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ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES (ABCA)

67-71 Minerva Street
and
147 Caroline Street
Derby, Connecticut 06418

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1.0 INTRODUCTION AND BACKGROUND

BL Companies has prepared this Analysis of Brownfields Cleanup Alternatives (ABCA) on behalf of the City of Derby, Connecticut (the "City"), Cedar Village Minerva Square, LLC (the "Developer"), and the Naugatuck Valley Council of Governments (NVCOG) for the 67-71 Minerva Street and 147 Caroline Street properties (hereafter collectively referred to as the "Site") located in Derby, Connecticut. The ABCA was prepared in support of funding from the Environmental Protection Agency (EPA) to provide grant funding to facilitate the cleanup and redevelopment of the 67-71 Minerva Street parcel. There is no known soil and/or groundwater contamination or Hazardous Building Materials (HBM) present on the 147 Caroline Street parcel.

The ABCA identifies areas of the 67-71 Minerva Street parcel requiring remedial actions for contaminated soil and applicable cleanup standards; provides information regarding the degree of impacts; the nature and extent of contaminants of concern; and provides an analysis of reasonable alternatives, taking into account such factors as effectiveness, implementability, costs, and sustainability; and identifies preferred cleanup methods.

1.1 Site Location and Description

The Site consists of two parcels of land identified in the City of Derby Tax Records as 67-71 Minerva Street and 147 Caroline Street in Derby, Connecticut, respectively. The 67-71 Minerva Street parcel is located between Minerva Street (to the west) and Caroline Street (to the east). The 147 Caroline Street parcel is located to the east of the 67-71 Minerva Street parcel, across Caroline Street. A Site Location Map is included in Appendix A. Figures detailing the proposed redevelopment plan ("Master Plan of Development / Final Detail Plans, 67-71 Minerva Street Derby, Connecticut, Cedar Village at Minerva Square", dated December 15, 2020 by Rose Tiso & Co., LLC) are included in Appendix B.

<u>67-71 Minerva Street</u>: The parcel is currently vacant and located in an area of residential and commercial land usage.

An asphalt parking area is present on the southern portion of the parcel, near the intersection of Third Street and Caroline Street.

The section of the parcel along Minerva Street is currently vacant with overgrown vegetation and remnants of a former basement.

The parcel was formerly occupied by a commercial/industrial building. Remnants of the former Site building currently include concrete flooring, former basement area, intact walls on the eastern, southern, and western sides, portions of the northern wall, and a roof.

Access to the parcel is provided from a fenced, paved yard that extends from the building to the adjoining street (Third Street) to the south, and from a driveway located in the northeastern portion of the property.

A Site Plan (SP-1) and Site Investigation Plan (SI-01) for the 67-71 Minerva Street parcel are included in Appendix C.

147 Caroline Street: The parcel currently consists of an asphalt-paved parking lot utilized for parking by neighbors. The condition of the paving is poor and unpaved areas of the parcel are overgrown.

1.2 Previous Site Uses

67-71 Minerva Street: The parcel was originally developed with residences (from at least 1886 to 1901) and was redeveloped for commercial/industrial use in 1906. Post-1906 historical operations at the parcel included automotive repair, auto body repair, and industrial/manufacturing facility operations until approximately 2003. The parcel has been vacant for almost twenty years.

147 Caroline Street: The parcel appears to have been developed with a residential dwelling from at least 1886 through the late 1970s, when the building was razed. The parcel has consisted of an asphalt-paved parking lot with wooded/overgrown land since at least the mid-1980s. The parking lot is currently utilized for parking by neighborhood residents.

1.3 Previous Assessment Findings

67-71 Minerva Street: Numerous phases of Site Assessment and Site Investigation (SI) were performed at the 67-71 Minerva Street parcel between 1990 through 2022, including the following:

- Phase I Environmental Site Assessment, 67-71 Minerva Street, Derby, Connecticut, September 28, 1990, Environmental Science and Engineers, Inc.
- Surficial Investigation, 67-71 Minerva Street, October 3, 1991, Aaron Environmental Specialists.
- Phase I Environmental Site Assessment, 67-71 Minerva Street, Derby, Connecticut, November 10, 2004, ASW Consulting Group, LLC.
- Phase III Contaminant Assessment Investigation, 67-71 Minerva Street, Derby, Connecticut, July 28, 2006, ASW Consulting Group, LLC.
- Phase I Environmental Site Assessment, Former Lombardi Car Company, 67-71 Minerva Street, Derby, Connecticut, May 2014, BL Companies.
- Limited Phase II Site Investigation, Former Lombardi Car Company, 67-71 Minerva Street, Derby, Connecticut, November 2014, BL Companies.
- Phase II/III Site Investigation, Former Lombardi Car Company, 67-71 Minerva Street, Derby, Connecticut, June 2019, BL Companies.
- Hazardous Building Materials Survey, 67-71 Minerva Street Derby, Connecticut, May 21, 2019, BL Companies.

- Phase I Environmental Site Assessment, Former Lombardi Motor Car Company, 67-71 Minerva Street, Derby, Connecticut, prepared by BL Companies, March 22 2021.
- Supplemental Phase III Site Investigation Report, 67-71 Minerva Street, Derby, Connecticut, April 2022, BL Companies.
- Remedial Action Plan, 67-71 Minerva Street, Derby, Connecticut, April 2022, BL Companies.

The results of these investigations indicate that soil and groundwater at 67-71 Minerva Street have been contaminated by releases of regulated compounds associated with the past use of the parcel at concentrations above and below applicable Connecticut Department of Energy and Environmental Protection (CTDEEP) Remediation Standard Regulation (RSR) criteria.

Regulated compounds detected in soils include petroleum hydrocarbons, perchloroethylene (PCE), trichloroethylene (TCE), cis-1,2-Dichloroethene (DCE), chloroform, various polycyclic aromatic hydrocarbons (PAHs), lead, arsenic, and chromium at concentrations above applicable CTDEEP RSR criteria for soil. The regulated compounds detected in groundwater include PCE and chromium, which have been detected at concentrations above and below applicable RSR criteria. Releases of regulated compounds to soil and groundwater at the property have generally been identified as comingled areas of concern (AOCs) and appear to be generally located beneath the former building and extend from Caroline Street to Minerva Street. Two aboveground storage tanks (ASTs) and two underground storage tanks (USTs) have been identified on the property and will require removal and closure in accordance with CTDEEP regulations.

A Significant Environmental Hazard (SEH) as defined under the CGS 22a-6u, was discovered during a 2019 Subsurface Investigation (SI), due to the concentrations of PAHs within two feet of the surface, that exceeded 15 times the Residential Direct Exposure Criteria (RES DEC) and/or exceeded 30 times the Industrial/Commercial DEC (I/C DEC). Remedial actions proposed for completion at the parcel will permanently address the outstanding SEH. The SEH is currently managed by restricting access to the property via secured fencing prior to the completion of remedial actions as part of redevelopment.

BL Companies has fully investigated all AOCs identified at the 67-71 Minerva Street parcel in order to comply with the CTDEEP Site Characterization Guidance Document (SCGD). BL Companies has also developed a Remedial Action Plan (RAP) for the parcel in cooperation with the Developer and the City of Derby.

Hazardous Building Material (HBM) assessments were performed at the 67-71 Minerva Street parcel in 2014 and 2019. Specifications were developed to address these materials prior to redevelopment of the parcel. The major conclusions from those assessments are as follows:

- Asbestos-Containing Materials (ACM) – The roofing materials associated with the remaining structure and gaskets associated with the piping are assumed ACMs and can be removed and segregated during demolition. A specification was drafted to address abatement of these materials dated June 21, 2019.

- Polychlorinated Biphenyl (PCB)-Containing Materials – PCB caulk was found at the remaining structure (east elevation) with no contamination of substrates. PCB caulk was identified in the basement of the structure on the duct which can be removed intact with no substrate contamination. The remaining concrete block wall along the north side of the parcel has PCB caulk and contamination substrates (concrete block, concrete slab and soil/asphalt) that require remediation prior to demolition. A specification was drafted to address this remediation dated March 3, 2021.

147 Caroline Street: The improvement of the 147 Caroline Street parcel would be completed in conjunction with redevelopment of the 67-71 Minerva Street parcel. The following assessment was completed for the 147 Caroline Street parcel:

- Phase I Environmental Site Assessment, Vacant Lot, 147 Caroline Street, Derby, Connecticut, prepared by BL Companies, March 22, 2021.

Based on the results of the Phase I Environmental Site Assessment (ESA), the parcel appears to have been developed with a residential dwelling (in the northwestern corner) from at least 1886 through the 1970s. Potential environmental concerns identified at the 147 Caroline Street parcel included the former residential heating source, potential contaminated fill materials, and potential groundwater impacts related to the 67-71 Minerva Street parcel.

A subsurface assessment for geotechnical purposes was conducted at the 147 Caroline Street parcel on April 21, 2021. BL Companies witnessed the advancement of test pits across the parcel to evaluate subsurface materials present at the parcel. Evidence of past heating sources (underground storage tanks, etc.) and/or contaminated fill materials was not observed in test pits advanced (from 0 to 5 feet below the ground surface [bgs]) on the northwestern corner of the parcel (location of a former residence). Subsurface materials observed in the test pits (from 0 to 5 feet bgs) advanced at the parcel primarily consist of fine to medium grained sand, gravel, and cobbles. BL Companies did not observe evidence of contaminated fill materials or potential environmental concerns in any of the test pits advanced at this parcel.

1.4 Project Goal- Site Reuse Plan

Cedar Village Minerva Square, LLC (the Developer) has entered into an agreement with the City of Derby to purchase and redevelop the Site as a 90-unit residential apartment community. The layout of the proposed development is illustrated on the Site development plan prepared by Rose Tiso & Co., LLC identified on a figure titled “Master Plan of Development / Final Detail Plans – Site Plan, 67-71 Minerva Street Derby,

Connecticut, Cedar Village at Minerva Square", dated December 15, 2020, and included in Appendix B. As shown on the plan, the development will include an approximately 17,500-square-foot building footprint that covers the majority of the eastern portion of the Site along Caroline Street. The building will be constructed on columns, with parking at grade under the building, and four stories of residential apartments above the parking.

The Developer has proposed to construct the parking surface under the building with three inches of bituminous concrete underlain by eight inches of subbase. However, based on conversations with CTDEEP staff, the proposed parking surface beneath the building will need to consist of six inches of concrete underlain by an appropriate thickness of sub-base to support the slab (as determined by the design engineer) to use the parking surface to render soil inaccessible. In addition, an impermeable liner will be required under the concrete slab in order to render the soil under the slab environmentally isolated.

The parking area will be semi-enclosed. Landscaped areas will surround the perimeter of the building. The western portion of the Site will be used for surface parking that will extend from the western side of the building to Minerva Street. The exterior parking surface reportedly will also consist of three inches of asphalt pavement and eight inches of processed subbase.

The grading and utility plan for the proposed development prepared by Rose Tiso & Co., LLC is also included in Appendix B. Detailed architectural renderings or drawings have not yet been provided for review.

2.0 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

2.1 Cleanup Oversight Responsibility

The 67-71 Minerva Street parcel was entered into the Connecticut Transfer Act (CTA) via a Form III filing submitted to the CTDEEP by a former property owner in 2005. At that time, the Certifying Party for the Form III filing was identified as The Great American Classic Car Company. Apparently, the property was never assigned an REM ID No. by CTDEEP. However, the property was abandoned by the Certifying Party and none of their obligations associated with the Form III filing were completed. In September 2018, the City of Derby took title to the property through a foreclosure action. A new CTA filing was not required for this transfer of ownership because taking title through a municipal foreclosure is not a transfer as defined by the CTA, but the 2005 Form III filing remains open.

On April 27, 2021, the City of Derby applied to the Connecticut Department of Economic and Community Development (DECD) Brownfield Remediation and Revitalization Program (BRRP) as an innocent landowner. The DECD has not yet sent a response to the application, but it is anticipated that the City of Derby will be accepted into the Program. Upon entry into the program, the City will receive certain liability relief.

As a condition of acceptance into the BRRP program, the City of Derby will be expected to enter the Site into the Voluntary Cleanup Program (VCP) under Connecticut General Statute (CGS) 22a-133x. As a volunteer under this program, the City of Derby will be required to achieve compliance with the RSRs for on-Site environmental conditions. Under the VCP, remediation of soil and/or groundwater would be overseen by a Connecticut Licensed Environmental Professional (LEP), unless the CTDEEP determines otherwise.

The hazardous building materials abatement at the 67-71 Minerva Street parcel would be conducted/overseen by a licensed abatement contractor.

As noted in Section 1.3 above, the Site is also entered into the SEH program under CGS 22a-6u. The requirements of the SEH program will be addressed concurrently with the requirements of the VCP.

