DECISION DOCUMENT

Brook 156
Brownfield Cleanup Program
Bronx, Bronx County
Site No. C203078
October 2018

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

DECLARATION STATEMENT - DECISION DOCUMENT

Brook 156
Brownfield Cleanup Program
Bronx, Bronx County
Site No. C203078
October 2018

Statement of Purpose and Basis

This document presents the remedy for the Brook 156 site, a 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 Brook 156 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. Excavation

The remediation will include excavation and off-site disposal of contaminant source areas, including:

- underground storage tanks (USTs) and any associated piping or other structures associated with a source of contamination;
- grossly-contaminated soil, as defined in 6NYCRR Part 375-1.2(u); and
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

Soil which exceeds the restricted residential use soil cleanup objectives (SCOs), as defined by 6 NYCRR Part 375-6.8, will be excavated to the extent practical and transported off-site for disposal. Soil will be excavated to a depth of 12 feet below grade surface beneath and around the periphery of the suspect USTs on the southwestern portion of the site (southern portion of Lot 3) and on the southeastern portion of the site; and to a depth of 2 feet below grade surface across the northern portion of Lot 3 and on the northeastern portion of the site.

Confirmation samples will be collected and analyzed to demonstrate achievement of restricted residential use SCOs. Approximately 1,000 cubic yards of contaminated soil will be removed from the site.

3. Backfill

Clean fill meeting the requirements of the 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site. Approximately 2,000 cubic yards of clean fill will be imported to raise the elevation of the rail bed on Lot 1 from 19 feet to 12 feet below grade surface for the partial cellar, and to install the 2-foot clean fill buffer for the cover system for the Site. On-site soil that does not exceed lower of the restricted residential use SCOs or protection of groundwater SCOs for any compound may be used on-site, including below the water table, to backfill the excavation areas or re-grade the Site.

4. 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.

5. Groundwater Treatment

Groundwater sampling will be conducted to establish pre-remedial baseline conditions at the site and to determine whether groundwater treatment and post-remedial monitoring is needed. Based on the results of the groundwater sampling, in-situ groundwater treatment will be implemented. Prior to the full implementation of in-situ treatment, laboratory and/or on-site pilot scale studies will be conducted to more clearly define design parameters. The method and depth of injection will be determined during the remedial design.

6. Soil Vapor Extraction (SVE)
Soil vapor extraction (SVE) will be implemented to remove volatile organic compounds (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 air extracted from the SVE wells is then treated as necessary prior to being discharged to the atmosphere.

7. Institutional Controls
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, commercial and industrial uses 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 NYCDOH; and
- require compliance with the Department approved Site Management Plan.

8. 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 controls remain in place and effective:
   - Institutional Controls: The Environmental Easement discussed above.
   - Engineering Controls: The cover system and the SVE system discussed above.

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 use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;

- 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 to assess the performance and effectiveness of the remedy;
   - a schedule of monitoring and frequency of submittals to the Department; and
   - monitoring for vapor intrusion for any buildings developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

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 may not be limited to:
   - compliance monitoring of treatment 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 the 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.

October 19, 2018

Date

Gerard Burke, Director
Remedial Bureau B

DECISION DOCUMENT

Brook 156
Bronx, Bronx County
Site No. C203078
October 2018

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, the redevelopment or reuse of which may be complicated by the presence or potential presence of a contaminant.

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:

Bronx Public Library - Melrose Branch
910 Morris Avenue
Bronx, NY 10451
Phone: 718-588-0110

Bronx Community Board 1
3024 Third Avenue
Bronx, NY 10455
Phone: (718) 585-7117

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, Voluntary 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 740 Brook Avenue, Bronx, NY. It is denoted on New York City tax maps as Block 2360, Lots 1 and 3. The site is bordered to the north by East 157th Street, to the east by a parking lot (part of Melrose Condominiums), to the west by Brook Avenue and to the south by East 156th Street.

