

DECISION DOCUMENT

Former Chesebrough Manufacturing
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224302
August 2023



**Department of
Environmental
Conservation**

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

DECLARATION STATEMENT - DECISION DOCUMENT

Former Chesebrough Manufacturing
Brownfield Cleanup Program
Brooklyn, Kings County
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Statement of Purpose and Basis

This document presents the remedy for the Former Chesebrough Manufacturing 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 (NYSDEC) for the Former Chesebrough Manufacturing site and the public's input to the proposed remedy presented by NYSDEC.

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 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. Excavation

The existing on-site building will be demolished and materials which cannot be beneficially reused on site will be taken off-site for proper disposal in order to implement the remedy.

Excavation and off-site disposal of contaminant source areas will include:

- three hot spots to a depth of ten feet below grade (ft-bg) with grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soil exceeding the 6 NYCRR Part 371 hazardous criteria for lead;
- any underground storage tanks (USTs), fuel dispensers, underground piping or other structures;
- soil with non-aqueous phase liquid; and
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards.

Excavation and off-site disposal of on-site soils outside the proposed building footprint which exceed restricted-residential SCOs (RRSCOs), as defined by 6 NYCRR Part 375-6.8, in the upper one or two feet to allow for placement of the site cover noted in Paragraph 5, below.

Additional excavation of site soils to a depth of four ft-bg in the portion of the site subject to the in-situ solidification (ISS) treatment is described in remedy element 3. Approximately 3,100 cubic yards of contaminated soil will be removed from the site.

Collection and analysis of confirmation samples at the remedial excavation depth will be used to verify that SCOs for the site have been achieved. If confirmation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify NYSDEC, submit the sample results and, in consultation with NYSDEC, determine if further remedial excavation is necessary. Further excavation for development will proceed after confirmation samples demonstrate that SCOs for the site have been achieved.

To ensure proper handling and disposal of excavated material, waste characterization sampling will be completed for all identified contaminated site material. Waste characterization sampling will be performed exclusively for the purposes of off-site disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws, rules, and regulations and facility-specific permits.

3. In Situ Solidification

An in-situ solidification (ISS) program will be implemented in the southeast portion of the site to address petroleum-contaminated and hazardous lead soil identified in this area. ISS is a process that binds the soil particles in place creating a low permeability mass. The contaminated soil will be mixed in place together with solidifying agents (typically Portland cement) or other binding agents using an excavator or augers. The soil and binding agents are mixed to produce a solidified mass resulting in a low permeability monolith. The solidified mass will then be covered with a cover system as described in Paragraph 5 to prevent direct exposure to the solidified mass. The resulting solid matrix reduces or eliminates mobility of contamination and reduces or eliminates the matrix as a source of groundwater contamination. It is anticipated that soil mixing for the ISS will be conducted across an approximately 110 foot by 100-foot area to a depth of approximately 20 ft-bg. An approximately 4-foot soil cut will need to be excavated in this area to contain the ISS spoils and increased soil volume created by the soil mixing.

4. Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d)(1) will be brought in to replace the excavated soil and establish the designed grades at the site. Approximately 1,500 cubic yards of clean fill will be imported to backfill the source area excavations and approximately 4,500 cubic yards of clean fill will be imported to raise the elevation beneath the proposed building out of the flood plain to facilitate installation of the cover system.

5. Cover System

A site cover will be required in areas where the upper two feet of exposed surface soil will exceed the applicable SCOs, to allow for restricted residential use of the site. 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.

6. Vapor Mitigation

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

7. 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 NYSDEC 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 NYCDOHMH; and
- require compliance with NYSDEC 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 and/or engineering controls remain in place and effective:
 - Institutional Controls: The Environmental Easement discussed in Paragraph 7 above.
 - Engineering Controls: The Cover System discussed in Paragraph 5 and the Vapor Mitigation system discussed in Paragraph 6.

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;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 5 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:

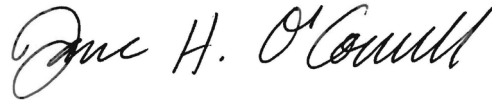
- monitoring of groundwater to assess the performance and effectiveness of the remedy;
 - a schedule of monitoring and frequency of submittals to NYSDEC.
- c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the active vapor mitigation system. The plan includes, but is not limited to:
- procedures for operating and maintaining the system; and
 - compliance inspection of the system to ensure proper O&M as well as providing the data for any necessary reporting.

The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until NYSDEC 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.

August 14, 2023



Date

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

DECISION DOCUMENT

Former Chesebrough Manufacturing
Brooklyn, Kings County
Site No. C224302
August 2023

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (NYSDEC), 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.

NYSDEC 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

NYSDEC 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 NYSDEC 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=C224302>

Brooklyn Public Library - Red Hook Library
7 Wolcott Street
Brooklyn, NY 11231
Phone: (718) 935-0203

Brooklyn Community Board 6
250 Baltic Street
Brooklyn, NY 11201
Phone: (718) 643-3027

Receive Site Citizen Participation Information By Email

Please note that NYSDEC'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 46 Verona Street in the Red Hook section of Brooklyn, NY in a mixed residential, commercial, and manufacturing-zoned area. The site is bounded to the north by Delavan Street, followed by warehouses; to the south by Verona Street, followed by Coffey Park; to the east by an apartment building; and to the west by Richards Street, followed by warehouses.

Site Features:

The site is an approximately 1.38-acre property consisting of a vacant, concrete-paved lot in the western portion, and an approximately 23,500-square foot, one-story vacant warehouse with a small partial basement and an adjacent gravel-covered area in the eastern portion.

Current Zoning and Land Use:

The site is zoned R6 (residential). The surrounding area is predominantly commercial and manufacturing related.