2.2 Laws, Regulations, and Standards Applicable to Site Cleanup

The RSRs are found in Sections 22a-133k-1 through 3 of the Regulations of the Connecticut State Agencies (RCSA). The RSRs were promulgated in January 1996 and subsequently amended in June 2013 and again in February 2021. The RSRs specify the allowable levels of regulated compounds in soil and groundwater that correspond with areas with groundwater classified as either GA (presumed suitable for drinking water purposes without treatment) or GB (presumed unsuitable for drinking without treatment).

The RSRs apply to Sites that are remediated pursuant to Chapter 445, Chapter 446k, or Section 22a-208a(c)(2) of the Connecticut General Statutes. Chapter 445 of the Connecticut General Statutes pertains to certain hazardous waste facilities, sites undergoing remediation under CTDEEP's Urban Sites remedial action program, sites that are subject to CTDEEP's voluntary site remediation programs (including CGS 22a-133x), and Establishments as defined under Section 22a-134 of the Connecticut General Statutes. Chapter 446k of the Connecticut General Statutes pertains to sites that are undergoing remediation pursuant to an enforcement action issued by the CTDEEP, sites with regulated underground storage tanks (USTs), sites with oil and chemical spills, sites where polychlorinated biphenyls (PCBs) have been released, and regional water pollution control facilities. Section 22a-208a(c)(2) of the Connecticut General Statutes pertains to permitted solid waste disposal facilities.

2.2.1 Soil Criteria

The RSRs define two criteria that apply to polluted soil: the Direct Exposure Criteria (DEC) and the Pollutant Mobility Criteria (PMC). Soil at sites that are subject to the RSRs must be remediated to concentrations that are equal to or less than the DEC and PMC or the background concentrations in soil. The DEC define the maximum levels of regulated compounds allowed in soil to a depth of 15 feet below ground surface without posing a threat due to direct human exposure. The PMC set the maximum level of regulated compounds allowed in soil without posing a threat to groundwater quality. Each criteria type is further divided into two categories; the DEC is based upon site usage (i.e., residential or industrial/commercial use), while the PMC is based on the groundwater classification (i.e., GA/GAA or GB). The Site is located in an area with a GB groundwater classification; therefore, the soil above the seasonal high-water table must meet the GB PMC.

Demonstration of soil meeting background concentrations (in lieu of demonstrating compliance with DEC and PMC) requires a representative sampling program to characterize the background concentration for soil that is:

- Of similar texture and composition;
- Collected from the nearest location practicable outside the release area; and,
- Not affected by another discrete release of the same substance or having an effect on the concentrations of the same substance for which a background concentration is determined and either all analytical results in the release area are equal to or less than the background concentration, or a statistical comparison of the background concentrations to the concentrations in the release area results in significant similarity.

The residential DEC must be met if a site is currently used for or in the future will be used for residential purposes. The CTDEEP and the RSRs define "residential activity" to mean

any activity at: (A) a place intended for people to live, including but not limited to, a residence, dwelling, house, apartment, condominium, nursing home, or dormitory; (B) a pre-school, primary school, secondary school, day care center, playground, or outdoor recreational area; or (C) a hospital, solely for the purposes of compliance with volatilization criteria.

If a site or property is not currently used or planned to be used in the future for residential purposes, then the industrial/commercial DEC apply if an Environmental Use Restriction (EUR) is filed in the land records for the Site. The EUR, which consists of either an Environmental Land Use Restriction (ELUR) or a Notice of Activity and Use Limitation (NAUL), limits the site to only industrial or commercial usage. A NAUL can only be used in circumstances that are listed in section 22a-133k-1(e)(1)(B) of the RSRs. The future use of the Site will meet the definition of residential.

The DEC do not apply if soil meets the definition of "inaccessible," and the PMC do not apply if soil meets the definition of "environmentally isolated." In either case, filing an EUR on the land records for the site is required to apply these exemptions.

Under the RSRs, polluted soil can be rendered "inaccessible" if it is; (A) more than four (4) feet below the ground surface, (B) is more than two (2) feet below a paved ground surface that includes a minimum of three inches of bituminous concrete or four inches of reinforced concrete with the balance clean fill, (C) covered by a building or other permanent structure, or (D) polluted fill that is beneath pavement or reinforced concrete, exceeds applicable DEC only due to semi-volatile organic substances or petroleum hydrocarbons, or contains metals at concentrations equal to or less than two times applicable DEC.

Polluted soils that are beneath a building with a roof and structural walls or other impermeable structure that prevent the infiltration of water through the underlying soil may be considered "environmentally isolated" provided they do not contain substances that are a continuing source of pollution, and, regardless of the groundwater classification of the site, if they contain volatile organic compounds (VOCs) above GA PMC, these have been reduced or immobilized to the "maximum extent prudent". The PMC do not apply to environmentally isolated polluted soil provided an EUR is in place that prevents its disturbance. Asphalt is not considered impermeable and cannot be used to render soil environmentally isolated. A building that renders soil environmentally isolated must consist of a roof and structural walls that prevent the infiltration of liquid into soil beneath the building footprint. An impermeable barrier that is installed as an Engineered Control to prevent the infiltration of liquid into soil must have a permeability of less than 10^{-6} centimeters/second and be approved by CTDEEP.

2.2.2 Groundwater Criteria

The RSRs include three criteria that apply to groundwater: the Groundwater Protection Criteria (GWPC), the Surface Water Protection Criteria (SWPC), and the Groundwater Volatilization Criteria (GWVC). Groundwater in GA areas must meet background

concentrations; as an alternative, groundwater in GA areas may meet the GWPC if a public water supply is available within 200 feet of the site where the release to groundwater is located, to adjacent sites, and to sites within the areal extent of the groundwater plume. In addition, the GWPC can be applied in lieu of demonstrating compliance with background; provided,

- The plume is not within an aquifer protection area;
- Prior to remediation of soil or groundwater remediation, the plume is in a diminishing state; and
- Each substance in groundwater is remediated to the GWPC and reduction of concentrations to background cannot be achieved.

The GWPC define the maximum levels of regulated compounds allowed in groundwater for protection of the groundwater as a potable water source. In areas that are classified as GB and the groundwater migrates to a GA area, the remediation goal is the GWPC or more stringent background conditions. The GWPC also apply to GB areas where water supply wells are located within the vicinity of an identified plume.

On March 12, 2021, on behalf of the City of Derby, BL Companies submitted an Application for Groundwater Classification Change for the Site from GA to GB quality. Following a public hearing, the application was approved by CTDEEP, and the classification was officially changed to GB on October 15, 2021. The subject area for the reclassification includes 9.11 acres of commercial/industrial and residential areas in downtown Derby, bordered by GB areas to the west under the adjacent block, under Water Street to the east, under Route 34 to the south, and Fourth Street to the north.

The Site is now located in a GB groundwater classification area, public water is available, and potable supply wells are not suspected to be present in the Site vicinity. Therefore, the GWPC do not apply to groundwater beneath the Site.

The SWPC apply to impacted groundwater that is discharging to a surface water body, including, streams, rivers, ponds, lakes, and Long Island Sound. The SWPC specifies the levels of compounds allowable in groundwater just prior to discharging into surface water. One standard has been set for groundwater that discharges to surface water, regardless of the classification of such surface water. Compliance with the SWPC is evaluated by sampling at the point at which the groundwater plume discharges to the surface water body. For groundwater plumes that discharge to low-dilution surface water bodies such as a wetland, tidal flat, intermittent watercourse, or location where the area of the plume occupies more than one half of one percent of the upstream drainage basin, the substance in the groundwater is evaluated relative to the applicable water quality criteria. The RSRs also allow the comparison of impacted groundwater to alternative SWPC, which can be calculated based on available dilution in the receiving water body.

Surface water bodies are not located on the Site. The Housatonic River is located approximately 0.2 miles to the southwest of the Site and the Naugatuck River is located approximately 0.3 miles to the east-southeast. The Naugatuck River flows into the Housatonic River. The Naugatuck River is classified by the CTDEEP as a class “B” quality surface water body. Class B surface waters are designated for use as habitat for fish and other aquatic life and wildlife; recreation; navigation; and industrial and agricultural water supply. The Housatonic River is classified as an “SB” surface water. Class SB surface waters are designated for use as habitat for marine fish and other aquatic life and wildlife; commercial shellfish harvesting; recreation; navigation; and industrial and water supply

The Site is not located within an Aquifer Protection Area.

The GWVC sets the allowable levels of volatile organic compounds (VOCs) other than petroleum related substances in groundwater that is less than 30 feet bgs or is within 30 feet from the lowest portion of a building. The GWVC are designed to protect humans from exposure to VOCs other than petroleum VOCs present in groundwater that may migrate into an overlying building interior. GWVC apply for volatile petroleum substances within 10 feet bgs or within 10 feet from the lowest portion of the building. Residential and industrial/commercial GWVC have been established, with the residential GWVC being more stringent, and the industrial/commercial GWVC requiring the use of an EUR. Use of I/C GWVC in lieu of residential GWVC is only applicable to areas where access by those individuals working at or temporarily visiting for industrial/commercial activities occurs. Compliance with the GWVC may not be required if monitoring of soil vapor above the water table or indoor air quality demonstrates that there is no exposure hazard.

Groundwater at the Site is more than 30 feet bgs; therefore, the GWVC does not currently apply, and it is anticipated that groundwater will be more than 30 feet below the lowest portion of the building, once constructed.

2.2.3 Soil Vapor Volatilization Criteria

The soil vapor volatilization criteria (SVVC) were developed for situations where VOCs present in soil vapor have the potential to migrate into an overlying building and pose a risk to human health from the inhalation of the contaminants by occupants of the building.

Residential SVVC and industrial/commercial SVVC have been established, with the residential SVVC being more stringent, and the I/C SVVC requiring the use of an EUR.

2.2.4 Applicable RSR Criteria

The residential DEC apply to soil that is present within 15 feet bgs at the Site.

The Site is located in a GB groundwater classification area, and the GB PMC applies to the soil that is present above the seasonal high-water table. The seasonal high-water table has been measured at approximately 35 feet bgs on the western portion of the Site, near Minerva Street, and at approximately 40 to 45 feet bgs under the eastern portion of the Site.

The GA PMC will apply to soil containing VOCs above the GA PMC if those soils are to be rendered environmentally isolated beneath the proposed building, in which case, the VOCs must be immobilized or reduced in concentration to the “maximum extent prudent” as stated in Section 22a-133k-2(c)(5)(A) of the RSRs.

The use of an EUR that renders soil inaccessible eliminates the requirement to meet the numeric criteria for the DEC and an EUR that renders soil environmentally isolated eliminates the requirement to meet the PMC for the soils subject to the EUR.

The residential SVVC applies to the Site.

The SWPC applies to the groundwater at the Site. The GWPC does not apply because the Site is located in a GB area and the Site and the surrounding area are serviced with municipal water. The GWVC does not apply to the Site because groundwater is deeper than 30 feet bgs currently and is expected to be more than 30 feet below the lowest portion of the proposed building.

A Request for Approval of Criteria for Additional Polluting Substances (APS) and Certain Alternative Criteria form has been submitted to the CTDEEP for certain Constituents of Concern (COCs) detected in soil and/or groundwater at the Site that have been reported in the March 2022 Phase III Site Investigation report. This request will allow the CTDEEP to approve criteria for COCs detected at the Site which do not have criteria that are included by default in the RSRs or have alternative criteria that CTDEEP has determined are acceptable alternatives to those included in the RSRs by default. Obtaining such approval for APS together with the default RSR criteria specified in the RSRs will be used to establish clearly defined remedial goals for the Site.

3.0 EVALUATION OF CLEANUP ALTERNATIVES

3.1 Release Areas Requiring Remediation

There are no known release areas or HBM present at the 147 Caroline Street parcel.

Based on an evaluation of the data collected as part of the Phase II and Phase III ESAs conducted at the 67-71 Minerva Street parcel, BL Companies identified the following release areas (RAs) that require remediation of soil to achieve compliance with the RSRs as described below. The soil remedial areas are depicted on Figure REM-01, included in Appendix C.

The primary COCs, which have been identified in soil and/or groundwater at the 67-71 Minerva Street property include chlorinated VOCs, ETPH, PAHs, lead, and arsenic. The contamination is widespread due to the presence of urban fill and specific releases from AOCs, all of which are co-mingled due to the history of the property.

As indicated above, it is difficult to tie the documented contamination to soil and/or groundwater to a specific AOC. Therefore, for the purpose of remedial planning, the 67-71 Minerva Street parcel has been divided into eight individual soil RAs. Each RA and the associated soil contamination is described below. The soil sample locations are illustrated on Figure SI-01 in Appendix C.

RA-1: RA -1 is located in the northwest portion of the property, outside the footprint of the proposed building. The proposed development plan indicates that the area will be used as a green space. The soils in this area have been impacted with lead, arsenic, and PAHs. Concentrations of these compounds exceed the residential DEC at sampling locations SB-130 (0-2') and LMC-A5-SS3 (0-3'). PAHs were determined to be present at concentrations less than the GB PMC via Synthetic Precipitation Leaching Procedure (SPLP) analysis at sample location SB-130.

