Full Stage1 Demonstration Project

Canterbury, Connecticut



ROC Geotechnical Consulting Engineers, PLLC
Rochester, New York

Terracon Project No. GR235C95B

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Summary of Potential Constraints and Next Steps

The following is a summary of constraints identified for the site. Please refer to the respective considerations sections of the report for more details.

Geotechnical

- Fill associated with the previous developments, site usage, and existing roadways is expected throughout the site. The existing fill will likely not be suitable for foundation support and will require conventional over-excavation and replacement with structural fill. Next Steps should include explorations to evaluate the extent and composition of fill and the relative density of underlying natural glacial outwash deposits.
- Eolian deposits are mapped throughout the property. These deposits are typically loose and may be susceptible to collapse, settlement, and reduced shear strength when wet. Next Steps should include subsurface explorations to evaluate the presence and extent of loess/eolian deposits and conducting laboratory testing on representative soil samples to evaluate physical properties.
- Due to anticipated shallow groundwater, construction dewatering will likely be required in some areas of the site, as well as permanent dewatering for below grade structures. Next Steps should include installation of piezometers to evaluate and monitor groundwater depths.
- On-site soils are anticipated to be corrosive to concrete and steel. Next Steps should include laboratory corrosion testing.
- Grading plans have not been developed for this early conceptual stage; however, based on existing site topography and anticipated finish floor elevations (FFE) of 156 feet above mean sea level, cuts ranging from approximately 15 to 25 feet deep, and fills on the order of about 20 to 30 feet will likely be required to achieve design grades. In addition, a significant number of site retaining walls will likely be required; these walls will be relatively long (surrounding a significant portion of the developed site), and wall heights may be as much as 30 feet in planned cut areas and 20 feet tall in planned fill areas. Next Steps should include review of conceptual/preliminary grading plans (once available) to evaluate the extent and magnitude of site grading and anticipated site retaining wall requirements.
- Based on historical aerial imagery, potential mining activities were present on-site. These mining activities were related to surficial borrow materials and not subsurface mining operations. Next Steps should include explorations to evaluate the potential presence of fill associated with historical operations at the site.

Subsurface Environmental

- Shallow groundwater and permeable soils are anticipated. This combination typically allows contaminants, if present, to readily migrate.
- There is a high likelihood of potential environmental concerns based upon the site and adjacent property usage.
- Regulatory database listings identified on the site and near the site indicated a high likelihood of potential environmental concerns for the site.
- Next Steps should include an ASTM E1527-21 Phase I Environmental Site Assessment and a Limited Site Investigation (LSI).

Cultural

- There are three archeological sites mapped results within a 1/4-mile radius. None are located within the project area.
- There is one previous cultural resource survey conducted within a 1/4-mile search.
- There is a low potential for cultural resources to be identified on the site.
- If a federal nexus is identified for the project, Next Steps should include coordination with a Secretary of Interior-qualified cultural resources professional.

Wetlands/Waters

- National Hydrography Database (NHD) and National Wetlands Inventory (NWI) features are mapped on-site and adjacent to the site.
- Desktop resources reviewed show evidence of aquatic features on-site.
- Portions of the site fall within mapped soil units with known hydric components.
- Next Steps should include a site reconnaissance to confirm findings and to conduct a delineation.

