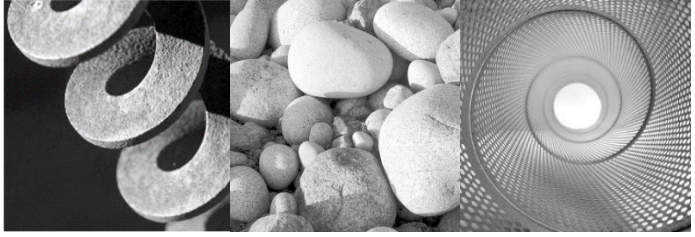


GEI Consultants

Consulting
Engineers and
Scientists

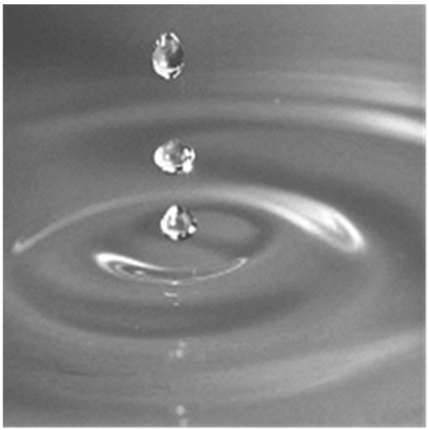
Geotechnical Report
CT-11 BESS

100 Salmon Brook Street
Granby, Connecticut

Submitted to:
VHB
100 Great Meadow Road, Suite 200
Wethersfield, CT 06109

Submitted by:
GEI Consultants, Inc.
455 Winding Brook Drive, Suite 201
Glastonbury, CT 06033
860-368-5300

September 12, 2024
Project No. 2405815



Thomas Rezzani, E.I.T.
Geotechnical Professional

Matthew Glunt, P.E.
Senior Geotechnical Engineer

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Figures

Appendices

1. Introduction

1.1 Project Summary

The project referenced herein is a proposed 4.99-MW battery storage (BESS) facility to be constructed on a 4.85-acre lot located at 100 Salmon Brook Street, Granby, Connecticut. We understand that the proposed facility will include multiple arrays of battery containers with associated electrical infrastructure and appurtenant site features.

This report was prepared to address foundation and site preparation recommendations for the proposed BESS development.

1.2 Scope of Services

Our scope of work included the following tasks:

- Reviewed provided site plans and layout drawings.
- Oversaw an investigation program consisting of three (3) test borings, seven (7) test pits, and in-situ resistivity testing at two (2) locations.
- Observed soil samples recovered from the test borings, took groundwater level measurements, and prepared test boring logs.
- Observed soils removed from test pits, groundwater conditions, and prepared test pit logs.
- Conducted downhole infiltration testing within four (4) of the test pits.
- Conducted in-situ thermal resistivity testing within two (2) of the test pits.
- Engaged a testing laboratory to perform laboratory analyses on soil samples from the test borings and test pits.
- Developed recommendations for earthworks and battery storage unit (BESS) foundation design and construction.
- Prepared this *Geotechnical Report*.

1.3 Authorization

Our work was performed in general accordance with our proposal dated March 12, 2024, and the resulting Subconsultant Agreement executed on July 16, 2024.

1.4 Horizontal and Vertical Reference

Boring locations were located and referenced using handheld GPS with accuracy on the order of 5 to 10 feet. The locations shown on the attached Figure 1 should be considered approximate.

Elevations referenced in this report and on the attached boring and test pit logs were estimated from the provided topographic survey.

2. Site and Project Description

2.1 Site Description

The proposed development will occur on a wooded, undeveloped 4.85-acre lot located off of Salmon Brook Street in Granby, Connecticut.

The project will be centrally located within a relatively level area of the parcel, surrounded on three sides by natural slopes up to about 15 feet in height and up to about 4H:1V in grade.

2.2 Proposed Construction

We were provided by VHB with permitting-level site plans for the project dated July 22, 2024.

We understand a 4.99-MW/19.96 MW-h battery energy storage system (BESS) facility is planned for the referenced site. From provided plans, we understand this facility is to consist of the following:

- Battery Energy Storage System (BESS) with eight battery containers, two inverters, and supporting equipment pads.
- Electrical tie-in to existing electrical infrastructure on Salmon Brook Street.
- Three permanent stormwater management basin(s) along the periphery of the project.
- A gravel access road approximately 24 feet in width into the site, connecting to an existing paved commercial lot.

The finished BESS area will be close to existing grades. Minor cuts and fills of up to about 5 feet will be required at various locations along the periphery.

3. Exploration Procedures

3.1 Test Borings

The boring locations were laid out on the site from the provided site plan using approximate measurements and a GPS-locator with horizontal accuracy on the order of 5 to 10 feet. Approximate boring locations relative to the site plan are shown on Figure 1.

Three (3) soil test borings were conducted at the site on July 23, 2024, by General Borings, Inc., under subcontract to GEI, with a track-mounted drilling rig. The appropriate one-call utility locate service (CBYD) was contacted prior to our arrival. The borings were advanced to depths of 27 feet each utilizing hollow-stem augering techniques. Soil test boring logs are attached in Appendix A.

Standard Penetration Testing (SPT) and split-spoon sampling were generally performed continuously through the upper 8 feet of the borings and at 5-foot intervals thereafter using an automatic 140-lb. hammer. Representative samples of the soils obtained by the sampler were classified by a GEI representative. The samples were placed in appropriately identified sealed glass jars and transported to our office for storage and laboratory assignment.

3.2 Test Pits

Seven (7) test pits were dug at the site on July 22, 2024, using an excavator to depths of approximately 4 feet to 8 feet each. These test pits were logged and photographed by a representative of GEI. After completion, each test pit was backfilled using excavated spoils tamped in lifts.

Test pit logs are attached in Appendix B.

3.3 Infiltration Testing

Site infiltration potential was measured using an infiltrometer within four (4) of the test pits at depths of approximately 4 to 4.5 feet below current grade.

Estimations of infiltration potential from the test measurements are attached in Appendix D.

3.4 Soil Resistivity Testing

In-situ resistivity testing was performed using the Wenner Four-Electrode Method at two (2) locations, as shown on Figure 1, each including two orthogonal traverses using electrode spacings of 1, 2.5, 5, 10, 20, and 40 feet. Test results are provided in Appendix E.

3.5 Laboratory Testing

Laboratory testing was conducted on representative soil samples to confirm field identification of the soils and establish engineering characteristics for design. Tests performed by GeoTesting Express, under subcontract to GEI, included the following:

- Three (3) grain-size analyses with standard sieve set (ASTM D6913)
- Three (3) natural moisture content (ASTM D2974)

A composite sample obtained between depths of 1 and 3 feet was also subjected to the following tests:

- pH (ASTM G51)
- Laboratory resistivity (ASTM G57)
- Chlorides (ASTM D512)
- Sulfates (ASTM D516)

The laboratory test results are included in Appendix C.

4. Subsurface Conditions

4.1 Geologic Setting

Local geology maps indicate that the site lies on a broad sand outwash plain extending along Route 202 in Granby and west from Salmon Brook.

4.2 Subsurface Conditions

The generalized subsurface conditions at the site are described below, in order of increasing depth. The subsurface conditions between test locations may differ. The nature and extent of variations between the sampling points will not become evident until construction.

Topsoil – Topsoil thickness generally varied between 5 to 11 inches at the site. Subsoil, containing approximately 10 to 15 percent fines and occasional organic fibers, was observed as deep as 24 inches.

Native Sand – Relatively uniform native sands were encountered beneath the surface materials to termination of each boring. Recovered samples were classified as brown, fine to medium or coarse-grained sand with less than 5 percent non-plastic silt fines.

Measured Standard Penetration Test (SPT) N-values ranged from 14 to 41 blows per foot, indicative of medium dense to dense conditions.

4.3 Groundwater Conditions

Groundwater was not encountered in all test borings at depths of approximately 20.5 to 21.0 feet below current grade.

Groundwater levels are subject to seasonal and weather-related variations. Groundwater measurements made at different times and different locations may be significantly different than the measurements taken as part of this investigation.

5. Design Recommendations

5.1 General Suitability

The site is underlain by medium dense to dense, well-drained native sands well-suited to this type of construction. The primary geotechnical concerns and risk factors moving forward for this project would include:

- Potential instability of cohesionless sands within excavated trenches and slopes.
- Susceptibility of site soils to erosion.

Both issues noted above are associated with constructability and can be considered largely temporary in nature. They would not be expected to result in any performance issues for the facility, so long as the site soils are properly stabilized during and after construction.

5.2 Soil Properties

Recommended soil properties for design are presented below. We selected these values based on published correlations to SPT N-values, our experience with similar soils in this locale, and our engineering judgment.

Table 2 – In-Place Soil Properties

Stratum	Angle of Internal Friction ($\phi°$)	Cohesion (c) (psf)	Moist (Total) Unit Weight (γ_T) (lb/ft^3)	Active Earth Pressure Coeff. (K_a)	Passive Earth Pressure Coeff. (K_p)
New Structural Fill	32	0	125	0.31	3.0
Native Sands	34	0	125	0.28	3.0

5.3 Foundation Considerations

The proposed battery units may be supported by drilled-in or conventional shallow foundations, subject to the limitations described in more detail below. We provide multiple options below that we believe are feasible given the subsurface conditions and unit constraints.