RA-1A: RA -1A is also located in the northwest portion of the property, outside the footprint of the proposed building and south of RA-1. The proposed development plan indicates that the area will be used as a green space. The soils in this area have been impacted with petroleum hydrocarbons and lead. Concentrations of ETPH exceed the GB PMC and residential DEC at sampling locations AS-SB-1, A4-SB-4, and LMC-A5-SB-6. Concentrations of PAHs and total lead exceed the GB PMC and/or residential DEC at sampling location SB-132.

RA-2: RA-2 is located beneath the northern, and the majority of the central portion of the proposed building footprint. VOCs have been detected in soils at concentrations exceeding both the GA and GB PMC and the residential DEC. The primary VOC present at elevated concentrations is PCE. Elevated concentrations of PCE have been detected at sampling locations LMC-A9-SB1, LMC-A9-SB2, SB-112, SB-122, SB-205, and SB-206. The highest concentration of PCE, 950 mg/Kg, has been detected at SB-112 at a depth of 6-7' bgs.

Elevated concentrations of TCE have been detected at SB-205 (4.1 mg/Kg) and A9-SB-2 (110 mg/Kg).

Other contaminants, including ETPH, PAHs, total lead and total chromium are also present in these soils at concentrations above either the residential DEC, the GB PMC, or both criteria. The contaminants have been detected at sample locations INT-1, B-7, B-2b, B-7b, LMC-A9-SB7, LMC-A4-SB8, LMC-A9-SB1, LMC-A9-SB2, LMC-A1-SS1, A3-SB-5, A4-SB-1, A9-SB-2, SB-112, SB-113, SB-114, SB-116, SB-118, SB-119, SB-131, and SB-134.

RA-2 also contains two USTs (associated with two anomalies identified during a ground penetrating radar (GPR) survey conducted in 2022, GPRA-1 and GPRA-4) and a concrete pit (associated with GPRA-3). Removal of the USTs and concrete pit, if required, is considered a construction related task; however, remediation of releases associated with underground structures may be required as an additional remediation task. This will be determined following removal of any structures encountered.

RA-3: RA-3 is located on the northeastern portion of the property. RA-3 extends from the east edge of the building at the parking lot entrance to the east, to the property boundary adjacent to Caroline Street. This area is proposed to be developed as driveway into the parking garage and as sidewalk and green space. Soils within RA-3 are impacted with chlorinated VOCs (primarily PCE), and, to a lesser degree, petroleum hydrocarbons. Contaminants exceed the GB PMC and/or the residential DEC from grade to at least 25 feet bgs.

PCE and ETPH are present in soil at RA-3 at concentrations above the GA PMC and/or residential DEC at A3-SB-7, A3-SB-6, SB-110, A3-SB-2, SB-211, and SB-212.

RA-3A: RA-3A is also located in the northeastern portion of the property, outside the footprint of the proposed building along Caroline Street and to the north of RA-3. This area is proposed to be developed as sidewalk and green space. Soil containing PAHs and/or ETPH above the GB PMC and the residential DEC have been identified in this area at sampling locations B-9, B-9a, B-9b, A3-SB-1, and LMC-A3-SB2. The samples collected from A3-SB-1 and LMC-A3-SB-2 also contain PCE above the residential DEC and the GB PMC.

RA-4: RA-4 is located under the southern portion of the footprint of the proposed building. Soils impacted with low concentrations of ETPH above the residential DEC are present in the northwestern portion of RA-4 at sampling location B-2c. Soil containing total lead and total arsenic above the residential DEC, and PAHs above the residential DEC and GB PMC are present in the southeastern portion of RA-4 at sampling location SB-215.

The majority of RA-4 consists of shallow urban fill and underlying native soil that do not contain regulated compounds, or if present, contain regulated compounds at low concentrations below the GA PMC and the residential DEC. To properly manage excess polluted and contaminated soil excavated during construction of the proposed

improvements, Clean and Polluted soil from RA-4 may be excavated and relocated to City-owned property on the south side of Route 34. The City-owned property, known as the Downtown Redevelopment Zone (DRZ), is also undergoing redevelopment, and large quantities of fill material are needed for that project. The City's environmental consultant for that project has reviewed the soil data from RA-4 and agrees that it is suitable for reuse at the DRZ.

RA-5: RA-5 is located on the western portion of the property and extends from the western edge of the proposed building to Minerva Street. The area is proposed to be used for parking and includes the placement of a 3-inch bituminous concrete surface and eight inches of subbase. Soils impacted with total lead above the residential DEC are present at sampling location LMC-A7-SS1. Soils impacted with PAHs exceeding the residential DEC and/or GB PMC are present within RA-5 at sampling locations LMC-MW01, A6-SB-2, A7, SB-1, SB-126, SB-127, and A8-SB-2. PAHs were determined to be less than the GB PMC via SPLP analysis at sample location SB-126. PCE is present above both the GA and GB PMC at two locations within SB-5, LMC-A8-SB1 and SB-207.

RA-5 also contains a concrete pit (associated with GPRA-6). Removal of the concrete pit, if required, is considered a construction related task; however, remediation of releases associated with underground structures may be required as an additional remediation task. This will be determined following removal of any structures encountered.

RA-6: RA-6 is located at the northern end of the Site. RA-6 is a small area of soil containing PCB impacts because of building material leaching into the soil. Soil remediation in this area is expected to consist of excavation and off-Site disposal of a small quantity of soil (one to two yards) and will be handled by the hazardous building materials abatement contractor.

3.2 Cleanup Alternatives Considered

Hazardous Building Materials and PCBs. Abatement of hazardous building materials and PCB building material remediation prior to redevelopment will need to be completed according to State and Federal regulation and standard industry practices.

The PCB-containing materials are considered unauthorized use by EPA (>50 PPPM) and are unauthorized by Connecticut (>1 PPM) and must be addressed once identified. The "No Action" is not an option for these materials.

Construction-Related Tasks. Demolition of the remaining building and associated floor slabs and basement structure is considered a construction task and is not part of remediation. This also includes removal of USTs and the concrete slabs and pit structures identified during the assessment of GPRAs in 2022 and subsequent test pits in 2022. Upon removal of any USTs or other structures at the GPRA locations, each excavation would be inspected by BL Companies for the presence of releases of petroleum or other regulated compounds and samples may be collected for laboratory analysis. If regulated compounds are present at concentrations above applicable RSR criteria, and such impacted soil cannot stay in-place as part of one of a proposed EUR Subject Area, then additional soil excavation may be necessary.

Contaminated Soils. This section identifies various alternatives that were considered in response to the environmental contamination identified at 67-71 Minerva Street. “Clean” soils are defined as those being free of regulated compounds above laboratory detection limits. “Polluted” soils are soils that contain regulated compounds at concentrations above laboratory detection limits (and above naturally occurring conditions) but below the applicable RSR criteria. “Contaminated” soils contain regulated compounds at concentrations above the applicable RSR criteria.

The following potential remedial alternatives for soil were considered for the 67-71 Minerva Street parcel:

Alternative #1 No Action. The “No Action” alternative is the option of not conducting any cleanup at the 67-71 Minerva Street parcel. This alternative would leave the parcel in its present condition and would not provide any additional protection to human health or the environment.

Alternative #2 Excavation and Off-Site Disposal of Contaminated Soils. Excavation of all known soils with contaminants at concentrations above applicable regulatory criteria prior to development. Excavation would be accomplished using an excavator for accessible impacted soils. The Contaminated soils would be transported to a permitted treatment/recycling facility or a solid or hazardous waste disposal facility.

Alternative #3 Combination of Excavation and On-Site Reuse of Contaminated Soil; Excavation and Off-Site Reuse of Polluted Soil; Engineered Control and Environmental Use Restriction (EUR); and Installation and Operation of a Soil Vapor Extraction (SVE) System. This alternative includes active soil remediation for specific release areas, combined with the implementation of institutional controls. A table summarizing the proposed remedial actions for each RA-area identified at the Site is included as Appendix D. Key elements of this alternative include:

- Excavation activities specific to this alternative would take place as part of construction and development activities and would be managed under a Soil Management Plan (SMP). To the extent practicable, the SMP would include the reuse of excavated Contaminated soils which have not been identified for off-Site disposal due to environmental impacts that prohibit reuse.

  Development plans for the Site call for excess soil to be generated to support creation of green space, grading and placement of underground utilities, and building footings. The Developer estimates the excess soil to be approximately 2,500-3,000 cubic yards. This alternative includes the removal of Clean and Polluted soils from the southern end of the parcel to an area designated by the City of Derby, with approval of CTDEEP, south of State Route 34 to support a future roadway and redevelopment project associated with the DRZ. The removal and reuse of these soils would be a mutually beneficial solution for each of the projects. The removal of soil from the parcel should allow for the on-Site relocation and reuse of an equivalent volume of eligible Contaminated soils.

On-Site reuse of Polluted and Contaminated soil includes the placement of Polluted and Contaminated soil under the proposed building. Polluted and Contaminated soil proposed for reuse would be placed in the Soil Relocation Area shown on Figure REM-01 (included in Appendix C) as controlled fill and compacted at the direction of the Developer or their Geotechnical Engineer.

Regulated off-Site disposal assumes the material may be handled as a Connecticut regulated waste and be shipped to an appropriate in-state disposal facility. For remediation compliance, the amount of soil which may require excavation and off-Site disposal (not reused on-Site or at another off-Site location) is expected to be in the range of 800-1500 cubic yards.

- An EUR is proposed to render soil inaccessible and environmentally isolated at several locations across the property. The EUR would address the exceedances of applicable RSR soil criteria that remain after selective soil excavation and off-Site disposal at each of the RAs. CTDEEP allows for Polluted soils to remain in-place provided that they meet the definition of inaccessible soil and/or environmentally isolated soil and an EUR has been recorded on the land records prohibiting the disturbance of the soil and/or infiltration of water through the soil. Based on the development plan for the Site, soils may be rendered inaccessible utilizing asphalt or concrete cover, as defined by the RSRs. Soils may be rendered environmentally isolated with the placement of an impermeable liner beneath the concrete slab of the parking garage. The EUR areas proposed for the parcel are identified on Figure REM-3 included in Appendix C.

  However, environmentally isolated soils cannot contain substances that are a continuing source of pollution; and regardless of the groundwater classification, if the soils contain VOCs above the GA PMC, then the concentrations of the VOCs must be reduced or immobilized to the “maximum extent prudent”.

  The VOCs detected in soils in RA-2 exceed the GA PMC, are located beneath the proposed building footprint, and must be reduced to the “maximum extent prudent”. Deeper soils containing regulated compounds above the DEC and the PMC would need to be rendered inaccessible and environmentally isolated with the use of an Engineered Control and EUR, and VOCs will also need to be reduced in concentration with an SVE system. The layout of the proposed SVE system is identified on Figure REM-02 included in Appendix C.

3.3 Evaluation of Cleanup Alternatives and Cost Estimates

3.3.1 Effectiveness

Hazardous Building Materials and PCBs. Abatement of HBM is necessary prior to the planned demolition of the existing building. The PCB-containing materials are considered unauthorized use by EPA (>50 PPPM) and are unauthorized by Connecticut (>1 PPM) and must be addressed once identified. The “No Action” is not an option for these

materials. These actions would be completed by a licensed abatement/remediation contractor and will permanently eliminate the HBM and PCB-containing materials.

Alternative #1- No Action. The "No Action" alternative is not an effective means of protecting human health or the environment from the environmental contamination present at the 67-71 Minerva Street parcel. This option does not include the ACM or PCB building materials, which will need to be remediated.

Alternative #2 Excavation and Off-Site Disposal of Contaminated Soils. This method would include the excavation and off-Site disposal of all soils with contaminants present at concentrations above applicable regulatory standards. The removal of contaminated soils would permanently eliminate the source of and prevent exposure to the contamination and achieve compliance with the applicable RSRs. However, this alternative would carry greater costs (related to transportation, soil disposal, and fill materials), would require increases in transportation and associated carbon footprint, and overall require more time and resources to complete.

Alternative #3 Combination of Excavation and On-Site Reuse of Contaminated Soil; Excavation and Off-Site Reuse of Polluted Soil; Engineered Control and Environmental Use Restriction (EUR); and Installation and Operation of a Soil Vapor Extraction (SVE) System. The remedial options identified for the Site include active remediation for specific RAs combined with institutional controls. Remedial activities would be conducted under an SMP and be RA-specific. The remedial activities included as part of this alternative would be protective of human health and the environment and would be sufficient to achieve compliance with the RSRs. This option provides the most expeditious, cost effective, and reasonable means for bringing the parcel into compliance with the CTDEEP RSRs.