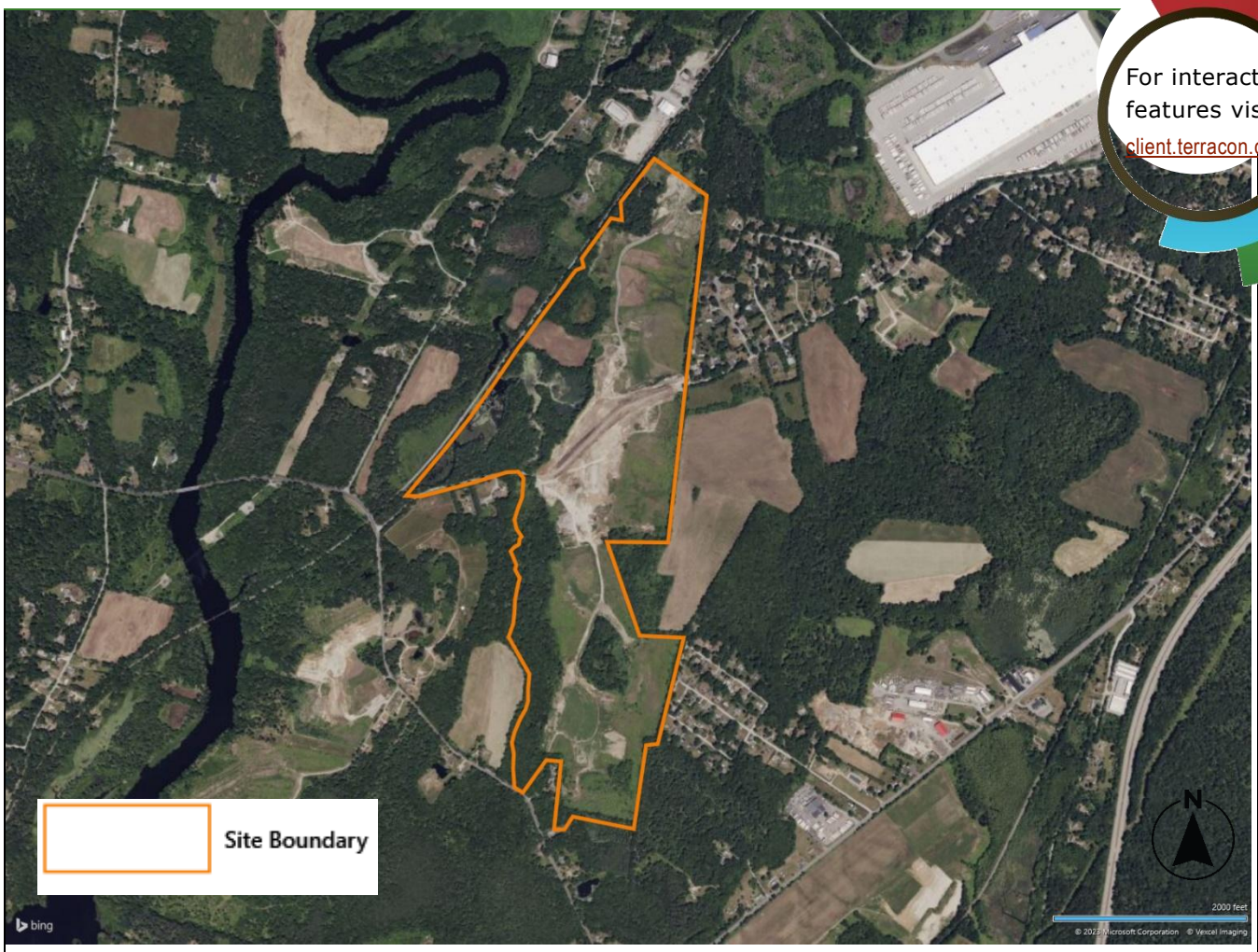
Federally Protected Species

- Potential for northern long-eared bat habitat exists within the trees of the site.
- Next Steps should include a Threatened and Endangered Species habitat evaluation and consultation with U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act if habitat is identified on-site.

Your Site

Project Description

The site covers approximately 227 acres and is planned to be developed with a distribution center building, stormwater retention pond, retaining walls, and paved parking and drive areas.



See **Information Sources** for a detailed list of sources used to generate this figure.

Geotechnical Considerations

See Information Sources for a more detailed list of sources reviewed in determining the Geotechnical Considerations for the site. Potential constraints are addressed in this section.

Topic	Comments
Anticipated foundation systems	Subsurface conditions at the project site are expected to consist of natural glacial outwash deposits of sand and gravel over gneiss and schist bedrock. We anticipate eolian deposits may be present within portions of the project site, and existing fill will likely be present above the natural sand and gravel deposits in areas of previous development and existing roadways. These deposits, if encountered, will likely not be suitable for foundation support and require conventional over-excavation and replacement methods. Conventional shallow foundations are anticipated to bear on medium dense natural soil or on structural fill placed above natural soil. Shallow foundations bearing on natural soil and/or structural fill placed above natural soil will likely be capable of supporting anticipated structural loads up to 150 kips.
Anticipated excavation equipment	Conventional earthwork equipment is anticipated for the overburden soils at the project site. Based on the planned cuts and anticipated depth to bedrock, rock excavation is not anticipated; however, if bedrock is encountered within planned excavation depths (i.e. typically, greater than about 25 feet), heavy earthwork equipment and blasting methods may be warranted. Areas of the site with shallow groundwater will likely encounter loose/wet soils with possible caving conditions.
Pavement	Typical pavement sections will likely be acceptable.
Anticipated seismic site class	Site Class C or D
Anticipated frost depth	42 inches
Bedrock	NRCS mapping indicates shallow bedrock will likely not be encountered. Our experience indicates bedrock will likely be encountered at depths greater than 25 feet.
Blasting anticipated	Not anticipated; however, if proposed cuts are deep (greater than about 25 feet) and bedrock is encountered, blasting may be warranted.

Topic	Comments
Groundwater	NRCS mapping indicates seasonal high groundwater at depths ranging from the ground surface to approximately 4 feet. Our experience indicates groundwater will likely be encountered at depths ranging from 1 foot to 20 feet below ground surface. Perched groundwater may be encountered in the fill and/or at the fill and natural soil interface.
Dewatering anticipated	Due to the anticipated shallow groundwater, the site may require temporary dewatering during construction. Permanent dewatering may also be required in cut areas.
Karst constraints	USGS mapping does not map the site in karst. The mapped schist and gneiss bedrock are not susceptible to karst development.
Sinkholes	Not anticipated
Seismic liquefaction	Not anticipated
Settlement monitoring likely required	Not expected for the anticipated subsurface conditions at the project site but may be warranted in areas of thicker fill (>15 feet).
Fill anticipated on-site	Yes. In areas of the site where fill is encountered, it will likely need to be removed and replaced with properly compacted engineered fill. Existing fill will likely not support loads associated with the anticipated development.
Site usage	Historical images indicated that the site was primarily wooded land with portions of the site used for agricultural purposes. Agricultural activities disturb upper material resulting in soft/loose material, likely requiring stabilization. Historical images also indicate that portions of the site were previously developed with possible mining/quarry activities. In our experience, there is an increased risk of encountering deleterious or unsuitable materials on a previously developed site.

Notes on Geotechnical Considerations

- Shallow foundations will likely be suitable for the proposed development provided they are founded on approved and suitable soil. This may require remediation or removal and replacement of loose/unsuitable materials.
- Subsurface conditions at the project site are expected to consist of natural sand and gravel deposits over gneiss and schist bedrock. We anticipate existing fill will likely be present above the natural soils in areas of previous development and existing roadways. Final designs will need to address key geotechnical aspects associated with these challenges such as evaluating reuse of on-site fill and natural soils to control earthwork costs, evaluating groundwater and the need for permanent drainage and underdrains, and managing earthwork activities and sequencing to protect on-site soils, which may be easily disturbed and lose strength quickly when wet.
- A significant amount of cutting and filling may be required to achieve design grades. Cuts on the order of 15 to 25 feet and upwards of 20 to 30 feet of fill will likely be required. Site retaining walls are expected to be relatively long with wall heights ranging from approximately 20 to 30 feet.
- NRCS mapping indicates on-site soils have a low shrink-swell potential. Based on our experience in the region, shrink-swell soils will not likely be a concern at this site.
- Seasonal perched groundwater is anticipated at relatively shallow depths in portions of the site. Water seepage in excavations is possible and dewatering of excavations will need to be considered. Agricultural field drain tiles might be encountered and procedures to divert tile lines would be necessary where encountered.
- Site stripping and excavations on-site may encounter stable soils, but when existing soils become exposed to the elements or disturbed, they will likely lose strength and become unstable and difficult to rework without additional stabilization and effort. NRCS mapping identifies Eolian deposits throughout the property. These deposits are typically loose and may be susceptible to collapse, settlement, and reduced shear strength when wet. Earthwork should be planned during seasonally dry periods to the extent practical. Considerations will need to be given to managing soil exposed to the weather, drying, and/or replacing wet or disturbed soil, or using soil stabilization methods such as the use of lime or cement if construction occurs during inclement weather or limited drying times prevail.
- Subsurface conditions within the project area are anticipated to include natural sand and gravel deposits, consideration should be given during design and construction to reuse as much of the on-site soil as possible to reduce the volume of import/export associated with developing the site.
- On-site soils are anticipated to be corrosive to concrete and steel.
- Faults were mapped within 1/2-mile of the project site; however, these faults are glacial depositions (ice margin, eskers, etc.) and not anticipated to be a concern.
- Based on historical aerial imagery, areas of mining were apparent on-site. Mining activities appear to be related to overburden soils/borrow materials.