Site Features: The site is approximately 0.17 acres in size and consists of two parcels, both of which are currently vacant. Lot 1, the eastern portion of the site, consists of an approximately 5,658 square foot abandoned rail-bed and tunnel and a small grass-covered area. Lot 3, the western portion of the site, consists of an approximately 1,780 square foot irregularly-shaped vacant lot.

Current Zoning and Land Use: The site is located in an R7-2 residential zone and is currently vacant. The surrounding area is mixed-use, and includes residential and commercial/retail uses.

Past Use of the Site: Historically Lot 3 was developed as a gasoline station with a one-story lubrication office, and used auto sales lot. The gasoline filling station occupied the site from approximately 1949 to 1969. Lot 1 was occupied by the Port Morris branch of the New York and Harlem Railroad since at least 1891. The railroad was abandoned circa 1999.

Site Geology and Hydrogeology: Surface topography of the majority of the site is generally level; the railbed is approximately 19 feet below surface grade. Soil at the site consists of up to 12 feet of fill containing sand, silt, gravel, ash, debris, wood, brick, asphalt, and concrete. The fill is underlain by sand with varying amount of gravel and sand on top of bedrock. Bedrock is located approximately six feet below grade along the railroad.

Groundwater was encountered at a depth of approximately 24.5 feet below grade. The direction of groundwater flow is to the south.

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 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(s) under the Brownfield Cleanup Agreement is a/are Volunteer(s). The Applicant(s) does/do not have an obligation to address off-site contamination. However, the Department has determined that this site does not pose a significant threat to public health or the environment; 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

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:

petroleum products	benzo(b)fluoranthene
1,2-dichloroethane	indeno(1,2,3-CD)pyrene
benzene	lead
toluene	barium
ethylbenzene	tetrachloroethene (PCE)
xylene (mixed)	heptane
benzo(a)anthracene	mercury
benzo(a)pyrene	trichloroethene (TCE)

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.

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), and pesticides. Based on investigations conducted to date, the primary contaminants of concern at the site are volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals.

Soil - Soil exhibiting petroleum impacts was observed in the southern portion of Lot 3 near the suspected underground storage tank (UST). The chlorinated solvent 1,2-dichloroethane (1,2-DCA) was detected at a maximum concentration of 0.052 parts per million (ppm) compared to the protection of groundwater soil cleanup objective (PGWSCO) of 0.020 ppm. Petroleum compounds (benzene, ethylbenzene, toluene, xylene) were detected in soil near the suspected UST at concentrations above their respective PGWSCOs. Benzene was detected at a maximum concentration of 4.43 ppm compared to the PGWSCO of 0.06 ppm; ethylbenzene was detected at a maximum concentration of 11.1 ppm compared to the PGWSCO of 1 ppm; toluene was detected at a maximum concentration of 26.9 ppm compared to the PGWSCO of 0.7 ppm; and xylene was detected at a maximum concentration of 73.2 ppm compared to the PGWSCO of 0.26 ppm. No VOCs were detected at concentrations exceeding their respective restricted residential use soil cleanup objectives (RRUSCOs). However, since several of these compounds were also detected in groundwater (see below) the PGWSCO is applicable. SVOCs were identified at concentrations exceeding RRUSCOs within the fill layer throughout the site. SVOCs, specifically polycyclic aromatic hydrocarbons (PAHs), were detected in up to four soil samples at concentrations exceeding their respective RRSCOs, including: benzo(a)anthracene detected at a maximum concentration of 2.45 ppm, benzo(a)pyrene at a maximum concentration of 2.78 ppm, benzo(b)fluoranthene at a maximum concentration of 4.08 ppm, dibenzo(a,h)anthracene at a maximum concentration of 0.79 ppm, and indeno[1,2,3-cd]pyrene at a maximum concentration of 2.86 ppm. Metals were identified in shallow soil throughout the site. In shallow soil, lead was detected at up to 752 ppm (compared to the RRSCO of 400 ppm); barium was detected at up to 655 ppm (RRSCO of 400 ppm); and mercury was detected at up to 5 ppm (RRSCO of 0.81 ppm). No PCBs or pesticides were detected at concentrations exceeding their respective RRSCOs. The elevated levels of petroleum-related VOCs, SVOCs, petroleum staining, and odors appear to be associated with the former use of the site as a gasoline station. The highest concentration of petroleum-related compounds was found downgradient of the suspect UST(s) on the southwestern portion of the site. The SVOCs and metals present in the soil appear to be associated with the historic use as a railroad, a gasoline filling station, and subsequent demolition of the former gasoline station building. Data does not indicate any off-site impacts in soil related to this site.

