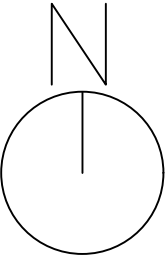


SUBJECT PROPERTY

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APPROXIMATE SCALE  
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TEL: (631) 462-5866

BASE DRAWING PREPARED BY  
MAP SOURCE: GOOGLE EARTH

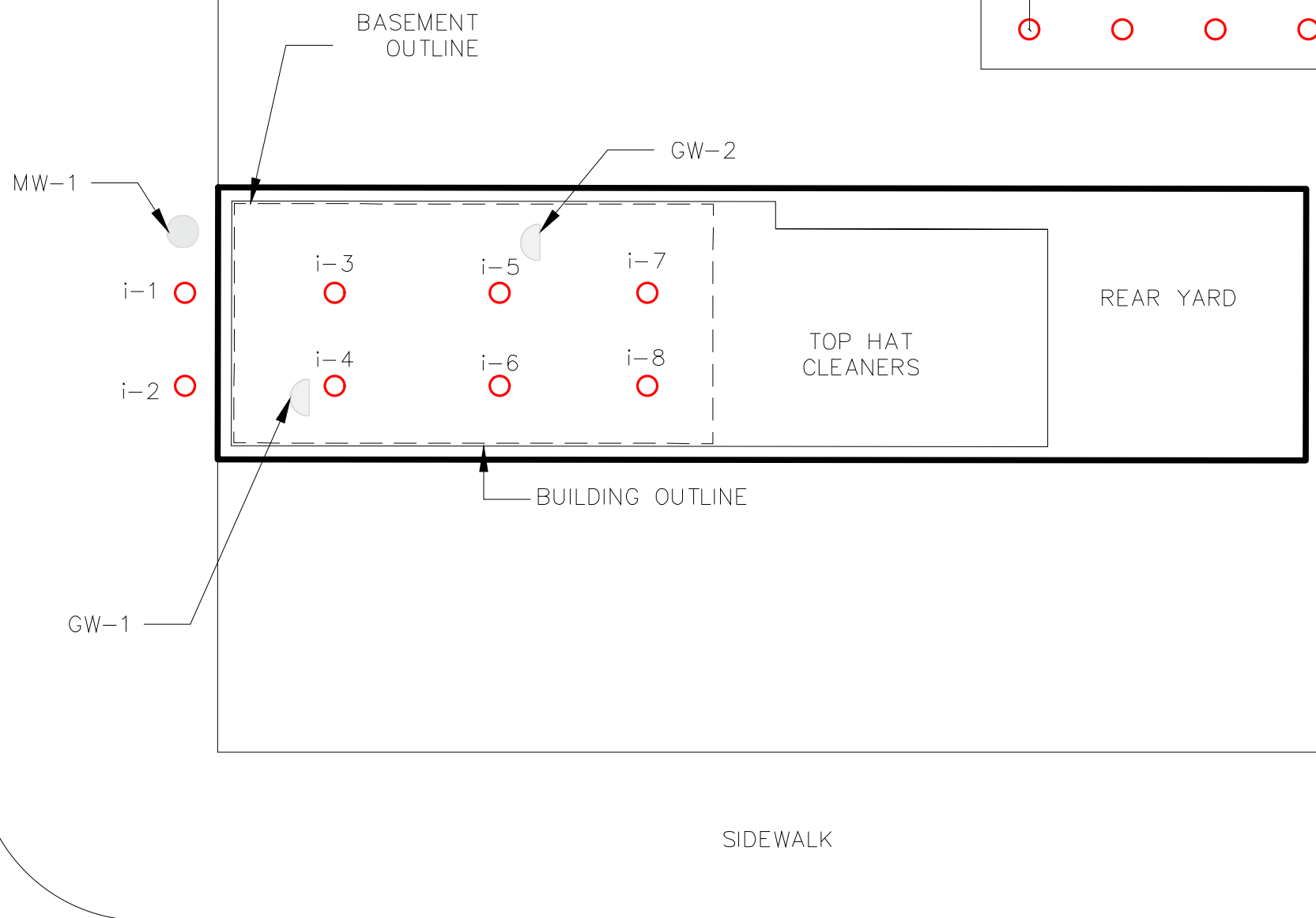
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PROJECT FIGURE  
FIGURE 1: SITE LOCATION MAP