Subsurface Environmental Considerations

See Information Sources for a more detailed list of sources reviewed in determining the Subsurface Environmental Considerations for the site. Potential constraints are addressed in this section.

Topic	Comments	
Anticipated surficial lithology	See Expected Lithology.	
Inferred groundwater flow	Based on the USGS topographic map, groundwater is inferred to flow in a general westerly direction.	
Regulatory database listings[1]	On-site	24
	Between the site and 100 feet of the site	6
	Between 100 feet and 1/8-mile of the site	8
	Between 1/8-mile and 1/4-mile of the site	8
Site and adjacent properties current and previous usage	Historical site use included possible mining/quarry activities, agricultural land, wooded land, ponds, and roadways. Aggregate piles are apparent on various portions of the site. Adjacent property usage consisted of a landfill, a recycling facility, residences, a railway, commercial/retail properties, and roadways. Site and adjacent property usage and age of development are considered to present a high likelihood of potential environmental concern for the site.	
Previous Terracon environmental site assessments near site	There were no prior Terracon projects involving assessment of subsurface environmental conditions identified within 1/4 mile of the site.	

1. See Regulatory Database Report for more details about the listings.

Notes on Environmental Considerations

- Regulatory database listings identified on the site and near the site indicated a high likelihood of potential environmental concerns for the site based on:
  - Plotted On-site: 24 listings including Leaking Underground Storage Tank (LUST), Property Transfer Filings (CT PROPERTY), Spills Listing (SPILLS), Contaminated or Potentially Contaminated Sites (CPCS), National Pollutant Discharge Elimination System (NPDES), Significant Environmental Hazards Reported to the Department of Energy & Environmental Protection (SEH), Permitted Air Sources Listing (AIRS), Enforcement Case Listing (ENF), Underground Storage Tank (UST), Recovered Government Archive Leaking Underground Storage Tank (RGA LUST), Facility Registry System / Facility Index System (FINDS), Environmental Compliance History Information (ECHO), Manifest Listing (MANIFEST), and Leachate and Wastewater Discharge Sites (LWDS) databases. These database listings were identified on-site; however, based on the address (133 Packer Road), these facilities were identified as located north-northwest adjoining. These facilities are further discussed below.

  - Between the site and 100 feet: 6 listings were identified in the database report; however, based on address, 30 listings including were identified less than 100 feet from the site including LUST, SPILLS, NPDES, SEH, AIRS, ENF, UST, RGA LUST, FINDS, ECHO, LWDS, MANIFEST, Activity and Use Limitation (AUL), CT PROPERTY, CPCS, and EDR Historical Cleaner (EDR Hist Cleaner) databases. These database listings are associated with the various adjoining facilities including Willimantic Waste Paper (WWP)– Canterbury Garage, Waste Management of Connecticut, Inc., 133 Packer Road, Yaworski Landfill / Yaworski Industrial, Canterbury Landfill, BKDS Enterprises, C & M Corporation / C & M Manufacturing, and Washboard Laundromat.

    WWP – Canterbury Garage, Waste Management of Connecticut, Inc., Yaworski Landfill / Yaworski Industrial, and Canterbury Landfill were identified north adjoining and listed in the LUST, PROPERTY, SPILLS, CPCS, NPDES, SEH, UST, ENF, FINDS, ECHO, MANIFEST, LWDS, RGA LUST, and AIRS databases. There are six USTs registered to this facility including one 10,000-gallon diesel UST, one 2,000-gallon heating oil UST, two 1,000-gallon heating oil USTs, one 500-gallon kerosene UST, and one 1,000-gallon used oil UST. Five of these USTs were reportedly closed and removed from the ground, while the 2,000-gallon heating oil UST reportedly remains in place and is currently in use. A LUST incident was reported at this facility in 2008 and was deemed completed in 2009. Additional information regarding this incident was not provided. A property transfer was initiated in April of 2007 with a Form II required, which informs that a, "discharge, spillage, uncontrolled loss, seepage, or filtration of hazardous waste has occurred at the parcel that has not been fully remediated or the environmental conditions at the parcel are unknown."

In 2006, a SPILLS notification was reported at this facility following an overfill of approximately 2 gallons of petroleum. This spill was reportedly removed and contained and deemed closed. An additional SPILLS incident was reported at this facility in 2010 when a hose failed and approximately 2 gallons of hydraulic oil was released. This release was reportedly removed, contained, sanded, and closed. NPDES permits were issued to this facility in 2001 and reissued in 2007 for the discharge of stormwater associated with industrial activities. This facility was identified in the SEH database in 2008 and 2016 when pollution was detected in a drinking water well at the facility.

This facility received multiple violations and were ordered enforcement actions associated with their landfill operations. The FINDS and ECHO listings are associated with this facility's participation in the Environmental Protection Agency's (EPA) landfill methane outreach program to help, "reduce methane emissions from landfills by the recovery and use of landfill gas (LFG) as an energy resource."

BKDS Enterprises and C & M Manufacturing were identified south-southeast adjoining and in the MANIFEST, AUL, PROPERTY, and CPCS databases; however, based on the address (51 South Walnut Street), this facility is located approximately 6 miles north of the site and is not considered an environmental concern.

Washboard Laundromat was identified east adjoining and in EDR's Hist Cleaner database as a dry-cleaning plant (except rugs) in 2003 and 2004.

- Based on the on-site and adjacent regulatory database listings, the review of aerial imagery, and anticipated physical setting, there is a high likelihood of potential environmental concerns for the site.
- Please review the Regulatory Database Report and Aerial reports on Compass for information referenced above.