3.3.2 Implementability

Hazardous Building Materials and PCBs. Abatement of HBM is necessary prior to the planned demolition of the existing building. The PCB-containing materials are considered unauthorized use by EPA (>50 PPPM) and are unauthorized by Connecticut (>1 PPM) and must be addressed once identified. The "No Action" is not an option for these materials. These actions would be completed by a licensed abatement/remediation contractor and will permanently eliminate the HBM and PCB-containing materials.

Alternative #1- No Action. The "No Action" alternative is not an effective means of protecting human health or the environment from the environmental contamination present at the 67-71 Minerva Street parcel. This option would be easy to implement as remedial actions related to contaminated soils would not be conducted.

Alternative #2 Excavation and Off-Site Disposal of Contaminated Soils. This alternative may not be feasible using standard excavation equipment due to the depths (greater than 15 feet bgs) at which VOC-contaminated soils are situated within RA-3/3A. In addition, it would be difficult, time consuming, and costly to implement this alternative.

Alternative #3 Excavation and On-Site Reuse of Contaminated Soil; Excavation and Off-Site Reuse of Polluted Soil; Engineered Control and Environmental Use Restriction (EUR); and Installation and Operation of a Soil Vapor Extraction (SVE) System. This alternative is feasible and effective towards achieving cleanup goals with the lowest cost and carbon footprint. This alternative will require the implementation of a SMP, CTDEEP approvals related to the reuse of soil, use of an engineered control, and the EUR proposed for the parcel.

3.3.3 Preliminary Cost Estimates

These estimated costs are based on our professional judgement and experience with similar work undertaken as part of previous environmental remediation and development projects. The costs presented are approximate cost opinions and are provided for the purpose of evaluating alternative remedial programs. These estimates involve approximate quantity evaluations, and quantities and unit costs may vary based on actual conditions encountered, future variations in market pricing, and other factors.

The preliminary opinion of cost includes those cost items identified and should not be assumed to include other costs such as legal, administrative, permitting, or others, The preliminary opinion of cost also does not include any costs with respect to third party claims, fines, penalties, or other charges which may be assessed against any responsible party because of either the existence of present conditions or the future existence or discovery of such conditions.

Hazardous Building Materials.

Hazardous Building Materials Abatement- Tasks and Estimated Costs	**Estimated Costs**
Asbestos Segregate During Demolition	$ 5,000
ACM Field Oversight/Clearance/Closeout	$ 2,500
PCB Remediation	$ 25,000
PCB field oversight, Clearances	$ 12,000
Estimated Total	**$ 44,500**

Alternative #2 Excavation and Off-Site Disposal of Contaminated Soils.

Alternative #2- Tasks and Estimated Costs	**Estimated Costs**
Hazardous Building Materials Abatement- Tasks and Estimated Costs	$ 44,500
Construction-Related Costs (Includes Soil Excavation Activities Related to RAs)	$ 530,000
Clean Backfill Materials	$ 690,000
Off-Site Soil Disposal, Waste Characterization Sampling, and Coordination (includes UST removal and disposal)	$1,677,500
Soil Remediation Oversight and Confirmation Sampling	$ 70,000
Pre-Remedial Assessment- Groundwater Monitoring Event	$ 5,000

Alternative #2- Tasks and Estimated Costs	Estimated Costs
Public Notice	$ 2,500
Remedial Action Report	$ 15,000
Groundwater Monitoring Well Installation, Compliance Monitoring, and Well Abandonment	$ 60,000
Final Verification Report	$ 20,000
Project Management	$ 20,000
20% contingency	$ 630,000
Estimated Total	**$3,764,500**

Alternative #3 Excavation and On-Site Reuse of Contaminated Soil; Excavation and Off-Site Reuse of Polluted Soil; Engineered Control and Environmental Use Restriction (EUR); and Installation and Operation of a Soil Vapor Extraction (SVE) System.

Alternative #3- Tasks and Estimated Costs	Estimated Costs
Hazardous Building Materials Abatement- Tasks and Estimated Costs	$ 45,000
UST Removal and Disposal	$ 13,000
Construction-Related Costs (Includes Soil Excavation Activities Related to RAs)	$ 47,000
Clean Backfill Materials	$ 35,000
Off-Site Soil Disposal, Waste Characterization Sampling, and Coordination	$ 145,700
Pre-Remedial Assessment- Groundwater Monitoring Event	$ 5,000
Public Notice	$ 2,500
CTDEEP Communications and Applications for Approval Related to Soil Reuse and Implementation of an Engineered Control	$ 25,000
Soil Remediation Oversight and Confirmation Sampling	$ 57,500
SVE System Installation, Operation/Maintenance, and Annual Reporting	$ 145,500
Engineered and Institutional Controls (EUR, Applications to CTDEEP, impermeable barrier, concrete slab)	$ 108,000
Entry into VCP Program	$ 5,000
Remedial Action Report	$ 15,000
Groundwater Monitoring Well Installation, Compliance Monitoring, and Well Abandonment	$ 60,000
Final Verification Report	$ 20,000
Project Management	$ 20,000
20% Contingency	$ 150,800
Estimated Total	**$900,000**

3.3.4 Recommended Cleanup Alternative

The recommended cleanup alternative is Alternative #3. Excavation and On-Site Reuse of Contaminated Soil; Excavation and Off-Site Reuse of Polluted Soil; Engineered Control

and Environmental Use Restriction (EUR); and Installation and Operation of a Soil Vapor Extraction (SVE) System. This alternative is feasible and effective towards achieving cleanup goals within the extent of available funding. This alternative will require the implementation of a SMP, CTDEEP approvals related to the reuse of soil, engineered control, and EUR proposed for the parcel.

The objective of the proposed Site remediation is to address potential risks to human health and the environment, if any, and to achieve compliance with the requirements of the BRRP, the VCP, and CTDEEP RSRs. Applicable RSR criteria for the Site include the residential DEC, the GA PMC for soil containing VOCs that will be rendered inaccessible under the building, the GB PMC for soil containing other contaminants, and the SWPC for groundwater.

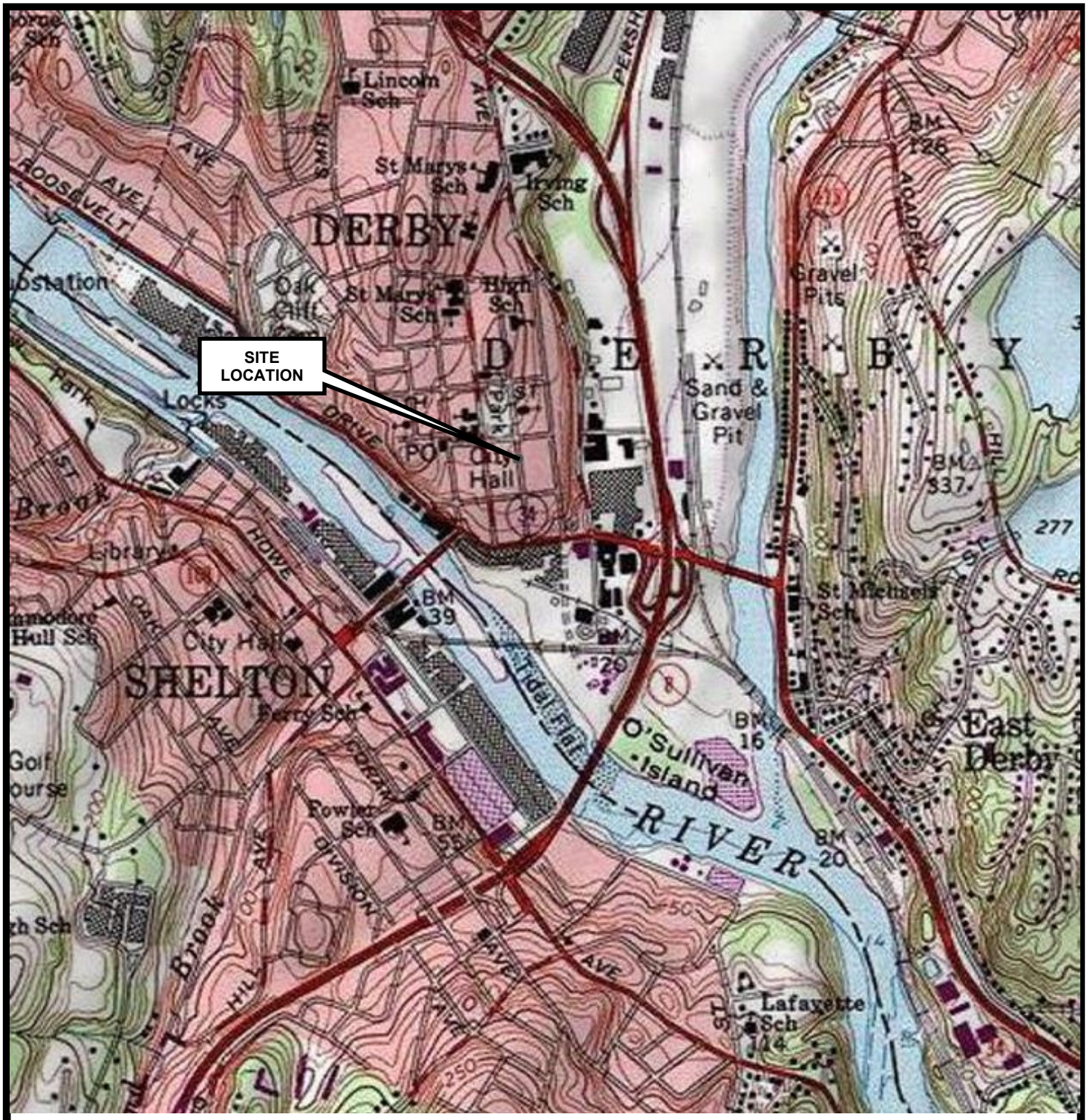
The remedial options identified for the Site include active remediation for specific release areas combined with institutional controls. The overall remedial strategy incorporates the Site development plan provided by Cedar Village, LLC and prepared by Rose Tiso & Co., LLC identified on a figure titled "Master Plan of Development/Final Detail Plans – Site Plan, 67-71 Minerva Street Derby, Connecticut, Cedar Village at Minerva Square" dated December 15, 2020 (and included in Appendix B).

A summary of the cleanup alternatives for each of the remediation areas at the Site is provided in Table 1, included in Appendix D.

To make the selected alternative greener, or more sustainable, several techniques are planned. The most recent Best Management Practices (BMPs) issued under ASTM Standard E-2893: Standard Guide for Greener Cleanups will be used as a reference in this effort. The Developer and cleanup contractors will be encouraged to follow an idle-reduction policy and use heavy equipment with emission controls operated on ultra-low sulfur diesel. The number of mobilizations to the Site would be minimized and erosion control measures would be used to minimize runoff to surrounding areas.

APPENDIX A

Site Location Map



Base map is a reproduction of the U.S.G.S. 7.5 Minute
Topographic Quadrangle of Ansonia, Connecticut, 2018