Groundwater - In groundwater, VOCs, SVOCs and metals were detected at concentrations exceeding the Ambient Water Quality Standard (AWQS). In groundwater, 1,2-dichloroethane was found at a maximum concentration of 122 parts per billion (ppb) on lot 3 in the vicinity of the suspected UST. Petroleum compounds were detected in a monitoring well located near the suspected UST at concentrations exceeding the AWQS, including: toluene, ethylbenzene and

total xylene detected at maximum concentrations of 50.9 ppb, 33.6 and 235 ppb, respectively, compared to their AWQS of 5 ppb; and benzene detected at a maximum concentration of 212 ppb compared to the AWQS of 1 ppb. Naphthalene was the only SVOC detected on Lot 3 in a monitoring well near the suspected UST at a concentration of 13.2 ppb, which is slightly above its AWQS of 10 ppb. No site-related metals were detected at concentrations above their respective AWQS. No PCBs or pesticides were detected in groundwater. Data does not indicate any off-site impacts in groundwater related to this site.

Soil Vapor - Elevated concentrations of petroleum-related and chlorinated VOCs were present in soil vapor at the site. The highest concentration of trichloroethene (TCE) was identified in an off-site soil vapor sample on the East 156th Street sidewalk immediately adjacent to the site boundary during the September 2016 investigation (up to 1.1 ug/m3 of TCE). Tetrachloroethene (PCE) was detected at a maximum concentration of 114 ug/m3 on Lot 1. The highest concentrations of petroleum-related VOCs in soil vapor (heptane at 1,340,000 ug/m3, hexane at 3,340,000 ug/m3, benzene at 1,010,000 ug/m3, and toluene at 942,000 ug/m3) were found in the vicinity of the suspected UST on Lot 3 on the southwestern portion of the site. Data does not indicate any additional actions are needed to address soil vapor intrusion off-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.*

The site is completely fenced, which restricts public access. However, persons who enter the site could contact contaminants in the soil by walking on the site, digging or otherwise disturbing the soil. 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 overlying 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. The inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern because the site is vacant. However, the potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site redevelopment and occupancy. Environmental sampling indicates soil vapor intrusion is not a concern for off-site buildings as a result of this 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 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 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 4: Restricted use with site-specific soil cleanup objectives remedy.

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

The elements of the selected remedy, as shown in Figures 2 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;

- 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. Excavation

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- underground storage tanks (USTs) and any associated piping or other structures associated with a source of contamination;
- grossly-contaminated soil, as defined in 6NYCRR Part 375-1.2(u); and
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

Soil which exceeds the restricted residential use soil cleanup objectives (SCOs), as defined by 6 NYCRR Part 375-6.8, will be excavated to the extent practical and transported off-site for disposal. Soil will be excavated to a depth of 12 feet below grade surface beneath and around the periphery of the suspect USTs on the southwestern portion of the site (southern portion of Lot 3) and on the southeastern portion of the site; and to a depth of 2 feet below grade surface across the northern portion of Lot 3 and on the northeastern portion of the site.

Confirmation samples will be collected and analyzed to demonstrate achievement of restricted residential use SCOs. Approximately 1,000 cubic yards of contaminated soil will be removed from the site.