Foundation design will be further progressed subsequent to this report, in coordination with Key Capture and the design team.

5.3.1 Grade Beams

Grade beams, installed either along each long side of the unit or in a grid format, would be well-suited for use in supporting the battery units.

From our review of the current site layout, it appears that bearing conditions for unit foundations will vary from grade-raise Structural Fill to native sands. These materials are suitable for support of the units using conventional shallow foundations designed and constructed as recommended below.

We recommend that all footing subgrades be evaluated by a GEI representative prior to concrete placement. The maximum allowable bearing pressures for the design of footings are:

Table 3 - Allowable Bearing Pressure

Bearing Stratum	Net Allowable Bearing Pressure
Structural Fill or Native Sands	3,000 lb/ft^2

Minimum individual grade beam widths should be at least 18 inches. All grade beams should bear at least 42 inches below exterior grade for frost protection.

Lateral capacity of shallow foundations includes a soil lateral pressure and coefficient of friction as described in CBC/IBC Section 1806. Footings will predominantly be embedded in material similar to those described as class 4 as described in Table 1806.2. Where foundations are cast neat against the sides of excavations, an allowable lateral bearing pressure of 150 psf per foot depth below natural grade may be used in computations. Assuming subgrades are prepared as recommended herein, an allowable coefficient of friction of 0.45 at the base of the foundations may be used in the calculation of sliding resistance.

5.3.2 Drilled Piers

Individual drilled concrete piers would also be feasible for use in supporting the battery units. Dense soil was encountered at depth, which could present moderate difficulty to drilling advancement.

For preliminary design and costing, we provide expected capacities for two common pier sizes below. Efficient pier sizing, spacing, and lengths will be further evaluated with the design team in future phases of this project, if this option is pursued.

Table 4 – Drilled Piers – Preliminary Capacities

Pier Diameter	Depth	Ultimate Axial Capacity (kips)	Allowable Axial Capacity (kips)
18 inches	10 feet	78	26
24 inches	10 feet	120	40

Rebar cages or individual center bars would also likely be required for the piers to provide sufficient lateral support. A minimum embedment depth may be required to satisfy uplift requirements.

5.3.3 Helical Piles

Helical, or "screw", piles consist of round or square steel shafts with welded helixes of specified diameter and at specified intervals along the shaft. Helical piles would be designed and installed by a specialty geotechnical contractor and held to a performance specification that includes a required pile capacity. Based on their experience with similar projects in similar geologic conditions, the specialty contractor would design a system intended to make most efficient use of the piling options.

Helical piles rated for the required load-bearing capacities would likely be suitable for this project. If the team desires to pursue this option further, a specialty contractor should be consulted for further information regarding cost, schedule, and feasibility. Installers should review the boring logs in detail and ensure the equipment available and brought to the site has sufficient torque to advance through soils similar to those encountered.

5.3.4 Equipment Pads

The natural topsoil and subsoil encountered to a depth of approximately 24 inches can be classified as slightly to moderately susceptible to frost heave. We recommend that the proposed equipment pads bear on Structural Fill or a prepared natural subgrade after the upper 24 inches (min.) of natural soil is removed. The exceedingly well-drained native sands encountered below this depth can be considered non-frost susceptible.

For pad subgrades prepared in this manner, a modulus of subgrade reaction of 150 pounds per cubic inch (pci) may be assumed.

5.4 Settlement

We expect battery units supported by one of the options listed above would be expected to settle less than 1 inch, with differential settlements between each unit of less than ½-inch. We expect nearly all expected settlement will occur during construction or soon after.

5.5 Subsurface Drainage Design

Post-construction stormwater runoff will be collected and conveyed to stormwater basins via an overland sheet flow, and then subsequently from the spillway to the existing slopes adjacent to the facility.

Based on the results of the borings and test pits, the proposed basins will likely be founded in relatively uniform sand deposits with very high infiltration potential. Infiltration testing was conducted within four (4) of the test pits at depths of approximately 4 to 4.5 feet below current grade. Results of all infiltration testing are included in Appendix D.

From our review of the data obtained and experience with similar soils, though field measurements were significantly higher, we recommend using a field-measured infiltration rate of **40.0 inches/hour** for basin design. In accordance with CT DEEP policy, a factor of safety of 2.0 must be applied to this value for design.

5.6 Site Slopes

The project is expected to include finished earthen cut and fill slopes on the periphery of the development area and within the stormwater basins. We recommend that all cut and fill slopes on the project be constructed at grades no steeper than 2H:1V. Suitable erosion protection should be established as quickly as possible following construction of slopes. This will be especially critical on this site, as the cohesionless site soils will be susceptible to erosion and raveling.

5.7 Access Roads

We understand that new roads into and around the facility will be constructed of gravel. We also understand that, once constructed, traffic on these roadways will consist primarily of maintenance pickup trucks, though the design will also need to accommodate full-size fire trucks. Fully constructed roadways should not be subjected to heavy-duty construction traffic.

Based on the results of this investigation, roadway subgrades are expected to consist predominantly of well-drained native sands or Structural Fill from on-site sources. These soils would be considered slightly susceptible to frost heave.

Assuming new roadways are supported on new Structural Fill or soil subgrades prepared in accordance with Section 6.1, we recommend the following roadway section to support the expected facility traffic:

Facility Roadways
4.0 inches of Gravel Surface (CTDOT Form 818 M02.06, Grading C)
8.0 inches of compacted gravel Subbase (CTDOT Form 818 M.02.06, Grading A)

Roadway materials should conform with and be placed in accordance with the *Connecticut Department of Transportation (CTDOT) Standard Specifications for Road, Bridges, and Incidental Construction (Form 818), 2020.*

5.8 Soil Corrosivity

We summarized our evaluation of the soil corrosivity to structural elements shown in the table below by comparing the laboratory test results to some available corrosivity references.

Table 5 – Soil Corrosivity

Test	Laboratory Results	Reference	Corrosivity to Structural Elements
pH	7.26	Caltrans - Corrosion Guidelines January 2015	Not corrosive
Electrical Resistivity	117,370 Ω-cm	EPRI - Environmental Factors Governing Corrosion Rates, Report 1021854 December 2011	Not corrosive[1]
Chloride	25 mg/kg	Caltrans - Corrosion Guidelines January 2015	Not corrosive
Sulfate	<10 mg/kg	Caltrans - Corrosion Guidelines January 2015	Not corrosive

[1]Field-measured resistivity values also indicate a non-corrosive environment.

5.9 Thermal Resistivity Testing

In-situ thermal resistivity tests were conducted within five (5) of the test pits at depths of approximately 3 feet below current grade, as summarized below. Tests were conducted using a Thermtest® TLS-100 meter in accordance with ASTM D5334-22.

Table 6 – Thermal Resistivity

Test Location	Depth (ft)	Thermal Conductivity (W/mK)	Thermal Resistivity (mK/W)	Soil Temp (°C)
TP-1 (Trial 1)	3.0	0.6850	1.4598	18.7
TP-1 (Trial 2)	3.0	0.3310	3.0210	18.2
TP-3 (Trial 1)	3.0	0.3743	2.6714	18.7
TP-3 (Trial 2)	3.0	0.5517	1.8124	17.6
TP-5 (Trial 1)	3.0	1.1946	0.8370	18.8
TP-5 (Trial 2)	3.0	0.9476	1.0552	18.7

6. Construction Considerations

6.1 Subgrade Preparation

6.1.1 General

Site preparation should include the removal of all unsuitable surface materials within the BESS development footprint. This should include surface vegetation, topsoil, and any otherwise unstable surface or subsurface soils.

6.1.2 Unit Foundations

If used to support the battery units, conventional shallow foundations are expected to bear on a subgrade consisting of native sands or grade-raise Structural Fill.

All finished bearing surfaces should be free of standing water, frost, and loose soil before placement of reinforcing steel and concrete. We recommend that a GEI representative observe the final preparation of all subgrades prior to footing construction.

6.1.3 Equipment Pads

The natural topsoil and subsoil encountered to a depth of approximately 24 inches can be classified as slightly to moderately susceptible to frost heave. We recommend that the proposed equipment pads bear on Structural Fill or a prepared natural subgrade after the upper 24 inches (min.) of natural soil is removed. The exceedingly well-drained sands encountered below this depth can be considered non-frost susceptible.

Excavations to final subgrade for the equipment pads should be performed in such a way that limits disturbing or loosening subgrade soils. After stripping and cutting and prior to placing pad base materials, the resulting subgrade should be firm, stable, and unyielding. Stabilization, where required, may consist of removing unsuitable material and replacement with compacted Structural Fill, or where unsuitable soils are relatively thin, drying and compacting in place.

Soil subgrades for equipment pads should be proof-rolled with at least four (4) passes of a minimum 10-ton vibratory roller in open areas, or a 1-ton vibratory roller or large plate compactor, such as Wacker DPU4545 or equivalent, in trenches. Final bearing surfaces should be free of standing water, frost, and loose soil.

6.1.4 Access Roads

Before placing the roadway section, the exposed subgrade (after removing topsoil, organic material, or otherwise unsuitable material) should be proof-rolled with at least four (4) passes

of a minimum 10-ton vibratory roller. The resulting subgrade should be firm, stable, and unyielding.