BL Companies

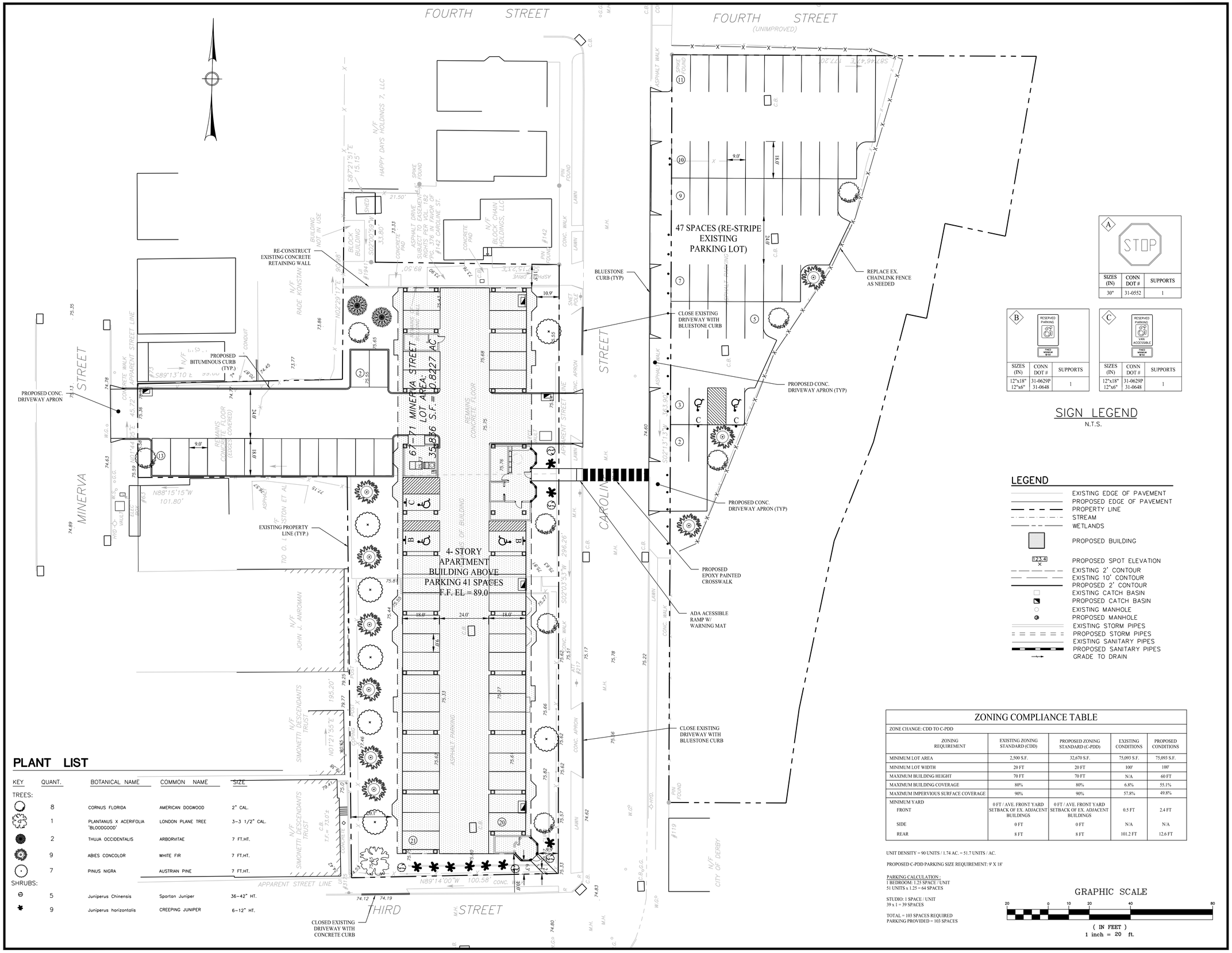
SITE LOCATION MAP

67-71 Minerva Street
Derby, Connecticut

Project No.
2001079

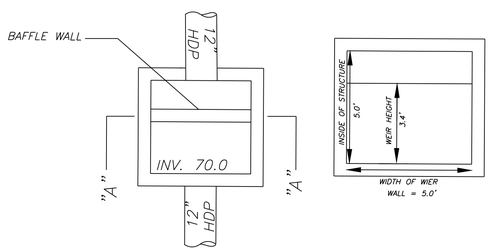
APPENDIX B

Master Plan of Development / Final Detail Plans – Site Plan
Master Plan of Development / Final Detail Plans – Grading & Utility Plan
67-71 Minerva Street Derby, Connecticut, Cedar Village at Minerva Square, dated December 15, 2020 prepared by Rose Tiso & Co., LLC


FOURTH STREET
FOURTH STREET
(UNIMPROVED)
MINERVA STREET
CAROLINE STREET
THIRD STREET
APPARENT STREET LINE
67-71 MINERVA STREET
LOT AREA:
35,836 S.F. = 0.8227 AC.
4-STORY
APARTMENT
BUILDING ABOVE
PARKING 41 SPACES
F.F. EL = 89.0
47 SPACES (RE-STRIPE
EXISTING
PARKING LOT)
RE-CONSTRUCT
EXISTING CONCRETE
RETAINING WALL
PROPOSED
BITUMINOUS CURB
(TYP.)
PROPOSED CONC.
DRIVEWAY APRON
EXISTING PROPERTY
LINE (TYP.)
BLUESTONE
CURB (TYP)
CLOSE EXISTING
DRIVEWAY WITH
BLUESTONE CURB
PROPOSED CONC.
DRIVEWAY APRON (TYP)
PROPOSED CONC.
DRIVEWAY APRON (TYP)
PROPOSED
EPOXY PAINTED
CROSSWALK
ADA ACESSIBLE
RAMP W/
WARNING MAT
CLOSE EXISTING
DRIVEWAY WITH
BLUESTONE CURB
CLOSED EXISTING
DRIVEWAY WITH
CONCRETE CURB
REPLACE EX.
CHAINLINK FENCE
AS NEEDED
N/F
HAPPY DAYS HOLDINGS 7, LLC
N/F
RADE KONSTAN
N/F
BLOCK CHAIN
HOLDINGS, LLC
N/F
JOHN J. ANROMAN
N/F
SIMONETTI DESCENDANTS
TRUST
N/F
CITY OF DERBY
N88°15'15"W
101.80'
N89°14'00"W 100.98'
S02°03'53"W 296.26'
N01°21'55"E
195.20'
S87°46'47"E 177.20'
S87°21'51"E
15.15'
N01°29'17"E
S89°13'10"E
45.72'
N01°44'
S02°21'31"E
163.00'
S22°07'59"W
33.80'
REMAINS
CONCRETE FLOOR
(LEGGS COVERED)
REMAINS
CONCRETE FLOOR
BUILDING NOT IN USE
BLOCK
BUILDING
SHED
CONCRETE
PAD
ASPHALT DRIVE
SUBJECT TO EASEMENT &
RIGHTS PER VOL. 182
PG. 33 IN BEHALF OF
#142 CAROLINE ST.
ASPHALT PARKING
CONC. APRON
CONC. WALK
ASPHALT WALK
LAWN
SPIKE FOUND
PIN FOUND
INLET
CONDUIT
W.G.
H.D.
H.H.
M.H.
C.B.
G.C.
9.0'
18.0'
24.0'
10.9'
24.0'
N/A
A/C
A/C
A/C

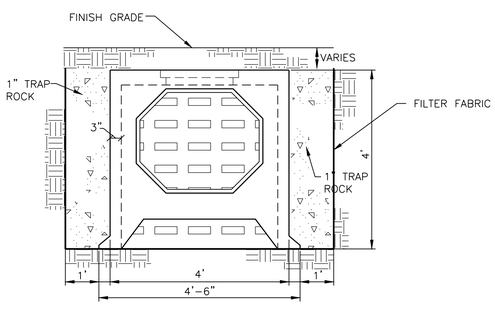
LEGEND

- EXISTING EDGE OF PAVEMENT
- PROPOSED EDGE OF PAVEMENT
- PROPERTY LINE
- STREAM
- WETLANDS
- PROPOSED BUILDING
- PROPOSED SPOT ELEVATION
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- PROPOSED 2' CONTOUR
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- EXISTING MANHOLE
- PROPOSED MANHOLE
- EXISTING STORM PIPES
- PROPOSED STORM PIPES
- EXISTING SANITARY PIPES
- PROPOSED SANITARY PIPES
- GRADE TO DRAIN
- SITE LIGHTING
- UNITS WITH BASEMENT



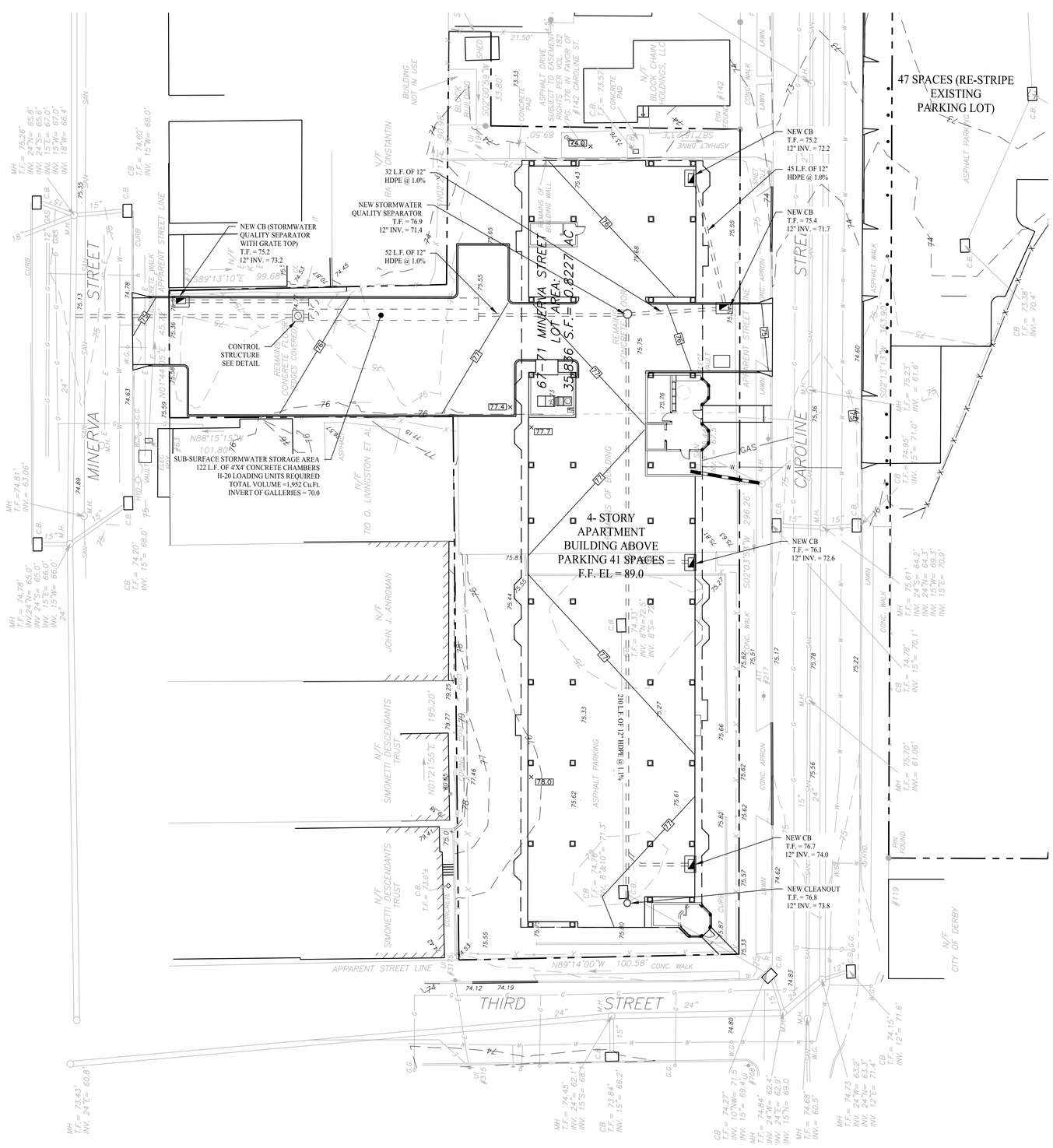
CONTROL STRUCTURE OS-1

SECTION "A"-"A'"



TYPICAL 4'x4' GALLERY

N.T.S.



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

GRADING & DRAINAGE NOTES

1. ALL ROOF DRAINS AND YARD DRAIN DISCHARGE PIPING SHALL BE MIN 4" PVC PLASTIC PIPE (ASTM D 3034) SDR-35 WITH RUBBER GASKETS, BELL AND SPIGOT TYPE JOINTS.
2. ALL PERFORATED DISTRIBUTION PIPES WITHIN GALLERIES SHALL BE 4" PERFORATED PVC PLASTIC PIPE (ASTM D 2729) WITH BELL AND SPIGOT, NO GASKET.
3. ALL SITE CONSTRUCTION SHALL CONFORM TO THE TOWN OF MILFORD STANDARD SPECIFICATIONS OR IN THE ABSENCE THEREOF TO THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION FORM 816, 2004.
4. ALL PROPOSED CATCH BASISN TO HAVE 2' SUMPS AND HOODED OUTLETS UNLESS NOTED OTHERWISE.
5. MAXIMUM 2% SLOPE THROUGHOUT ALL ACCESSIBLE PARKING AND ACCESSIBLE STRIPED AREAS

GALLERIES AND CATCH BASIN INSPECTION & MAINTENANCE PLAN:

1. UNITS ARE TO BE INSPECTED EVERY 6-MONTHS AND SUMP VACUUMED IF SEDIMENT DEPTH IS GREATER THAN 18 INCHES
2. OIL ACCUMULATION IS TYPICALLY MUCH LESS THAN SEDIMENT, HOWEVER, REMOVAL OF OIL AND SEDIMENT DURING THE SAME SERVICE IS RECOMMENDED.
3. REMOVE FLOATABLES FIRST, AND THEN REMOVE REMAINING VOLUME.

GALLERY INSPECTION & MAINTENANCE PLAN:

1. GALLERIES ARE TO BE INSPECTED EVERY 12-MONTHS AND VACUUMED IF SEDIMENT DEPTH IS GREATER THAN 12 INCHES.
2. SITE CATCH BASINS ARE TO BE INSPECTED EVERY 6- MONTHS AND SUMP VACUUMED IF SEDIMENT DEPTH IS GREATER THAN 12 INCHES.