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Clean fill meeting the requirements of the 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site. Approximately 2,000 cubic yards of clean fill will be imported to raise the elevation of the rail bed on Lot 1 from 19 feet to 12 feet below grade surface for the partial cellar, and to install the 2-foot clean fill buffer for the cover system for the Site. On-site soil that does not exceed lower of the restricted residential use SCOs or protection of groundwater SCOs for any compound may be used on-site, including below the water table, to backfill the excavation areas or re-grade the Site.

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Groundwater sampling will be conducted to establish pre-remedial baseline conditions at the site and to determine whether groundwater treatment and post-remedial monitoring is needed. Based on the results of the groundwater sampling, in-situ groundwater treatment will be implemented. Prior to the full implementation of in-situ treatment, laboratory and/or on-site pilot scale studies will be conducted to more clearly define design parameters. The method and depth of injection will be determined during the remedial design.

6. Soil Vapor Extraction (SVE)

Soil vapor extraction (SVE) will be implemented to remove volatile organic compounds (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 air extracted from the SVE wells is then treated as necessary prior to being discharged to the atmosphere.

7. Institutional Controls

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, commercial and industrial uses 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 NYCDOH; and
- require compliance with the Department approved Site Management Plan.

8. 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 controls remain in place and effective:

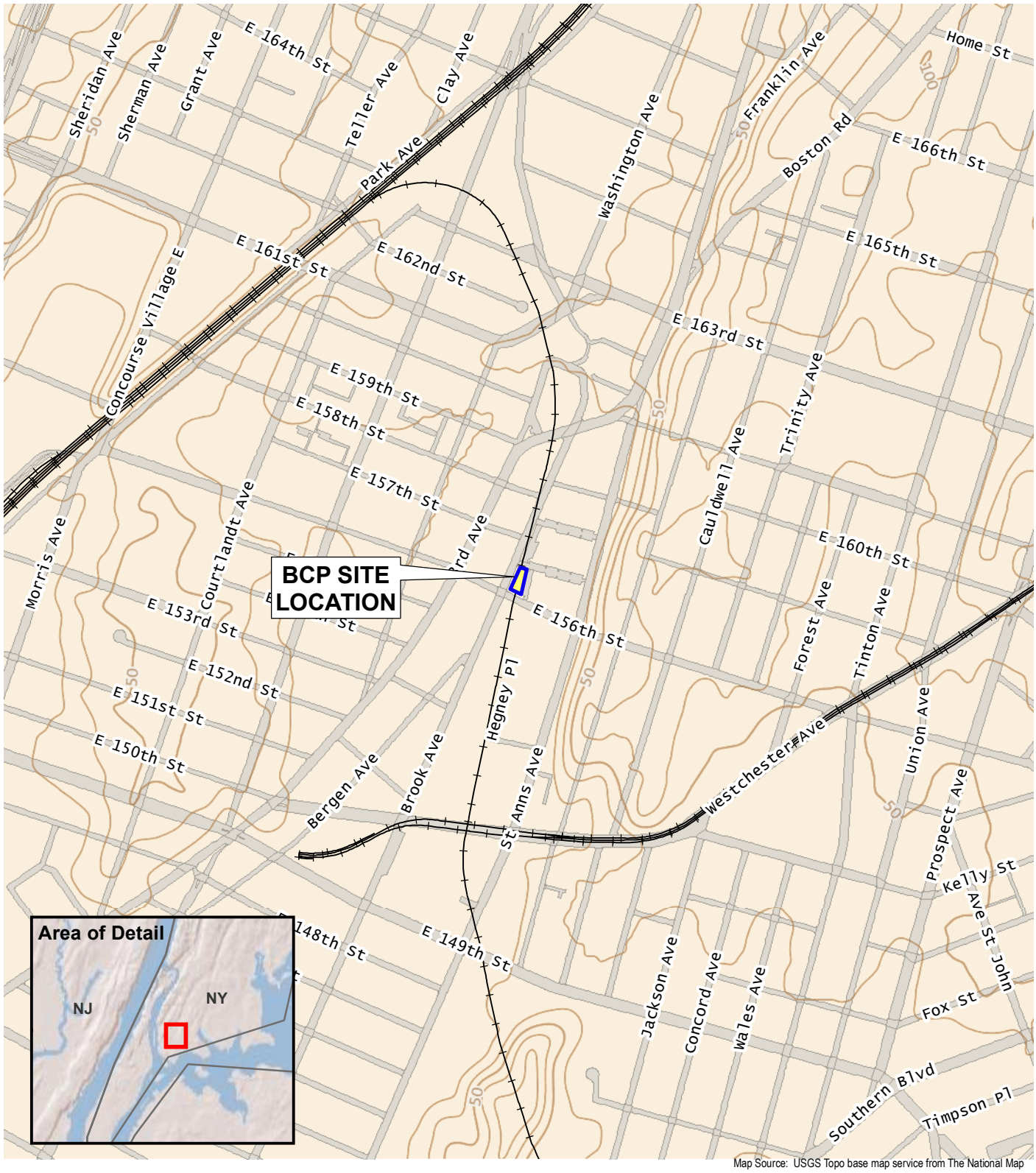
- Institutional Controls: The Environmental Easement discussed above.
- Engineering Controls: The cover system and the SVE system discussed above.