We recommend that the road surface be graded with a minimum cross slope of ½ inch per foot of road width to allow water to drain. Drainage ditches should be provided along the edges of the road to direct surface water and runoff away from the road and subbase.

We recommend that a GEI representative observe the final preparation of all subgrades prior to access road construction.

6.2 Excavation and Dewatering

Excavations can be accomplished with conventional earthmoving equipment. Excavations should be sloped or shored in accordance with the local, state, and federal regulations, including Occupational Safety and Health Agency (OSHA 29 CFR Part 1926) excavation trench safety standards. We caution that on-site soils are cohesionless and will likely be susceptible to raveling and erosion when exposed, prior to stabilization.

Based on the results of this investigation, we do not expect that groundwater will be encountered within site excavations. If required, we anticipate that dewatering can be accomplished with filtered sumps and pumps.

6.3 Freezing Conditions

The soils at the sites are slightly frost susceptible. Therefore, if construction is performed during freezing weather, special precautions will be required to prevent the subgrade soils from freezing. Freezing of the soil beneath equipment foundations during construction may result in subsequent settlement.

All subgrades should be free of frost before placement of concrete. Frost-susceptible soils that have frozen should be removed and replaced with compacted Structural Fill. Soil placed as fill should be free of frost, as should the ground on which it is placed.

6.4 Backfilling and Compaction

Recommended specifications for gradation and compaction of backfill soils are provided in the attached recommended Material Specifications.

Based on the boring results, native sands soils can likely be re-used as Structural Fill or Ordinary Fill, provided the material can meet the appropriate compaction requirements, does not contain deleterious materials, and is stable under the weight of construction equipment.

Soils to be used as fill imported from off-site should also meet the attached gradation requirements. Fill placed within the primary BESS area and under equipment pads and roadways should meet the compaction requirements for Structural Fill. Backfill placed in non-structural areas should meet the compaction requirements for Ordinary Fill. Proposed borrow materials that fall slightly outside of these specifications may also be suitable for use, subject to review and approval by GEI.

7. Closure

7.1 Follow-on Services

We recommend that GEI be kept on the project through the final design and construction phases of this project for the following services:

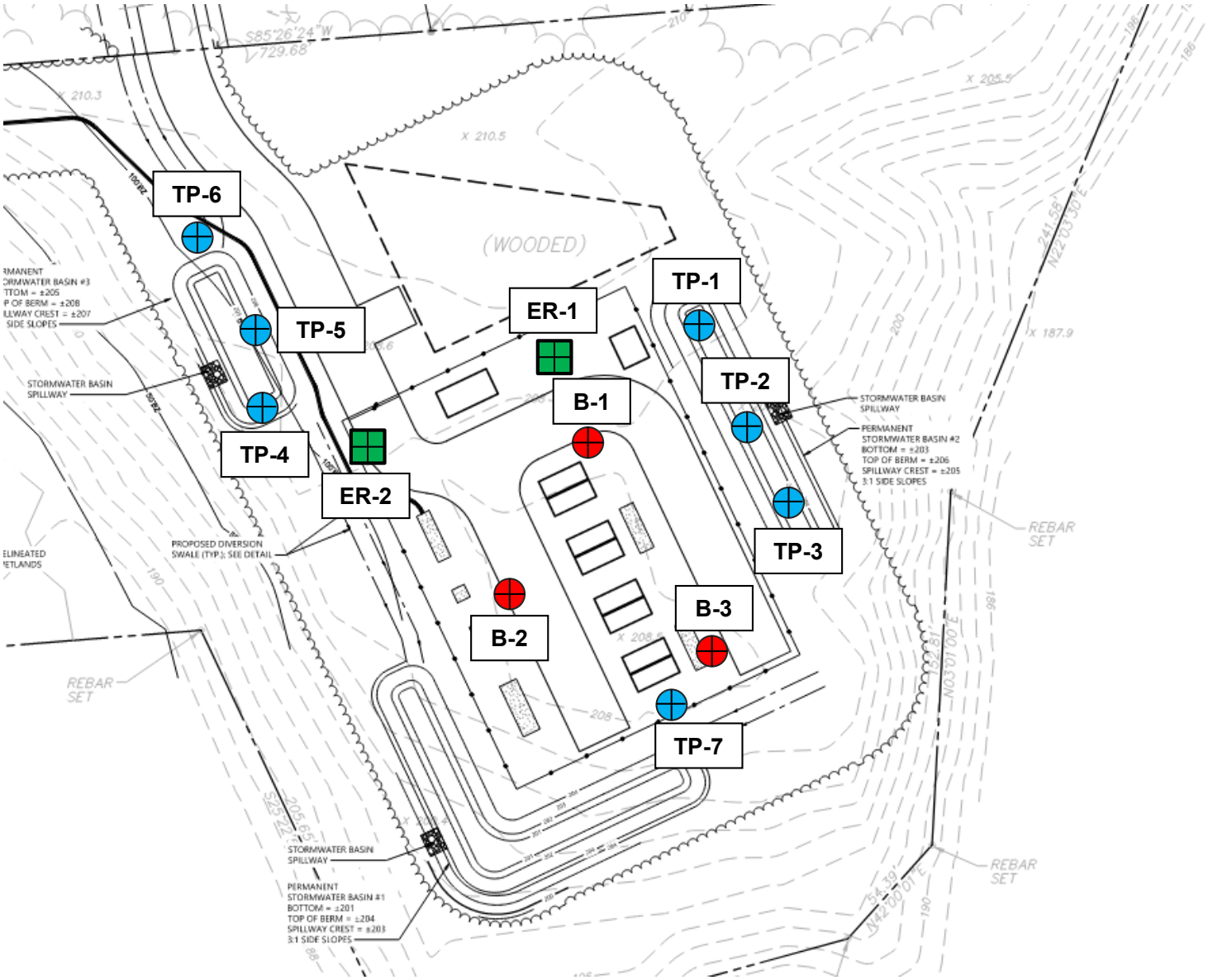
- Review geotechnical-related contractor submittals and assist in developing responses to questions from the contractor (i.e. RFI's).
- Provide periodic site visits during construction to view subgrades and consult on geotechnical-related issues that occur.

7.2 Limitations

This report was prepared for the use of the project team, exclusively. Our recommendations are based on the project information provided to us at the time of this report and may require modification if there are any changes in the nature, design, or location of the proposed building. We cannot accept responsibility for designs based on our recommendations unless we are engaged to review the final plans and specifications to determine whether any changes in the project affect the validity of our recommendations, and whether our recommendations have been properly implemented in the design.

Our professional services for this project have been performed in accordance with generally accepted engineering practices. No warranty, expressed or implied, is made.

Figures



LEGEND

- APPROX. TEST PIT LOCATION
- APPROX. BORING LOCATION
- APPROX. RESISTIVITY TEST LOCATION

SOURCE:

GRADING, DRAINAGE, UTILITIES PLAN (VHB, 07/22/24)

GEI Consultants

TEST LOCATION PLAN
CT11 BESS
Granby, CT

GEI PROJECT NO: **2405815**

FIGURE NO.
1

Appendix A

Boring Logs

BORING INFORMATION

LOCATION: See plan
GROUND SURFACE EL. (ft): 208
VERTICAL DATUM:
TOTAL DEPTH (ft): 27.0
LOGGED BY: Tyler Yurman
DATE START/END: 7/23/2024 - 7/23/2024
DRILLING COMPANY: General Boring
DRILLER NAME: J. Wyant
RIG TYPE: Diedrich D-50 Track Rig

BORING

B-1

DRILLING INFORMATION

HAMMER TYPE: Safety Hammer - semi-automatic
AUGER I.D./O.D.: 2.25 inch / NA
DRILLING METHOD: Hollow Stem Auger
WATER LEVEL DEPTHS (ft): ▽ 21.0
CASING I.D./O.D.: NA/ NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D. NA / NA

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/15	4-5-7-8		SAND	S1A (0-2"): TOPSOIL, organic fibers, dark-brown, moist. S1B (2-12"): SILTY SAND (SM); ~85% F-sand, ~15% NP fines, yellow-brown, dry. S1C (12-15"): WIDELY GRADED SAND (SW); ~100% F-C sand, light-brown, dry.
		S2	2 to 4	24/12	9-9-11-15			S2: WIDELY GRADED SAND (SW); ~95% F-C sand, ~5% F-gravel, light-brown, dry.
	5	S3	4 to 6	24/17	8-15-18-24			S3: WIDELY GRADED SAND (SW); ~100% F-C sand, light-brown, dry.
		S4	6 to 8	24/19	23-22-19-25			S4: WIDELY GRADED SAND (SW); ~100% F-C sand, light-brown, dry to moist.
200								
	10	S5	10 to 12	24/16	11-11-9-12			S5: Similar to S4, mostly F-M sand.
	15	S6	15 to 17	24/18	7-11-11-11			S6: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% F-sand, ~10% NP fines, light-brown, dry to moist.
190								
	20	S7	20 to 22	24/18	9-10-10-10			S7: NARROWLY GRADED SAND (SP); ~95% F-sand, ~5% NP fines, light-brown to grayish-brown, damp to wet.