Subsurface Environmental Consideration and corresponding Next Steps prepared by Emily Moroni and reviewed by Sean Kennedy.

Cultural Resource Considerations

Topic	Comments
National Register of Historic Places (NRHP) listed resources (e.g., structures or districts) on-site	0
NRHP listed resources within a 1/4-mile radius of the project	0
Cemeteries	None mapped within a 1/4-mile radius on a topographic map.
Site contains publicly owned land	No
Public funds will be utilized for development	Unknown

Notes on Cultural Resource Considerations

The following cultural resources were identified through review of readily available data sources (e.g., National Register of Historic Places [NRHP]).

Name	Resources No.	Description	NRHP Eligibility	On-Site
Opryland Site	40DV29	Open Habitation (Archaic)	Unknown	No
FS-1	40DV752	Open Habitation (Unknown Precontact)	Unknown	No
FS-8	40DV754	Open Habitation (Archaic)	Unknown	No

- There is one previously recorded survey approximately 0.15 miles from the project area, performed on a portion of SR-155 (Briley Parkway) by the Department of Transportation (DOT) in 1998 (DOA #5061).
- The closest archaeological site, 40DV754, is approximately 0.09 miles west of the project area. While the boundary of the site is only partially explored, the landform on which it exists is separated from the project area by a steep ravine marking a significant drop in elevation and is unlikely to have constituents on the upper terrace of the project area landform.

- Although the project area has not been subject to previously recorded surveys, ground-disturbing activities would take place within the footprint of extensive previous disturbance, resulting in low potential for adverse effects to buried cultural resources. Furthermore, due to past disturbances resulting from urban development, flooding events, and landscape modification, intact cultural deposits are unlikely within the project area.
- Modern and historic urban development have already altered the viewshed of surrounding eligible and potentially eligible above-ground resources within line of sight. Project is unlikely to adversely affect above-ground cultural resources.
- If a federal nexus is identified for the project, or if the project is anticipated to impact state or federal lands, next Steps should include coordination with a Secretary of Interior-qualified cultural resources professional.
- The eastern portion of the project area appears to be within a sand and gravel pit or quarry. The western and southern portions contain wetlands and ponds. There is minimal to no potential for encountering precontact or historic period archaeological sites in the disturbed eastern portion of the project area. Based on the presence of intermittent streams, wetlands, and ponds in the western portion, there is a low to moderate potential for encountering precontact period archaeological sites. Historic maps and aerial photographs indicate that no development has occurred within the project area, suggesting that there is minimal potential for encountering historic period archaeological sites in the undisturbed western portion.

Cultural Resource Considerations and corresponding Next Steps prepared by Kathy Lombardi and reviewed by David Dickson.

Natural Resource Considerations

See Information Sources for a more detailed list of sources reviewed in determining the Natural Resource Considerations for the site. Potential constraints are addressed in this section.

Wetlands / Waters

Topic	Comments
National Hydrography Database (NHD)	Numerous wetland areas (identified as "swamp marsh") are mapped along the western site boundary and in the southern portion of the site. An intermittent stream is mapped along the northwestern site boundary and extends into the southern portion of the site. A freshwater pond is mapped in the southern portion of the site. The site is surrounded by NHD features to the west.
National Wetlands Inventory (NWI)	Numerous freshwater emergent and freshwater forested/shrub wetlands are mapped along the western site boundary and in the southern portion of the site. A riverine feature is mapped along the northwestern site boundary and extends into the southern portion of the site. Freshwater ponds are also mapped in the southern portion of the site. The site is surrounded by NWI features to the east, south, and west.
Hydric Soils	Portions of the site are mapped within the boundaries of soil units with known hydric components.
Regulatory Floodway	The site is located outside of a regulatory floodway.
Floodplain	The site is located outside of a floodplain.

Federally Protected Species

Topic	Comments
Critical Habitat Anticipated On-Site	No
Federal Threatened Species Anticipated	No threatened species are expected to occur in the vicinity of the site.
Federal Endangered Species Anticipated	Based on aerial photography, potential for northern long-eared bat (NLEB) habitat exists within the trees on the site and surrounding properties.

Notes on Natural Resource Considerations

- NWI/NHD features are mapped within the boundaries of the site and on the adjoining properties.
- Portions of the site are mapped within the boundaries of partially hydric to hydric soils.
- The USFWS has listed the site as containing potential habitat for the northern long-eared bat. Based on aerial photography, potential bat habitat exists within the trees on the site.
- One candidate species, the monarch butterfly, was identified as potentially occurring on or near the site. There are generally no Section 7 requirements for candidate species, therefore, the candidate-listed species is not discussed above.
- It is not anticipated that migratory birds will pose a substantial constraint to project site development; however, a migratory bird nest survey would be recommended to evaluate the potential for the presence of avian species protected by the Migratory Bird Treaty Act (MBTA) at the project location if clearing begins and is conducted during the nesting season (generally March through August). If the site is cleared outside the nesting season, then a survey would not be recommended. The USFWS typically recommends that development occur outside the peak migratory bird nesting season.
- Although the scope of this Stage1 report does not include consideration of State-listed species, it is possible that habitat for additional State-listed species may occur on the site. It is recommended that the site be evaluated for the potential to contain habitat for State-listed species.
- Wetland impacts are likely to be part of the project. Terracon recommends that a waters of the United States and wetland delineation be conducted and a jurisdictional determination submitted to the U.S. Army Corps of Engineers (USACE). If wetland impacts are proposed, then a permit application will need to be prepared and submitted to USACE. If impacts are 1/2-acre or less, a Nationwide Permit verification may be appropriate. If impacts are greater than 1/2-acre, then a Standard (individual) Permit will likely be required. Please note that approvals may also be required by the State.
- Please review the IPaC resource list on Compass for information provided by USFWS for a visualization of mapped sources that were reviewed for natural resource considerations which includes a downloadable copy of mapped areas.

Natural Resource Considerations and corresponding Next Steps prepared by Nicole Hain and reviewed by David Dickson.

Next Steps

Below are our recommended next steps that will likely be needed to proceed with site development. To complete any of the Next Steps described below, please contact Marcey Fox at marcey.fox@terracon.com.