Past Use of the Site:

Historically, the entire site was developed with a Vaseline factory between 1886 and 1904. The eastern portion of the site was later occupied by a ship repair/marine services operation between 1915 and 1986, occupying the current warehouse building by 1938. The warehouse contained a machine shop between 1938 and 2007 and was most recently used as a lumber yard. The western portion of the site contained unspecified manufacturing between 1915 and 1938, was used for steel plate storage between 1950 and 1980 and consisted of a vacant lot used for trailer parking between 1981 and 2007. Historic records also indicate use by a chemical company in 1928 and potential storage of construction and demolition debris in the western half of the site between 1999 and 2001. The site has been vacant since 2007.

Site Geology and Hydrology:

The site lies at elevations ranging from approximately 8 to 10 feet above the North American Vertical Datum of 1988 (NAVD 1988). Surface topography slopes gently down toward the north.

Historic fill (sand, silt, and gravel, with varying amounts of brick, ash, concrete, glass, and wood) was observed extending from ground surface down to depths ranging from approximately 9 to 16 feet below grade (ft-bg). The fill is underlain by an approximately 1- to 4-foot-thick silt and clay layer containing peat/organics (potential marshland deposits) at most locations, followed by fine sand with silt down to at least 20 ft-bg (the maximum boring depth). The top of the silt/clay layer was generally encountered at depths of 11 to 15 ft-bg but was somewhat deeper (approximately 16 to 17.5 ft-bg) under the southeastern portion of the warehouse. Bedrock was not encountered during the remedial investigation activities.

Groundwater ranges from a depth of approximately 6 to 8 ft-bg and flows in a westerly direction with a localized low point in the western portion of the site.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

NYSDEC 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 Volunteer. The Applicant does not have an obligation to address off-site contamination. However, NYSDEC 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. NYSDEC 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:

benzo(a)anthracene	cadmium
benzo(a)pyrene	lead
benzo(b)fluoranthene	mercury
benzo(k)fluoranthene	cyanides(soluble cyanide salts)
arsenic	xylene (mixed)
barium	benzene

isopropylbenzene
n-propylbenzene
tetrachloroethene (PCE)
trichloroethene (TCE)

1,1,1-Trichloroethane(TCA)
butane
indeno(1,2,3-cd)pyrene

The contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil

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 for the site are petroleum-related VOCs, SVOCs, and metals in soil; petroleum-related VOCs and metals in groundwater; and petroleum-related and chlorinated VOCs in soil vapor.

Soil - Soil samples were compared against the restricted residential soil cleanup objectives (RRSCOs) as well as the protection of groundwater SCOs (PGWSCOs) for VOCs only. For VOCs, benzene was detected at a maximum concentration of 0.14 parts per million (ppm) (PGWSCO of 0.06 ppm) and total xylenes were detected at 2.6 ppm (PGWSCO of 1.6 ppm). SVOCs detected at concentrations exceeding RRSCOs include benzo(a)anthracene up to 79 ppm (RRSCO is 1 ppm), benzo(a)pyrene up to 67 ppm (RRSCO is 1ppm), benzo(b)fluoranthene up to 100 ppm (RRSCO is 1ppm), dibenzo(a,h)anthracene up to 9.8 ppm (RRSCO is 0.33 ppm), benzo(k)fluoranthene up to 33 ppm (RRSCO is 3.9 ppm), chrysene up to 75 ppm (RRSCO is 3.9 ppm), fluoranthene up to 160 ppm (RRSCO is 100 ppm), indeno(1,2,3-c,d)pyrene up to 43 ppm (RRSCO is 0.5 ppm), phenanthrene up to 130 ppm (RRSCO is 100 ppm), and pyrene up to 140 ppm (RRSCO is 100 ppm).

Total polychlorinated biphenyls (PCBs) were detected in one sample with a concentration of 1.1 ppm exceeding the RRSCO of 1 ppm.

Metals detected at concentrations exceeding the RRSCOs include arsenic up to 80.1 ppm (RRSCO is 16 ppm), barium up to 428 ppm (RRSCO is 400 ppm), cadmium up to 11.1 ppm (RRSCO is 4.3 ppm), copper up to 840 ppm (RRSCO is 270 ppm), lead up to 4,770 ppm (RRSCO is 400 ppm), mercury up to 19.1 ppm (RRSCO is 0.81 ppm) and cyanide at 41.6 ppm (RRSCO is 27 ppm).

The PFAS perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) were not detected at concentrations exceeding their respective restricted residential guidance values. 1,4-dioxane was not detected above laboratory reporting limits in any of the soil samples analyzed.

Lead was detected at concentrations exceeding the hazardous threshold for toxicity of 5 ppm (6NYCRR Part 371.3(e)), via the toxicity characteristic leaching procedure (TCLP) in six soil samples located in the southeastern section of the site, with concentrations ranging from 7.6 to 93.8 ppm.

Evidence of gross petroleum contamination such as petroleum-like odors, elevated photoionization detector (PID) readings, and/or the presence of non-aqueous phase liquid (NAPL) was observed in soil in the southern half of the former warehouse. In general, the contamination extended from a few feet above the groundwater interface (approximately 7 to 8 ft-bg) to approximately 12 to 13 ft-bg, with NAPL observed as deep as 16 to 17 ft-bg in 2 borings. There were also 3 hot spots exhibiting similar contamination identified in the western portion of the site at depths up to 10 ft-bg.

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

Groundwater - VOCs were detected in groundwater at concentrations exceeding NYSDEC Class GA Ambient Water Quality Standards and Guidance Values (AWQSGV) including benzene at a maximum concentration of 34.3 parts per billion (ppb) (AWQSGV is 0.06 ppb), isopropylbenzene at 5.4 ppb (AWQSGV is 5 ppb), and n-propylbenzene at 7 ppb (AWQSGV is 5 ppb).