NOTES:

PROJECT NAME: CT-11 BESS Granby
CITY/STATE: Granby, Connecticut
GEI PROJECT NUMBER: 2405815

GEI Consultants

LOCATION: See plan
GROUND SURFACE EL. (ft): 208 **DATE START/END:** 7/23/2024 - 7/23/2024
VERTICAL DATUM: **DRILLING COMPANY:** General Boring

BORING B-1

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	25	S8	25 to 27	24/20	6-10-15-18		SAND	S8: Similar to S7, wet.
180	30							Bottom of boring at depth 27 ft. Backfilled with drill cuttings.
170	35							
	40							
	45							
160	50							

NOTES:

PROJECT NAME: CT-11 BESS Granby

CITY/STATE: Granby, Connecticut

GEI PROJECT NUMBER: 2405815

GEI Consultants

BORING INFORMATION

LOCATION: See plan
GROUND SURFACE EL. (ft): 208
VERTICAL DATUM:
TOTAL DEPTH (ft): 27.0
LOGGED BY: Tyler Yurman
DATE START/END: 7/23/2024 - 7/23/2024
DRILLING COMPANY: General Boring
DRILLER NAME: J. Wyant
RIG TYPE: Diedrich D-50 Track Rig

BORING

B-2

DRILLING INFORMATION

HAMMER TYPE: Safety Hammer - semi-automatic
AUGER I.D./O.D.: 2.25 inch / NA
DRILLING METHOD: Hollow Stem Auger
WATER LEVEL DEPTHS (ft): ▽ 20.5
CASING I.D./O.D.: NA/ NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D. NA / NA

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/16	3-3-2-3		SAND	S1A (0-1"): TOPSOIL, organic fibers, dark-brown, dry to moist. S1B (1-16"): SILTY SAND (SM); ~85% F-sand, ~15% NP fines, few organic fibers, orange-brown, dry to moist.
		S2	2 to 4	24/11	6-8-11-12			S2A (0-6"): Similar to S1B, absent fibers. S2B (6-11"): WIDELY GRADED SAND (SW); ~100% F-C sand, light-brown, dry.
	5	S3	4 to 6	24/16	15-11-11-14			S3: NARROWLY GRADED SAND (SP); ~95% F-M sand, ~5% F-C gravel, few cobbles, light-brown, dry.
		S4	6 to 8	24/18	15-13-14-13			S4: NARROWLY GRADED SAND (SP); ~95% F-M sand, ~5% NP fines, light-brown, dry to moist.
200								
	10	S5	10 to 12	24/15	7-10-9-11			S5: NARROWLY GRADED SAND (SP); ~100% F-M sand, light-brown, dry to moist.
	15	S6	15 to 17	24/16	9-16-16-14			S6: Similar to S5.
190								
	20	S7	20 to 22	24/22	5-9-6-14			S7: NARROWLY GRADED SAND (SP); ~95% F-sand, ~5% NP fines, brown, wet.

NOTES:

PROJECT NAME: CT-11 BESS Granby
CITY/STATE: Granby, Connecticut
GEI PROJECT NUMBER: 2405815

GEI Consultants

LOCATION: See plan
GROUND SURFACE EL. (ft): 208 **DATE START/END:** 7/23/2024 - 7/23/2024
VERTICAL DATUM: **DRILLING COMPANY:** General Boring

BORING B-2

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	25	S8	25 to 27	24/24	8-12-15-14		SAND	S8: NARROWLY GRADED SAND (SP); ~95% F-sand, ~5% NP fines, brown to grayish-brown, wet.
180	30							Bottom of boring at depth 27 ft. Backfilled with drill cuttings.
170	35							
	40							
	45							
160	50							

NOTES:

PROJECT NAME: CT-11 BESS Granby

CITY/STATE: Granby, Connecticut

GEI PROJECT NUMBER: 2405815

GEI Consultants

BORING INFORMATION

LOCATION: See plan
GROUND SURFACE EL. (ft): 207.5
VERTICAL DATUM:
TOTAL DEPTH (ft): 27.0
LOGGED BY: Tyler Yurman
DATE START/END: 7/23/2024 - 7/23/2024
DRILLING COMPANY: General Boring
DRILLER NAME: J. Wyant
RIG TYPE: Diedrich D-50 Track Rig

BORING

B-3

DRILLING INFORMATION

HAMMER TYPE: Safety Hammer - semi-automatic
AUGER I.D./O.D.: 2.25 inch / NA
DRILLING METHOD: Hollow Stem Auger
WATER LEVEL DEPTHS (ft): ▽ 21.0
CASING I.D./O.D.: NA/ NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D. NA / NA

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/8	1-3-4-3		SAND	S1A (0-5"): TOPSOIL, organic fibers, dark-brown, moist. S1B (5-8"): WIDELY GRADED SAND (SW); ~95% F-C sand, ~5% NP fines, brown, dry.
		S2	2 to 4	24/14	4-6-8-8			S2: WIDELY GRADED SAND (SW); ~100% F-C sand, brown to light-brown, dry.
	5	S3	4 to 6	24/15	6-9-10-12			S3: WIDELY GRADED SAND (SW); ~100% F-C sand, light-brown, dry.
200		S4	6 to 8	24/18	10-12-15-16			S4: WIDELY GRADED SAND (SW); ~100% F-C sand, light-brown, dry to moist.
	10	S5	10 to 12	24/16	8-8-10-9			S5: NARROWLY GRADED SAND (SP); ~100% F-M sand, light-brown, moist.
	15	S6	15 to 17	24/14	7-9-11-12			S6: NARROWLY GRADED SAND (SP); ~95% F-M sand, ~5% NP fines, light-brown, moist.
190								
	20	S7	20 to 22	24/14	7-9-10-12			S7: NARROWLY GRADED SAND (SP); ~95% F-sand, ~5% NP fines, brown, wet.

NOTES:

PROJECT NAME: CT-11 BESS Granby
CITY/STATE: Granby, Connecticut
GEI PROJECT NUMBER: 2405815

GEI Consultants

LOCATION: See plan
GROUND SURFACE EL. (ft): 207.5 **DATE START/END:** 7/23/2024 - 7/23/2024
VERTICAL DATUM: **DRILLING COMPANY:** General Boring

BORING B-3

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	25	S8	25 to 27	24/24	8-13-22-19		SAND	S8: Similar to S7, with dark brown.
180								Bottom of boring at depth 27 ft. Backfilled with drill cuttings.
	30							
	35							
170								
	40							
	45							
160								
	50							

NOTES:

PROJECT NAME: CT-11 BESS Granby

CITY/STATE: Granby, Connecticut

GEI PROJECT NUMBER: 2405815

GEI Consultants

Appendix B

Test Pit Logs

CT-11 BESS
Granby, CT
GEI Project No. 2405815
Test Pit Results

Date:	7/22/2024
GEI Representative:	T. Yurman
GS Elevation:	208.0
Depth to GW:	Not encountered
Contractor:	General Borings
Equipment:	Kubota KX080-4

ID	Depth	Description
TP-1	0 - 11"	TOPSOIL, organic fibers, dark-brown, dry.
	11" - 2'-10"	NARROWLY GRADED SAND (SP); ~95% F-sand, ~5% NP fines, yellow-brown, dry to moist.
	2'-10" - 8'	WIDELY GRADED SAND WITH GRAVEL (SW); 88.1% F-C sand, 9.0% F-C gravel, 2.9% NP fines, light-brown, dry to moist.

Notes:
1. Thermal Conductivity test performed at 3.0 ft.
2. Infiltration test performed at 4.0 ft.
3. Groundwater not encountered, soil mottling not observed.
4. Excavation backfilled with excavated soils, compacted in lifts.

CT-11 BESS
Granby, CT
GEI Project No. 2405815
Test Pit Results

Date:	7/22/2024
GEI Representative:	T. Yurman
GS Elevation:	207.0
Depth to GW:	Not encountered
Contractor:	General Borings
Equipment:	Kubota KX080-4

ID	Depth	
TP-2	0 - 8"	TOPSOIL, organic fibers, dark-brown, dry.
	8" - 2'	NARROWLY GRADED SAND (SP); 95% F-sand, ~5% NP fines, some organic fibers, brown, dry to moist.
	2' - 3'-9"	WIDELY GRADED SAND WITH GRAVEL (SW); ~75% F-C sand, ~25% F-C gravel, light-brown, dry to moist.
	3'-9" - 6'	WIDELY GRADED SAND (SW); ~100% F-C sand, light-brown, dry to moist.

Notes:
1. Groundwater not encountered, soil mottling not evident.
2. Sidewalls collapsing at 6.0 ft, test pit terminated.
3. Excavation backfilled with excavated spoils, compacted in lifts.

CT-11 BESS
Granby, CT
GEI Project No. 2405815
Test Pit Results

Date:	7/22/2024
GEI Representative:	T. Yurman
GS Elevation:	207.0
Depth to GW:	Not encountered
Contractor:	General Borings
Equipment:	Kubota KX080-4

ID	Depth	Description
TP-3	0 - 10"	TOPSOIL, organic fibers, dark-brown, dry.
	10" - 2'-10"	NARROWLY GRADED SAND (SP); ~90% F-sand, ~5% F-gravel, ~5% NP fines, few organic fibers, orange-brown, dry to moist.
	2'-10" - 7'-8"	WIDELY GRADED SAND WITH GRAVEL (SW); 82.7% F-C sand, 17.0% F-M gravel, 0.3% NP fines, few organic fibers near top of layer, light-brown, dry to moist.