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 use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- 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 to assess the performance and effectiveness of the remedy;
   - a schedule of monitoring and frequency of submittals to the Department; and
   - monitoring for vapor intrusion for any buildings developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

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 may not be limited to:
   - compliance monitoring of treatment 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 the O&M records.



Map Source: USGS Topo base map service from The National Map

0 800 1,600

SCALE IN FEET

	Brook 156 **740 Brook Avenue** Bronx, New York	DATE **2/14/2018**
		PROJECT NO. **11703**
	BROWNFIELD CLEANUP PROGRAM **SITE LOCATION**	FIGURE **1**

LEGEND

- BCP SITE BOUNDARY
- FENCE
- RAIL BED RETAINING WALL
- 1 — LOT BOUNDARY AND TAX LOT NUMBER
- 2360 — TAX BLOCK NUMBER
- PROPOSED BUILDING
- MH — UTILITY MANHOLE
- PROPOSED ENDPOINT SAMPLE LOCATION
- UST — UNDERGROUND STORAGE TANK
- PROPOSED EXCAVATION TO 12' BELOW GRADE
- PROPOSED EXCAVATION TO 2' BELOW GRADE
- UNEXCAVATED AREA

SOURCE: MONTROSE SURVEYING CO., LLP, SURVEY NO. 62510-39, TAX BLOCK 2360, TAX LOTS 1 & 3, REVISED 9/20/2016.

0 25 50
SCALE IN FEET

Brook 156
740 Brook Avenue
Bronx, New York

PROPOSED REMEDIAL EXCAVATION PLAN

DATE
4/23/2018

PROJECT NO.
11703

FIGURE
2

SOURCE: MONTROSE SURVEYING CO., LLP, SURVEY NO. 62510-39, TAX BLOCK 2360, TAX LOTS 1 & 3, REVISED 9/20/2016.