The SVOC hexachloroethane was detected in one groundwater sample at a concentration of 44 ppb, above the AWQSGV of 5 ppb.

No PCBs or pesticides were detected above laboratory reporting limits in any of the groundwater samples.

PFOA was detected in all groundwater samples at concentrations ranging from 20 to 69.8 parts per trillion (ppt) (AWQSGV is 6.7 ppt), and PFOS was detected in one sample at a concentration of 10.8 ppt (AWQSGV is 2.7 ppt). 1,4-dioxane was not detected above laboratory reporting limits in any of the groundwater samples analyzed.

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

Soil Vapor – Several petroleum-related VOCs were detected in soil vapor, most notably n-butane detected at a maximum concentration of 2,600 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Chlorinated VOCs include trichloroethene detected at a maximum concentration of 5,200 $\mu\text{g}/\text{m}^3$, 1,1,1-trichloroethane at a maximum concentration of 3,800 $\mu\text{g}/\text{m}^3$ and tetrachloroethene at a maximum concentration of 220 $\mu\text{g}/\text{m}^3$. Off-site soil vapor samples indicated no elevated concentrations of VOCs.

Data does not indicate any off-site impacts to 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*.

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, 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. Because the site is vacant, the inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern, however, could represent an exposure concern in future buildings on-site. Environmental sampling indicates soil vapor intrusion is not a concern for 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

- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated 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 Soil Excavation and Solidification, Site Cover and Soil Vapor Mitigation 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;
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- 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 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. Excavation

The existing on-site building will be demolished and materials which cannot be beneficially reused on site will be taken off-site for proper disposal in order to implement the remedy.

Excavation and off-site disposal of contaminant source areas will include:

- three hot spots to a depth of ten feet below grade (ft-bg) with grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soil exceeding the 6 NYCRR Part 371 hazardous criteria for lead;
- any underground storage tanks (USTs), fuel dispensers, underground piping or other structures;
- soil with non-aqueous phase liquid; and
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards.

Excavation and off-site disposal of on-site soils outside the proposed building footprint which exceed restricted-residential SCOs (RRSCOs), as defined by 6 NYCRR Part 375-6.8, in the

upper one or two feet to allow for placement of the site cover noted in Paragraph 5, below. Additional excavation of site soils to a depth of four ft-bg in the portion of the site subject to the in-situ solidification (ISS) treatment is described in remedy element 3. Approximately 3,100 cubic yards of contaminated soil will be removed from the site.

Collection and analysis of confirmation samples at the remedial excavation depth will be used to verify that SCOs for the site have been achieved. If confirmation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify NYSDEC, submit the sample results and, and in consultation with NYSDEC, determine if further remedial excavation is necessary. Further excavation for development will proceed after confirmation samples demonstrate that SCOs for the site have been achieved.

To ensure proper handling and disposal of excavated material, waste characterization sampling will be completed for all identified contaminated site material. Waste characterization sampling will be performed exclusively for the purposes of off-site disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws, rules, and regulations and facility-specific permits.

3. In Situ Solidification

An in-situ solidification (ISS) program will be implemented in the southeast portion of the site to address petroleum-contaminated and hazardous lead soil identified in this area. ISS is a process that binds the soil particles in place creating a low permeability mass. The contaminated soil will be mixed in place together with solidifying agents (typically Portland cement) or other binding agents using an excavator or augers. The soil and binding agents are mixed to produce a solidified mass resulting in a low permeability monolith. The solidified mass will then be covered with a cover system as described in Paragraph 5 to prevent direct exposure to the solidified mass. The resulting solid matrix reduces or eliminates mobility of contamination and reduces or eliminates the matrix as a source of groundwater contamination. It is anticipated that soil mixing for the ISS will be conducted across an approximately 110 foot by 100-foot area to a depth of approximately 20 ft-bg. An approximately 4-foot soil cut will need to be excavated in this area to contain the ISS spoils and increased soil volume created by the soil mixing.

4. Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d)(1) will be brought in to replace the excavated soil and establish the designed grades at the site. Approximately 1,500 cubic yards of clean fill will be imported to backfill the source area excavations and approximately 4,500 cubic yards of clean fill will be imported to raise the elevation beneath the proposed building out of the flood plain to facilitate installation of the cover system.

5. Cover System

A site cover will be required in areas where the upper two feet of exposed surface soil will exceed the applicable SCOs, to allow for restricted residential use of the site. 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.

6. Vapor Mitigation

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

7. 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 NYSDEC 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 NYCDOHMH; and
- require compliance with NYSDEC 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 and/or engineering controls remain in place and effective:
 - Institutional Controls: The Environmental Easement discussed in Paragraph 7 above.
 - Engineering Controls: The Cover System discussed in Paragraph 5 and the Vapor Mitigation system discussed in Paragraph 6.

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;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 5 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 to assess the performance and effectiveness of the remedy;
 - a schedule of monitoring and frequency of submittals to NYSDEC.

- 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 active vapor mitigation system. The plan includes, but is not limited to:
 - procedures for operating and maintaining the system; and
 - compliance inspection of the system to ensure proper O&M as well as providing the data for any necessary reporting.