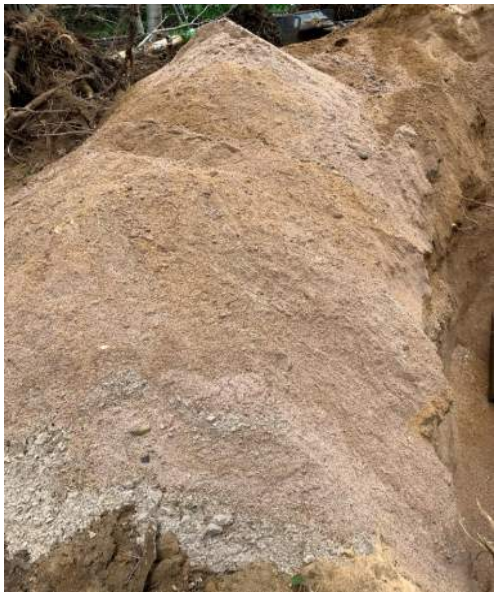
Notes:
1. Thermal Conductivity test performed at 3.0 ft.
2. Infiltration test performed at 4.5 ft.
3. Groundwater not encountered, soil mottling not evident.
4. Excavation backfilled with excavated spoils, compacted in lifts.

CT-11 BESS
Granby, CT
GEI Project No. 2405815
Test Pit Results

Date:	7/22/2024
GEI Representative:	T. Yurman
GS Elevation:	208.0
Depth to GW:	Not encountered
Contractor:	General Borings
Equipment:	Kubota KX080-4

ID	Depth	Description
TP-4	0 - 6"	TOPSOIL, organic fibers, dark-brown, dry.
	6" - 2'-2"	NARROWLY GRADED SAND (SP); ~90% F-sand, ~5% NP fines, ~5% F-gravel, some organic fibers, brown, dry to moist.
	2'-2" - 3'	WIDELY GRADED SAND WITH GRAVEL (SW); ~80% F-C sand, ~20% F-C gravel, light-brown, dry to moist.
	3' - 6'	WIDELY GRADED SAND (SW); ~95% F-C sand, ~5% F-C gravel, light-brown, dry to moist.

Notes:
1. Infiltration test performed at 4.0 ft.
2. Groundwater not encountered, soil mottling not evident.
3. Sidewalls collapsing at 6.0 ft, test pit terminated.
4. Excavation backfilled with excavated spoils, compacted in lifts.

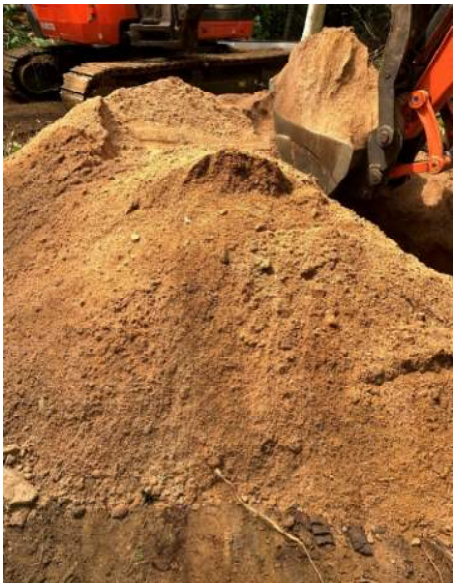


CT-11 BESS
Granby, CT
GEI Project No. 2405815
Test Pit Results

Date:	7/22/2024
GEI Representative:	T. Yurman
GS Elevation:	208.0
Depth to GW:	Not encountered
Contractor:	General Borings
Equipment:	Kubota KX080-4

ID	Depth	Description
TP-5	0 - 6"	TOPSOIL, organic fibers, dark-brown, dry.
	6" - 2'	NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% F-sand, ~10% NP fines, few organic fibers, brown, dry to moist.
	2' - 2'-8"	WIDELY GRADED SAND WITH GRAVEL (SW); ~85% F-C sand, ~15% F-C gravel, light-brown, dry to moist.
	2'-8" - 7'	WIDELY GRADED SAND (SW); ~100% F-C sand, light-brown, dry to moist.

Notes:
1. Thermal Conductivity test performed at 3.0 ft.
2. Groundwater not encountered, soil mottling not evident.
3. Sidewalls collapsing at 7.0 ft, test pit terminated.
4. Excavation backfilled with excavated soils, compacted in lifts.



CT-11 BESS
Granby, CT
GEI Project No. 2405815
Test Pit Results

Date:	7/22/2024
GEI Representative:	T. Yurman
GS Elevation:	208.5
Depth to GW:	Not encountered
Contractor:	General Borings
Equipment:	Kubota KX080-4

ID	Depth	Description
TP-6	0 - 6"	TOPSOIL, organic fibers, dark brown, dry.
	6" - 2'-3"	NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% F-sand, ~10% NP fines, some organic fibers, brown, dry to moist.
	2'-3" - 4'-6"	NARROWLY GRADED SAND (SP); 98.8% F-M sand, 1.2% NP fines, light-brown, dry to moist.
	4'-6" - 5'-1"	WIDELY GRADED SAND WITH GRAVEL (SW); ~80% F-C sand, ~20% F-C gravel, light-brown, dry to moist.
	5'-1" - 8'	WIDELY GRADED SAND (SW); ~95% F-C sand, ~5% F-C gravel, light-brown, dry to moist.

Notes:
1. Infiltration test performed at 3.5 ft.
2. Groundwater not encountered, soil mottling not evident.
3. Excavation backfilled with excavated spoils, compacted in lifts.

CT-11 BESS
Granby, CT
GEI Project No. 2405815
Test Pit Results

GEI Consultants
Consulting Engineers & Scientists

Date:	7/22/2024
GEI Representative:	T. Yurman
GS Elevation:	206.0
Depth to GW:	Not encountered
Contractor:	General Borings
Equipment:	Kubota KX080-4

ID	Depth	Description
TP-7	0 - 10"	TOPSOIL, organic fibers, dark-brown, dry.
	10" - 2'-11"	NARROWLY GRADED SAND (SP); ~90% F-sand, ~5% F-gravel, ~5% NP fines, some organic fibers, orange-brown, dry to moist.
	2'-11" - 4'	WIDELY GRADED SAND (SW); ~95% F-C sand, ~5% NP fines, light-brown, dry to moist.

Notes:
1. Groundwater not encountered, soil mottling not observed.
2. Excavation backfilled with excavated soils, compacted in lifts.

Appendix C

Laboratory Test Results

Client:	GEI Consultants, Inc.				
Project:	Granby Battery Storage				
Location:	Gramby, CT			Project No:	GTX-319590
Boring ID:	---	Sample Type:	---	Tested By:	ajl
Sample ID:	---	Test Date:	08/12/24	Checked By:	GA
Depth :	---	Test Id:	780858		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
TP-1	- --	4	Moist, brown sand	1.3
TP-3	- --	4	Moist, brown sand with gravel	1.3
TP-6	- --	2.5	Moist, brown sand	3.4

Notes: Temperature of Drying : 110º Celsius

Client:	GEI Consultants, Inc.
Project Name:	Granby Battery Storage
Project Location:	Granby, CT
GTX #:	319590
Test Date:	08/09/24
Tested By:	NMK
Checked By:	GA

Laboratory pH of Soil by ASTM G51

Boring ID	Sample ID	Depth, ft	Description	Soil Temperature, ° C	Average pH Reading
TP-7	COMPOSITE (3 Bags)	1-3 ft	Moist, dark yellowish brown silty sand with gravel	21.7	7.26

Notes:

Client:	GEI Consultants, Inc.
Project:	Granby Battery Storage
Location:	Granby, CT
GTX#:	319590
Test Date:	08/15/24
Due Date:	8/16/2024
Tested By:	NMK
Checked By:	GA