Geotechnical

In order to characterize the subsurface conditions and provide design parameters, we recommend the following:

Topic	Comments
Field exploration	Yes, Standard Penetration Test (SPT) Borings as follows: 32 SPTs advanced to depths of 20 feet below FFE in the proposed distribution building footprint. 24 SPTs advanced to depth of 20 feet below FFE in the proposed dry/wet depot footprint. 39 SPTs advanced to depths of 10 feet below design grade in proposed pavement areas. 2 to 3 SPTs advanced to ≥50 feet to evaluate the Seismic Site Class. Based on anticipated cuts planned to achieve design FFEs and the estimated depth to bedrock, rock coring may be warranted during the field explorations and may be necessary where rock is encountered. Where site retaining walls are planned, additional borings and test pits will be required where wall heights are greater than 4 feet. Where permanent soil slopes are planned, additional explorations will likely be required. The approximate locations of our recommended geotechnical explorations will be determined when site plans are available.

Topic	Comments
Test pits	Yes, within proposed stormwater management areas to evaluate seasonal high groundwater table and to perform infiltration testing. The number of test pits will be determined when site plans are available.
Geophysical shear wave velocity testing to evaluate the seismic site class	Possibly, depending upon SPT values and potential impacts that seismic site class has on structural design.
Piezometer installation and monitoring	Yes
Infiltration testing	Yes, in accordance with local code specifications.
Laboratory testing	Yes
Site clearing	Yes
Mine spoil testing	Yes
Vibration monitoring	Yes, if blasting is required.

Subsurface Environmental

Service	Recommended
ASTM E1527-21 Phase I Environmental Site Assessment	Yes
Limited Site Investigation (for economical purposes, this could be performed in conjunction with the geotechnical investigation)	Yes
Obtain appropriate regulatory assurances and regulatory file closure	Yes
Preparation of a media management plan	Yes

Cultural Resources

Service	Recommended
Coordinate with Secretary of Interior-qualified cultural resources professional to identify additional previously recorded cultural resources on or near the project site	Yes
Evaluate whether the proposed project would require consultation under Section 106 of the National Historic Preservation Act of 1966, as amended and/or other applicable state/local regulation	Yes

Wetlands / Waters

Service	Recommended
Conduct a site reconnaissance to confirm findings	Yes
Delineate aquatic resources (wetlands, streams, ponds, etc.) with the potential to be regulated as waters of the U.S. under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act	Dependent upon the findings of the site reconnaissance.

Federally Protected Species

Service	Recommended
Threatened and Endangered Species habitat evaluation	Yes
Consultation with USFWS under the Endangered Species Act	Consultation may be required if suitable habitat is identified and impacts may occur.
Migratory bird nest survey	Yes, if clearing began and is conducted during the nesting season.

Information Sources

Publicly Available GIS Data	National Register of Historic Places Database FEMA Flood Mapping United States Forestry Service National Wetlands Inventory Connecticut Bedrock Geology Connecticut Surficial Geology
Aerial Imagery	Terracon reviewed the following readily available historical aerial images and street view images available on October 4, 2023, to develop a limited history of previous site usage: **Aerial Images** Google Earth Pro™ EDR Historical Aerial Photographs **Street View Images** Google Maps, Google Earth Pro™ The use of available aerial imagery resources is intended to help understand previous site usage. These images are widely spaced in time. They should not be considered appropriate for identifying all site activities which may have impacted subsurface conditions. A more comprehensive review of aerial imagery and/or site interviews would be required to further evaluate previous site usage.
Other Sources	Historical Terracon Data

Methods and Limitations

Methods

General Note About Data Availability

The sources of publicly available information as provided in this Stage1 are identified on Compass. Terracon makes no warranty as to accuracy of any public information, as displayed in the map viewer.

Virtual Soil Profile Process

The VSP is a spatial dataset that combines the United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS) Gridded Soil Survey Geographic (gSSURGO) Database, the NRCS Digital General Soil Map of the United States (STATSGO2) Database, and Terracon project borehole data collected since 2014. The VSP is provided as a polygon geometry spatial layer with the polygons derived from gSSURGO's Map Unit Polygon geometry. The VSP is reviewed and occasionally revised by the local professional, based upon their knowledge in the project area. Additionally, the VSP is utilized to develop the geotechnical considerations provided in the Stage1.

Subsurface Environmental Considerations

We have provided an opinion of potential environmental constraints based upon the physical setting, site use, regulatory database information and Terracon historical projects. Depending on the type of development, additional regulatory review may be required. We have evaluated the following for potential constraints:

- **Physical Setting:** Physical setting plays a role in the sensitivity to and migration of pollution and, consequently, associated environmental risks to a site. To evaluate physical setting, Terracon reviewed hydrogeologic conditions in the area of the site including shallow groundwater geology, depth to groundwater and anticipated groundwater flow direction.
- **Site and Adjacent Property Use:** Current and historical site use and adjoining property use are key factors in determining likelihood of potential environmental concerns on and in the area of the site. In addition to the usage of the site and adjoining properties, Terracon also considers the duration of such usage in evaluating the potential constraints. Terracon evaluated site use and adjoining property use against its experience with various operations known to present environmental concerns to sites.
- **Previous Terracon Experience:** Terracon has vast experience as an environmental consultant and has a database of over 300,000 reports from around the United States. Terracon has mined attributes from these local reports and performed analysis on the findings on an anonymized basis, holding client data confidential, while using proprietary data to evaluate potential environmental constraints posed in an area.
- **Regulatory Database:** The nearby presence of regulated facilities with past, present, or threatened releases is a primary factor in determining the likelihood of potential environmental constraints in the area of a site. Terracon obtained and evaluated a Record Review Report prepared by EDR, including selected federal and state environmental regulatory databases as well as proprietary dry cleaner and historical databases. The Records Review Report is provided on Compass.

Natural And Cultural Resources Considerations

Terracon evaluated the site for potential constraints based on planning level data combined with practitioner experience to evaluate the likelihood that resources would be present and the anticipated effort to help you navigate the regulatory framework.