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

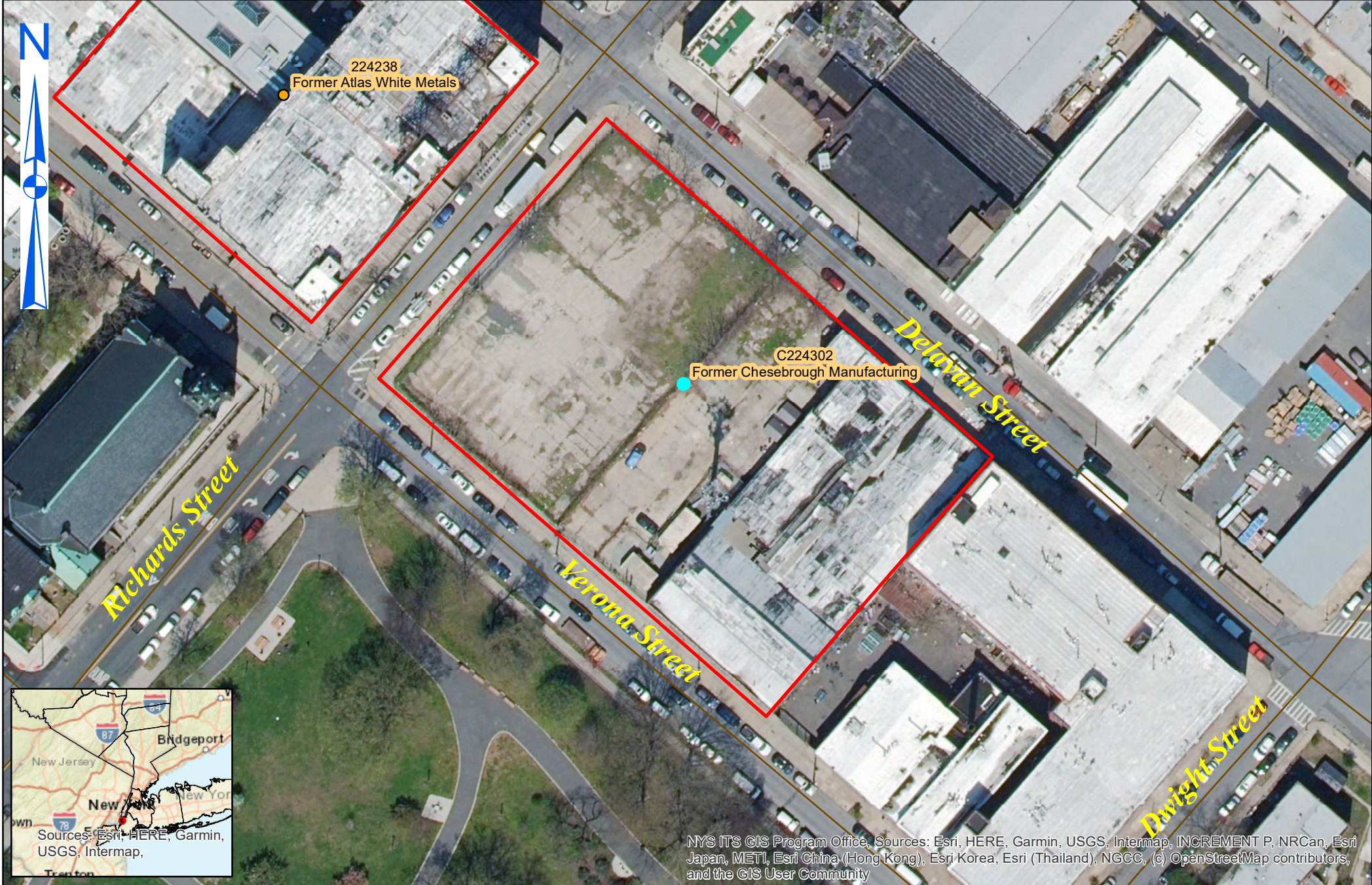
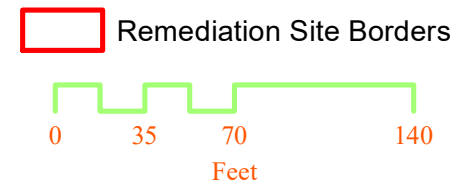


Figure 1 - Site Location Map
Former Chesebrough Manufacturing
Site No. C224302

Legend



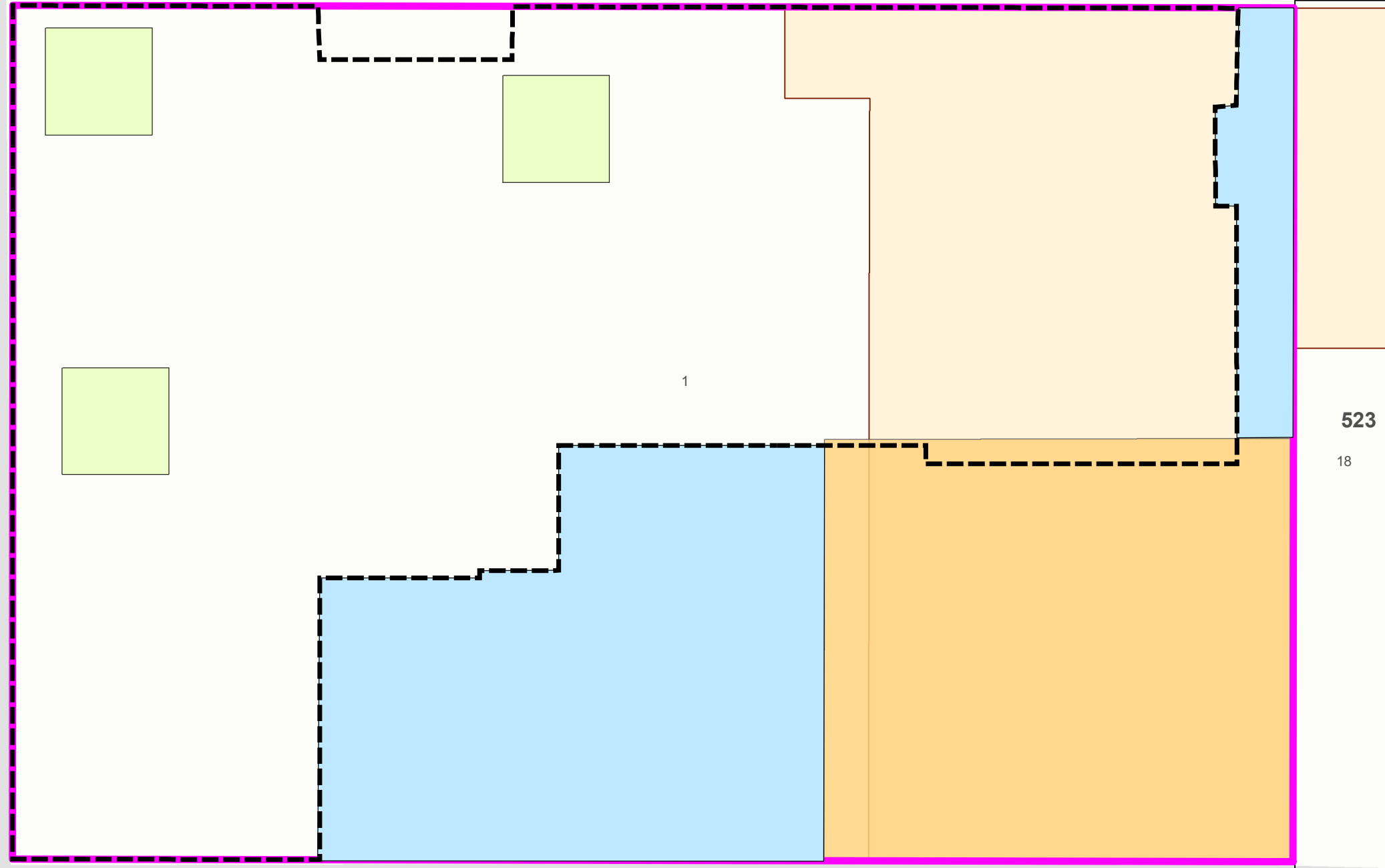
**Department of
 Environmental
 Conservation**