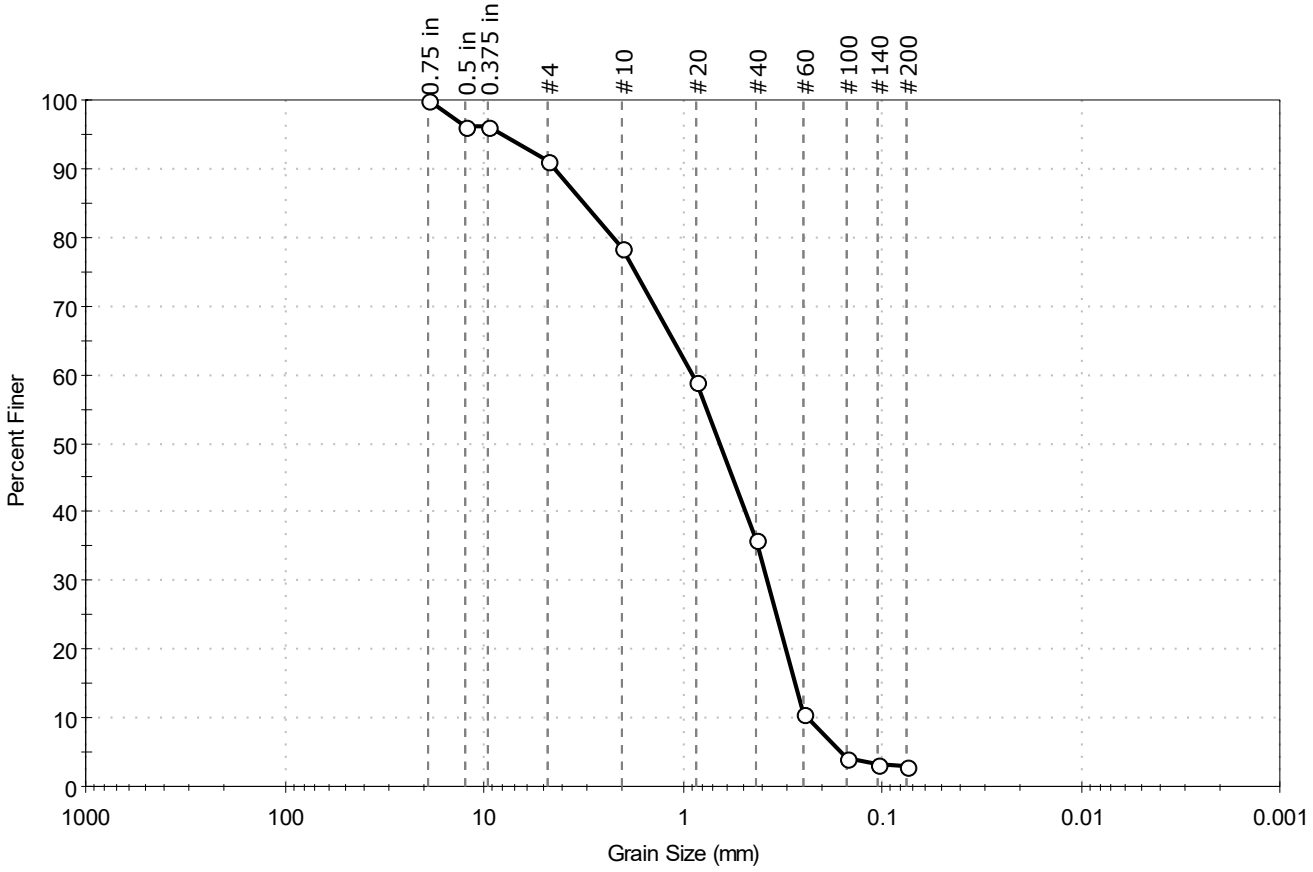
Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
TP-7	COMPOSITE (3 bags)	1-3 ft	Moist, dark yellowish brown silty sand with gravel	117,370	8.52E-06

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Client:	GEI Consultants, Inc.				
Project:	Granby Battery Storage				
Location:	Gramby, CT			Project No:	GTX-319590
Boring ID:	TP-1	Sample Type:	Bag	Tested By:	ajl
Sample ID:	---	Test Date:	08/16/24	Checked By:	GA
Depth :	4	Test Id:	780853		
Test Comment:	---				
Visual Description:	Moist, brown sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	9.0	88.1	2.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	96		
0.375 in	9.50	96		
#4	4.75	91		
#10	2.00	78		
#20	0.85	59		
#40	0.42	36		
#60	0.25	11		
#100	0.15	4		
#140	0.11	3		
#200	0.075	2.9		

Coefficients

D_{85} =3.1388 mm	D_{30} =0.3750 mm
D_{60} =0.8869 mm	D_{15} =0.2741 mm
D_{50} =0.6477 mm	D_{10} =0.2389 mm
C_u =3.712	C_c =0.664

Classification

ASTM — Poorly graded SAND (SP)

AASHTO — Stone Fragments, Gravel and Sand (A-1-b (1))

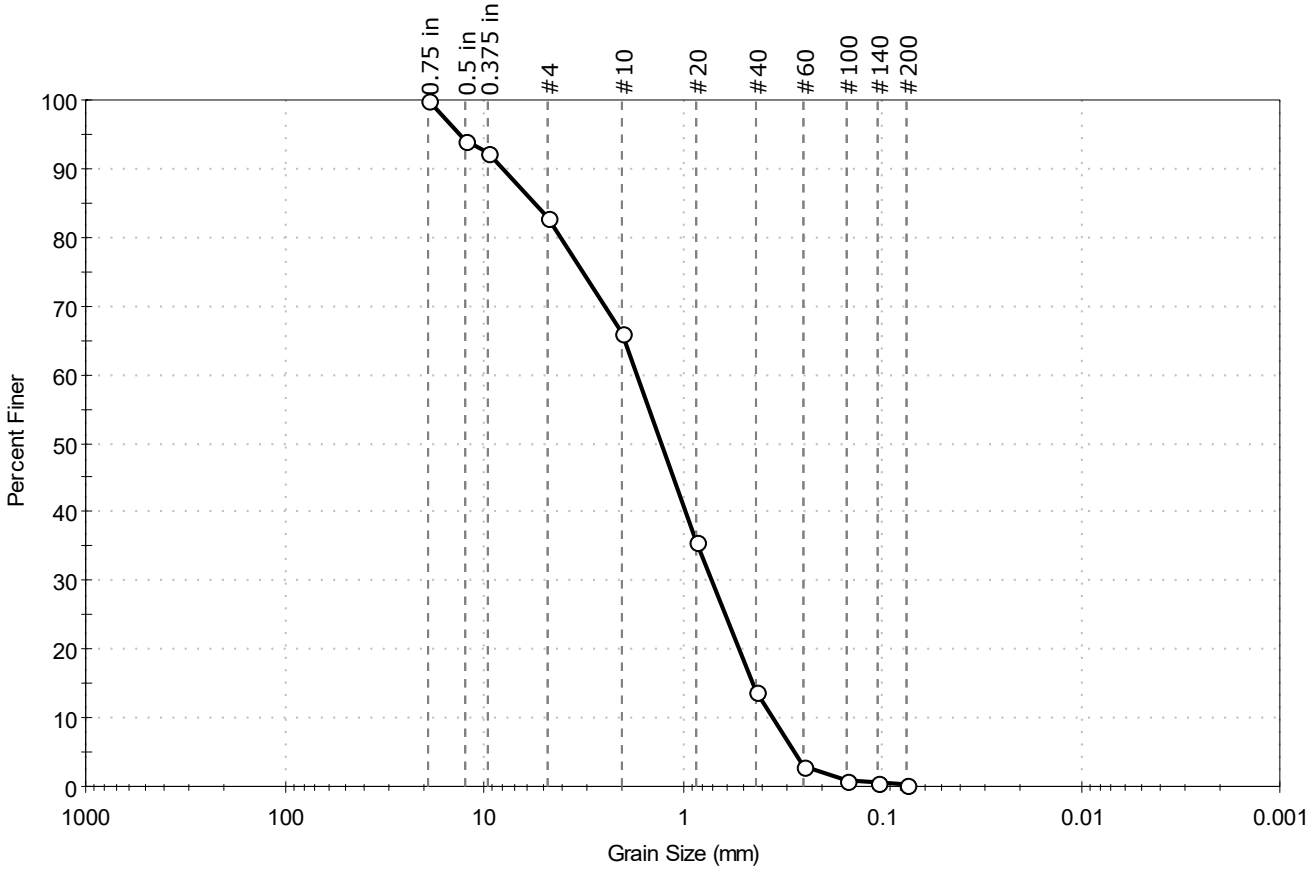
Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Client:	GEI Consultants, Inc.				
Project:	Granby Battery Storage				
Location:	Gramby, CT			Project No:	GTX-319590
Boring ID:	TP-3	Sample Type:	Bag	Tested By:	ajl
Sample ID:	---	Test Date:	08/16/24	Checked By:	GA
Depth :	4	Test Id:	780854		
Test Comment:	---				
Visual Description:	Moist, brown sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	17.0	82.7	0.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	94		
0.375 in	9.50	92		
#4	4.75	83		
#10	2.00	66		
#20	0.85	36		
#40	0.42	14		
#60	0.25	3		
#100	0.15	1		
#140	0.11	0		
#200	0.075	0.3		

Coefficients

D_{85} =5.5202 mm	D_{30} =0.7091 mm
D_{60} =1.6857 mm	D_{15} =0.4393 mm
D_{50} =1.2721 mm	D_{10} =0.3513 mm
C_u =4.798	C_c =0.849

Classification

ASTM — Poorly graded SAND with Gravel (SP)

AASHTO — Stone Fragments, Gravel and Sand (A-1-b (1))