WATER QUALITY VOLUME COMPUTATION:

COMMERCIAL DEVELOPMENT = 35,836 SF
IMPERVIOUS AREA = 24,054 OR 67%
WQV= (P*RV*A); RV=0.05+0.009*I
RV= 0.05+0.009*I= 0.653WATERSHED INCHES
WQV= (0.653**35,836)/12=1,950 CF REQUIRED
PROVIDED = 1,952 CF

ROSE •TISO & CO. LLC.
ARCHITECTS●SURVEYORS●ENGINEERS
WWW.ROSETISO.COM
35 BRENTWOOD AVENUE, FAIRFIELD, CT 06825
TEL: (203)610-6262 ● FAX: (203)610-6404

REVISIONS

NO.	BY	DATE	DESCRIPTION
1.	SFS	9-16-21	ENGINEER COMMENTS
2.	SFS	9-30-21	C-PDD SUBMISSION

PROJECT TITLE

MASTER PLAN OF DEVELOPMENT / FINAL DETAIL PLANS

67-71 MINERVA STREET
DERBY, CONNECTICUT

CEDAR VILLAGE AT MINERVA SQUARE

PREPARED FOR:
CEDAR VILLAGE MINERVA SQUARE, LLC

SHEET TITLE

GRADING & UTILITY PLAN

DESIGNED BY: SFS	SCALE: 1"=20'
DRAWN BY: SFS	DATE: 12-15-2020
CHECKED BY: MJS	PROJECT NUMBER: 2522
CAD FILE: R:\2522\dwg\2522-site plan 12-16-20	

SEAL

STATE OF CONNECTICUT
MARC J. SOLTYS
LICENSED PROFESSIONAL ENGINEER

SHEET NUMBER

SP-2

APPENDIX C

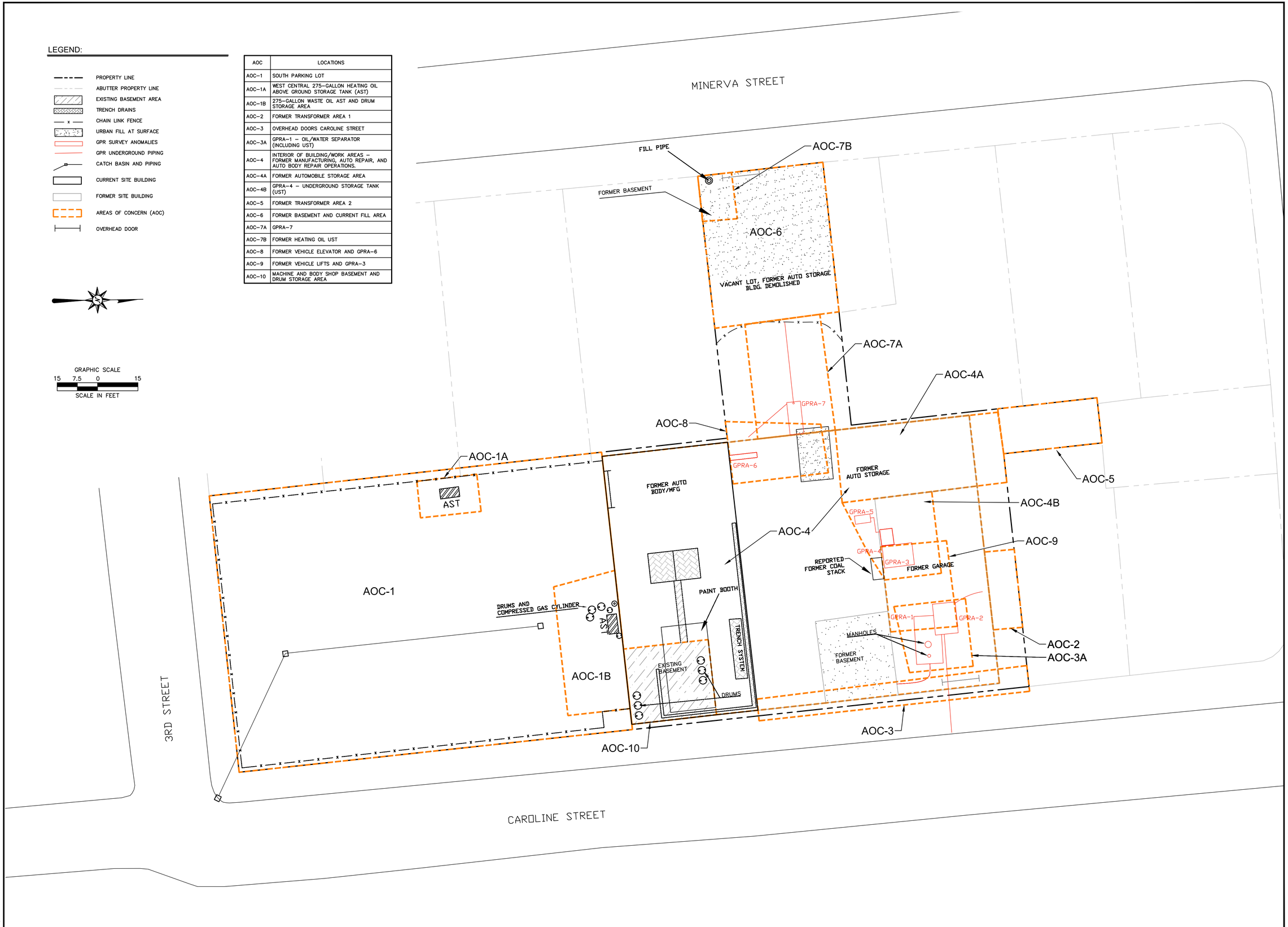
Site Plan (SP-01)
Site Investigation Plan (SI-01)
Soil Remediation Areas (REM-01)
Proposed SVE System (REM-02)
Proposed EUR Subject Area (REM-03)

LEGEND:

- PROPERTY LINE
- ABUTTER PROPERTY LINE
- EXISTING BASEMENT AREA
- TRENCH DRAINS
- CHAIN LINK FENCE
- URBAN FILL AT SURFACE
- GPR SURVEY ANOMALIES
- GPR UNDERGROUND PIPING
- CATCH BASIN AND PIPING
- CURRENT SITE BUILDING
- FORMER SITE BUILDING
- AREAS OF CONCERN (AOC)
- OVERHEAD DOOR

AOC	LOCATIONS
AOC–1	SOUTH PARKING LOT
AOC–1A	WEST CENTRAL 275–GALLON HEATING OIL ABOVE GROUND STORAGE TANK (AST)
AOC–1B	275–GALLON WASTE OIL AST AND DRUM STORAGE AREA
AOC–2	FORMER TRANSFORMER AREA 1
AOC–3	OVERHEAD DOORS CAROLINE STREET
AOC–3A	GPRA–1 – OIL/WATER SEPARATOR (INCLUDING UST)
AOC–4	INTERIOR OF BUILDING/WORK AREAS – FORMER MANUFACTURING, AUTO REPAIR, AND AUTO BODY REPAIR OPERATIONS.
AOC–4A	FORMER AUTOMOBILE STORAGE AREA
AOC–4B	GPRA–4 – UNDERGROUND STORAGE TANK (UST)
AOC–5	FORMER TRANSFORMER AREA 2
AOC–6	FORMER BASEMENT AND CURRENT FILL AREA
AOC–7A	GPRA–7
AOC–7B	FORMER HEATING OIL UST
AOC–8	FORMER VEHICLE ELEVATOR AND GPRA–6
AOC–9	FORMER VEHICLE LIFTS AND GPRA–3
AOC–10	MACHINE AND BODY SHOP BASEMENT AND DRUM STORAGE AREA

GRAPHIC SCALE
15 7.5 0 15
SCALE IN FEET



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67-71 MINERVA STREET, DERBY, CONNECTICUT

REVISIONS

No.	Date	Desc.

Designed	P.R.L.
Drawn	J.E.S.
Reviewed	C.L.Q.
Scale	1"=15'
Project No.	1900269
Date	05/11/2022
CAD File	EV200107901

Title
SITE PLAN

Sheet No.
SP-01

May 11, 2022 10:18am wjohnson G:\JOBS20\1020\107\DWG\EV200107901.dwg
Layout: SP-01 (ANSI)

Xref (s) : XN14L402401 ; EV14L402401 ; N-DAT-1900269-GW CONTOURS-2019-05-31.grd

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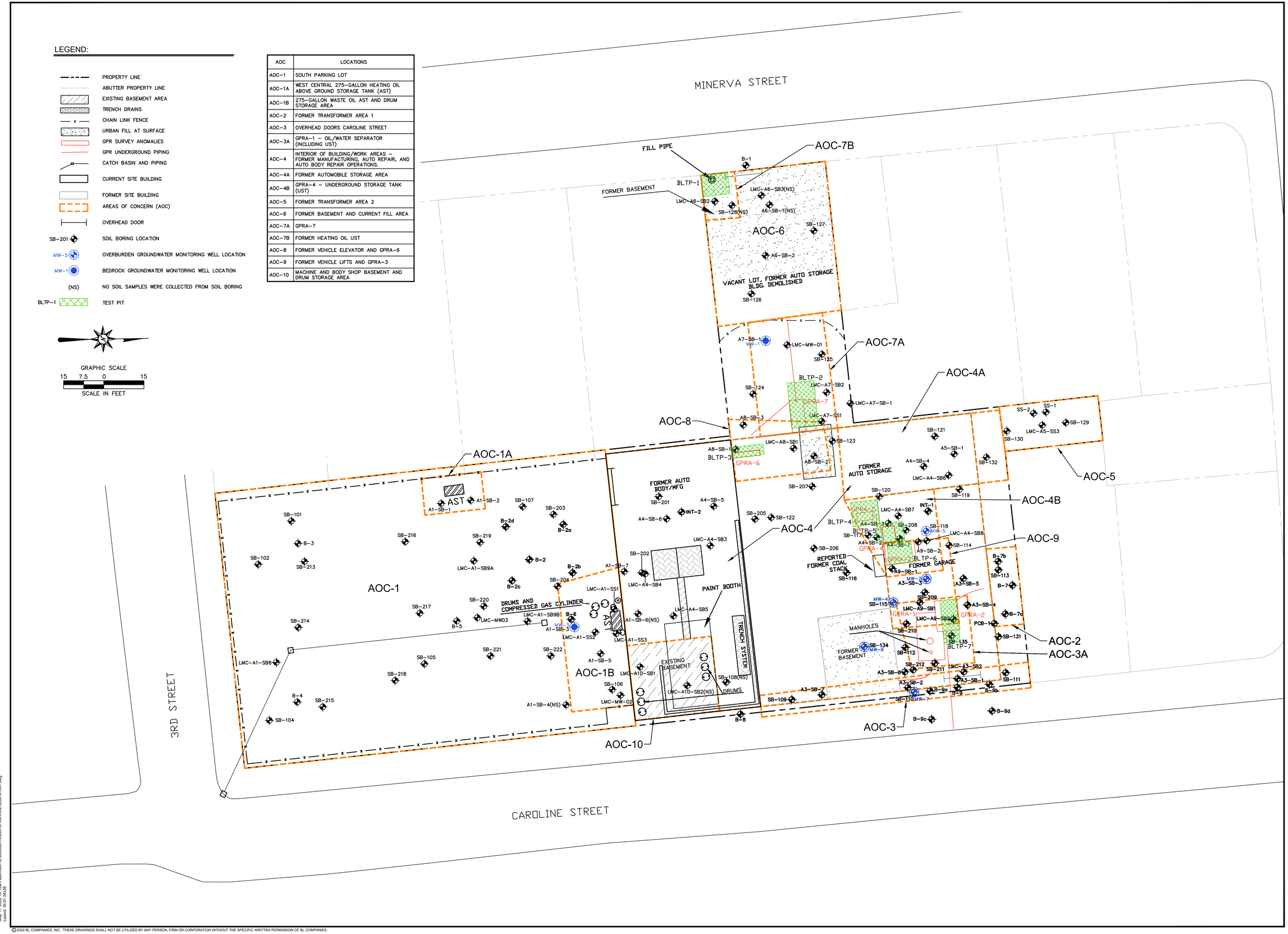
LEGEND:

- PROPERTY LINE
- ABUTTER PROPERTY LINE
- EXISTING BASEMENT AREA
- TRENCH DRAINS
- CHAIN LINK FENCE
- URBAN FILL AT SURFACE
- GPR SURVEY ANOMALIES
- GPR UNDERGROUND PIPING
- CATCH BASIN AND PIPING
- CURRENT SITE BUILDING
- FORMER SITE BUILDING
- AREAS OF CONCERN (AOC)
- OVERHEAD DOOR
- SB-201 — SOIL BORING LOCATION
- MW-5 — OVERBURDEN GROUNDWATER MONITORING WELL LOCATION
- MW-1 — BEDROCK GROUNDWATER MONITORING WELL LOCATION
- (NS) — NO SOIL SAMPLES WERE COLLECTED FROM SOIL BORING
- BLTP-1 — TEST PIT