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Richards St








Delavan St

Verona St



PLAN NORTH

LEGEND

-  PROJECT SITE BOUNDARY
-  LOT BOUNDARY AND TAX LOT NUMBER
- 523** BLOCK NUMBER
-  EXISTING BUILDING
-  PROPOSED NEW BUILDING
-  GENERAL CUT OUTSIDE OF BUILDING FOOTPRINT - EXCAVATION TO APPROXIMATELY 1 FOOT BELOW GRADE
-  PETROLEUM-CONTAMINATED SOIL REMOVAL AREA - EXCAVATION TO APPROXIMATELY 9 TO 10 FEET BELOW GRADE (2 FEET BELOW GROUNDWATER)
-  EXTENT OF GROSSLY CONTAMINATED SOIL - EXCAVATION TO APPROXIMATELY 4 FEET BELOW GRADE (PRIOR TO ISS)

NOTE:
 EXCAVATION FOR INSTALLATION OF SSDS/SITE CAP INSIDE THE PROPOSED BUILDING FOOTPRINT IS NOT REQUIRED. NEW BUILDING SLAB WILL BE APPROXIMATELY 3 FEET ABOVE CURRENT GRADE DUE TO THE SITE'S LOCATION IN A FLOOD ZONE.



SCALE IN FEET

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database



440 Park Avenue South, New York, NY 10016

Former Chesebrough Manufacturing
 46 Verona Street
 Brooklyn, New York

PROPOSED EXTENTS OF REMEDIAL EXCAVATION AREAS

DATE

4/7/2023

PROJECT NO.

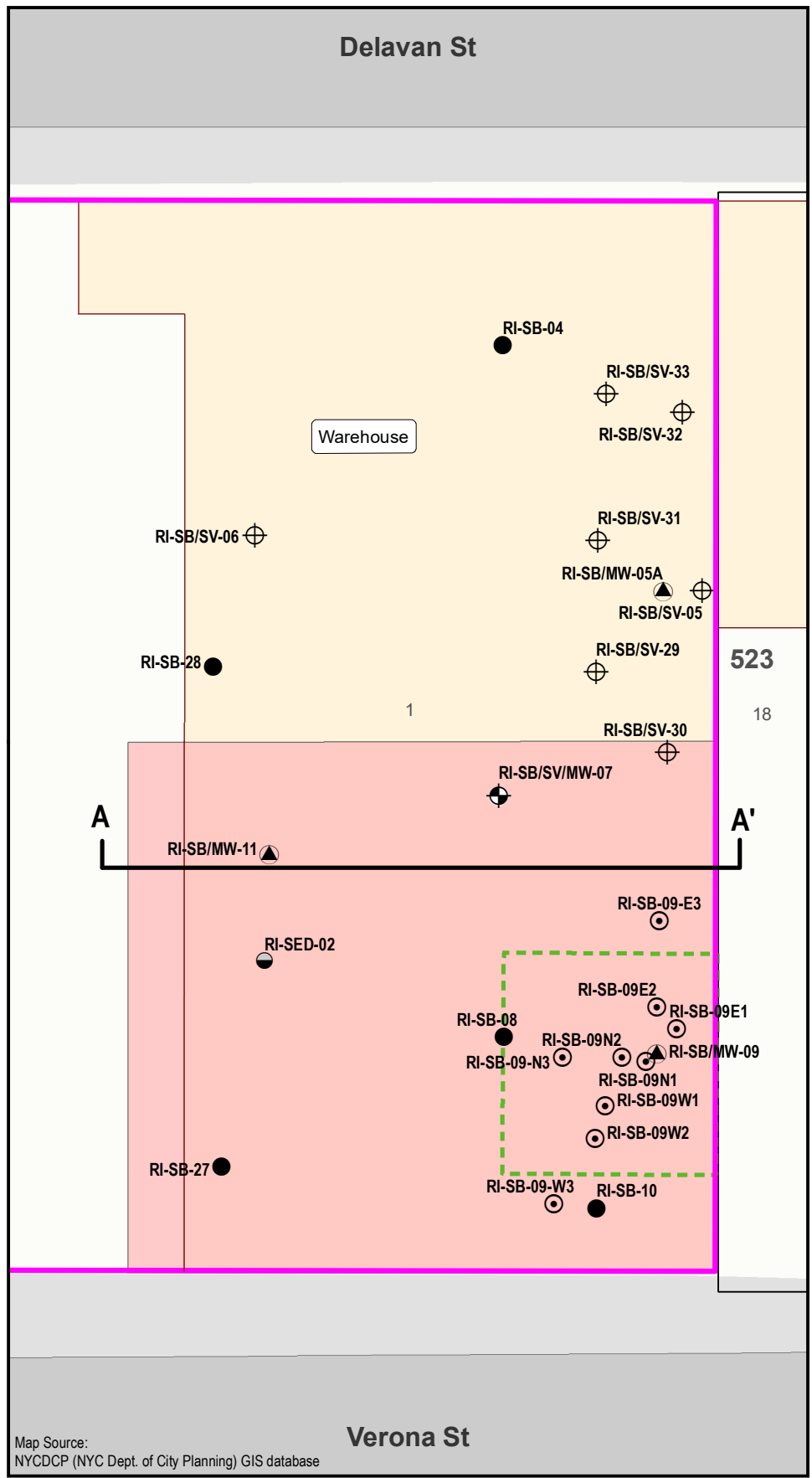
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FIGURE