For the Cultural Resources Considerations review, the practitioner evaluates the publicly available mapped data and likelihood increases when certain data (e.g., mapped cemeteries or known archeological sites) are mapped on or near the site. An absence of mapped resources (e.g., in the NRHP) does not necessarily indicate an absence of resources.

For the Waters/Wetlands Considerations review, the practitioners evaluate the mapped features (e.g., mapped streams or NWI features) contributing to the likelihood of jurisdictional features.

For the Federally Protected Species Considerations review, the practitioner would evaluate the habitat requirements from IPaC in the context of species listed and the likelihood that those species might find adequate habitat based on interpretation of an aerial photograph of the site as well as if critical habitat is mapped on or nearby the site. In some instances, our practitioners preparing this document may have professional, local knowledge beyond the national datasets. In such cases, the practitioner may adjust the likelihood evaluation based on their knowledge and make a notation regarding their knowledge. This is a planning level exercise that is conceptual in nature and the potential constraints have been developed through a desktop review of public and private information sources. They must be validated with appropriate on-site assessment. The considerations listed are limited to those technical areas provided herein. This evaluation is in no way intended for design, construction, or permitting purposes.

Limitations

This report provides very preliminary opinions of siting and construction challenges that may be associated with the stated project plans for the stated property. Confirmation of opinions stated in this document is essential. Absence of a mapped resource does not mean that it is not present. Confirmation should include performing a site-specific evaluation consistent with the guidelines set forth in Next Steps.

All parties are advised that any decisions or actions taken by any party based on the information contained herein, including decisions with financial implications are done solely at the risk of that party. By providing this information in this preliminary form, Terracon expressly disclaims any duties or obligations associated with the usage of this information for decision-making or design purposes.

In the event that changes to the nature, design, or location of the project, as outlined in this report, are planned, the preliminary conclusions and recommendations contained in this report shall not be used unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing. As the project moves into the design phase, Terracon should be retained to develop and complete a scope of work that includes site-specific explorations as noted in Next Steps.

Terracon and ROC Geotechnical Consulting Engineers, PLLC recognize we have entered into an agreement that may contain certain confidential or non-disclosure obligations relating to our services. ROC Geotechnical Consulting Engineers, PLLC recognizes, however, that although such confidentiality obligations may be in place, those obligations do not create an exclusive relationship between the parties nor do those obligations create an exclusive ownership right to ROC Geotechnical Consulting Engineers, PLLC relating to the data in question. Terracon has the unfettered ability to provide similar services to any other party and use any public or previously available data for the service of others, even if included as part of this report, but Terracon will refrain from disclosing confidential information of ROC Geotechnical Consulting Engineers, PLLC which is provided by ROC Geotechnical Consulting Engineers, PLLC to the extent required by any applicable non-disclosure agreement.

Terracon does not represent the imagery reviewed to be a complete historical record of previous site usage, nor does Terracon validate the accuracy and sufficiency of the public domain sources that have been utilized.

Virtual Soil Profiles

The Virtual Soil Profile (VSP) provides an aggregation of public and private historical data and is meant to inform preliminary geotechnical engineering and geological understanding at a given location. It is anticipated the user will employ the VSP in considering preliminary concepts for site development. It is also intended to provide a basis for a subsequent exploration program to confirm the expected conditions as necessary to develop plans for site preparation and construction. Predictions presented in the VSP regarding expected geotechnical conditions are based upon algorithmic aggregation of public soil maps and Terracon's historical soil boring information from within the SSURGO soil map units. Therefore, any opinions regarding the subsurface conditions presented by this dataset may not represent actual conditions encountered during site-specific project exploration or construction. In no case should the information or predictions provided as part of the VSP be utilized for final design. Anyone using the contents of the VSP in-whole, or in-part, is cautioned to understand the preliminary nature of the predictions that are presented. Confirmation of the predictions stated in the VSP is essential and should include site-specific geotechnical exploration consisting of exploratory soil borings and/or related exploration methods. Terracon should be retained to develop a scope of work that would be necessary to confirm these preliminary predictions. The VSP addresses a preliminary prediction of geotechnical and geologic conditions only and does not include either specifically or by implication any environmental assessment of the site or identification or prevention of pollutants, hazardous materials or conditions.

The VSP has been prepared for the exclusive use of our client to represent preliminary predictions of geotechnical conditions. No warranties, either express or implied, will be intended or made. Furthermore, given the limitations described above and based on the preliminary nature of this data, all parties are advised that any decisions or actions taken by any party based on the information contained in the VSP(s), including decisions with financial implications are done solely at the risk of that party. By providing these prediction(s), Terracon expressly disclaims any duties or obligations associated with the usage of the information for decision-making purposes.

Terracon and our client recognize that we have entered into an agreement that may contain certain confidential or non-disclosure obligations relating to our services. Client recognizes however that while Terracon will not violate any such terms or obligations, none of these obligations create an exclusivity obligation to Terracon relating to the service or data in question and that Terracon has the unfettered ability to provide similar services to any other party and use any public or previously available data or information for the service of others even if included as part of the VSP.