GRAPHIC SCALE
15 7.5 0 15
SCALE IN FEET

AOC	LOCATIONS
AOC-1	SOUTH PARKING LOT
AOC-1A	WEST CENTRAL 275-GALLON HEATING OIL ABOVE GROUND STORAGE TANK (AST)
AOC-1B	275-GALLON WASTE OIL AST AND DRUM STORAGE AREA
AOC-2	FORMER TRANSFORMER AREA 1
AOC-3	OVERHEAD DOORS CAROLINE STREET
AOC-3A	GPRA-1 – OIL/WATER SEPARATOR (INCLUDING UST)
AOC-4	INTERIOR OF BUILDING/WORK AREAS – FORMER MANUFACTURING, AUTO REPAIR, AND AUTO BODY REPAIR OPERATIONS.
AOC-4A	FORMER AUTOMOBILE STORAGE AREA
AOC-4B	GPRA-4 – UNDERGROUND STORAGE TANK (UST)
AOC-5	FORMER TRANSFORMER AREA 2
AOC-6	FORMER BASEMENT AND CURRENT FILL AREA
AOC-7A	GPRA-7
AOC-7B	FORMER HEATING OIL UST
AOC-8	FORMER VEHICLE ELEVATOR AND GPRA-6
AOC-9	FORMER VEHICLE LIFTS AND GPRA-3
AOC-10	MACHINE AND BODY SHOP BASEMENT AND DRUM STORAGE AREA



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67-71 MINERVA STREET, DERBY, CONNECTICUT

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Reviewed	C.L.Q.
Scale	1"=15'
Project No.	1900269
Date	05/11/2022
CAD File	EV200107901

Title
SITE INVESTIGATION PLAN

Sheet No.
SI-01

May 11, 2022 10:15am wjohnson G:\JOBS20\1020\0107\DWG\EV200107901.dwg
Layout: SI-01 (24x36)

Xref (s) : XN14L402401 | EV14L402401 | N-DAT-1900269-GW CONTOURS-2019-05-31.grd

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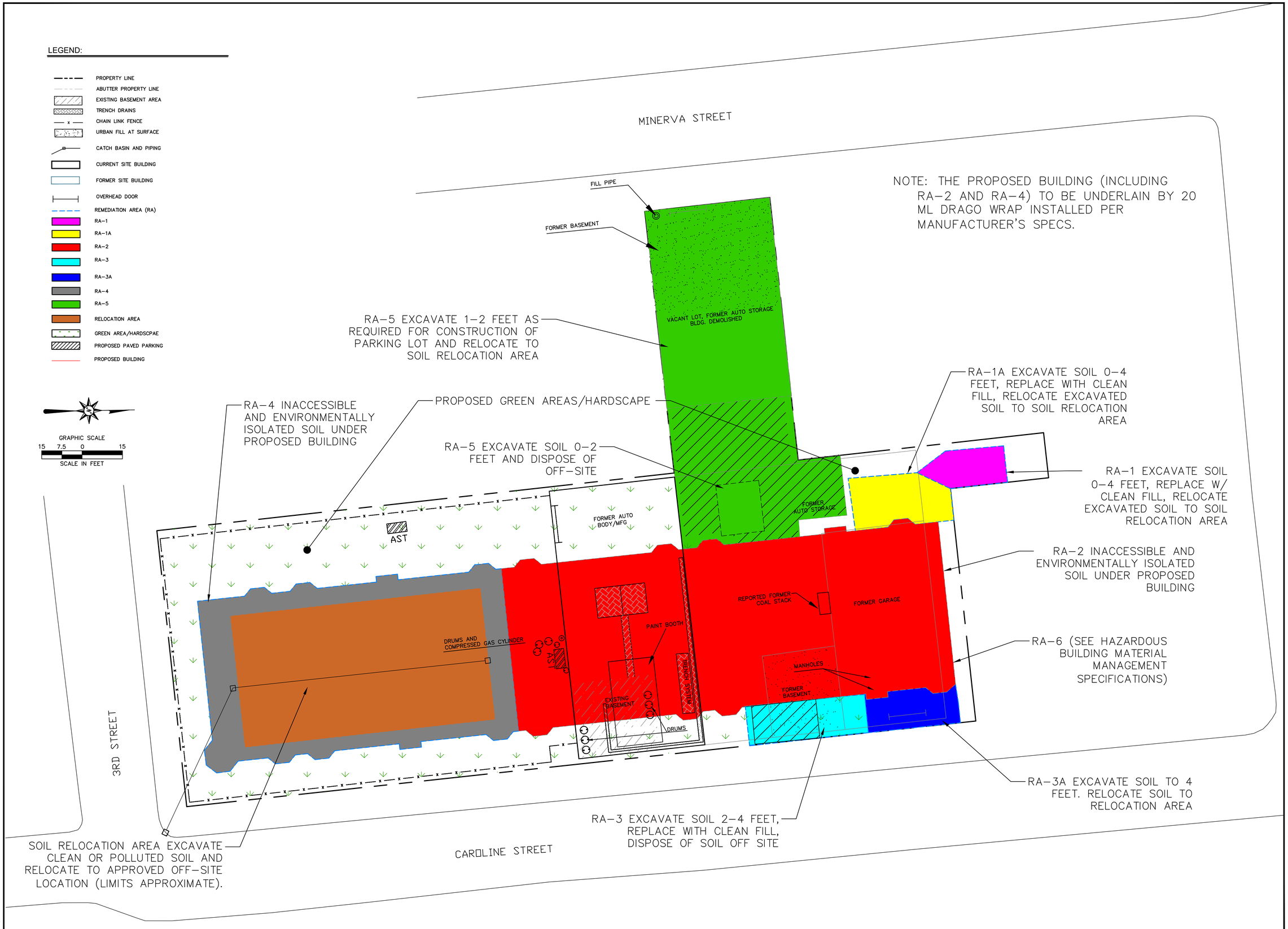
LEGEND:

- PROPERTY LINE
- ABUTTER PROPERTY LINE
- EXISTING BASEMENT AREA
- TRENCH DRAINS
- CHAIN LINK FENCE
- URBAN FILL AT SURFACE
- CATCH BASIN AND PIPING
- CURRENT SITE BUILDING
- FORMER SITE BUILDING
- OVERHEAD DOOR
- REMEDIATION AREA (RA)
- RA–1
- RA–1A
- RA–2
- RA–3
- RA–3A
- RA–4
- RA–5
- RELOCATION AREA
- GREEN AREA/HARDSCPAE
- PROPOSED PAVED PARKING
- PROPOSED BUILDING

GRAPHIC SCALE
15 7.5 0 15
SCALE IN FEET



NOTE: THE PROPOSED BUILDING (INCLUDING RA–2 AND RA–4) TO BE UNDERLAIN BY 20 ML DRAGO WRAP INSTALLED PER MANUFACTURER'S SPECS.

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67-71 MINERVA STREET, DERBY, CONNECTICUT

REVISIONS
No. Date Desc.

Designed	P.R.L.
Drawn	J.E.S.
Reviewed	C.L.Q.
Scale	1"=15'
Project No.	1900269
Date	05/11/2022
CAD File	EV200107901

Title
SOIL REMEDIATION AREAS

Sheet No.
REM-01

May 11, 2022 10:07am wjohnson G:\JOBS20\1020\0107\DWG\EV200107901.dwg
Layout: REM-01

Xref (s) : XN14L402401 ; EV14L402401 ; N:DAT=1900269-GW CONTOURS-2019-05-31.grd

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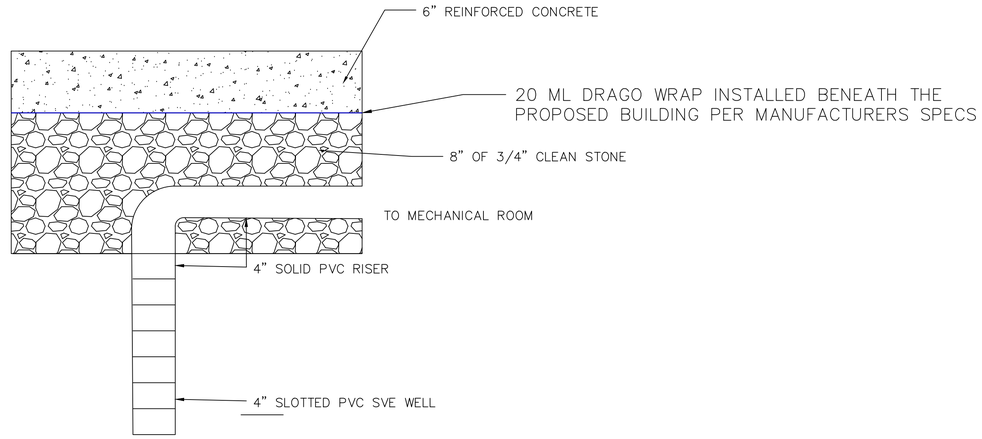
LEGEND:

- PROPERTY LINE
- CURRENT SITE BUILDING
- 4" SLOTTED PVC SVE WELL TO 30 FEET BGS (TYP.)
- PORTION OF PROPOSED BUILDING
- SOLID PVC OR METAL EXHAUST RISER TO ROOF



SVE WELL DETAIL

GRAPHIC SCALE

10 5 0 10

SCALE IN FEET

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REVISIONS

No.	Date	Desc.

Designed	P.R.L.
Drawn	J.E.S.
Reviewed	C.L.Q.
Scale	1"=10'
Project No.	1900269
Date	05/11/2022
CAD File	EV200107901

Title

PROPOSED SVE SYSTEM

Sheet No.

REM-02

May 11, 2022, 10:45am wjohnson G:\JOBS20\1920\0269\DWG\EV200107901.dwg
Layout: REM-02

Xref (s) : 2KN14L402401 ; EV14L402401 ; N-DAT-19002689-GW CONTOURS-2019-05-31.grd

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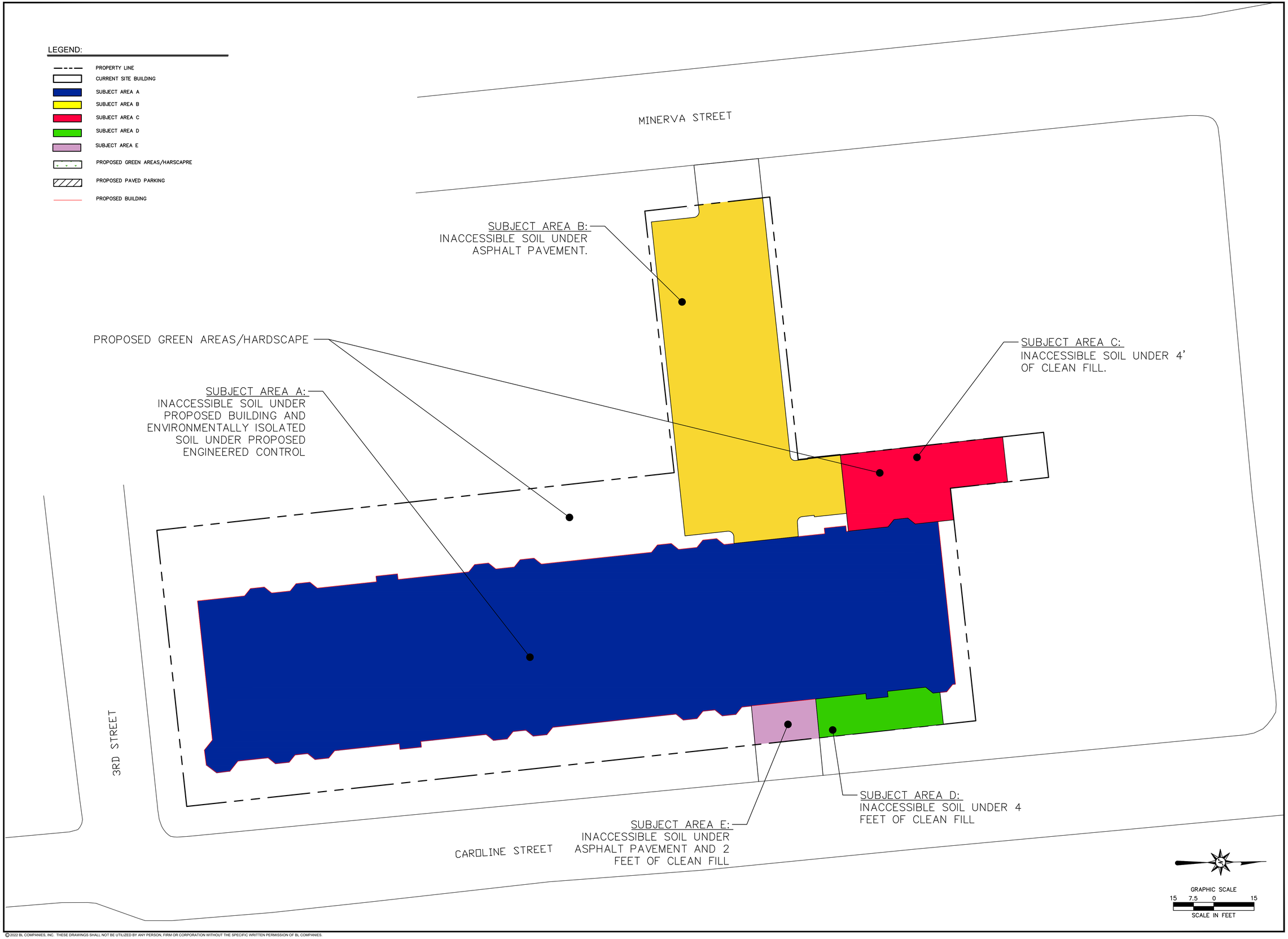

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67-71 MINERVA STREET, DERBY, CONNECTICUT

REVISIONS

No.	Date	Desc.