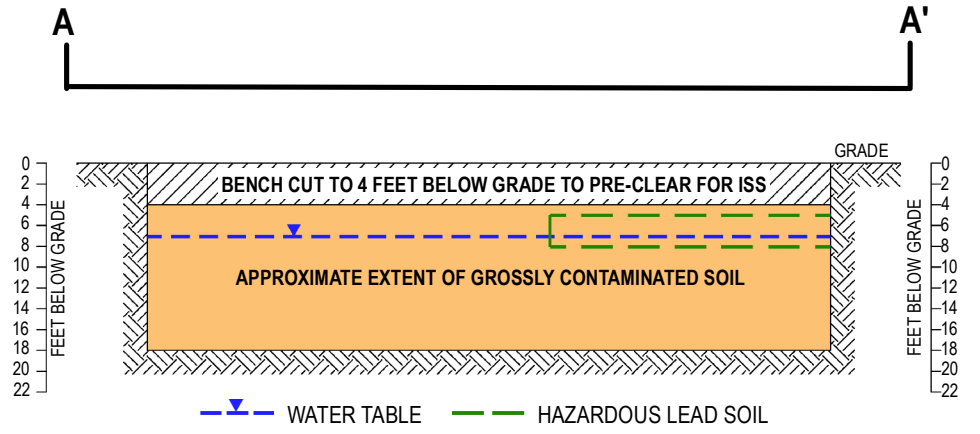
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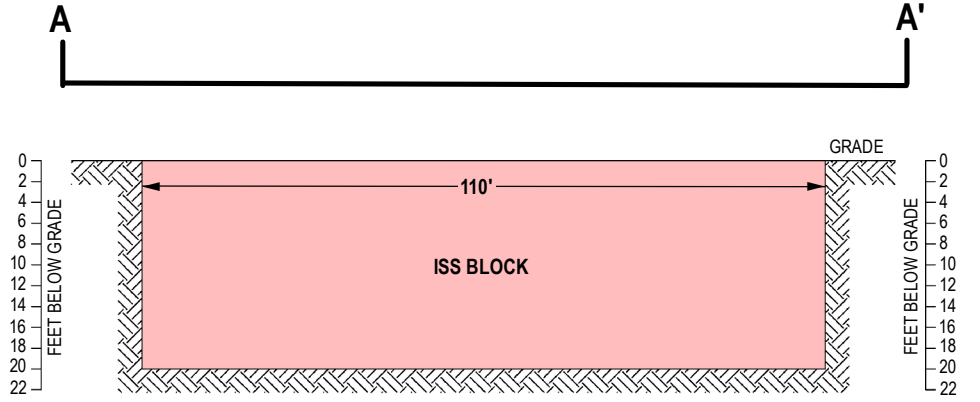
©2023 AKRF. C:\Projects\200283.11 - K680 - 21-31 AND 35 DELAVAN STREET\Technical\GIS and Graphics\SAR\RAW\200283-11 Fig 14 Proposed In-Situ Solidification Plan.mxd 4/7/2023 2:58:24 PM nveilleux



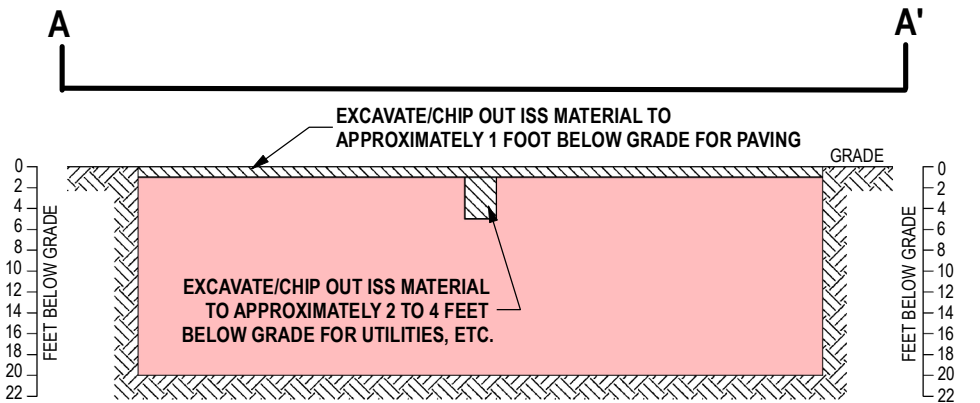
DETAIL 1
Extent of ISS Area
SCALE: 1" = 30'