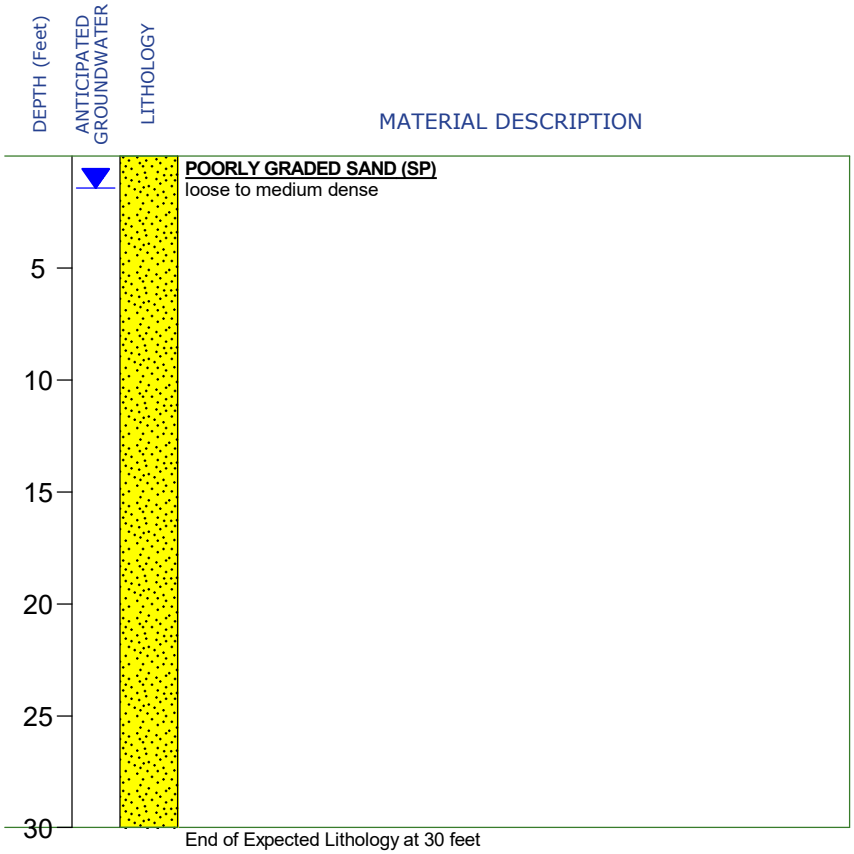
ATTACHMENTS: Expected Lithology

EXPECTED LITHOLOGY

The opinions of subsurface conditions are very preliminary in nature. These opinions must be validated with site-specific exploration and testing. Each Soil Series is a geographic area defined by the Natural Resources Conservation Service (NRCS) and is anticipated to have similar soil properties.

See Methods and Limitations for information on how the Soil Series was used to prepare this Expected Lithology as well as clarification regarding the limitations to the following opinions and methods used to derive these opinions. For a lateral extent of this soil series please refer to Compass.

Area Represented: SSURGO Soil Series Catden, Timakwa



COMMENTS ON POTENTIAL VARIABILITY

- Fill is anticipated in previously developed areas.
- NRCS mapping indicates shallow bedrock will likely not be encountered. Our experience indicates bedrock will likely be encountered at depths greater than 25 feet.
- Partially weathered rock (PWR) may be encountered on top of the competent, intact bedrock.
- NRCS mapping indicates seasonal high groundwater at depths ranging from the ground surface to approximately 4 feet. Our experience indicates groundwater will likely be encountered at depths ranging from 1 foot to 20 feet below ground surface.
- Perched groundwater may be encountered in the fill and/or at the fill and natural soil interface.

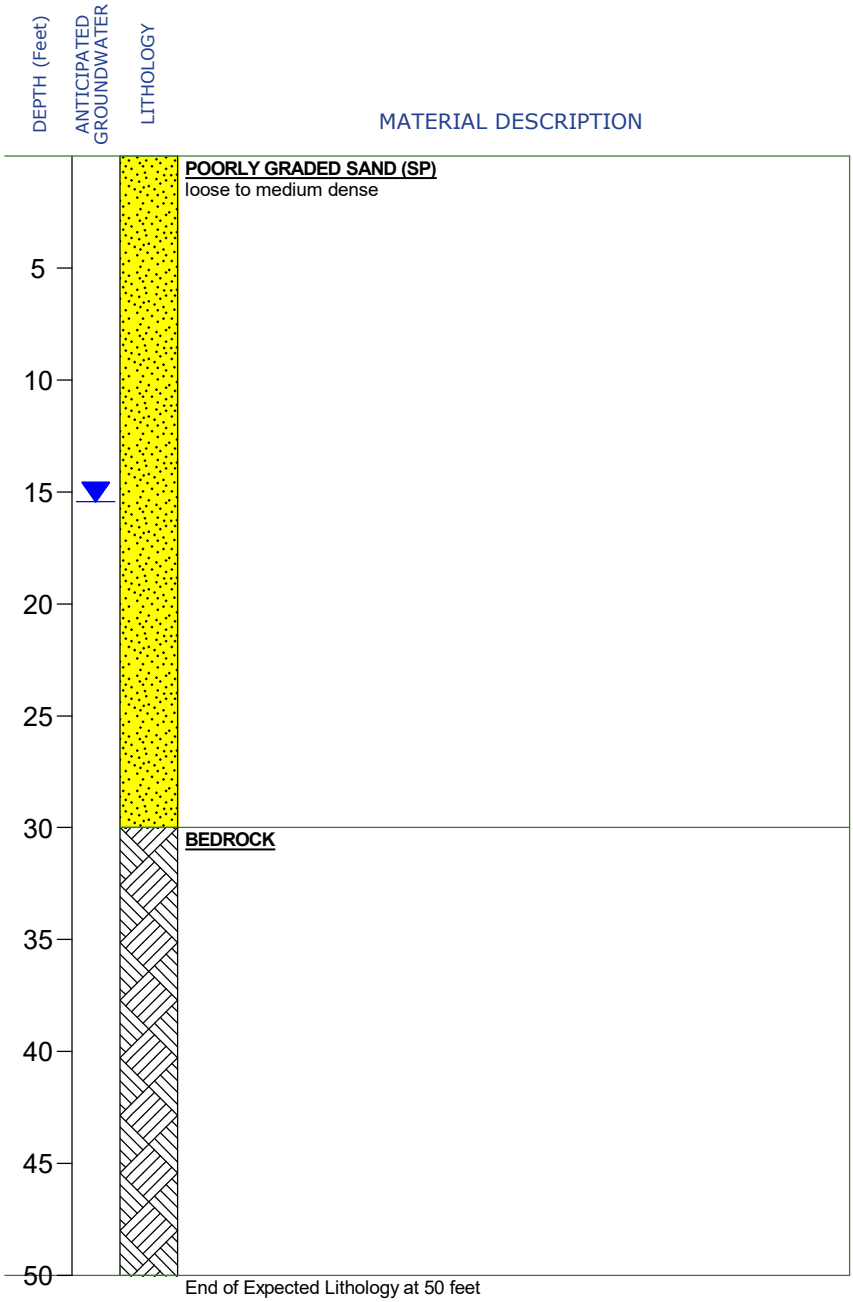
The expected lithology was prepared using Terracon's Virtual Soil Profile (VSP) model as a part of this Stage1 report. It should not be utilized or distributed outside of this report. Refer to the Geotechnical Considerations section in the Stage1 for more information regarding potential variability on the site. See Methods and Limitations for more information regarding how the VSP is utilized.