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Drawn	J.E.S.
Reviewed	C.L.Q.
Scale	1"=15'
Project No.	1900269
Date	05/11/2022
CAD File	EV200107901

Title
PROPOSED ELUR SUBJECT AREAS

Sheet No.
REM-03

May 11, 2022 9:53am wjohnson G:\JOBS\2010\2001979\DWG\EV200107901.dwg
Layout: REM-03

Xref (s) : XN14L402401 ; EV14L402401 ; N-DAT-1900269-GW CONTOURS-2019-05-31.grd

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APPENDIX D

Table 1- Recommended Remedial Strategies for RAs

TABLE 1: RECOMMENDED REMEDIAL STRATEGIES FOR REMEDIATION AREAS
67-71 MINERVA STREET, DERBY, CONNECTICUT

Remediation Area	Soil Contaminants	Recommended Remedial Alternatives
RA-1: RA -1 is located in the northwest portion of the Site, outside the footprint of the proposed building. The proposed development plan indicates that the area will be used as a green space.	PAHs > RES DEC, I/C DEC, and/or GB PMC Lead and Arsenic > I/C DEC and/or RES DEC	The soils in this area would be excavated due to the presence of total lead, total arsenic, and PAHs at concentrations above the residential DEC. The initial excavation will include an approximate 380 square-foot area around boring locations SB-130 and LMC-A5-SS3 excavated to four feet bgs. Assuming the plan to relocate Clean and/or Polluted soil from the southern portion of the Site to the DRZ south of Route 34 is approved by CTDEEP, then the soil excavated from RA-1 will be relocated to the Soil Relocation Area within RA-4, shown on Figure REM-01. Soil placed in the Soil Relocation Area will be rendered inaccessible and environmentally isolated, such that with the use of an EUR preventing its disturbance, the soil will be in compliance with the RSRs. If the soil cannot be relocated and rendered inaccessible on-Site, then it will require off-Site disposal at a permitted facility. The estimated volume of soil to be excavated from this area is approximately 60 to 80 cubic yards. The top two feet of soil would require excavation and replacement with topsoil. An EUR may be required to render soil below four feet bgs inaccessible. This would be determined based on the results of the confirmation samples.
RA-1A: RA -1A is also located in the northwest portion of the Site, outside the footprint of the proposed building and south of RA-1. The proposed development plan indicates that the area will be used as a green space.	ETPH and PAHs> RES DEC, I/C DEC, and /or GB PMC Lead > RES DEC	The soils in this area will need to be excavated due to PMC and/or DEC exceedances of ETPH, PAHs, and total lead as well as to support the development plan which indicates a cut of two feet to support future green space. The initial excavation will include an approximately 650 square-foot area around boring locations SB-132, AS-SB-1, A4-SB-4 and LMC-A5-SB-6 excavated from 0-4 feet bgs. Assuming the plan to relocate Clean and/or Polluted soil from the southern portion of the Site to the DRZ south of Route 34 is approved by the CTDEEP, then the soil excavated from RA-1A will be relocated to the Soil Relocation Area within RA-4, shown on Figure REM-01. Soil placed in the Soil Relocation Area will be rendered inaccessible and environmentally isolated, such that, with the use of an EUR preventing its disturbance, the soil will be in compliance with the RSRs. If the soil cannot be relocated and rendered inaccessible on-Site, then it will require off-Site disposal at a permitted facility. The estimated volume of soil to be excavated from this area is approximately 90 to 100 cubic yards. The top two feet of soil would require excavation and replacement with topsoil. An EUR would be required to render soil below four feet bgs inaccessible. This would be determined based on the results of the confirmation samples.

TABLE 1: RECOMMENDED REMEDIAL STRATEGIES FOR REMEDIATION AREAS
67-71 MINERVA STREET, DERBY, CONNECTICUT

RA-2: RA-2 is located beneath the northern, and the majority of the central portion of the proposed building footprint. VOCs have been detected in soils at concentrations exceeding both the GA and GB PMC and the residential DEC. The primary VOC present at elevated concentrations is PCE.	ETPH and PAHs> RES DEC, I/C DEC, and/or GB PMC Lead and Chromium> RES DEC, I/C DEC CVOCs> RES DEC, I/C DEC, and/or GB PMC	Soils within RA-2 contain VOCs, ETPH, PAHs, total lead, total arsenic, and total chromium at concentrations above the residential DEC and/or GB PMC. Soil remediation will be achieved in RA-2 primarily through encapsulation by the building with the use of an EUR and through the installation of the SVE system. Significant soil excavation is not proposed within RA-2 except for that which is required for construction of the proposed improvements. The VOCs detected in soils in RA-2 exceed the GA PMC at several boring locations, are located beneath the proposed building footprint, and must be reduced to the "maximum extent prudent". Shallow soils containing VOCs exceeding the GA PMC may be left in-place, excavated and reused on-Site under the building, or disposed off-Site. Deeper soils containing regulated compounds above the DEC and the PMC will be rendered inaccessible and environmentally isolated with the use of an Engineered Control (impermeable barrier) and EUR, and the VOCs will also be reduced in concentration with the SVE system. As with soil in other RAs, soil excavated for construction from RA-2 should be reused in the Soil Relocation Area if possible. Shallow soils containing VOCs above the GA PMC that are excavated due to the cuts required for redevelopment of the Site will require stockpiling and off-Site disposal. These cuts would likely be associated with the portions of the foundation components adjacent to RA-3 and RA-5, and with the proposed stormwater drainage system under the northern end of the parking garage. The volume of VOC-impacted soil that will be excavated during the installation of these improvements, and which therefore will require off-Site disposal is unknown at this time and needs to be provided by the Developer. For planning purposes, this soil is assumed to be part of the estimated 600 to 1,000 cubic yards that will require off-Site disposal at a permitted facility.
RA-3: RA-3 is located on the northeastern portion of the Site. RA-3 extends from the east edge of the building at the parking lot entrance to the east, to the property boundary adjacent to Caroline Street. This area is proposed to be developed as driveway into the parking garage and as sidewalk and green space.	ETPH and PAHs> RES DEC, I/C DEC, and /or GB PMC CVOCs> RES DEC and GB PMC	Soils within RA-3 are impacted with VOCs, and to a lesser degree, petroleum hydrocarbons. Sampling results indicate the presence of contaminants that exceed the PMC and the residential DEC from grade to at least 25 feet bgs. Soils within RA-3 will need to be excavated from 0-4 feet bgs and the area backfilled with clean fill in order to comply with the residential DEC, with the placement of an EUR rendering the soils left in-place inaccessible, if needed. The initial excavation will include an approximate 640 square-foot area around boring locations A3-SB-7, A3-SB-6, SB-110, A3-SB-2, SB-212, and SB-211 excavated from 0 – 4 feet bgs. The estimated volume of soil to be excavated from this area is approximately 90 to 100 cubic yards. The top two feet of soil would require excavation and replacement with topsoil. An EUR will be required to render soil below four feet bgs inaccessible. This will be determined based on the results of the confirmation samples. Soil remediation for deeper soils below four feet that contain VOCs or ETPH above the GA/GB PMC will be achieved in RA-3 through the installation of the SVE system.

TABLE 1: RECOMMENDED REMEDIAL STRATEGIES FOR REMEDIATION AREAS
67-71 MINERVA STREET, DERBY, CONNECTICUT

RA-3A: RA-3A is also located in the northeastern portion of the Site, outside the footprint of the proposed building along Caroline Street and to the north of RA-3. This area is proposed to be developed as sidewalk and green space.	ETPH> RES DEC PAHs> RES DEC, I/C DEC, and /or GB PMC CVOCs> RES DEC and GB PMC	The soils within RA-3A need to be excavated due to PMC and/or DEC exceedances of PAHs, as well as to support the development plan which indicates a cut of two feet to support future green space. The initial excavation will include an approximate 460 square-foot area around boring locations B-9, B-9a, and B-9b excavated to four feet bgs. Assuming the plan to relocate Clean and/or Polluted soil from the southern portion of the Site to the DRZ south of Route 34 is approved by the CTDEEP, then the soil excavated from RA-3A will be relocated to the Soil Relocation Area within RA-4, shown on Figure REM-01. Soil placed in the Soil Relocation Area will be rendered inaccessible and environmentally isolated, such that, with the use of an EUR preventing its disturbance, the soil will be in compliance with the RSRs. If the soil cannot be relocated and rendered inaccessible on-Site, then it will require off-Site disposal at a permitted facility. The estimated volume of soil to be excavated from this area is approximately 70 to 80 cubic yards. The top two feet of soil would require excavation and replacement with topsoil. An EUR may be required to render soil below four feet bgs inaccessible. This will be determined based on the results of the confirmation samples.
RA-4: RA-4 is located under the southern portion of the footprint of the proposed building.	ETPH> RES DEC PAHs> RES DEC, I/C DEC, and/or GB PMC Arsenic and Lead > RES DEC and I/C DEC	RA-4 is located under the southern portion of the footprint of the proposed building. Soils impacted with low concentrations of ETPH above the residential DEC are present in the northwestern portion of RA-4 at sampling location B-2c. Soil containing total lead and total arsenic above the residential DEC, and PAHs above the residential DEC and GB PMC are present in the southeastern portion of RA-4 at sampling location SB-215. These soils can be left in place, or excavated and reused on-Site, if rendered inaccessible and environmentally isolated with the placement of an EUR. The majority of RA-4 consists of shallow urban fill and underlying native soil that does not contain regulated compounds, or if present, contain regulated compounds at low concentrations below the GB PMC and the residential DEC. In order to properly manage excess Polluted and Contaminated soil excavated during construction of the proposed improvements, clean and slightly Polluted soil from RA-4 may be excavated and relocated to City-owned property on the south side of Route 34. The City-owned property, known as the Downtown Redevelopment Zone (DRZ), is also undergoing redevelopment, and large quantities of fill material are needed for that project. The City's environmental consultant for that project has reviewed the soil data from RA-4 and agrees that it is suitable for reuse at the DRZ. Approval by CTDEEP will be required prior to moving any soil. Once approved, it is anticipated that up to 2,000 yards of Clean soil from RA-4 will be excavated and relocated to the DRZ, allowing for the relocation and on-Site reuse of up to 2,000 yards of Polluted and Contaminated soil from the Site that will be generated from either construction or remediation activities to be placed in the resulting excavation and rendered inaccessible and environmentally isolated under the proposed building. This area is referred to as the Soil Relocation Area in Figure REM-01.

TABLE 1: RECOMMENDED REMEDIAL STRATEGIES FOR REMEDIATION AREAS
67-71 MINERVA STREET, DERBY, CONNECTICUT

RA-5: RA-5 is located on the western portion of the Site and extends from the western edge of the proposed building to Minerva Street. The area is proposed to be used for parking.	PAHs> RES DEC, I/C DEC, and/or GB PMC Lead > RES DEC CVOCs> RES DEC and GB PMC	The area includes the proposed placement of a paved parking surface, consisting of three inches of bituminous concrete and eight inches of subbase. Soils impacted with metals, ETPH, and/or PAHs exceeding the DEC can be rendered inaccessible beneath the pavement with the placement of an EUR. Excess soils generated from construction of the parking lot that exceed the RSRs may be relocated to the Soil Relocation Area and rendered inaccessible or will require off-Site disposal. The quantity of soil from this area to be to be removed to support development activities is assumed to be part of the excess soil quantity estimated by the Developer. PCE is present in soil at two locations within RA-5, SB-207 and LMC-A8-SB1, at concentrations above the GA PMC and/or residential DEC. In addition, PAHs at A8-SB-2 exceed the GB PMC. These sample locations are located in the eastern portion of RA-5, near the entrance to the parking garage and will require excavation and off-Site disposal. The estimated volume of soil to be excavated from this area is approximately 45 to 50 cubic yards. An EUR would be required to render soil remaining in RA-5 inaccessible. Soil remediation for deeper soils below four feet that contain VOCs above the GA/GB PMC will be achieved in RA-5 through the installation of the SVE system.
RA-6: RA-6 is located at the northern end of the Site.	PCBs > RES DEC	PCB-containing caulk in the retaining wall at the northern edge of the Site has leached and impacted soil (approximately four cubic feet) at the base of the wall, which soil will be removed from the Site and properly disposed of at a licensed disposal facility.
HBM Roof and Gaskets	Asbestos	Remove and segregate during demolition
HBM – Caulks and Substrates	PCB-Containing Materials	Remediate prior to demolition