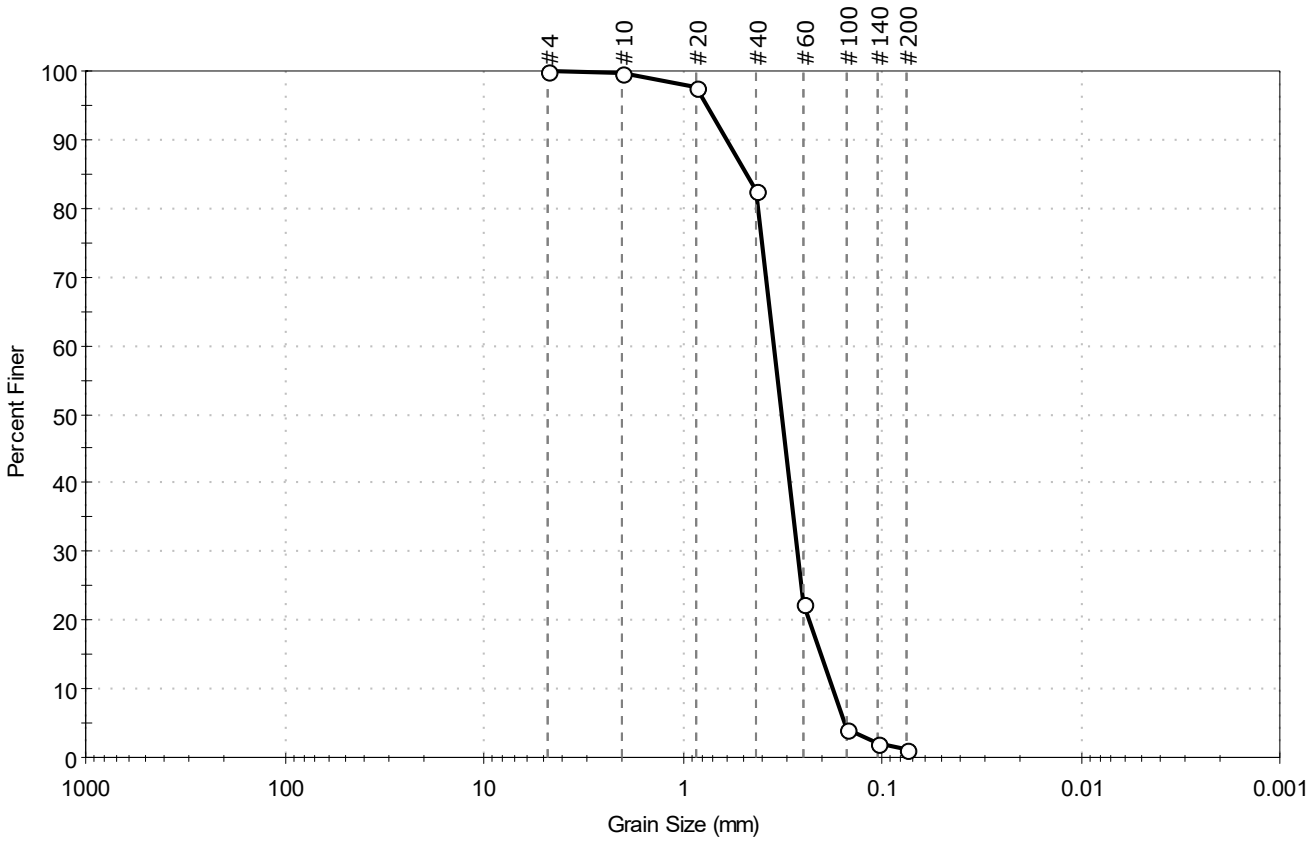
Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Client:	GEI Consultants, Inc.				
Project:	Granby Battery Storage				
Location:	Gramby, CT			Project No:	GTX-319590
Boring ID:	TP-6	Sample Type:	Bag	Tested By:	ajl
Sample ID:	---	Test Date:	08/16/24	Checked By:	GA
Depth :	2.5	Test Id:	780855		
Test Comment:	---				
Visual Description:	Moist, brown sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	98.8	1.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	98		
#40	0.42	83		
#60	0.25	23		
#100	0.15	4		
#140	0.11	2		
#200	0.075	1.2		

Coefficients

D_{85} =0.4725 mm	D_{30} =0.2670 mm
D_{60} =0.3479 mm	D_{15} =0.2028 mm
D_{50} =0.3185 mm	D_{10} =0.1766 mm
C_u =1.970	C_c =1.160

Classification

ASTM Poorly graded SAND (SP)

AASHTO Fine Sand (A-3 (1))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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GEOTESTING EXPRESS INCORPORATED
125 NAGOG PARK
ACTON MA 01720-3451
USA

Analysis No.	TS-A2412069
Report Date	16 August 2024
Date Sampled	09 August 2024
Date Received	14 August 2024
Where Sampled	Acton, MA USA
Sampled By	Client

This is to attest that we have examined: Soil: Project: Granby Battery Storage; Site Location: - — -; Job Number: GTX-319590

When examined to the applicable requirements of:

ASTM D 512-12*	"Standard Test Methods for Chloride Ion in Water" Method B
ASTM D 516-16	"Standard Test Method for Sulfate Ion in Water"

Results:

ASTM D 512 - Chloride Method B

Sample		Results		Minimum Detection Limit
		ppm (mg/kg)	%[1]	
TP-7		25.	0.0025	10.
Composite (3 Bags)	1 – 3'			

NOTE: [1]Percent by weight after drying and prepared as per the Standard. *Withdrawn 2021 without Replacement

ASTM D 516 – Sulfates (Soluble)

Sample		Results		Minimum Detection Limit
		ppm (mg/kg)	%[1]	
TP-7		< 10.	< 0.0010	10.
Composite (3 Bags)	1 – 3'			

NOTE: [1]Percent by weight after drying and prepared as per the Standard.

END OF ANALYSIS

USEPA Laboratory ID UT00930

Merrill Gee P.E. – Engineer in Charge

Appendix D

Infiltration Testing Results

GEI Consultants, Inc. **Calc. by:** T. Yurman **Date:** 8/6/2024
GEI Proj # 2405815 **Check by:** M. Glunt **Date:** 8/22/2024
Infiltrometer Testing
Granby CT-11 BESS

Test Date 7/22/2024

Field Data TP-1

Unit Turf-Tec
Unit Set 3"
GS Elev. 208
Depth of Test 4.0 FT
Depth to GW Not encountered
GEI Rep. T. Yurman
Soil Type WIDELY GRADED SAND WITH GRAVEL (SW); 88.1% F-C sand, 9.0% F-C gravel, 2.9% NP fines, light-brown, dry to moist.

Test 1

Time (min)	Time Change (min)	Change in Water Level (in)	Rate of Change (in/min)	Rate of Change (in/hr)
0.0				
0.17	0.2	0.625	3.75	225.0
0.33	0.2	0.625	3.75	225.0
0.50	0.2	0.625	3.75	225.0
0.67	0.2	0.5	3	180.0
			Steady Rate of Change, R_1 (in/hr)	**180.0**

Test 2

Time (min)	Time Change (min)	Change in Water Level (in)	Rate of Change (in/min)	Rate of Change (in/hr)
0.00				
0.17	0.2	0.5625	3.375	202.5
0.33	0.2	0.75	4.5	270.0
0.50	0.2	0.5625	3.375	202.5
0.67	0.2	0.5	3	180.0
			Steady Rate of Change, R_1 (in/hr)	**180.0**

GEI Consultants, Inc. **Calc. by:** T. Yurman **Date:** 8/6/2024
GEI Proj # 2405815 **Check by:** M. Glunt **Date:** 8/22/2024
Infiltrometer Testing
Granby CT-11 BESS

Test Date 7/22/2024

Field Data TP-3

Unit Turf-Tec
Unit Set 3"
GS Elev. 207
Depth of Test 4.5 FT
Depth to GW Not encountered
GEI Rep. T. Yurman
Soil Type WIDELY GRADED SAND WITH GRAVEL (SW); 82.7% F-C sand, 17.0% F-M gravel, 0.3% NP fines, few organic fibers near top of layer, light-brown, dry to moist.

Test 1

Time (min)	Time Change (min)	Change in Water Level (in)	Rate of Change (in/min)	Rate of Change (in/hr)
0.00				
0.17	0.2	0.5	3	180.0
0.33	0.2	0.4375	2.625	157.5
0.50	0.2	0.4375	2.625	157.5
0.67	0.2	0.4375	2.625	157.5
0.83	0.2	0.375	2.25	135.0
1.00	0.2	0.375	2.25	135.0
1.17	0.2	0.375	2.25	135.0
			Steady Rate of Change, R_1 (in/hr)	**135.0**

Test 2

Time (min)	Time Change (min)	Change in Water Level (in)	Rate of Change (in/min)	Rate of Change (in/hr)
0				
0.17	0.2	0.4375	2.625	157.5
0.33	0.2	0.4375	2.625	157.5
0.50	0.2	0.375	2.25	135.0
0.67	0.2	0.375	2.25	135.0
0.83	0.2	0.375	2.25	135.0
1.00	0.2	0.3125	1.875	112.5
1.17	0.2	0.3125	1.875	112.5
1.33	0.2	0.25	1.5	90.0
			Steady Rate of Change, R_1 (in/hr)	**90.0**

GEI Consultants, Inc. **Calc. by:** T. Yurman **Date:** 8/6/2024
GEI Proj # 2405815 **Check by:** M. Glunt **Date:** 8/22/2024
Infiltrometer Testing
Granby CT-11 BESS

Test Date 7/22/2024

Field Data TP-4

Unit Turf-Tec
Unit Set 3"
GS Elev. 208
Depth of Test 4.0 FT
Depth to GW Not encountered
GEI Rep. T. Yurman
Soil Type WIDELY GRADED SAND (SW); ~95% F-C sand, ~5% F-C gravel, light-brown, dry to moist.