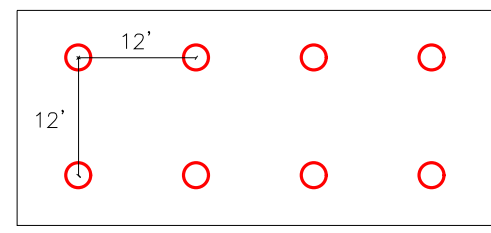
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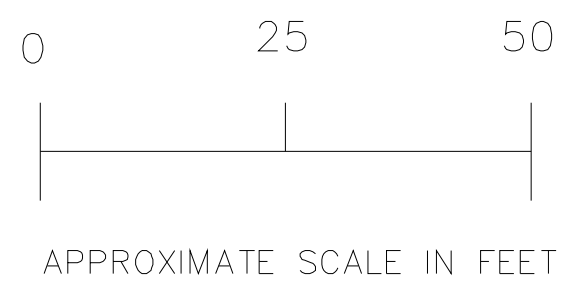


SPACING BETWEEN INJECTION POINTS



- LEGEND
- PROPOSED BIOREMEDIAL INJECTION POINTS (i-)
  - WELL LOCATION (MW-) INSTALLED BY HYDROTECH IN 2018
  - GROUNDWATER MONITORING WELL (GW-) INSTALLED BY HYDROTECH IN 2018

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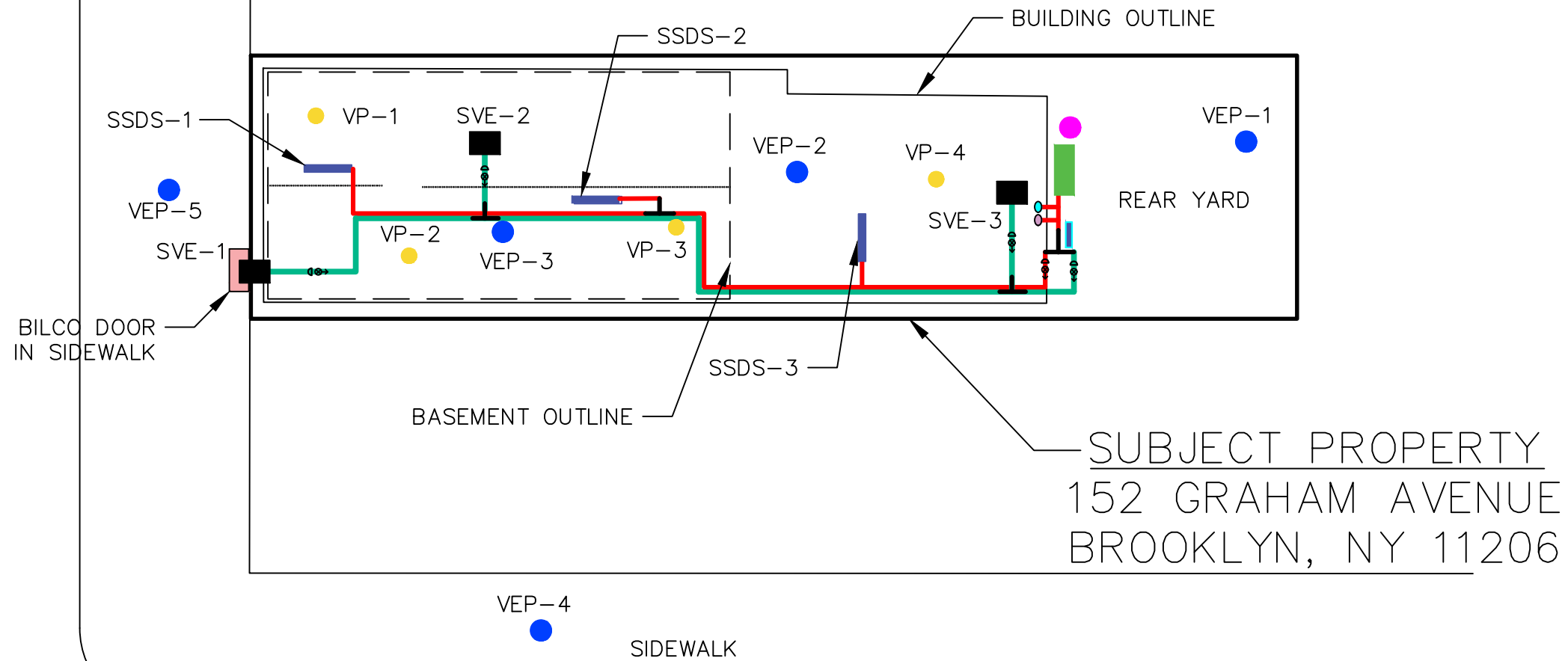
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PROJECT FIGURE  
FIGURE 3 : PROPOSED BIOREMEDIAL INJECTION MAP
