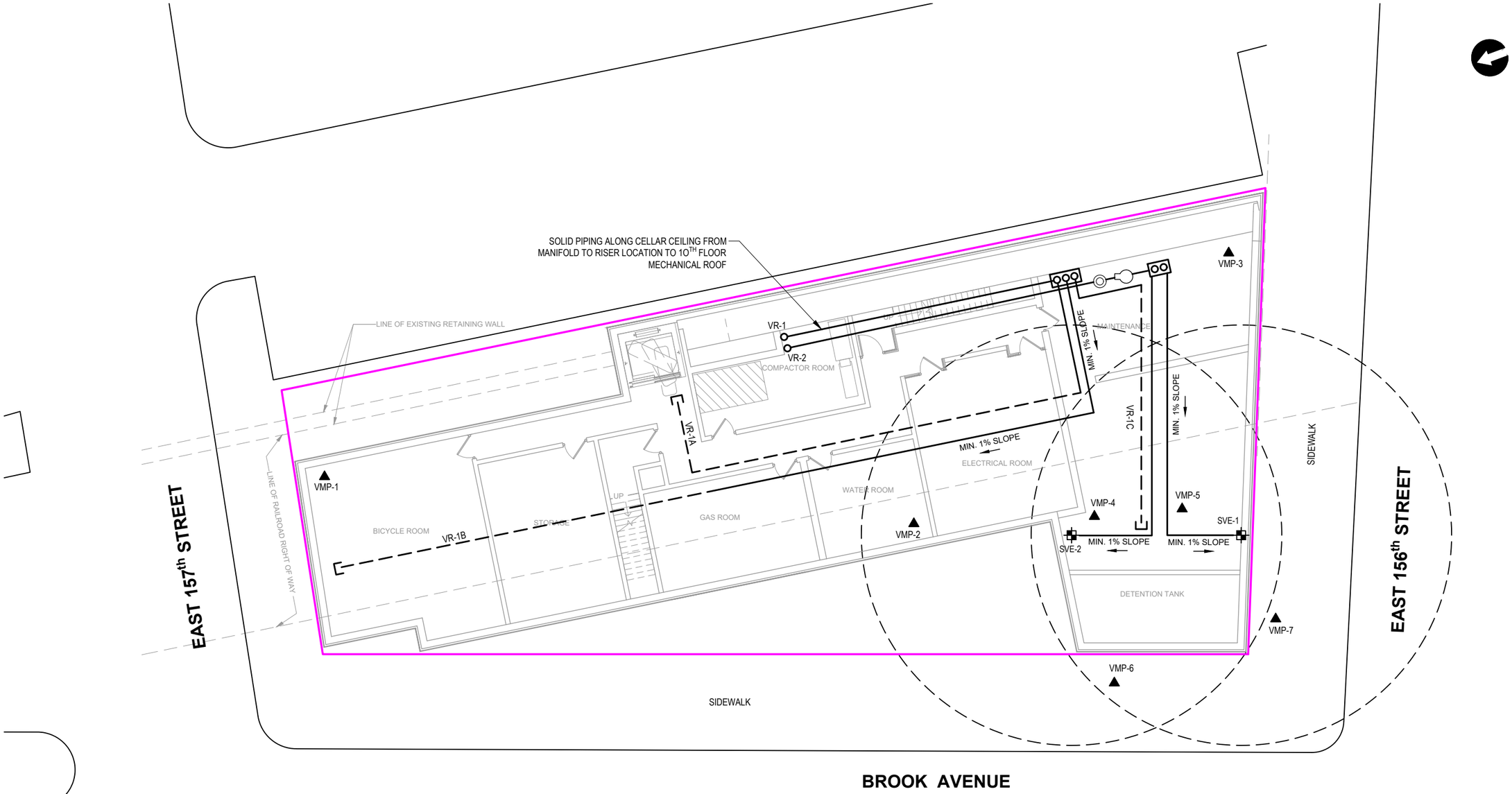
Brook 156
740 Brook Avenue
Bronx, New York

PROPOSED ENDPOINT SAMPLE LOCATION PLAN

DATE
4/23/2018

PROJECT NO.
11703

FIGURE
3



LEGEND

- BCP SITE BOUNDARY
- SLOTTED 0.02" SCHEDULE 40 4" PVC PIPE BENEATH SLAB WITH ENDCAP
- SOLID SCHEDULE 40 4" PVC PIPE BENEATH SLAB
- VMP-1 — MONITORING POINT LOCATION WITH ID
- VR-1 — VERTICAL RISER PENETRATION LOCATION WITH ID
- SLAB PENETRATION / MANIFOLD
- GAC UNITS (TWO IN SERIES)
- BLOWER
- MIN. 1% SLOPE — MINIMUM 1% SLOPE
- PROPOSED SOIL VAPOR EXTRACTION WELL LOCATION WITH ASSUMED MINIMUM 30' RADIUS OF INFLUENCE