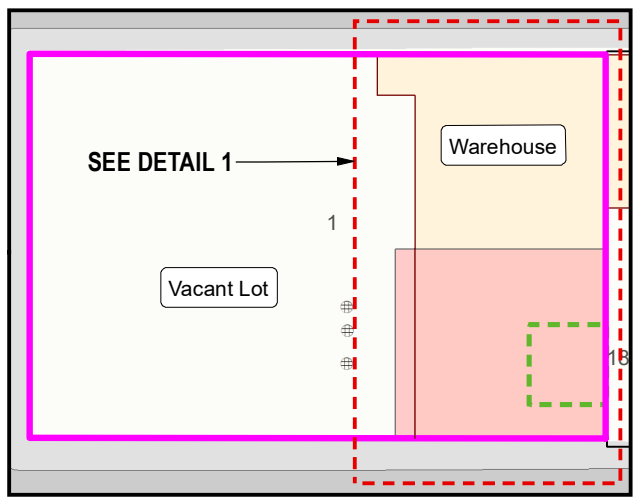
DETAIL 2
Cross Section A-A' - Prior to ISS
NOT TO SCALE



DETAIL 3
Cross Section A-A' - After ISS
NOT TO SCALE



DETAIL 4
Cross Section A-A' - After ISS and Chipping Out to Subgrades
NOT TO SCALE



KEY MAP
SCALE: 1" = 100'



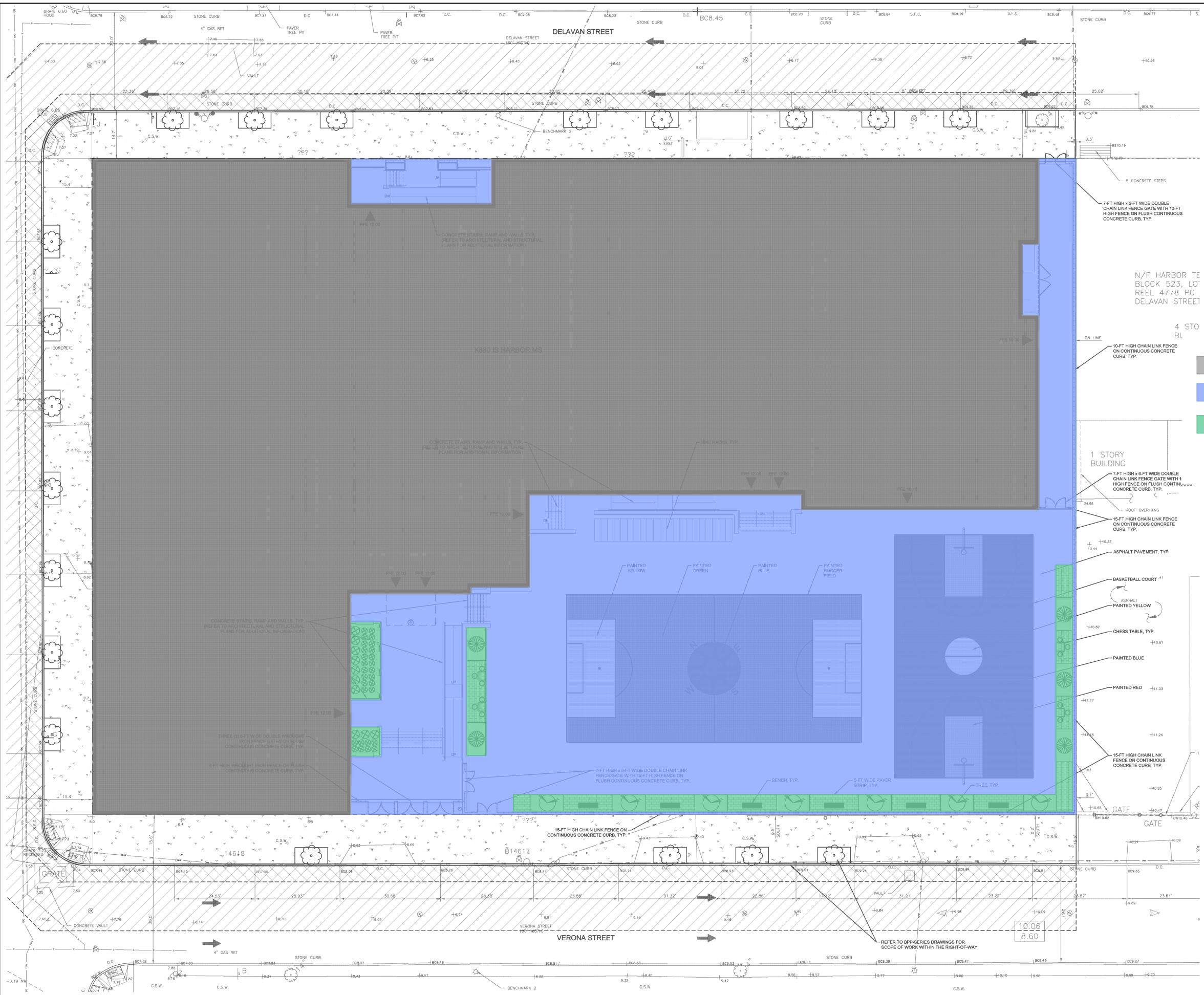
LEGEND

- PROJECT SITE BOUNDARY
- 1 LOT BOUNDARY AND TAX LOT NUMBER
- 523** BLOCK NUMBER
- EXISTING BUILDING
- ⊕ APPROXIMATE LOCATION OF STORM DRAIN
- APPROXIMATE EXTENT OF HAZARDOUS LEAD SOIL/FILL
- PROPOSED EXTENT OF IN-SITU SOLIDIFICATION (ISS) AREA
- ⊙ DELINEATION SOIL BORING LOCATION
- SOIL BORING LOCATION
- ▲ SOIL BORING/MONITORING WELL LOCATION
- ⊕ SOIL BORING/SOIL VAPOR POINT LOCATION
- ⊕ SOIL BORING/SOIL VAPOR POINT/MONITORING WELL LOCATION
- SEDIMENT SAMPLE LOCATION