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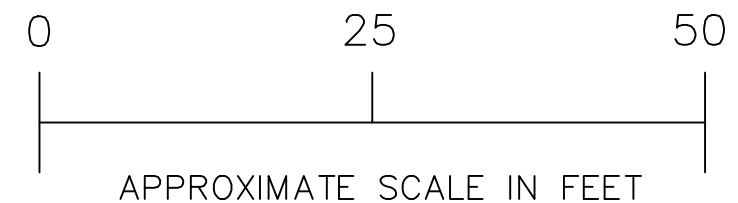
GRAHAM AVENUE



LEGEND

- |   |   |   |   |
|---|---|---|---|
|  | PROPOSED SVE WELL LOCATION (SVE-)                                   |  | 55-GAL GAC DRUM                         |
|  | EXISTING SSDS VACUUM MONITORING POINT (VP-)                         |  | SVE BLOWER INSIDE A HAZMAT ENCLOSURE    |
|  | EXISTING SUB-SLAB SSDS SUCTION TRENCHES                             |  | SITE BOUNDARIES                         |
|  | EXISTING SSDS 4" Ø CPVC RISER PIPES                                 |  | BASEMENT LAYOUT                         |
|  | EXISTING ELECTRIC PANEL FOR THE SSD SYSTEM MOUNTED ON EXTERIOR WALL |  | BUILDING LAYOUT                         |
|  | 4" Ø CPVC PIPE MERGING TWO PIPES INTO SINGLE 3" Ø CPVC PIPE         |  | PROPOSED 4" Ø CPVC SVE WELL RISER PIPES |
|  | PROPOSED SVE VACUUM MONITORING POINTS (VEP-)                        |  | BUTTERFLY VALVE AND VACUUM GAUGE        |
|   |   |  | VACTRACK SYSTEM AND RADON ALARM         |