0 15 30
SCALE IN FEET

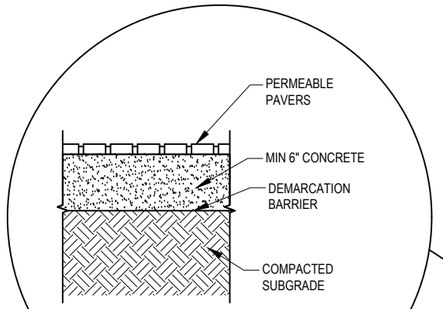
Brook 156
740 Brook Avenue
Bronx, New York

PROPOSED SSDS AND SVE SYSTEM PLAN

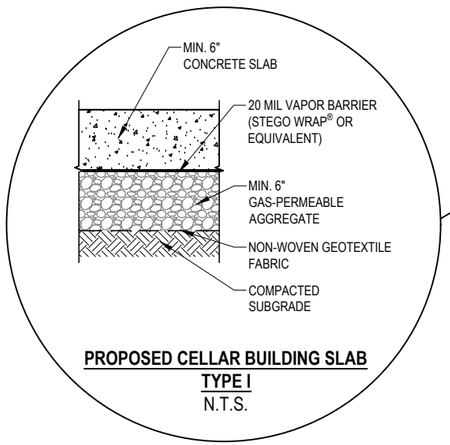
DATE
4/24/2018

PROJECT NO.
11703

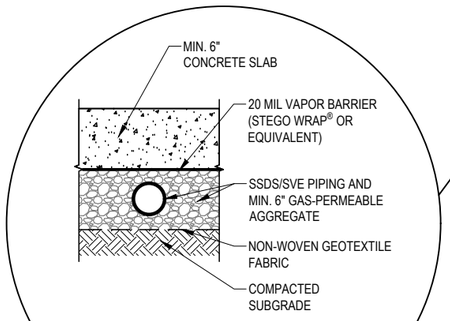
FIGURE
4



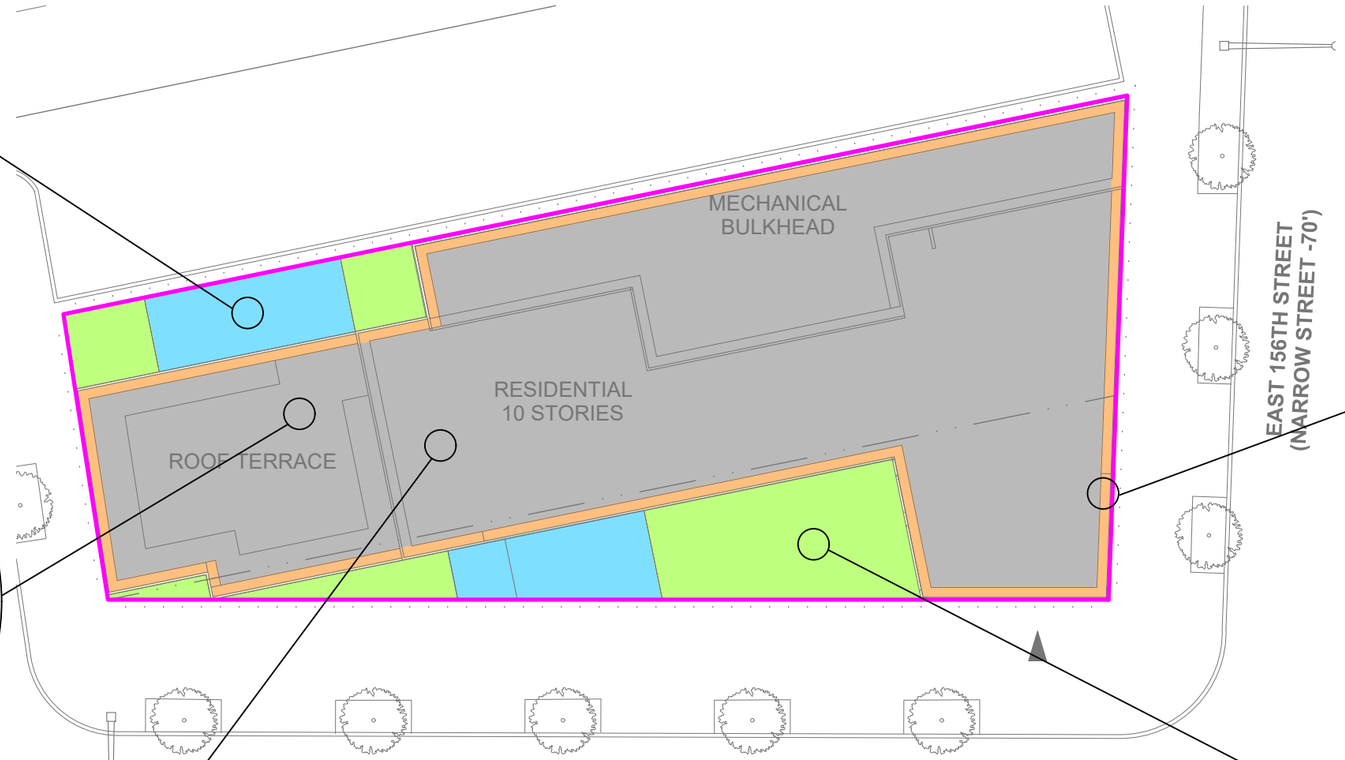
PERMEABLE PAVERS WALKWAY (TYPICAL)
N.T.S.

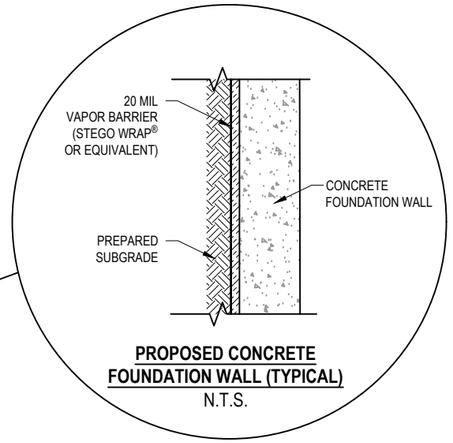


PROPOSED CELLAR BUILDING SLAB TYPE I
N.T.S.

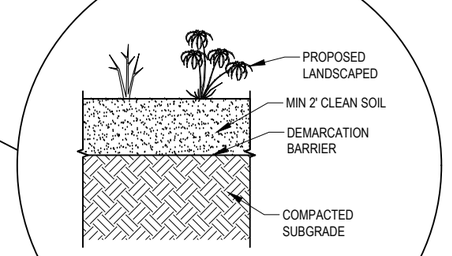


PROPOSED CELLAR BUILDING SLAB TYPE II
N.T.S.





PROPOSED CONCRETE FOUNDATION WALL (TYPICAL)
N.T.S.



LANDSCAPED AREA (TYPICAL)
N.T.S.

LEGEND

- BCP SITE BOUNDARY
- PROPOSED LANDSCAPED AREAS WITH 2' CLEAN FILL BUFFER
- PROPOSED PERMEABLE PAVER WALKWAYS
- PROPOSED CELLAR BUILDING SLAB
- PROPOSED FOUNDATION WALL

0 20 40
SCALE IN FEET

Brook 156
740 Brook Avenue
Bronx, New York

COMPOSITE COVER SYSTEM PLAN

DATE
4/23/2018

PROJECT NO.
11703

FIGURE
5