Test 1

Time (min)	Time Change (min)	Change in Water Level (in)	Rate of Change (in/min)	Rate of Change (in/hr)
0.00				
0.17	0.2	0.625	3.75	225.0
0.33	0.2	0.5	3	180.0
0.50	0.2	0.4375	2.625	157.5
0.67	0.2	0.4375	2.625	157.5
0.83	0.2	0.4375	2.625	157.5
1.00	0.2	0.3125	1.875	112.5
			Steady Rate of Change, R_1 (in/hr)	**112.5**

Test 2

Time (min)	Time Change (min)	Change in Water Level (in)	Rate of Change (in/min)	Rate of Change (in/hr)
0.00				
0.17	0.2	0.5	3	180.0
0.33	0.2	0.4375	2.625	157.5
0.50	0.2	0.375	2.25	135.0
0.67	0.2	0.4375	2.625	157.5
0.83	0.2	0.3125	1.875	112.5
1.00	0.2	0.3125	1.875	112.5
1.17	0.2	0.375	2.25	135.0
			Steady Rate of Change, R_1 (in/hr)	**123.8**

GEI Consultants, Inc. **Calc. by:** T. Yurman **Date:** 8/6/2024
GEI Proj # 2405815 **Check by:** M. Glunt **Date:** 8/22/2024
Infiltrometer Testing
Granby CT-11 BESS

Test Date 7/22/2024

Field Data TP-6

Unit Turf-Tec
Unit Set 3"
GS Elev. 208.5
Depth of Test 4.0 FT
Depth to GW Not encountered
GEI Rep. T. Yurman
Soil Type NARROWLY GRADED SAND (SP); 98.8% F-M sand, 1.2% NP fines, light-brown, dry to moist.

Test 1

Time (min)	Time Change (min)	Change in Water Level (in)	Rate of Change (in/min)	Rate of Change (in/hr)
0.00				
0.17	0.2	0.3125	1.875	112.5
0.33	0.2	0.3125	1.875	112.5
0.50	0.2	0.25	1.5	90.0
0.67	0.2	0.25	1.5	90.0
0.83	0.2	0.3125	1.875	112.5
1.00	0.2	0.3125	1.875	112.5
1.17	0.2	0.25	1.5	90.0
1.33	0.2	0.25	1.5	90.0
1.50	0.2	0.25	1.5	90.0
			Steady Rate of Change, R_1 (in/hr)	**90.0**

Test 2

Time (min)	Time Change (min)	Change in Water Level (in)	Rate of Change (in/min)	Rate of Change (in/hr)
0.00				
0.17	0.2	0.25	1.5	90.0
0.33	0.2	0.3125	1.875	112.5
0.50	0.2	0.3125	1.875	112.5
0.67	0.2	0.25	1.5	90.0
0.83	0.2	0.25	1.5	90.0
1.00	0.2	0.25	1.5	90.0
1.17	0.2	0.3125	1.875	112.5
1.33	0.2	0.4375	2.625	157.5
1.50	0.2	0.25	1.5	90.0
			Steady Rate of Change, R_1 (in/hr)	**90.0**

Appendix E

In-situ Resistivity Testing Results

Resistivity Testing Results
GEI Project Number 2405815-1.1
Site Name: CT-11 Granby BESS

Tested By: Mahmoodabadi/Yurman
Date: 8/16/24
Location: ER-1 (See Plan)
Orientation: 232 degrees Southwest
Weather: Cloudy, 70°F
Surface: TOPSOIL, moist

Spacing (feet)			Readings			Apparent Resistivity E-W (Ohm-cm)	Notes
"a"	Potential	Current	Potential (Volts)	Current (mAmp)	Resistivity E-W (Ohms)		
1	0.5	1.5	400	10	NA	NA	High range. Resistivity out of range.
2.5	1.25	3.75	400	10	1389.0	665,024	High range.
5	2.5	7.5	400	10	1008	965,218	High range.
10	5	15	400	10	687	1,315,684	High range.
20	10	30	400	10	432	1,654,659	High range.
40	20	60	400	10	171.3	1,312,237	High range.

Resistivity Testing Results
GEI Project Number 2405815-1.1
Site Name: CT-11 Granby BESS

Tested By: Mahmoodabadi/Yurman
Date: 8/16/24
Location: ER-1 (See Plan)
Orientation: 327 degrees Northwest
Weather: Cloudy, 70°F
Surface: TOPSOIL, moist

Spacing (feet)			Readings			Apparent Resistivity E-W (Ohm-cm)	Notes
"a"	Potential	Current	Potential (Volts)	Current (mAmp)	Resistivity E-W (Ohms)		
1	0.5	1.5	400	10	NA	NA	High range. Resistivity out of range.
2.5	1.25	3.75	400	10	1269.0	607,570	High range.
5	2.5	7.5	400	10	1027.0	983,411	High range.
10	5	15	400	10	731	1,399,949	High range.
20	10	30	400	10	403	1,543,583	High range.
40	20	60	400	10	156.3	1,197,330	High range.

Resistivity Testing Results
GEI Project Number 2405815-1.1
Site Name: CT-11 Granby BESS

Tested By: Mahmoodabadi/Yurman
Date: 8/16/24
Location: ER-2 (See Plan)
Orientation: 240 degrees Southwest
Weather: Cloudy, 70°F
Surface: TOPSOIL, moist

Spacing (feet)			Readings			Apparent Resistivity E-W (Ohm-cm)	Notes
"a"	Potential	Current	Potential (Volts)	Current (mAmp)	Resistivity E-W (Ohms)		
1	0.5	1.5	400	10	1024	196,108	High range.
2.5	1.25	3.75	400	10	704.0	337,060	High range.
5	2.5	7.5	400	10	639	611,879	High range.
10	5	15	400	10	568	1,087,785	High range.
20	10	30	400	10	424.0	1,624,017	High range.
40	20	60	400	10	172.3	1,319,897	High range.

Resistivity Testing Results
GEI Project Number 2405815-1.1
Site Name: CT-11 Granby BESS

Tested By: Mahmoodabadi/Yurman
Date: 8/16/24
Location: ER-2 (See Plan)
Orientation: 342 degrees North
Weather: Sunny, 70°F
Surface: TOPSOIL, moist

Spacing (feet)			Readings			Apparent Resistivity E-W (Ohm-cm)	Notes
"a"	Potential	Current	Potential (Volts)	Current (mAmp)	Resistivity E-W (Ohms)		
1	0.5	1.5	400	10	903	172,935	Re-tested to confirm.
2.5	1.25	3.75	400	10	949.0	454,361	High range.
5	2.5	7.5	400	10	580.0	555,383	High range.
10	5	15	400	10	542	1,037,992	High range.
20	10	30	400	10	457	1,750,415	High range.
40	20	60	400	10	190.0	1,455,487	High range.

Appendix F

Recommended Material Specifications

Recommended Material Specifications
CT 11 BESS
Granby, CT

Per the Geotechnical Report, native sands soils can likely be re-used as Structural Fill or Ordinary Fill, provided the material can meet the appropriate compaction requirements, does not contain deleterious materials, and is stable under the weight of construction equipment.

Soils to be used as fill imported from off-site should also meet the below gradation requirements. Fill placed within the building limits, within a 3-foot-wide zone outside foundation walls, and under all pavements and slabs should meet the compaction requirements for Structural Fill. Backfill placed in areas that will not support structural or paved elements should meet the compaction requirements for Ordinary Fill. Proposed borrow materials that fall slightly outside of these specifications may also be suitable for use, subject to review and approval by GEI.

Structural Fill

Structural Fill should consist of hard, durable sand and gravel. It should be free of clay, organic matter, surface coatings, and other deleterious materials. Soil finer than the No. 200 sieve (the "fines") should be nonplastic. Structural Fill shall meet the following gradation requirements:

Sieve Size	Percent Passing by Weight
3 inches	100
1 - ½ inch	55 – 100
No. 4	35 – 85
No. 16	20 – 65
No. 50	5 – 40
No. 200 (fines)	0 – 10

Structural Fill should be compacted in maximum 12-inch-thick, loose lifts to at least 95 percent of the maximum dry density determined in accordance with ASTM D1557 (Modified AASHTO Compaction). The moisture content should be held to within +/- 3 percent of optimum moisture content (as determined by ASTM D1557).

Ordinary Fill

Ordinary fill should consist of hard, durable sand and gravel, free of clay, organic matter, surface coatings, and other deleterious materials. Soil finer than the No. 200 sieve (the "fines") should be nonplastic. Ordinary Fill shall meet the following gradation requirements:

Sieve Size	Percent Passing by Weight
6 inches	100
3 inches	80 – 100
No. 4	20 – 100
No. 200 (fines)	0 – 20

Ordinary fill should be compacted in maximum 12-inch-thick, loose lifts to at least 92 percent of the maximum dry density determined in accordance with ASTM D1557 (Modified AASHTO Compaction). The moisture content should be held to within +/- 3 percent of optimum moisture content (as determined by ASTM D1557).

Crushed Stone

Crushed Stone should consist of a ¾-inch size durable crushed rock or durable crushed gravel stone and shall conform to the requirements of the ConnDOT Form 819, Section M.01.01, No. 6. Crushed stone should be compacted with at least four passes of a vibratory compactor.

Geotextile Fabric

Geotextile fabric should be a non-woven fabric, consisting of Mirafi 140N or an approved equivalent product.