DATE	4/7/2023
PROJECT NO.	200283.11
FIGURE	3

©2022 AKRF, Inc. W:\Projects\200283.11 - K880 - 21-31 AND 35 DELAVAN STREET\Technical\Hazmat\CAD\RAWP\200283-11 Fig 13 Proposed Composite Cover System.dwg last save: jzsalus 10/6/2022 9:28 AM



- LEGEND**
- 6-INCH CONCRETE BUILDING SLAB
 - ASPHALT OR CONCRETE PAVEMENT
 - PERMEABLE PAVERS/LANDSCAPED AREA WITH MINIMUM 2-FOOT CLEAN SOIL

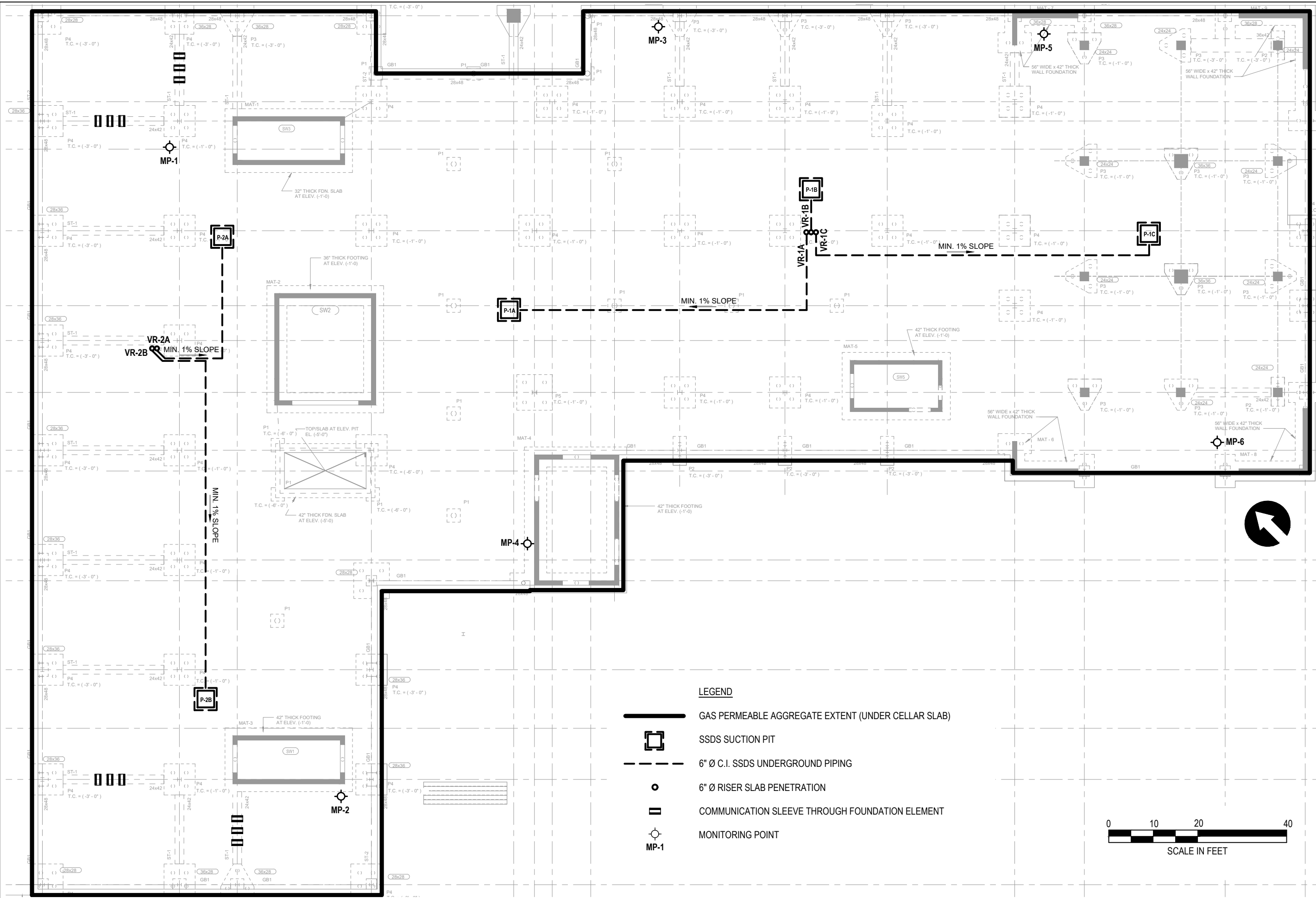


Former Chesebrough Manufacturing
46 Verona Street
 Brooklyn, New York



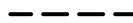



PROPOSED COMPOSITE COVER SYSTEM

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 440 Park Avenue South, New York, NY 10016

DATE	10/6/2022
PROJECT NO.	200283.11
FIGURE	4



LEGEND

-  GAS PERMEABLE AGGREGATE EXTENT (UNDER CELLAR SLAB)
-  SSDS SUCTION PIT
-  6" Ø C.I. SSDS UNDERGROUND PIPING
-  6" Ø RISER SLAB PENETRATION
-  COMMUNICATION SLEEVE THROUGH FOUNDATION ELEMENT
-  MONITORING POINT



Former Chesebrough Manufacturing
46 Verona Street
 Brooklyn, New York



DATE	10/4/2022
PROJECT NO.	200283.11
FIGURE	5