EXPECTED LITHOLOGY

The opinions of subsurface conditions are very preliminary in nature. These opinions must be validated with site-specific exploration and testing. Each Soil Series is a geographic area defined by the Natural Resources Conservation Service (NRCS) and is anticipated to have similar soil properties.

See Methods and Limitations for information on how the Soil Series was used to prepare this Expected Lithology as well as clarification regarding the limitations to the following opinions and methods used to derive these opinions. For a lateral extent of this soil series please refer to Compass.

Area Represented: SSURGO Soil Series Hinckley, Merrimac, Paxton, Udorthents



COMMENTS ON POTENTIAL VARIABILITY

- Fill is anticipated in previously developed areas.
- NRCS mapping indicates shallow bedrock will likely not be encountered. Our experience indicates bedrock will likely be encountered at depths greater than 25 feet.
- Partially weathered rock (PWR) may be encountered on top of the competent, intact bedrock.
- NRCS mapping indicates seasonal high groundwater at depths ranging from the ground surface to approximately 4 feet. Our experience indicates groundwater will likely be encountered at depths ranging from 1 foot to 20 feet below ground surface.
- Perched groundwater may be encountered in the fill and/or at the fill and natural soil interface.

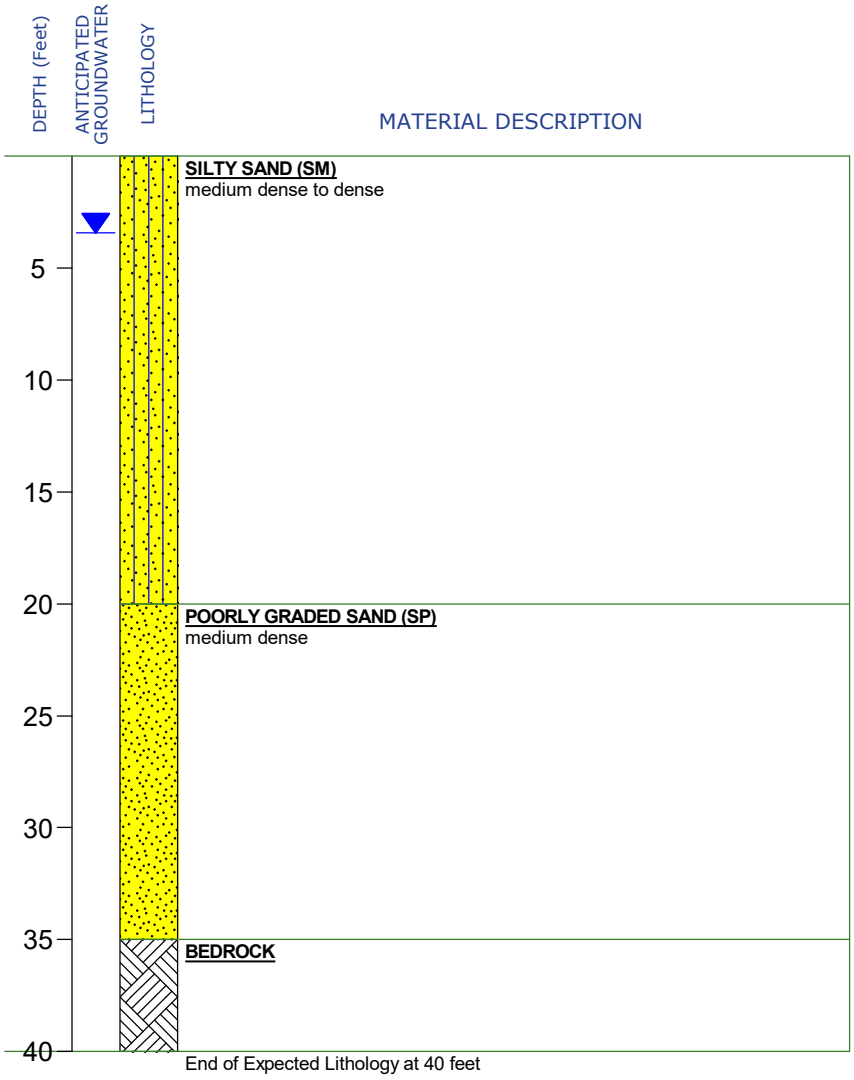
The expected lithology was prepared using Terracon's Virtual Soil Profile (VSP) model as a part of this Stage1 report. It should not be utilized or distributed outside of this report. Refer to the Geotechnical Considerations section in the Stage1 for more information regarding potential variability on the site. See Methods and Limitations for more information regarding how the VSP is utilized.

EXPECTED LITHOLOGY

The opinions of subsurface conditions are very preliminary in nature. These opinions must be validated with site-specific exploration and testing. Each Soil Series is a geographic area defined by the Natural Resources Conservation Service (NRCS) and is anticipated to have similar soil properties.

See Methods and Limitations for information on how the Soil Series was used to prepare this Expected Lithology as well as clarification regarding the limitations to the following opinions and methods used to derive these opinions. For a lateral extent of this soil series please refer to Compass.

Area Represented: SSURGO Soil Series Ninigret, Scarboro, Sudbury, Windsor



COMMENTS ON POTENTIAL VARIABILITY

- Fill is anticipated in previously developed areas.
- NRCS mapping indicates shallow bedrock will likely not be encountered. Our experience indicates bedrock will likely be encountered at depths greater than 25 feet.
- Partially weathered rock (PWR) may be encountered on top of the competent, intact bedrock.
- NRCS mapping indicates seasonal high groundwater at depths ranging from the ground surface to approximately 4 feet. Our experience indicates groundwater will likely be encountered at depths ranging from 1 foot to 20 feet below ground surface.
- Perched groundwater may be encountered in the fill and/or at the fill and natural soil interface.

The expected lithology was prepared using Terracon's Virtual Soil Profile (VSP) model as a part of this Stage1 report. It should not be utilized or distributed outside of this report. Refer to the Geotechnical Considerations section in the Stage1 for more information regarding potential variability on the site. See Methods and Limitations for more information regarding how the VSP is utilized.