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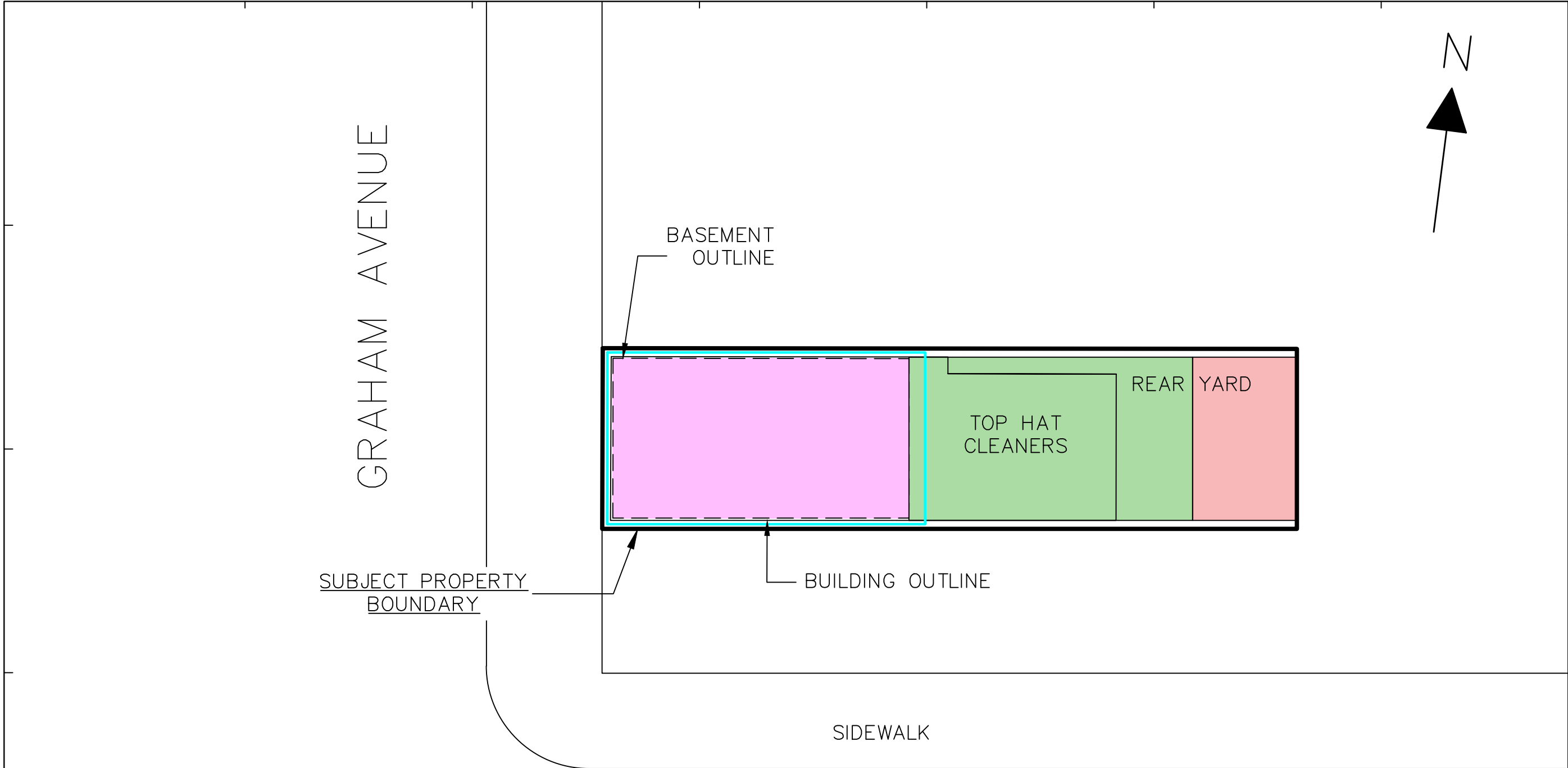
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PROJECT FIGURE

FIGURE 4 PROPOSED SVE SYSTEM DESIGN PLAN VIEW

PROJECT NO. 210011	DATE 5/3/2023
DRAWN BY G.T.	REVIEWED BY P.M.
SCALE (11X17) NOT TO SCALE	APPROVED BY P.M.



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PROJECT FIGURE

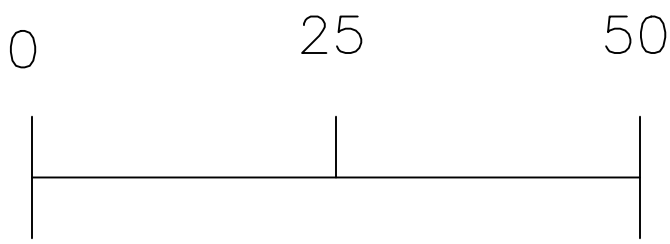
FIGURE 5 COMPOSITE COVER  
SYSTEM

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LEGEND

- POURED 2" SLAB ON TOP OF EXISTING 3" SLAB IN POOR CONDITION IN PARTIAL BASEMENT. 20 MIL VAPORBLOCK PLUS VAPOR BARRIER MEMBRANE INSTALLED BENEATH THE 2" SLAB AS PART OF BUILDING ENERGY EFFICIENCY.
- EXISTING 6"-8" SLAB ON GRADE
- PROPOSED 6" SLAB ON GRADE ON BARE SURFACE
- SEALING PENETRATIONS IN THE MASONRY WALLS IN PARTIAL BASEMENT WITH CEMENT PLASTER AS PART OF BUILDING ENERGY EFFICIENCY

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